



## FCC PART 15.247

### TEST REPORT

For

#### HSE SMART INC

14453 Hillcroft Street Suite 250, Houston, Texas, United States

**FCC ID: 2BQXR-HSEBT5C1**

<b>Report Type:</b> Original Report	<b>Product Name:</b> Tsubame_D
<b>Report Number:</b> <u>RKSA250507001-00A</u>	
<b>Report Date:</b>	<u>2025-06-05</u>
<b>Reviewed By:</b>	<u>Bard Liu</u> 
<b>Approved By:</b>	<u>Kyle Xu</u> 
<b>Prepared By:</b>	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road, Kunshan, Jiangsu Province, China Tel: +86-512-86175000 Fax: +86-512-88934268 <a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a>

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

<b>REPORT REVISION HISTORY</b> .....	<b>4</b>
<b>GENERAL INFORMATION</b> .....	<b>5</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....	5
OBJECTIVE .....	5
TEST METHODOLOGY .....	5
MEASUREMENT UNCERTAINTY .....	6
TEST FACILITY .....	6
<b>SYSTEM TEST CONFIGURATION</b> .....	<b>7</b>
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
<b>TEST EQUIPMENT LIST</b> .....	<b>11</b>
<b>SUMMARY OF TEST RESULTS</b> .....	<b>12</b>
<b>FCC §1.1310 &amp; §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)</b> .....	<b>13</b>
<b>FCC §15.203 – ANTENNA REQUIREMENT</b> .....	<b>14</b>
APPLICABLE STANDARD .....	14
ANTENNA CONNECTOR CONSTRUCTION .....	14
<b>FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS</b> .....	<b>15</b>
APPLICABLE STANDARD .....	15
TEST SYSTEM SETUP.....	15
EMI TEST RECEIVER SETUP.....	15
TEST PROCEDURE .....	16
TEST RESULTS SUMMARY .....	16
TEST DATA: SEE APPENDIX .....	16
<b>FCC §15.209, §15.205 &amp; §15.247(d) - SPURIOUS EMISSIONS</b> .....	<b>17</b>
APPLICABLE STANDARD .....	17
TEST SYSTEM SETUP.....	17
EMI TEST RECEIVER SETUP.....	18
TEST PROCEDURE .....	18
TEST RESULTS SUMMARY .....	19
TEST DATA: SEE APPENDIX .....	19
<b>FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH</b> .....	<b>20</b>
APPLICABLE STANDARD .....	20
TEST PROCEDURE .....	20
TEST DATA: SEE APPENDIX .....	20
<b>FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER</b> .....	<b>21</b>
APPLICABLE STANDARD .....	21
TEST PROCEDURE .....	21
TEST DATA: SEE APPENDIX .....	21
<b>FCC §15.247(d) – BAND EDGE</b> .....	<b>22</b>
APPLICABLE STANDARD .....	22
TEST PROCEDURE .....	22
TEST DATA: SEE APPENDIX .....	22
<b>FCC §15.247(e) - POWER SPECTRAL DENSITY</b> .....	<b>23</b>

APPLICABLE STANDARD .....	23
TEST PROCEDURE .....	23
TEST DATA: SEE APPENDIX .....	23
<b>EUT PHOTOGRAPHS .....</b>	<b>24</b>
<b>TEST SETUP PHOTOGRAPHS .....</b>	<b>25</b>
<b>APPENDIX - TEST DATA.....</b>	<b>26</b>
AC LINE CONDUCTED EMISSIONS .....	26
SPURIOUS EMISSIONS.....	30
6 DB EMISSION BANDWIDTH .....	52
MAXIMUM CONDUCTED OUTPUT POWER.....	54
BAND EDGE .....	56
CONDUCTED SPURIOUS EMISSION.....	58
POWER SPECTRAL DENSITY .....	60

**REPORT REVISION HISTORY**

Number of Revisions	Report No.	Version	Issue Date	Description
0	RKSA250507001-00A	R1V1	2025-06-05	Initial Release

## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

Applicant:	HSE SMART INC
Tested Model:	Tsubame_D
Product Name:	Tsubame_D
Power Supply:	DC 3.3V
RF Function:	BLE
Operating Band/Frequency:	2402-2480 MHz
Maximum Output Power:	BLE (1 Mbps): 3.14 dBm BLE (2 Mbps): 2.88 dBm
Channel Number:	40
Channel Separation:	2 MHz
Modulation Type	GFSK
Antenna Type:	Monopole Antenna
★Maximum Antenna Gain:	-0.8 dBi

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

*All measurement and tested data in this report was gathered from production sample serial number: RKSA250507001-1 (Assigned by BACL (Kunshan). The EUT supplied by the applicant was received on 2025-05-07.)*

### Objective

This report is prepared for *HSE SMART INC* 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.

**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 1M /2M 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: BDT\_EMI Tool

★Power level: 5.8

Note: The power level was declared by the applicant.

### Special Accessories

No special accessory.

### Equipment Modifications

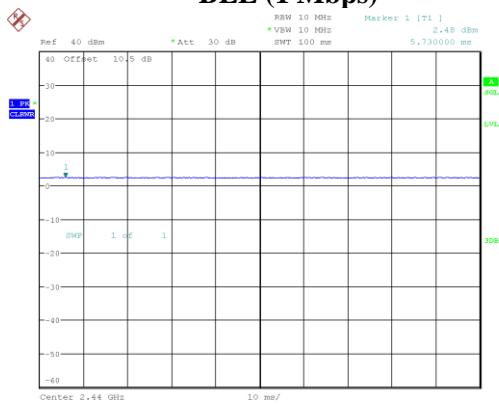
No modification was made to the EUT tested.

## **Environmental Conditions & Test Information**

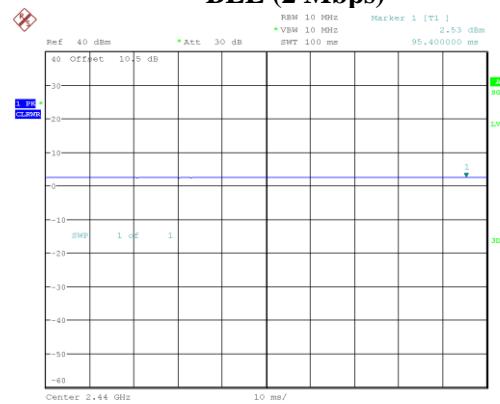
<b>Test Date:</b>	2025-05-26
<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	53 %
<b>ATM Pressure:</b>	101.9 kPa
<b>Test Result:</b>	Pass
<b>Test Engineer:</b>	Neil Zhou

## Duty Cycle:

### BLE (1 Mbps)



## BLE (2 Mbps)



ProjectNo.:RKS A250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:18:57

ProjectNo.:RKS A250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:49:20

Mode	Duty Cycle (%)	T <sub>on</sub> (ms)	T <sub>on+off</sub> (ms)
BLE (1 Mbps)	100	100	100
BLE (2 Mbps)	100	100	100

## Support Equipment List and Details

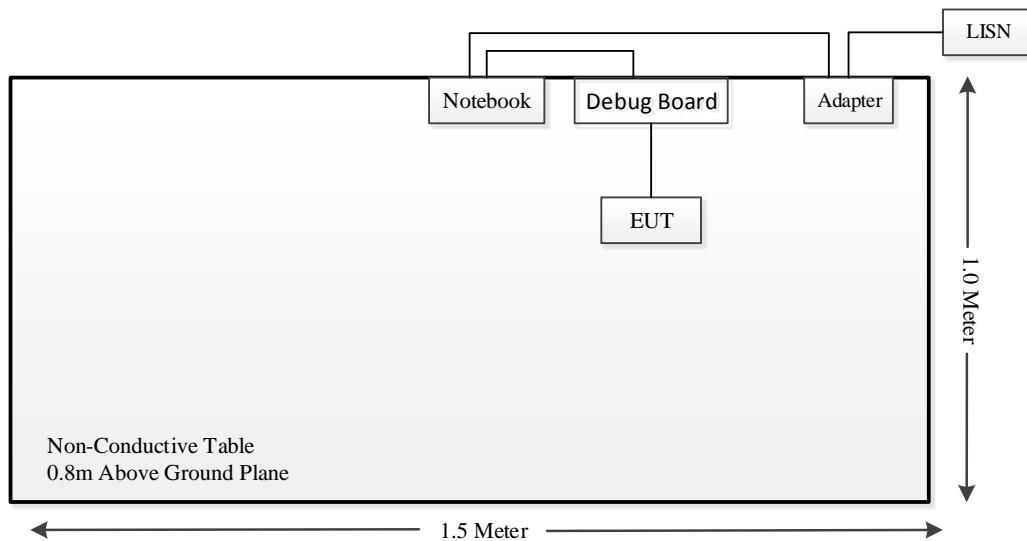
Manufacturer	Description	Model	Serial Number
Lenovo	Notebook	Thinkpad T470S	83ECAF1B-E1AF-4053-95DE-2E51B8D188D7
/	Adapter	/	/
/	Debug Board	/	/

## External I/O Cable

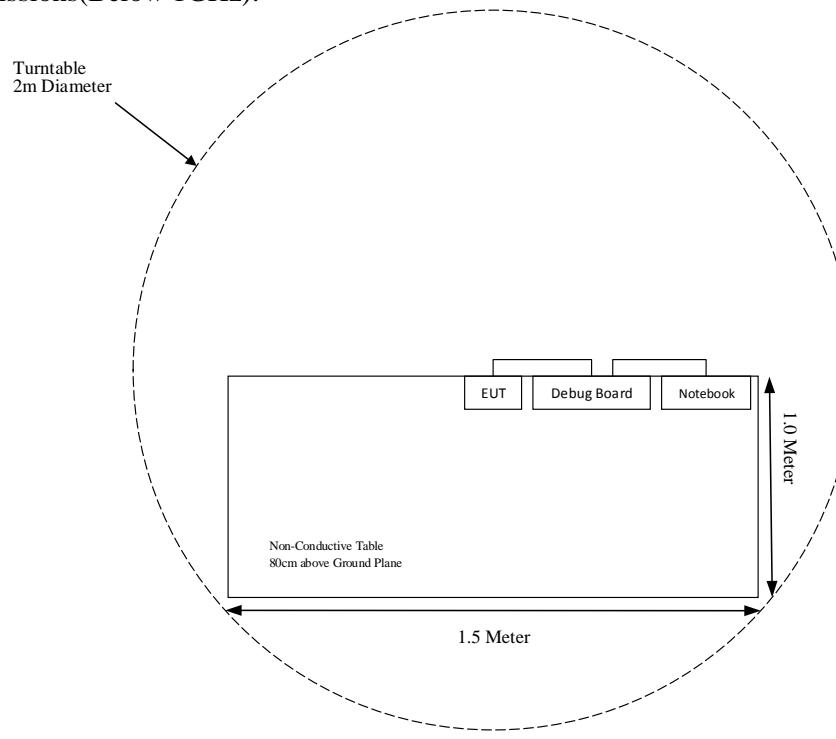
Cable Description	Length (m)	From Port	To Port
Power Cable 1	1.0	LISN	Adapter
Power Cable 2	1.5	Notebook	Adapter
Data Cable	0.1	EUT	Debug Board
USB Cable	0.2/0.5/1.5	Notebook	Debug Board

## Block Diagram of Test Setup

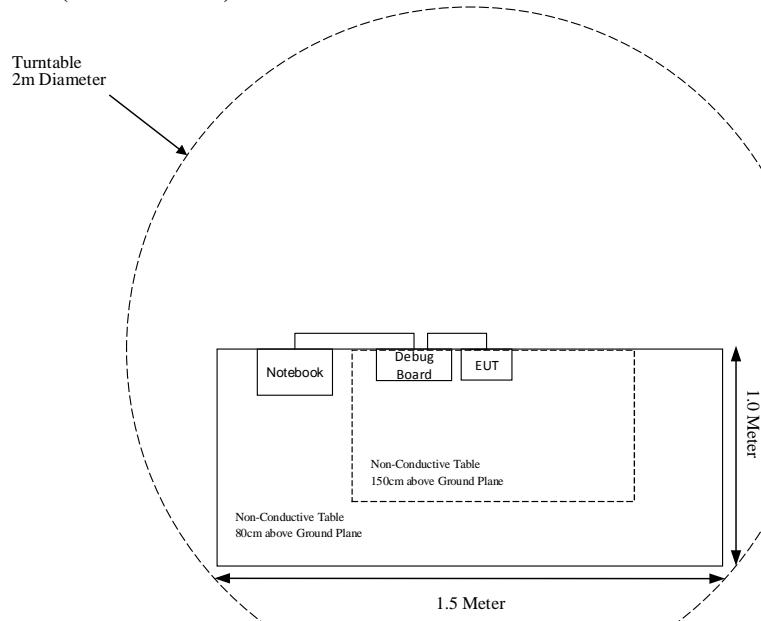
For Conducted Emissions:



For Radiated Emissions(Below 1GHz):



For Radiated Emissions(Above 1GHz):



## TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>Radiated Emission Test (Chamber #1)</b>					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2025-04-09	2026-04-08
Sunol Sciences	Broadband Antenna	JB3	A090314-1	2024-11-08	2027-11-07
Narda	6dB Attenuator	773-6	10690812-2-1	2024-11-08	2027-11-07
BACL	Active Loop Antenna	1313-1A	4041511	2024-11-22	2027-11-21
Sonoma Instrument	Pre-amplifier	310N	171205	2025-04-09	2026-04-08
Rohde & Schwarz	Auto Test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-8	008	2025-04-09	2026-04-08
MICRO-COAX	Coaxial Cable	Cable-9	009	2025-04-09	2026-04-08
MICRO-COAX	Coaxial Cable	Cable-10	010	2025-04-09	2026-04-08
<b>Radiated Emission Test (Chamber #2)</b>					
Rohde & Schwarz	EMI Test Receiver	ESU40	100207/040	2025-04-09	2026-04-08
ETS-LINDGREN	Horn Antenna	3115	9311-4159	2024-12-02	2025-12-01
ETS-LINDGREN	Horn Antenna	3116	2516	2024-12-12	2027-12-11
A.H.Systems, inc	Amplifier	PAM-0118P	512	2025-04-09	2026-04-08
SELECTOR	Amplifier	EM18G40G	060726	2025-04-09	2026-04-08
MICRO-TRONICS	Band Reject Filter	BRM50702	G024	2024-08-05	2025-08-04
Narda	Attenuator	10dB	010	2025-04-08	2026-04-07
Rohde & Schwarz	Auto test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-6	006	2025-04-09	2026-04-08
MICRO-COAX	Coaxial Cable	Cable-11	011	2025-04-09	2026-04-08
MICRO-COAX	Coaxial Cable	Cable-12	012	2025-04-09	2026-04-08
MICRO-COAX	Coaxial Cable	Cable-13	013	2025-04-09	2026-04-08
<b>RF Conducted Test</b>					
Rohde & Schwarz	Spectrum Analyzer	FSU26	200103	2025-04-09	2026-04-08
Narda	Attenuator	10dB	010	2025-04-08	2026-04-07
XHFDZ	RG316 Coaxial Cable	SMA-316	XHF-1175	Each time	N/A
<b>Conducted Emission Test</b>					
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2024-07-28	2025-07-27
Rohde & Schwarz	LISN	ENV216	101115	2025-04-08	2026-04-07
Audix	Test Software	e3	V9	N/A	N/A
Rohde & Schwarz	Pulse limiter	ESH3-Z2	100552	2025-04-08	2026-04-07
MICRO-COAX	Coaxial Cable	Cable-15	015	2025-04-08	2026-04-07

**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(d)	Conducted Spurious Emission	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 <sup>2</sup> )	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	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/4πR<sup>2</sup> = power density (in appropriate units, e.g. mW/cm<sup>2</sup>);

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 <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
		(dBi)	(numeric)	(dBm)	(mW)			
BLE	2402-2480	-0.8	0.83	3.5	2.24	20	0.0004	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 Monopole Antenna for BLE, and the antenna gain is -0.8 dBi, use a unique type of connector to attach to the EUT, fulfill the requirement of this section. Please refer to the EUT photos.

