TEST REPORT

of

JAPAN MIC

Product:	**Bluetooth 5.3, 802.15.4 module**
Brand:	**Fanstel**
Main Model:	**BT40N**
Series Model:	**BT40NE**