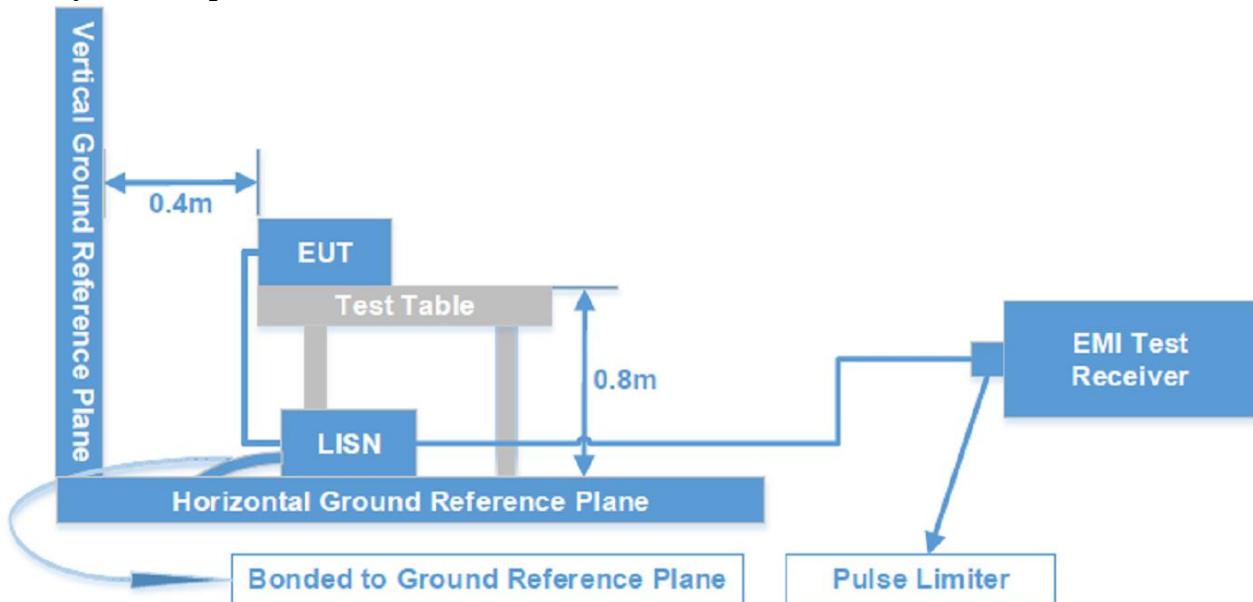
**Result:** Compliant.

## 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

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

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

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

**Test Procedure**

ANSI C63.10-2013 clause 6.2

During the conducted emission test, the 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:

$$\begin{aligned} \text{Factor (dB)} &= \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)} \\ \text{Level (dB}\mu\text{V)} &= \text{Read level (dB}\mu\text{V)} + \text{Factor (dB)} \end{aligned}$$

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:

$$\text{Over Limit (dB)} = \text{Level (dB}\mu\text{V)} - \text{Limit (dB}\mu\text{V)}$$

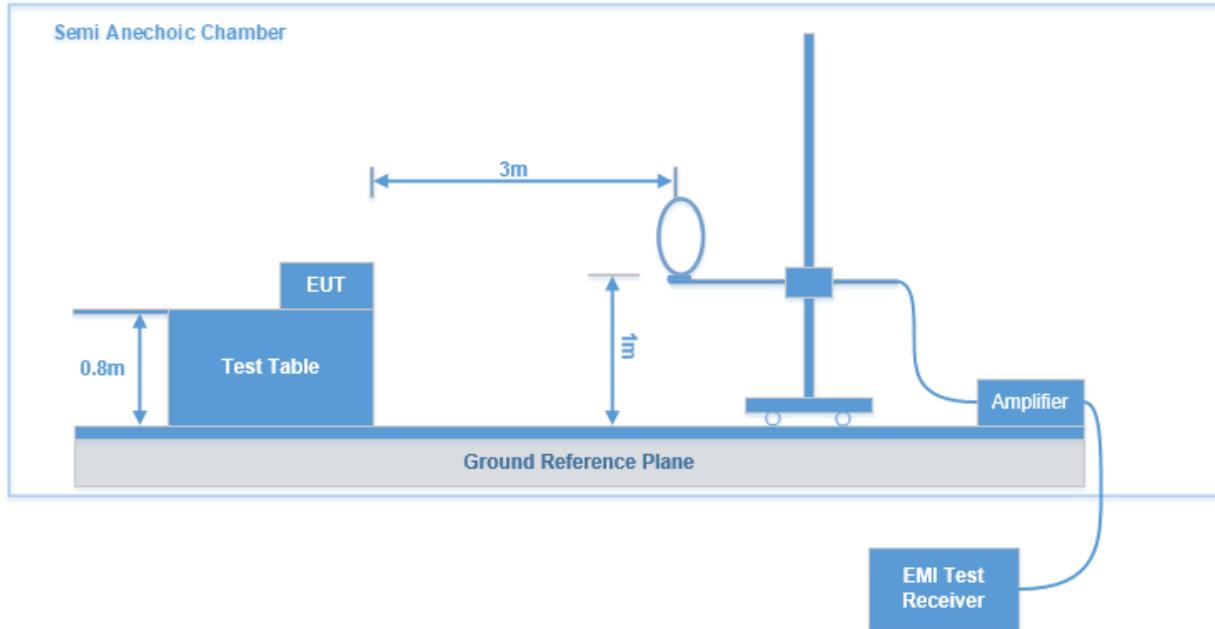
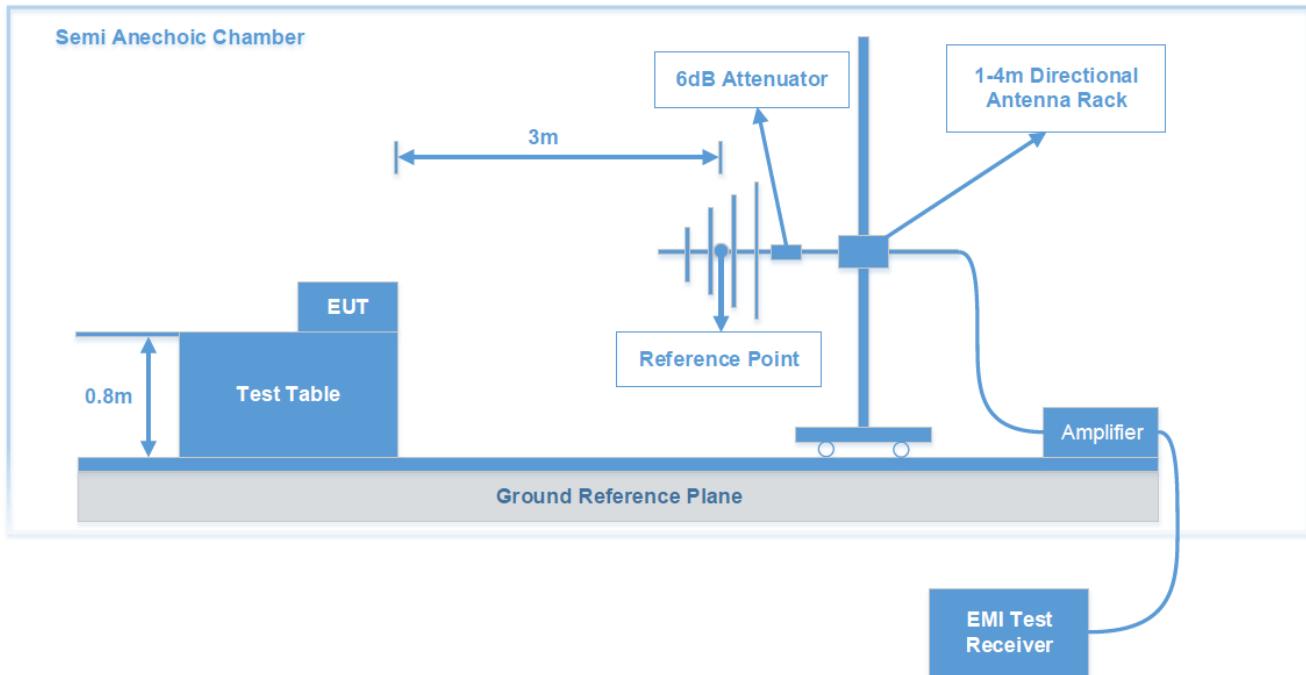
**Test Results Summary**

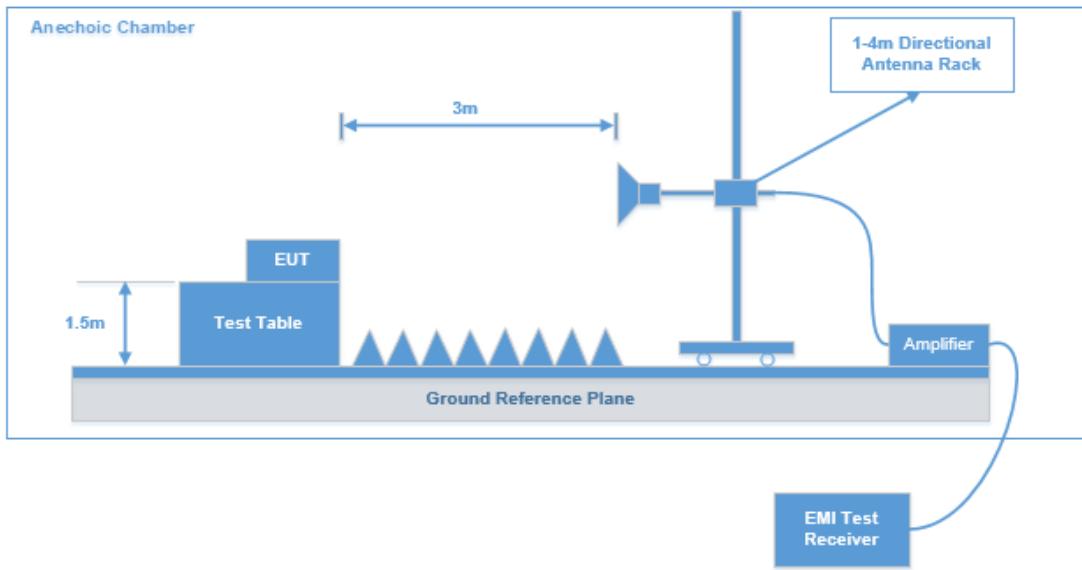
According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

**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**

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 $\mu$ V/m) = Meter Reading (dB $\mu$ 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 $\mu$ V/m) - Corrected Amplitude (dB $\mu$ V/m)

Note: The QuasiPeak (dB $\mu$ V/m), MaxPeak (dB $\mu$ V/m), Average (dB $\mu$ 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

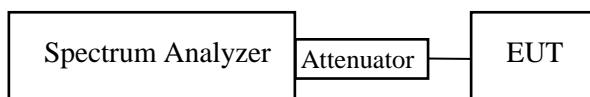
### Applicable Standard

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.



Note: the offset=Attenuator (10dB) + Cable loss (0.5dB) has been added in Spectrum Analyzer.

### Test Data: See Appendix

## FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

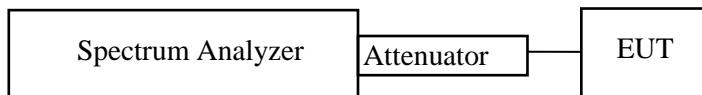
### Applicable Standard

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  $\text{RBW} \geq \text{DTS}$  bandwidth.
2. Set  $\text{VBW} \geq 3 * \text{RBW}$ .
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.



Note: the offset=Attenuator (10dB) + Cable loss (0.5dB) has been added in Spectrum Analyzer.

### Test Data: See Appendix

## FCC §15.247(d) – BAND EDGE

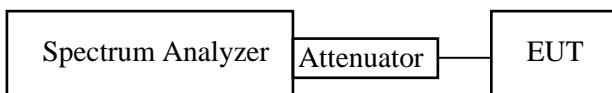
### Applicable Standard

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.



Note: the offset=Attenuator (10dB) + Cable loss (0.5dB) has been added in Spectrum Analyzer.

### Test Data: See Appendix

## FCC §15.247(e) - POWER SPECTRAL DENSITY

### Applicable Standard

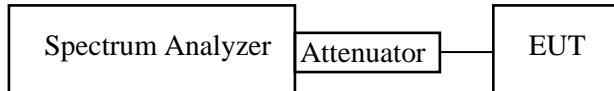
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of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



Note: the offset=Attenuator (10dB) + Cable loss (0.5dB) has been added in Spectrum Analyzer.

### 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

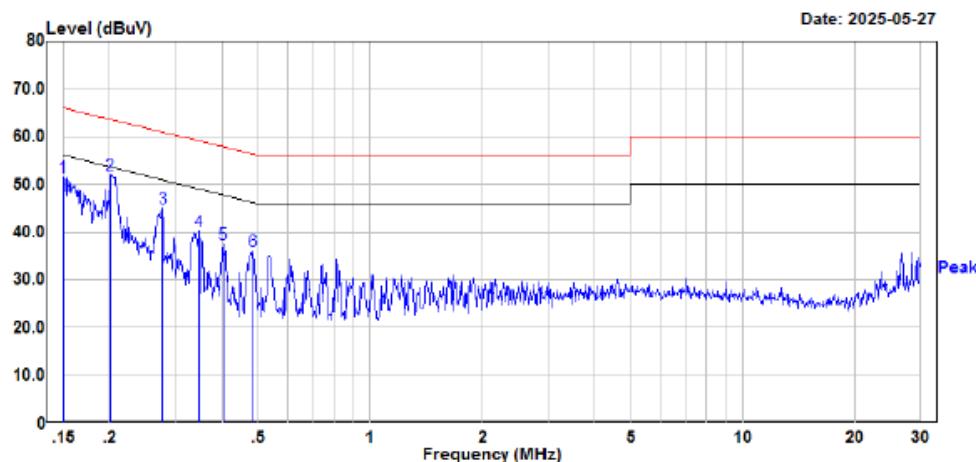
### AC LINE CONDUCTED EMISSIONS

#### Environmental Conditions & Test Information

Test Date:	2025-05-19 to 2025-05-27
Temperature:	23.2-23.6 °C
Relative Humidity:	50-56 %
ATM Pressure:	101.0-101.8 kPa
Test Result:	Pass
Test Engineer:	Myles Miao

EUT operation mode: Transmitting in BLE (1 Mbps) low channel (maximum output power)

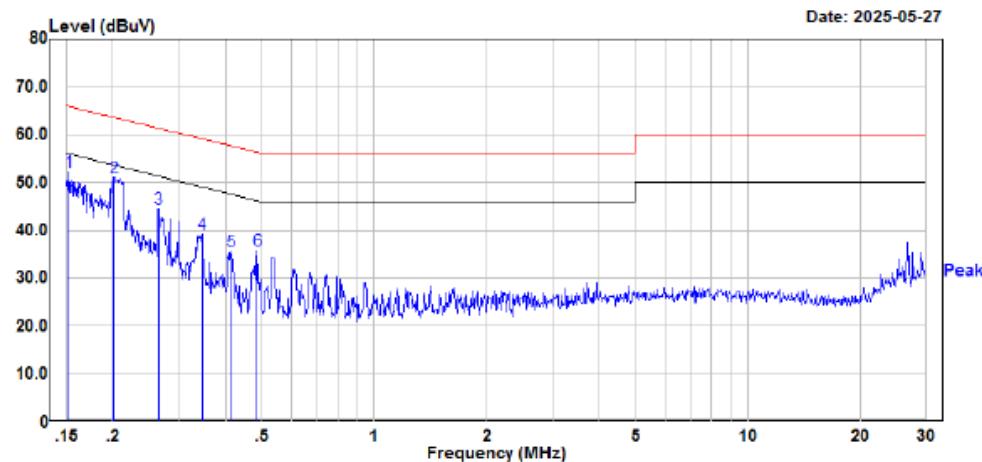
AC 120V/60 Hz, Line



Site : CE  
 Condition : limit\FCC PART 15.207  
 : DET:Peak  
 Project No. : RKSA250507001  
 Model : Tsubame\_D  
 Phase : L  
 Voltage : 120V/60Hz  
 Mode : BLE 1M  
 Test Equipment : ENV216, ESR3  
 Receiver Setting : RBW: 9 kHz, Sweep Time: Auto  
 Temperature : 23.2°C  
 Humidity : 50%  
 Atmospheric pressure: 101.8KPa  
 Test Engineer : Myles Miao

Freq	Read		Limit		Over	Remark
	MHz	dBuV	dB	dBuV	dB	
1	0.150	31.32	20.13	51.45	66.00	-14.55 Peak
2	0.200	31.90	20.15	52.05	63.60	-11.55 Peak
3	0.277	24.83	20.19	45.02	60.91	-15.89 Peak
4	0.347	19.84	20.22	40.06	59.04	-18.98 Peak
5	0.402	17.18	20.24	37.42	57.80	-20.38 Peak
6	0.484	15.89	20.20	36.09	56.27	-20.18 Peak

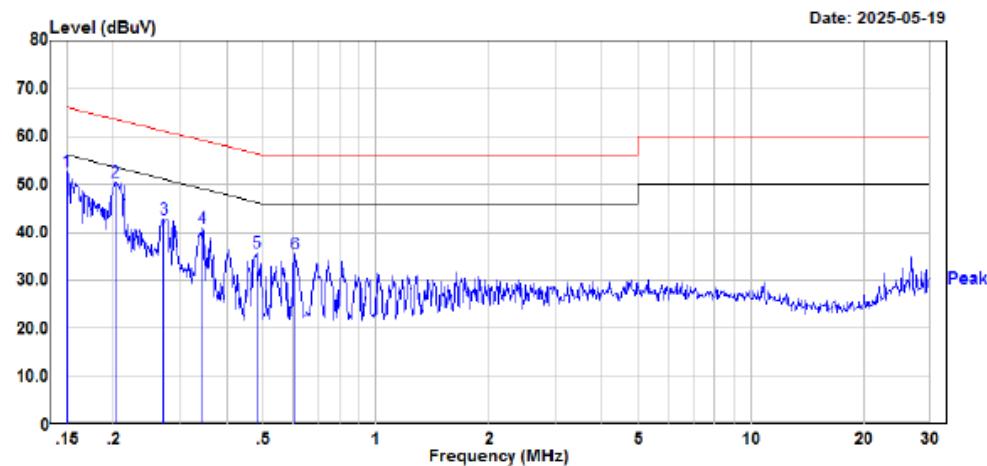
## AC 120V/60 Hz, Neutral



Site : CE  
Condition : limit\FCC PART 15.207  
: DET:Peak  
Project No. : RKSA250507001  
Model : Tsubame\_D  
Phase : N  
Voltage : 120V/60Hz  
Mode : BLE 1M  
Test Equipment : ENV216,ESR3  
Receiver Setting : RBW: 9 kHz,Sweep Time: Auto  
Temperature : 23.2°C  
Humidity : 50%  
Atmospheric pressure: 101.8KPa  
Test Engineer : Myles Miao

	Freq	Read		Limit		Over	Remark
		MHz	dBuV	dB	dBuV		
1	0.152	32.12	20.13	52.25	65.88	-13.63	Peak
2	0.201	30.87	20.15	51.02	63.56	-12.54	Peak
3	0.265	24.41	20.18	44.59	61.28	-16.69	Peak
4	0.347	18.84	20.22	39.06	59.04	-19.98	Peak
5	0.413	15.26	20.24	35.50	57.60	-22.10	Peak
6	0.486	15.49	20.19	35.68	56.23	-20.55	Peak

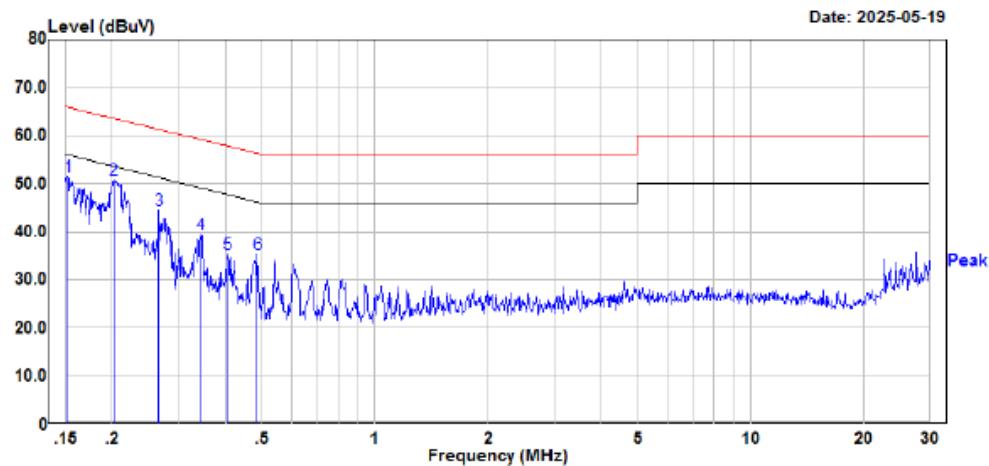
EUT operation mode: Transmitting in BLE (2 Mbps) low channel (maximum output power)  
AC 120V/60 Hz, Line



Site : CE  
Condition : limit\FCC PART 15.207  
: DET:Peak  
Project No. : RKSA250507001  
Model : Tsubame\_D  
Phase : L  
Voltage : 120V/60Hz  
Mode : BLE 2M  
Test Equipment : ENV216,ESR3  
Receiver Setting : RBW: 9 kHz,Sweep Time: Auto  
Temperature : 23.6°C  
Humidity : 56%  
Atmospheric pressure: 101.0KPa  
Test Engineer : Myles Miao

	Read Freq	Level	Factor	Limit Level	Over Line	Over Limit	Remark
	MHz	dBuV		dBuV	dBuV		
1	0.150	32.60	20.13	52.73	66.00	-13.27	Peak
2	0.202	30.42	20.15	50.57	63.52	-12.95	Peak
3	0.271	22.62	20.19	42.81	61.07	-18.26	Peak
4	0.345	20.65	20.22	40.87	59.09	-18.22	Peak
5	0.482	15.56	20.19	35.75	56.31	-20.56	Peak
6	0.609	15.36	20.19	35.55	56.00	-20.45	Peak

## AC 120V/60 Hz, Neutral



Site : CE  
Condition : limit\FCC PART 15.207  
: DET:Peak  
Project No. : RKSA250507001  
Model : Tsubame\_D  
Phase : N  
Voltage : 120V/60Hz  
Mode : BLE 2M  
Test Equipment : ENV216,ESR3  
Receiver Setting : RBW: 9 kHz, Sweep Time: Auto  
Temperature : 23.6°C  
Humidity : 56%  
Atmospheric pressure: 101.0KPa  
Test Engineer : Myles Miao

Freq	Read			Limit		Over Line Limit Remark
	MHz	dBuV	dB	dBuV	dB	
1	0.152	31.31	20.13	51.44	65.88	-14.44 Peak
2	0.202	30.51	20.15	50.66	63.52	-12.86 Peak
3	0.266	24.21	20.18	44.39	61.24	-16.85 Peak
4	0.345	19.19	20.22	39.41	59.09	-19.68 Peak
5	0.404	15.03	20.24	35.27	57.76	-22.49 Peak
6	0.486	15.13	20.19	35.32	56.23	-20.91 Peak

**SPURIOUS EMISSIONS****Environmental Conditions & Test Information**

Test Item:	SPURIOUS EMISSIONS		
	9kHz - 1GHz	1 GHz - 18 GHz	18 GHz - 25 GHz
Test Date:	2025-05-20	2025-05-21	2025-05-28
Temperature:	25.6 °C	23.7 °C	23 °C
Relative Humidity:	51 %	50 %	53 %
ATM Pressure:	100.7 kPa	100.6 kPa	101.6 kPa
Test Result:	Pass	Pass	Pass
Test Engineer:	Jonathan	Destine Hu	Hugh Wu

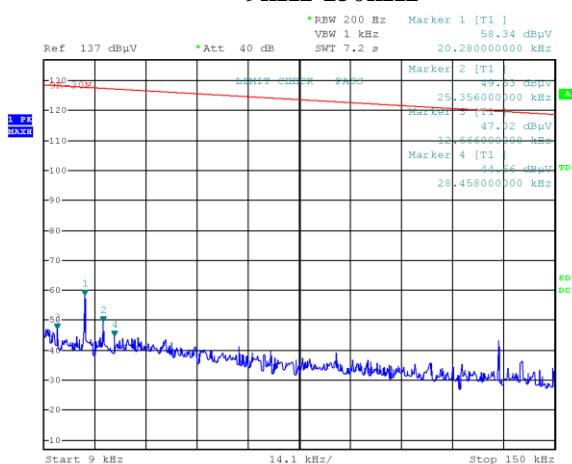
**Test Result:** Compliant.

*EUT operation mode: Transmitting*

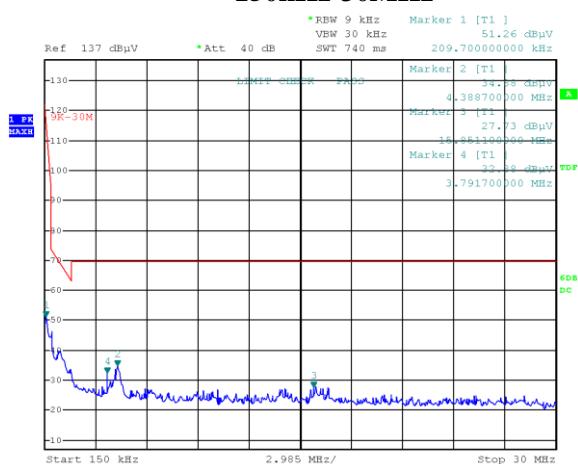
*After pre-scan in the X, Y and Z axes of orientation, the worst case is below:*

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

**9kHz-150kHz**



**150kHz-30MHz**



**9 kHz-150 kHz**

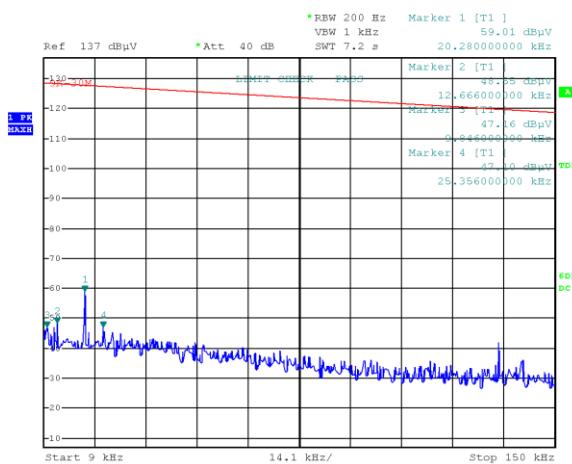
Frequency (kHz)	Corrected Amplitude (dB $\mu$ V/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m) @3m	Margin (dB)
12.67	47.02	PK	-0.52	125.55	78.53
20.28	58.34	PK	-0.56	121.46	63.12
25.36	49.53	PK	-0.59	119.52	69.99
28.46	44.66	PK	-0.60	118.52	73.86

**150 kHz-30 MHz**

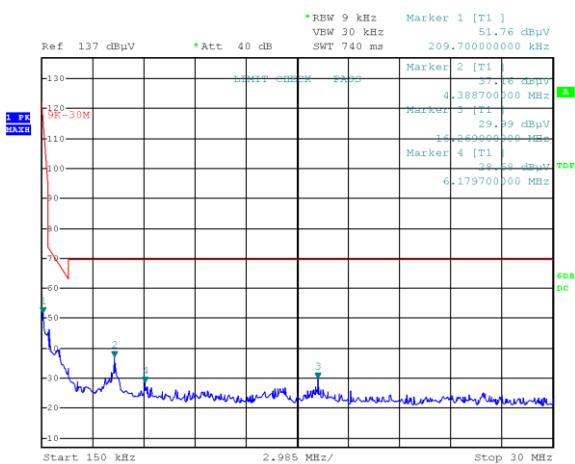
Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dB $\mu$ V/m) @3m	Margin (dB)
0.21	51.26	PK	-13.89	101.16	49.90
3.79	32.38	PK	-31.81	69.54	37.16
4.39	34.88	PK	-31.97	69.54	34.66
15.85	27.73	PK	-33.30	69.54	41.81

**9 kHz-30MHz: Transmitting in maximum output power mode BLE (2 Mbps) low channel  
Parallel(worst case)**

**9kHz-150kHz**



**150kHz-30MHz**



Project No.RKSA250507001

Tester:Jonathan

Date: 20.MAY.2025 10:27:05

Project No.RKSA250507001

Tester:Jonathan

Date: 20.MAY.2025 10:30:15

**9 kHz-150 kHz**

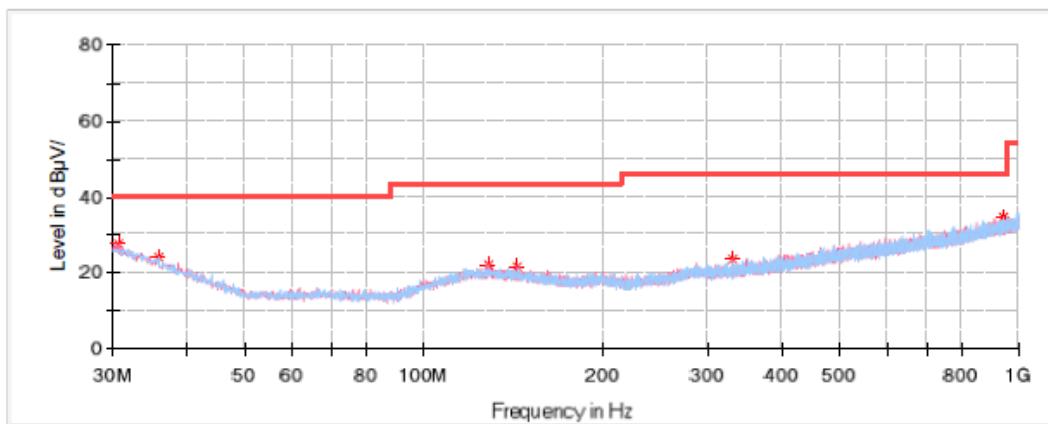
Frequency (kHz)	Corrected Amplitude (dBµV/m) @3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBµV/m) @3m	Margin (dB)
9.85	47.16	PK	-0.48	127.74	80.58
12.67	48.55	PK	-0.52	125.55	77.00
20.28	59.01	PK	-0.56	121.46	62.45
25.36	47.10	PK	-0.59	119.52	72.42

**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)
0.21	51.76	PK	-13.89	101.16	49.40
4.39	37.16	PK	-31.97	69.54	32.38
6.18	28.68	PK	-32.24	69.54	40.86
16.27	29.99	PK	-33.20	69.54	39.55

**30 MHz - 1 GHz:****Transmitting in maximum output power BLE 1M low channel****Low Channel: 2402 MHz****Common Information**

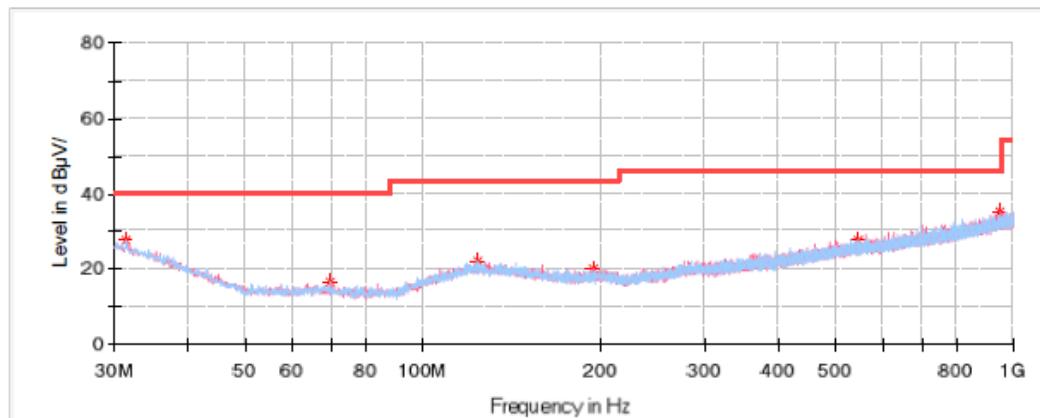
Project No: RKSA250507001  
 EUT Model: Tsubame\_D  
 Test Mode: Transmitting in BLE-1M mode low channel  
 Standard: FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.247  
 Test Equipment: ESCI, JB3, 310N  
 Receiver Setting: RBW: 100 kHz, VBW: 300 kHz, Sweep Time: Auto  
 Temperature: 25.6°C  
 Humidity: 51%  
 Barometric Pressure: 100.7 kPa  
 Test Engineer: Jonathan  
 Test Date: 2025/5/20

**Critical\_Freqs**

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)
30.727500	27.83	40.00	12.17	V	-5.2
35.820000	24.00	40.00	16.00	H	-8.6
128.818750	22.08	43.50	21.42	V	-11.0
143.732500	21.42	43.50	22.08	V	-11.4
330.942500	23.60	46.00	22.40	V	-9.6
945.801250	34.82	46.00	11.18	V	1.8

**30 MHz - 1 GHz:****Transmitting in maximum output power BLE 2M low channel****Low Channel: 2402 MHz****Common Information**

Project No: RKSA250507001  
EUT Model: Tsubame\_D  
Test Mode: Transmitting in BLE-2M mode low channel  
Standard: FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.247  
Test Equipment: ESCI, JB3, 310N  
Receiver Setting: RBW: 100 kHz, VBW: 300 kHz, Sweep Time: Auto  
Temperature: 25.6°C  
Humidity: 51%  
Barometric Pressure: 100.7kPa  
Test Engineer: Jonathan  
Test Date: 2025/5/20

**Critical\_Freqs**

Frequency (MHz)	MaxPeak (dB µV/m)	Limit (dB µV/m)	Margin (dB)	Pol	Corr. (dB/m)
31.455000	27.59	40.00	12.41	H	-5.7
69.648750	16.75	40.00	23.25	H	-16.6
123.847500	22.26	43.50	21.24	H	-10.9
194.778750	20.28	43.50	23.22	V	-12.3
547.616250	27.55	46.00	18.45	H	-4.7
949.560000	35.23	46.00	10.77	V	1.8

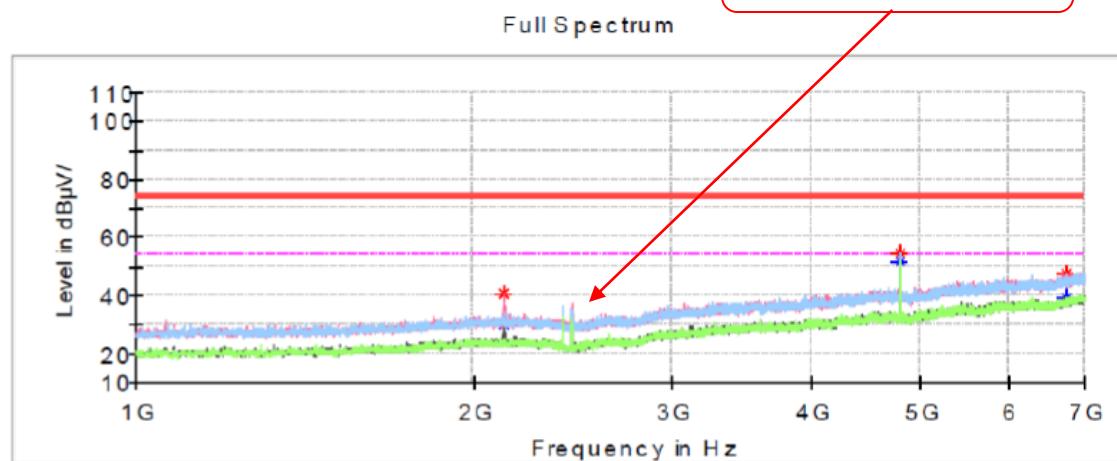
**1 GHz-18 GHz:**  
**BLE (1 Mbps)**

**Low Channel: 2402 MHz**

## Common Information

Project No.: RKSA250507001  
 EUT Model: Tsubame\_D  
 Test Mode: BLE\_1M low channel  
 Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
 Test Equipment: ESU40,3115,PAM-0118P  
 Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
 Temperature: 23.7°C  
 Humidity: 50%  
 Atmospheric Pressure: 100.6kPa  
 Test Engineer: Destine Hu  
 Test Date: 2025/5/21

Fundamental Test with  
Band Reject Filter

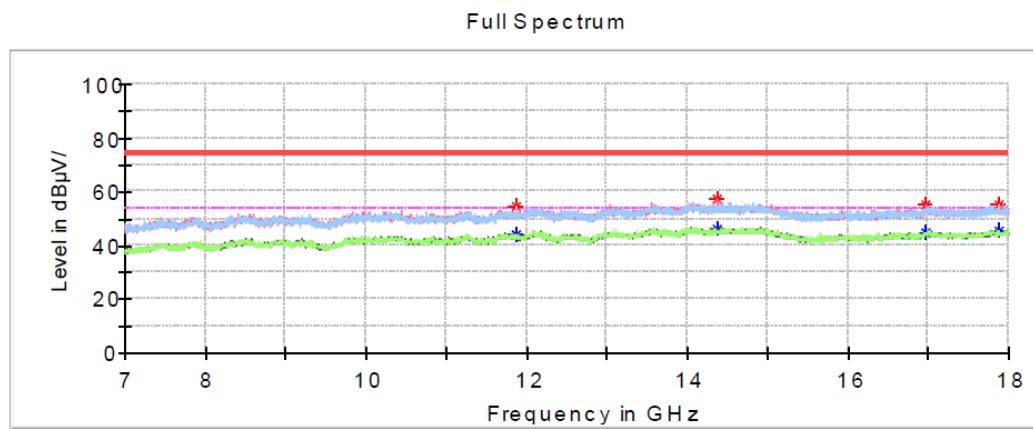


## Critical\_Freqs

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB)
2126.200000	40.43	---	74.00	33.57	V	-9.9
2126.200000	---	29.94	54.00	24.06	V	-9.9
4804.000000	54.97	---	74.00	19.03	H	-3.4
4804.000000	---	52.02	54.00	1.98	H	-3.4
6738.400000	47.68	---	74.00	26.32	V	0.3
6738.400000	---	39.33	54.00	14.67	V	0.3

## Common Information

Project No.: RKSA250507001  
EUT Model: Tsubame\_D  
Test Mode: BLE\_1M low channel  
Standard: FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209  
Test Equipment: ESU40,3115,PAM-0118P  
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
Temperature: 23.7°C  
Humidity: 50%  
Atmospheric Pressure: 100.6kPa  
Test Engineer: Destine Hu  
Test Date: 2025/5/21



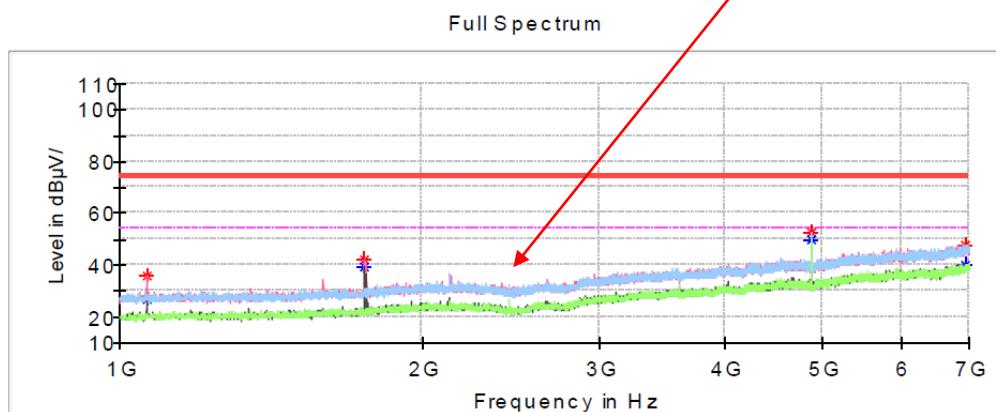
## Critical\_Freqs

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB)
11864.20000	---	44.00	54.00	10.00	H	8.8
11864.20000	54.87	---	74.00	19.13	H	8.8
14374.60000	57.03	---	74.00	16.97	V	11.7
14374.40000	---	46.09	54.00	7.91	V	11.7
16970.40000	---	44.80	54.00	9.20	V	10.8
16970.40000	54.98	---	74.00	19.02	V	10.8
17887.80000	55.09	---	74.00	18.91	H	11.5
17887.80000	---	45.64	54.00	8.36	H	11.5

**Middle Channel: 2440 MHz****Common Information**

Project No.: RKSA250507001  
 EUT Model: Tsubame\_D  
 Test Mode: BLE\_1M middle channel  
 Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
 Test Equipment: ESU40,3115,PAM-0118P  
 Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
 Temperature: 23.7°C  
 Humidity: 50%  
 Atmospheric Pressure: 100.6kPa  
 Test Engineer: Destine Hu  
 Test Date: 2025/5/21

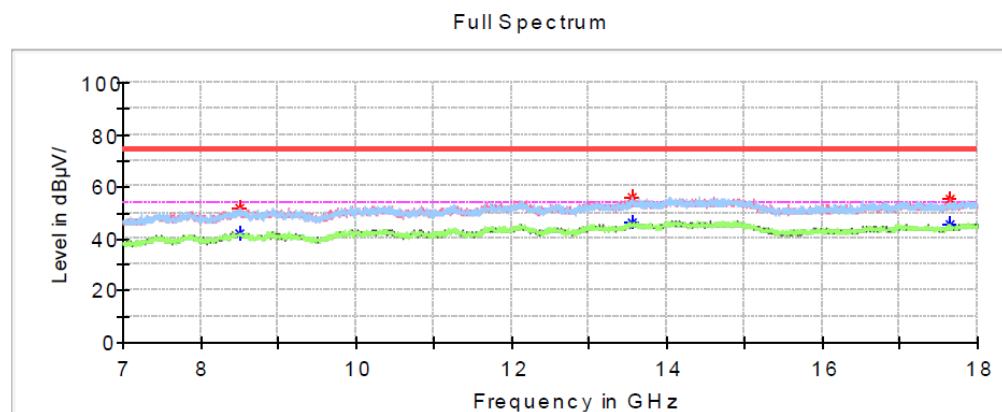
Fundamental Test with Band Reject Filter

**Critical\_Freqs**

Frequency (MHz)	MaxPeak (dB µV/m)	Average (dB µV/m)	Limit (dB µV/m)	Margin (dB)	Pol	Corr. (dB)
1064.800000	---	26.65	54.00	27.35	V	-15.0
1064.800000	35.95	---	74.00	38.05	V	-15.0
1752.400000	---	39.72	54.00	14.28	V	-11.7
1752.400000	42.40	---	74.00	31.60	V	-11.7
4880.200000	---	50.08	54.00	3.92	H	-3.2
4880.200000	52.72	---	74.00	21.28	H	-3.2
6932.200000	48.03	---	74.00	25.97	V	1.2
6932.200000	---	40.26	54.00	13.74	V	1.2

## Common Information

Project No.: RKSA250507001  
EUT Model: Tsubame\_D  
Test Mode: BLE\_1M middle channel  
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
Test Equipment: ESU40,3115,PAM-0118P  
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
Temperature: 23.7°C  
Humidity: 50%  
Atmospheric Pressure: 100.6kPa  
Test Engineer: Destine Hu  
Test Date: 2025/5/21



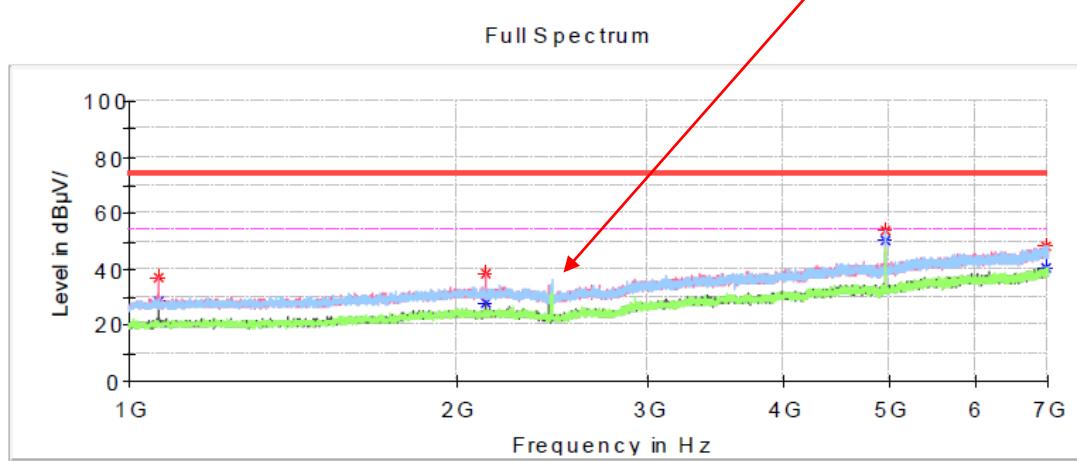
## Critical\_Freqs

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB)
8500.600000	51.84	---	74.00	22.16	H	4.7
8500.600000	---	42.09	54.00	11.91	H	4.7
13564.80000	---	46.30	54.00	7.70	V	10.1
13564.80000	56.06	---	74.00	17.94	V	10.1
17648.00000	54.91	---	74.00	19.09	V	10.8
17648.00000	---	45.32	54.00	8.68	V	10.8

**High Channel: 2480 MHz****Common Information**

Project No.: RKSA250507001  
 EUT Model: Tsubame\_D  
 Test Mode: BLE\_1M high channel  
 Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
 Test Equipment: ESU40,3115,PAM-0118P  
 Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
 Temperature: 23.7°C  
 Humidity: 50%  
 Atmospheric Pressure: 100.6kPa  
 Test Engineer: Destine Hu  
 Test Date: 2025/5/21

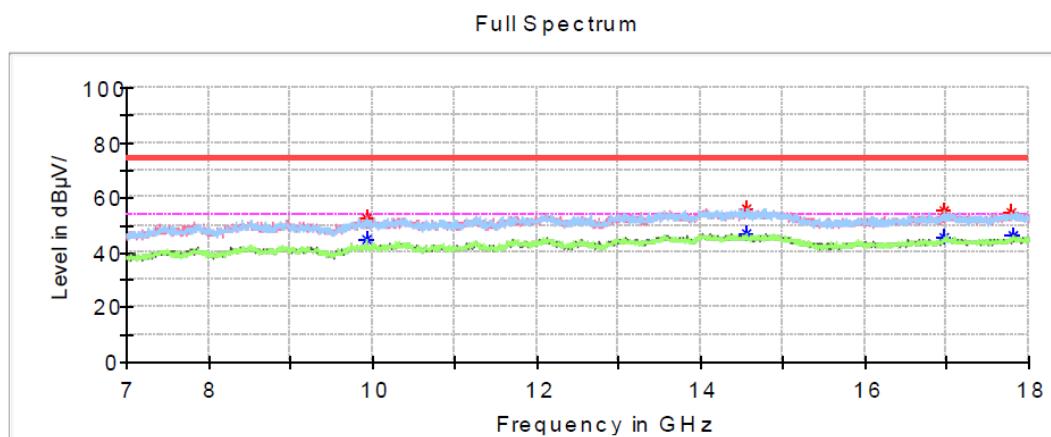
Fundamental Test with  
Band Reject Filter

**Critical\_Freqs**

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB)
1064.200000	---	28.54	54.00	25.46	V	-15.0
1064.200000	36.75	---	74.00	37.25	V	-15.0
2126.200000	---	28.31	54.00	25.69	V	-9.9
2126.200000	38.73	---	74.00	35.27	V	-9.9
4960.000000	54.09	---	74.00	19.91	H	-3.0
4960.000000	---	51.82	54.00	2.18	H	-3.0
6973.600000	---	40.23	54.00	13.77	H	1.4
6973.600000	48.50	---	74.00	25.50	H	1.4

## Common Information

Project No.: RKSA250507001  
EUT Model: Tsubame\_D  
Test Mode: BLE\_1M high channel  
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
Test Equipment: ESU40,3115,PAM-0118P  
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
Temperature: 23.7°C  
Humidity: 50%  
Atmospheric Pressure: 100.6kPa  
Test Engineer: Destine Hu  
Test Date: 2025/5/21



## Critical\_Freqs

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB)
9919.400000	---	44.88	54.00	9.12	H	6.1
9919.400000	52.70	---	74.00	21.30	H	6.1
14554.80000	---	46.53	54.00	7.47	H	11.8
14554.80000	55.94	---	74.00	18.06	H	11.8
16977.00000	---	45.27	54.00	8.73	H	10.9
16977.00000	54.90	---	74.00	19.10	H	10.9
17799.80000	54.88	---	74.00	19.12	V	11.2
17799.80000	---	46.16	54.00	7.84	V	11.2

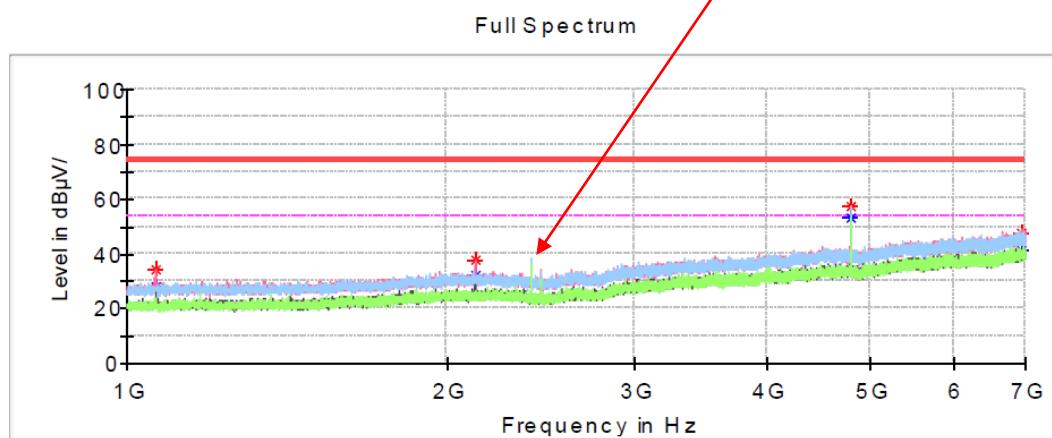
**1 GHz-18 GHz:**  
**BLE (2 Mbps)**

**Low Channel: 2402 MHz**

## Common Information

Project No.: RKSA250507001  
 EUT Model: Tsubame\_D  
 Test Mode: BLE\_2M low channel  
 Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
 Test Equipment: ESU40,3115,PAM-0118P  
 Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
 Temperature: 23.7 °C  
 Humidity: 50%  
 Atmospheric Pressure: 100.6kPa  
 Test Engineer: Destine Hu  
 Test Date: 2025/5/21

Fundamental Test with  
Band Reject Filter



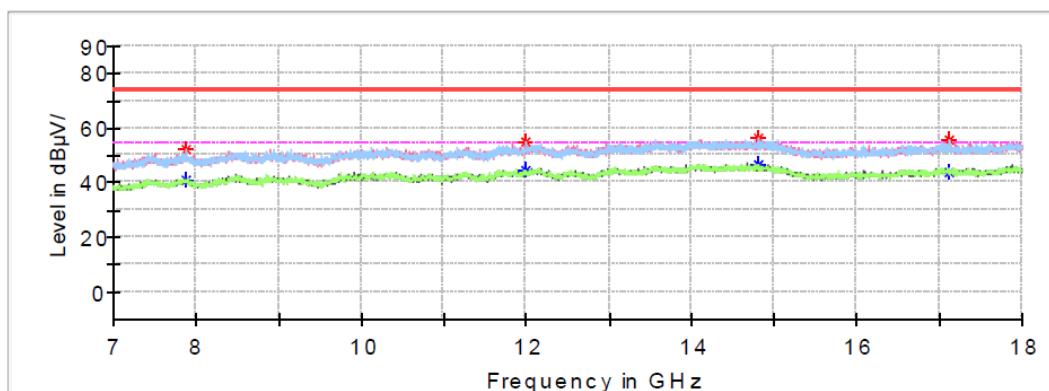
## Critical\_Freqs

Frequency (MHz)	MaxPeak (dB µV/m)	Average (dB µV/m)	Limit (dB µV/m)	Margin (dB)	Pol	Corr. (dB)
1064.800000	---	28.20	54.00	25.80	V	-15.0
1064.800000	34.61	---	74.00	39.39	V	-15.0
2123.500000	---	32.38	54.00	21.62	V	-9.9
2123.500000	37.82	---	74.00	36.18	V	-9.9
4804.000000	57.27	---	74.00	16.73	H	-3.4
4804.000000	---	52.54	54.00	1.46	H	-3.4
6948.100000	47.46	---	74.00	26.54	H	1.3
6948.100000	---	41.55	54.00	12.45	H	1.3

## Common Information

Project No.: RKSA250507001  
EUT Model: Tsubame\_D  
Test Mode: BLE\_2M low channel  
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
Test Equipment: ESU40,3115,PAM-0118P  
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
Temperature: 23.7°C  
Humidity: 50%  
Atmospheric Pressure: 100.6kPa  
Test Engineer: Destine Hu  
Test Date: 2025/5/21

Full Spectrum



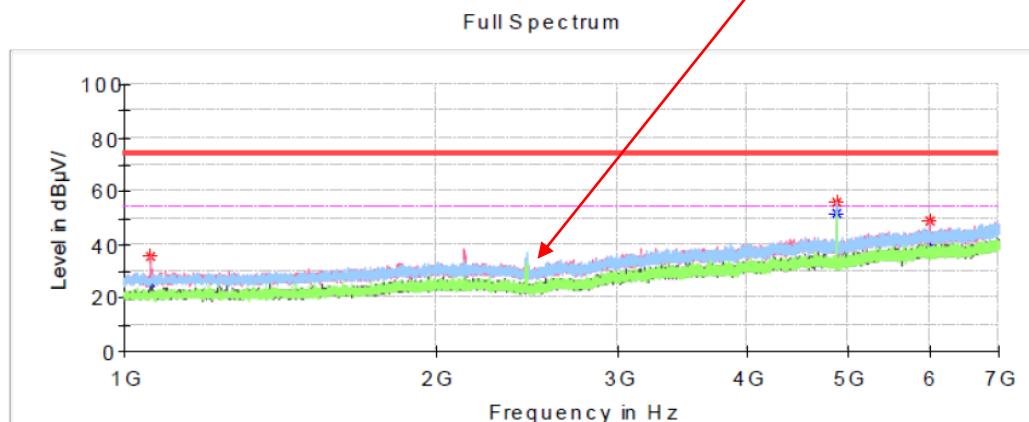
## Critical\_Freqs

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB)
7875.600000	---	40.97	54.00	13.03	H	3.2
7875.600000	52.23	---	74.00	21.77	H	3.2
11998.400000	---	44.26	54.00	9.74	H	9.1
11998.400000	54.87	---	74.00	19.13	H	9.1
14803.400000	---	46.31	54.00	7.69	H	10.9
14803.400000	56.19	---	74.00	17.81	H	10.9
17133.200000	---	43.64	54.00	10.36	V	10.8
17133.200000	55.41	---	74.00	18.59	V	10.8

**Middle Channel: 2440 MHz****Common Information**

Project No.: RKSA250507001  
 EUT Model: Tsubame\_D  
 Test Mode: BLE\_2M middle channel  
 Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
 Test Equipment: ESU40,3115,PAM-0118P  
 Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
 Temperature: 23.7°C  
 Humidity: 50%  
 Atmospheric Pressure: 100.6kPa  
 Test Engineer: Destine Hu  
 Test Date: 2025/5/21

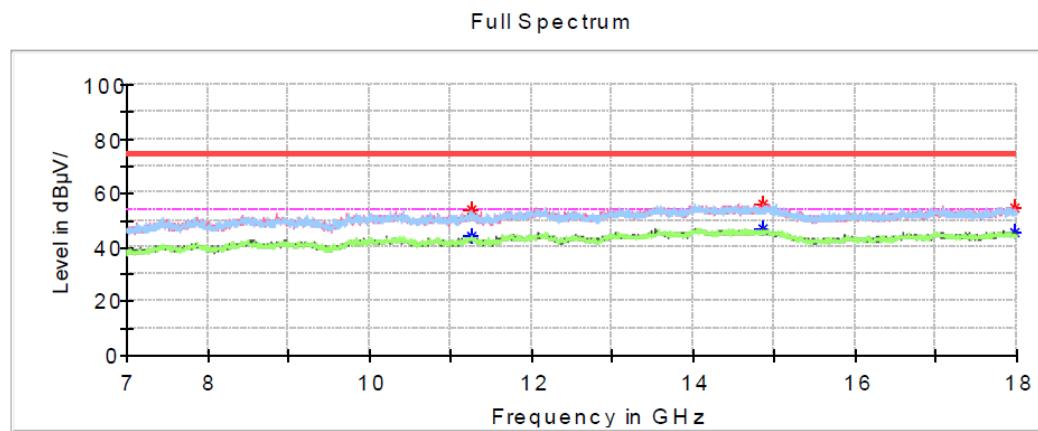
Fundamental Test with  
Band Reject Filter

**Critical\_Freqs**

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB)
1061.500000	---	25.86	54.00	28.14	V	-15.0
1061.500000	35.68	---	74.00	38.32	V	-15.0
4880.000000	---	51.53	54.00	2.47	H	-3.2
4880.000000	55.98	---	74.00	18.02	H	-3.2
5997.400000	---	39.32	54.00	14.68	V	-0.6
5997.400000	48.86	---	74.00	25.14	V	-0.6

## Common Information

Project No.: RKSA250507001  
EUT Model: Tsubame\_D  
Test Mode: BLE\_2M middle channel  
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
Test Equipment: ESU40,3115,PAM-0118P  
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
Temperature: 23.7 °C  
Humidity: 50%  
Atmospheric Pressure: 100.6kPa  
Test Engineer: Destine Hu  
Test Date: 2025/5/21



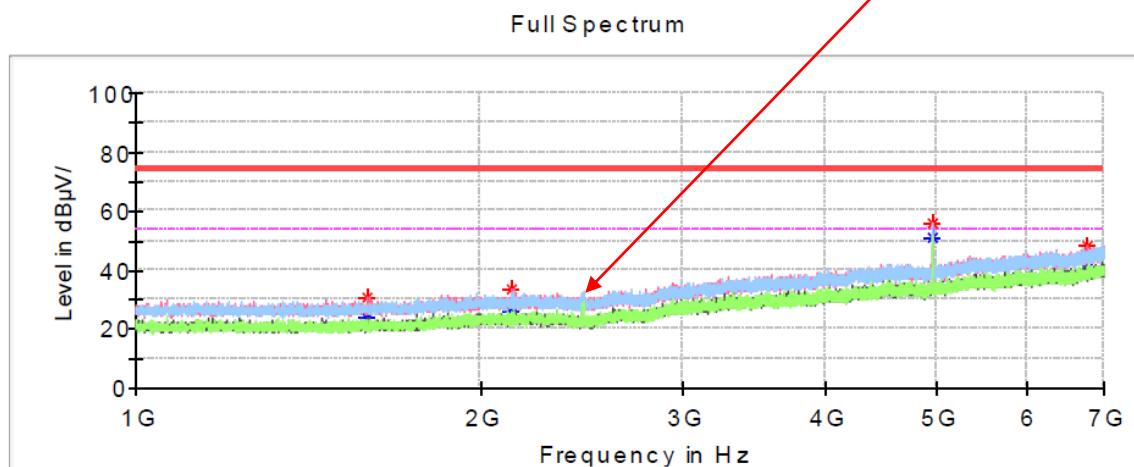
## Critical\_Freqs

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB)
11254.80000	53.95	---	74.00	20.05	V	7.4
11254.80000	---	44.05	54.00	9.95	V	7.4
14860.60000	---	46.52	54.00	7.48	V	10.8
14860.60000	56.11	---	74.00	17.89	V	10.8
17975.80000	54.78	---	74.00	19.22	V	11.7
17975.80000	---	45.77	54.00	8.23	V	11.7

**High Channel: 2480 MHz****Common Information**

Project No.: RKSA250507001  
 EUT Model: Tsubame\_D  
 Test Mode: BLE\_2M high channel  
 Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
 Test Equipment: ESU40,3115,PAM-0118P  
 Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
 Temperature: 23.7°C  
 Humidity: 50%  
 Atmospheric Pressure: 100.6kPa  
 Test Engineer: Destine Hu  
 Test Date: 2025/5/21

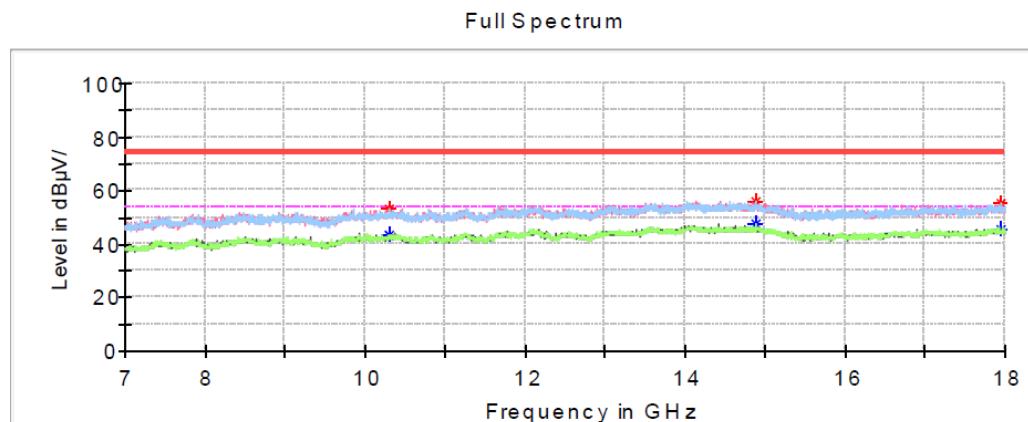
Fundamental Test with  
Band Reject Filter

**Critical\_Freqs**

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB)
1593.100000	---	23.86	54.00	30.14	V	-12.8
1593.100000	30.67	---	74.00	43.33	V	-12.8
2125.000000	---	25.89	54.00	28.11	V	-9.9
2125.000000	33.23	---	74.00	40.77	V	-9.9
4960.000000	---	51.01	54.00	2.99	H	-3.0
4960.000000	56.02	---	74.00	17.98	H	-3.0
6758.800000	---	40.31	54.00	13.69	V	0.4
6758.800000	48.02	---	74.00	25.98	V	0.4

## Common Information

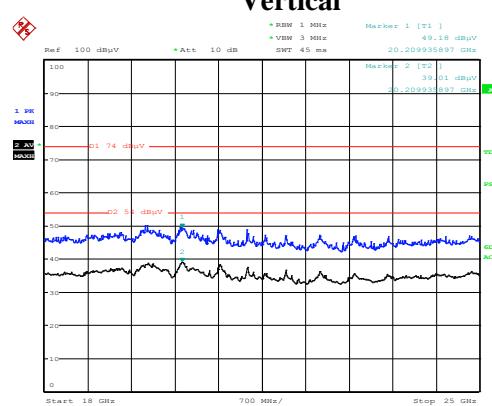
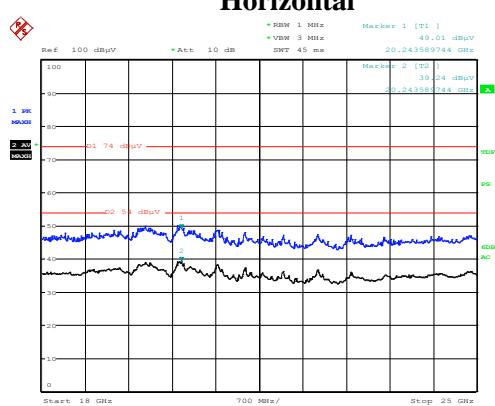
Project No.: RKSA250507001  
EUT Model: Tsubame\_D  
Test Mode: BLE\_2M high channel  
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
Test Equipment: ESU40,3115,PAM-0118P  
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
Temperature: 23.7°C  
Humidity: 50%  
Atmospheric Pressure: 100.6kPa  
Test Engineer: Destine Hu  
Test Date: 2025/5/21



## Critical\_Freqs

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB)
10306.60000	---	43.21	54.00	10.79	H	6.6
10306.80000	53.28	---	74.00	20.72	H	6.6
14878.20000	---	47.32	54.00	6.68	H	10.7
14878.20000	56.27	---	74.00	17.73	H	10.7
17956.00000	55.41	---	74.00	18.59	V	11.7
17956.00000	---	45.67	54.00	8.33	V	11.7

**18 GHz - 25 GHz :**  
**Transmitting in maximum output power BLE (1 Mbps) low channel:**  
**Horizontal**



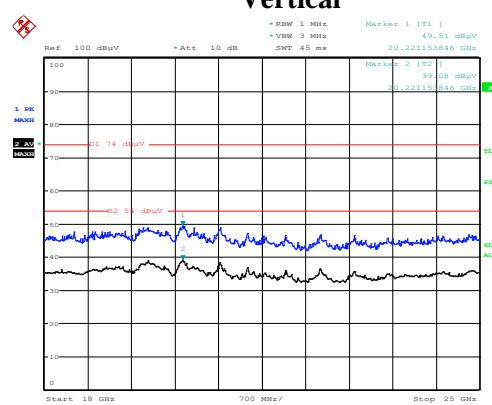
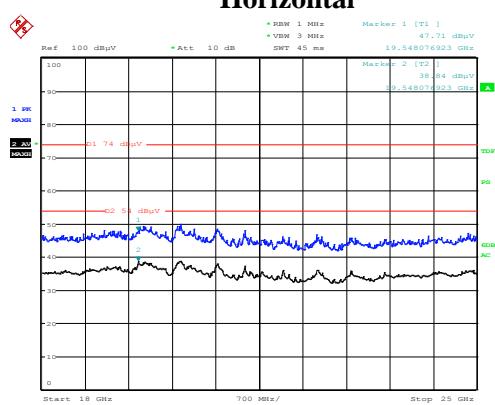
Project No :RKSA250507001  
 Date: 28.MAY.2025 14:13:32

Tester :Hugh Wu  
 Date: 28.MAY.2025 14:38:07

Project No :RKSA250507001  
 Tester :Hugh Wu

Frequency (GHz)	Max Peak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
20.21	---	39.01	54	14.99	V	12.47
20.21	49.18	---	74	24.82	V	12.47
20.24	---	39.24	54	14.76	H	12.5
20.24	49.01	---	74	24.99	H	12.5

**18 GHz - 25 GHz :**  
**Transmitting in maximum output power BLE (2 Mbps) low channel:**  
**Horizontal**



Project No :RKSA250507001  
 Date: 28.MAY.2025 15:14:08

Tester :Hugh Wu  
 Date: 28.MAY.2025 15:48:58

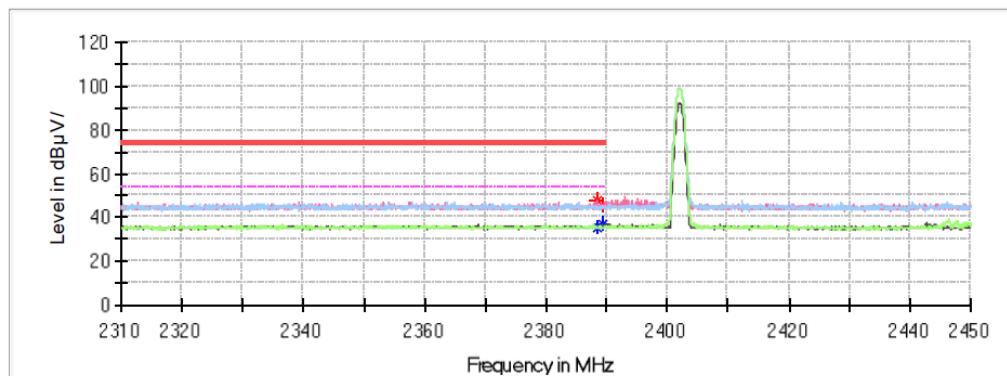
Project No :RKSA250507001  
 Tester :Hugh Wu

Frequency (GHz)	Max Peak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Pol	Corr. (dB/m)
19.55	---	38.84	54	15.16	H	10.97
19.55	47.71	---	74	26.29	H	10.97
20.22	---	39.08	54	14.92	V	12.48
20.22	49.51	---	74	24.49	V	12.48

**RESTRICTED BANDS EMISSION:  
BLE (1 Mbps)****Left Side****Common Information**

Project No.: RKSA250507001  
EUT Model: Tsubame\_D  
Test Mode: BLE  
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
Test Equipment: ESU40,3115,PAM-0118P  
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
Temperature: 23.7°C  
Humidity: 50%  
Atmospheric Pressure: 100.6kPa  
Test Engineer: Destine Hu  
Test Date: 2025/5/21

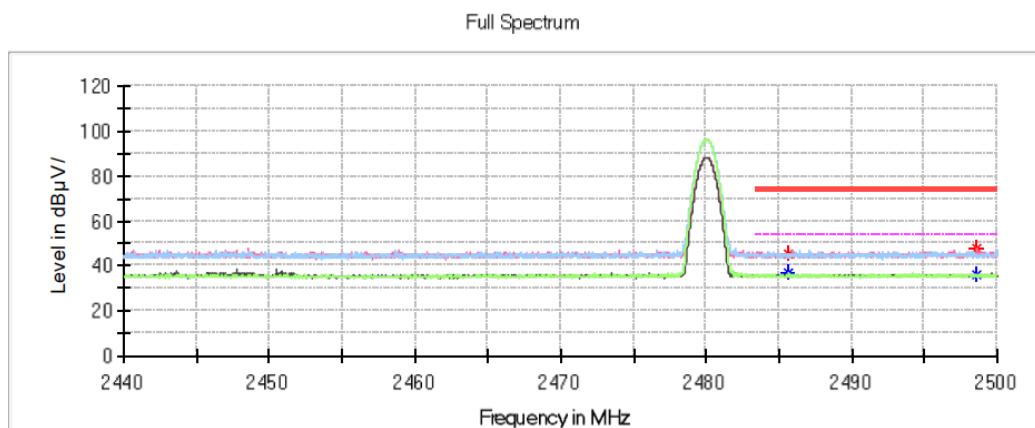
Full Spectrum

**Critical\_Freqs**

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (Db/m)
2388.456000	47.99	---	74.00	26.01	V	-0.3
2388.456000	---	35.53	54.00	18.47	V	-0.3
2389.240000	45.06	---	74.00	28.94	V	-0.3
2389.240000	---	36.75	54.00	17.25	V	-0.3

**Right Side****Common Information**

Project No.: RKSA250507001  
EUT Model: Tsubame\_D  
Test Mode: BLE  
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
Test Equipment: ESU40,3115,PAM-0118P  
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
Temperature: 23.7°C  
Humidity: 50%  
Atmospheric Pressure: 100.6kPa  
Test Engineer: Destine Hu  
Test Date: 2025/5/21

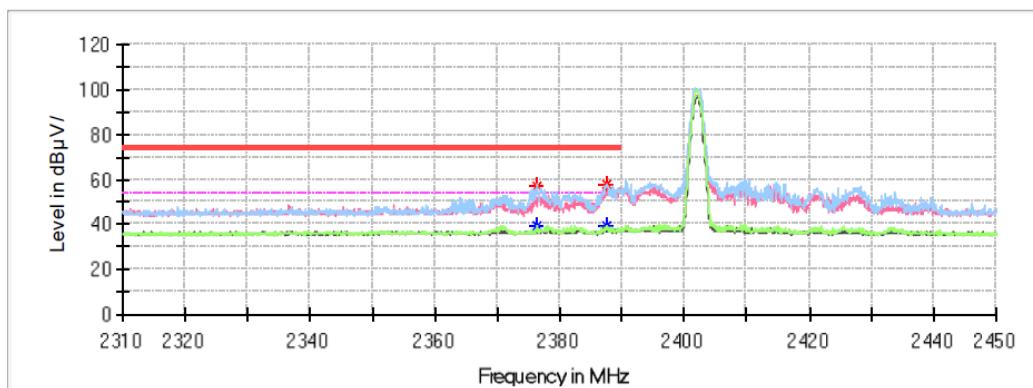
**Critical\_Freqs**

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2485.696000	---	36.68	54.00	17.32	H	-0.2
2485.696000	45.04	---	74.00	28.96	H	-0.2
2498.632000	---	36.06	54.00	17.94	V	-0.2
2498.632000	47.48	---	74.00	26.52	V	-0.2

**RESTRICTED BANDS EMISSION:  
BLE (2 Mbps)****Left Side****Common Information**

Project No.: RKSA250507001  
EUT Model: Tsubame\_D  
Test Mode: BLE  
Standard: FCC Part 15.247& FCC Part 15.205& FCC Part 15.209  
Test Equipment: ESU40,3115,PAM-0118P  
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
Temperature: 23.7°C  
Humidity: 50%  
Atmospheric Pressure: 100.6kPa  
Test Engineer: Destine Hu  
Test Date: 2025/5/21

Full Spectrum

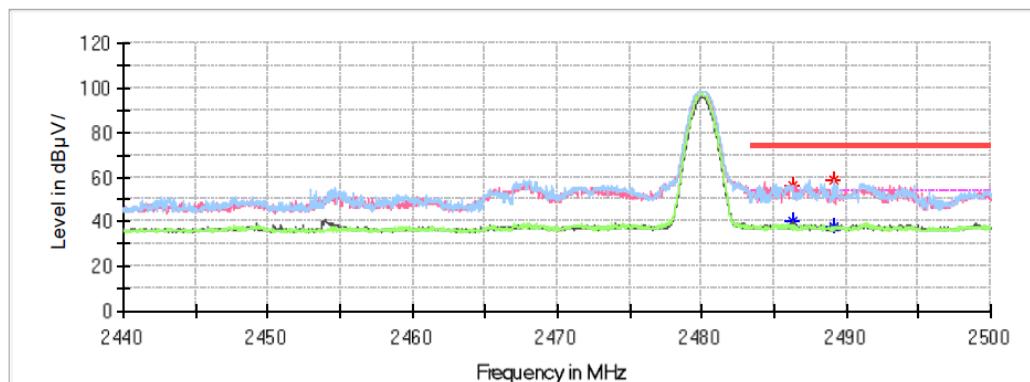
**Critical\_Freqs**

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2376.360000	---	39.25	54.00	14.75	H	-0.4
2376.360000	56.77	---	74.00	17.23	H	-0.4
2387.672000	---	39.06	54.00	14.94	H	-0.3
2387.672000	57.70	---	74.00	16.30	H	-0.3

**Right Side****Common Information**

Project No.: RKSA250507001  
EUT Model: Tsubame\_D  
Test Mode: BLE  
Standard: FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209  
Test Equipment: ESU40,3115,PAM-0118P  
Receiver Setting: RBW: 1MHz, VBW: 3MHz, Sweep Time: Auto  
Temperature: 23.7°C  
Humidity: 50%  
Atmospheric Pressure: 100.6kPa  
Test Engineer: Destine Hu  
Test Date: 2025/5/21

Full Spectrum

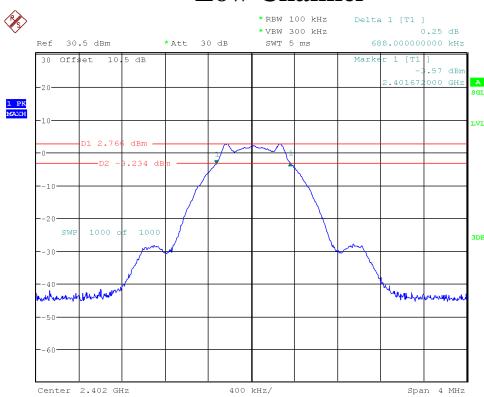
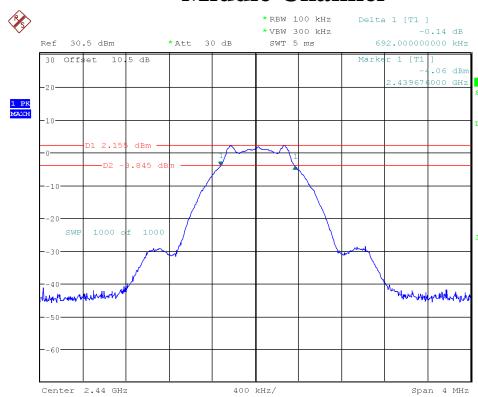
**Critical\_Freqs**

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
2486.296000	---	39.89	54.00	14.11	V	-0.2
2486.296000	56.02	---	74.00	17.98	V	-0.2
2489.176000	---	38.17	54.00	15.83	H	-0.2
2489.176000	58.99	---	74.00	15.01	H	-0.2

**6 dB EMISSION BANDWIDTH****Environmental Conditions & Test Information**

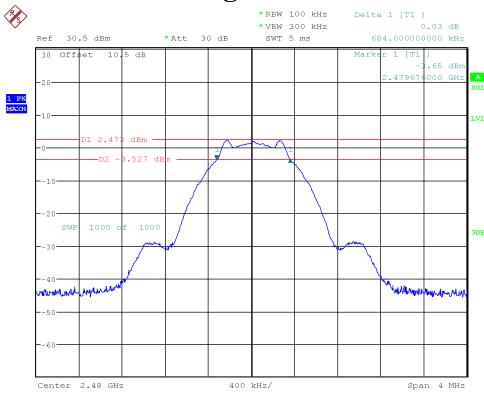
<b>Test Date:</b>	2025-05-26 to 2025-05-29
<b>Temperature:</b>	23-25 °C
<b>Relative Humidity:</b>	50-53 %
<b>ATM Pressure:</b>	100.5-101.3 kPa
<b>Test Result:</b>	Pass
<b>Test Engineer:</b>	Neil Zhou

Mode	Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (MHz)
BLE (1 Mbps)	Low	2402	0.688	≥0.5
	Middle	2440	0.692	≥0.5
	High	2480	0.684	≥0.5

**BLE (1 Mbps)****Low Channel****Middle Channel**

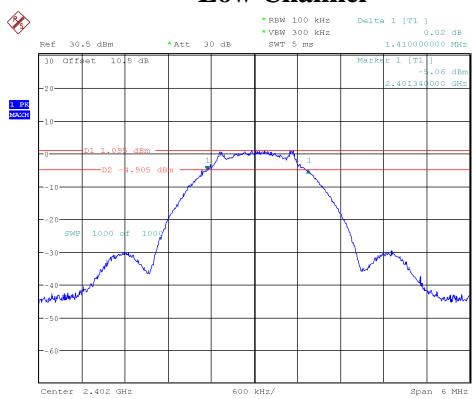
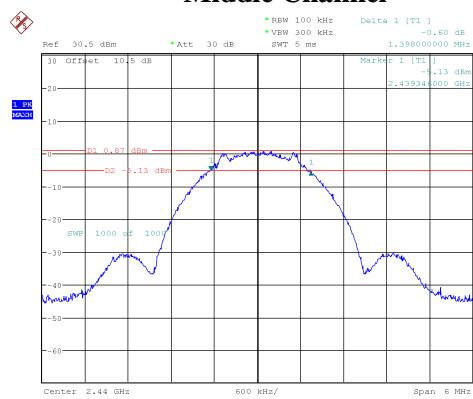
ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 29.MAY.2025 09:44:11

ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:10:37

**High Channel**

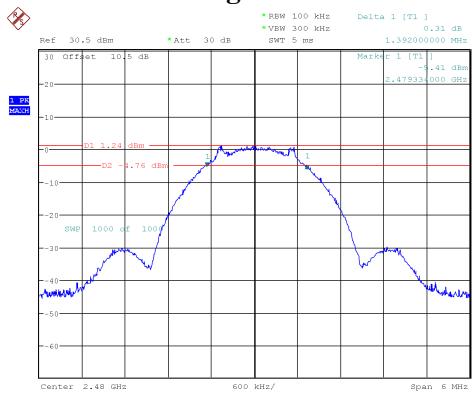
ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:22:26

Mode	Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (MHz)
BLE (2 Mbps)	Low	2402	1.410	$\geq 0.5$
	Middle	2440	1.398	$\geq 0.5$
	High	2480	1.392	$\geq 0.5$

**BLE (2 Mbps)****Low Channel****Middle Channel**

ProjectNo.:RKSA250507001 Tester:Neill Zhou  
Date: 26.MAY.2025 17:35:45

ProjectNo.:RKSA250507001 Tester:Neill Zhou  
Date: 26.MAY.2025 17:43:40

**High Channel**

ProjectNo.:RKSA250507001 Tester:Neill Zhou  
Date: 26.MAY.2025 17:53:02

## MAXIMUM CONDUCTED OUTPUT POWER

## Environmental Conditions & Test Information

<b>Test Date:</b>	2025-05-26 to 2025-05-29
<b>Temperature:</b>	23-25 °C
<b>Relative Humidity:</b>	50-53 %
<b>ATM Pressure:</b>	100.5-101.3 kPa
<b>Test Result:</b>	Pass
<b>Test Engineer:</b>	Neil Zhou

## 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	3.14	30	Pass
	Middle	2440	2.59	30	Pass
	High	2480	2.82	30	Pass

### BLE (1 Mbps)

## Low Channel



ProjectNo.:RKS A250507001 Tester:Neil Zhou  
Date: 29.MAY.2025 09:45:07

## Middle Channel



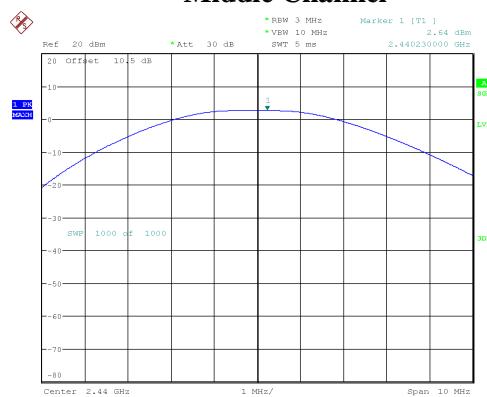
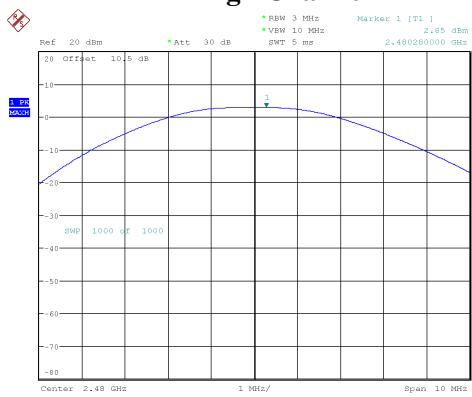
ProjectNo.:RKS A250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:19:41

## High Channel



ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:30:46

Mode	Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Limit (dBm)	Result
BLE (2 Mbps)	Low	2402	2.88	30	Pass
	Middle	2440	2.64	30	Pass
	High	2480	2.85	30	Pass

**BLE (2 Mbps)****Low Channel****Middle Channel****High Channel**

## BAND EDGE

## Environmental Conditions & Test Information

<b>Test Date:</b>	2025-05-26 to 2025-05-29
<b>Temperature:</b>	23-25 °C
<b>Relative Humidity:</b>	50-53 %
<b>ATM Pressure:</b>	100.5-101.3 kPa
<b>Test Result:</b>	Pass
<b>Test Engineer:</b>	Neil Zhou

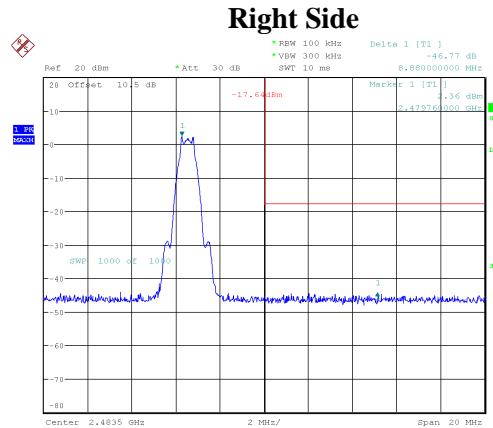
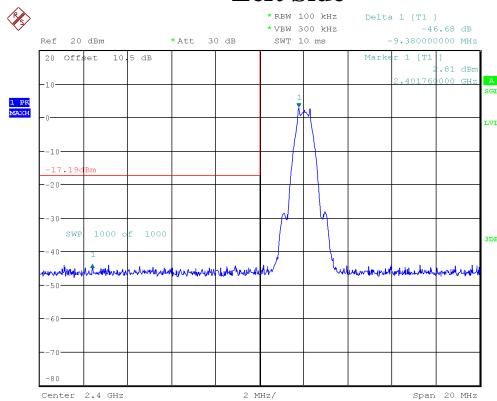
## Test Result: Compliant.

### *EUT operation mode: Transmitting*

Mode	Channel	Frequency (MHz)	Result (dBc)	Limit (dBc)
BLE (1 Mbps)	Low	2402	46.68	20
	High	2480	46.77	

### BLE (1 Mbps)

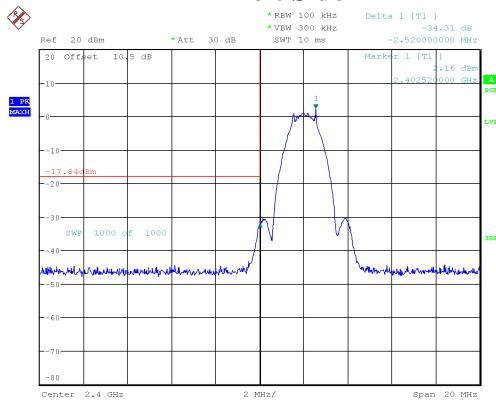
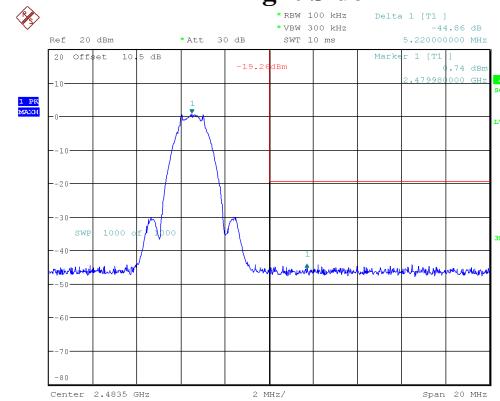
## Left Side



ProjectNo.:RKS A250507001 Tester:Neil Zhou  
Date: 29.MAY.2025 09:46:05

ProjectNo.:RKS A250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:21:32

Mode	Channel	Frequency (MHz)	Result (dBc)	Limit (dBc)
BLE (2 Mbps)	Low	2402	34.31	20
	High	2480	44.86	

**BLE (2 Mbps)****Left Side****Right Side**

ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:33:05

ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:52:08

## CONDUCTED SPURIOUS EMISSION

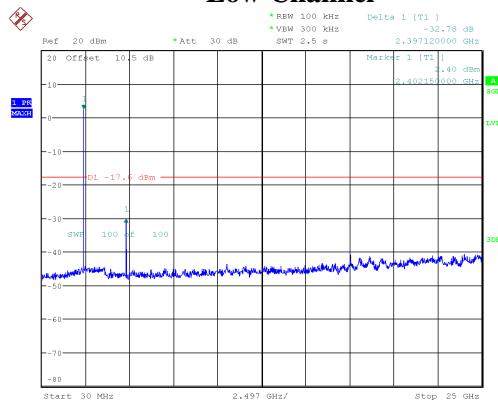
## Environmental Conditions &amp; Test Information

Test Date:	2025-05-26 to 2025-05-29
Temperature:	23-25 °C
Relative Humidity:	50-53 %
ATM Pressure:	100.5-101.3 kPa
Test Result:	Pass
Test Engineer:	Neil Zhou

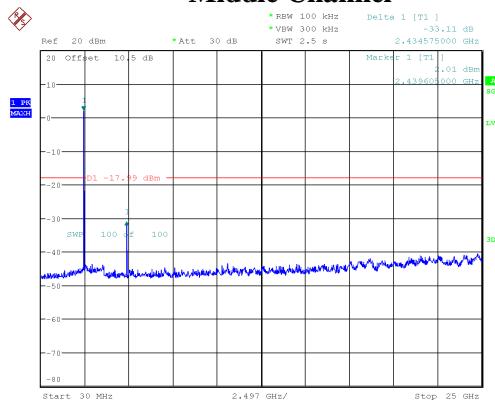
Mode	Channel	Frequency (MHz)	Result (dB)	Limit (dB)
BLE (1 Mbps)	Low	2402	32.78	20
	Middle	2440	33.11	20
	High	2480	37.80	20

## BLE (1 Mbps)

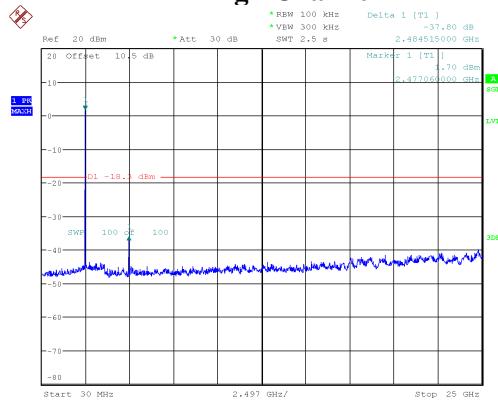
## Low Channel



## Middle Channel



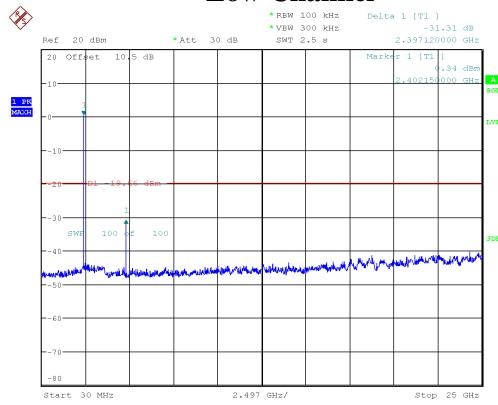
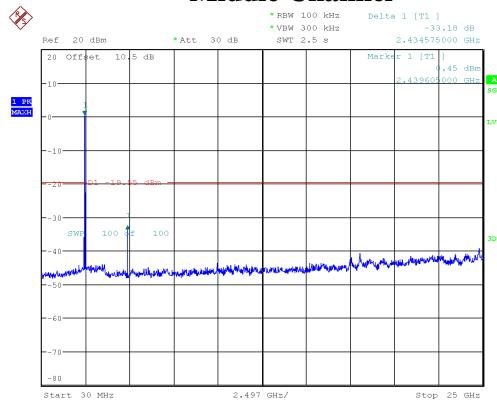
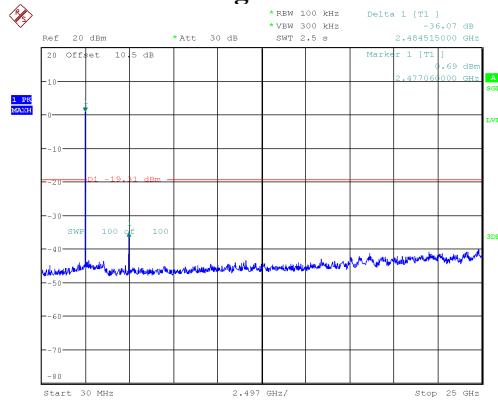
## High Channel



ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 29.MAY.2025 09:51:08

ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:15:30

Mode	Channel	Frequency (MHz)	Result (dB)	Limit (dB)
BLE (2 Mbps)	Low	2402	31.31	20
	Middle	2440	33.18	20
	High	2480	36.07	20

**BLE (2 Mbps)****Low Channel****Middle Channel****High Channel**

## POWER SPECTRAL DENSITY

## Environmental Conditions &amp; Test Information

Test Date:	2025-05-26 to 2025-05-29
Temperature:	23-25 °C
Relative Humidity:	50-53 %
ATM Pressure:	100.5-101.3 kPa
Test Result:	Pass
Test Engineer:	Neil Zhou

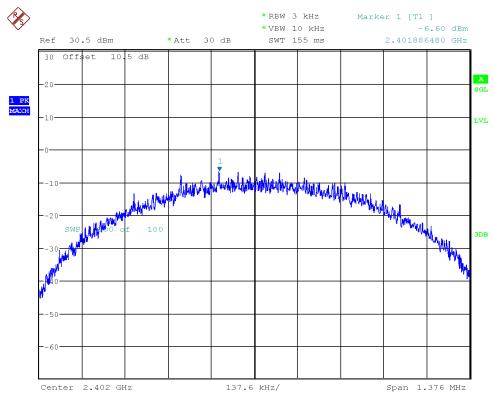
**Test Result:** Compliant.

*EUT operation mode: Transmitting*

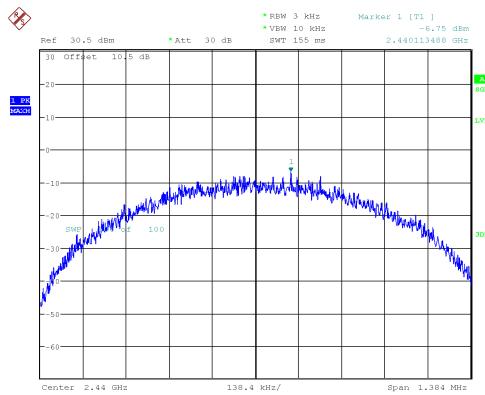
Mode	Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
BLE (1 Mbps)	Low	2402	-6.60	≤8
	Middle	2440	-6.75	≤8
	High	2480	-6.99	≤8

## BLE (1 Mbps)

## Low Channel



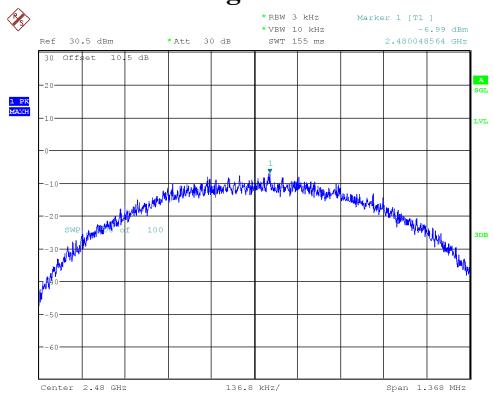
## Middle Channel



ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 29.MAY.2025 09:46:28

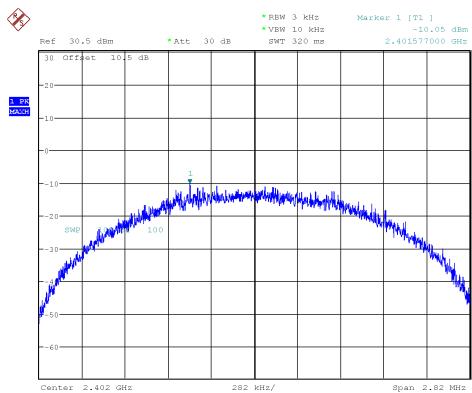
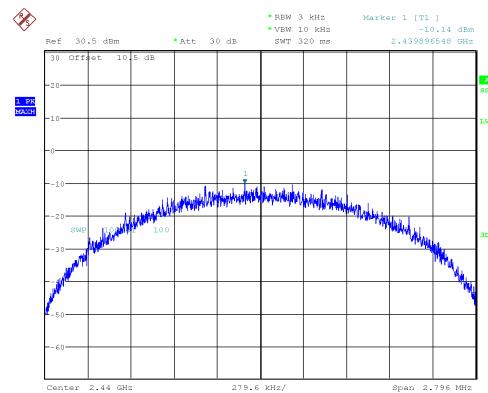
ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:20:05

## High Channel



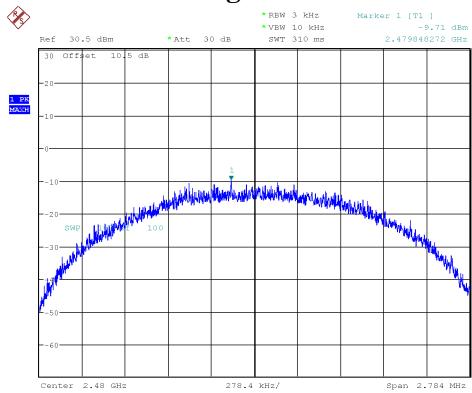
ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:31:10

Mode	Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)
BLE (2 Mbps)	Low	2402	-10.05	≤8
	Middle	2440	-10.14	≤8
	High	2480	-9.71	≤8

**BLE (2 Mbps)****Low Channel****Middle Channel**

ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:42:45

ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 17:50:41

**High Channel**

ProjectNo.:RKSA250507001 Tester:Neil Zhou  
Date: 26.MAY.2025 18:02:08

**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** \*\*\*\*\*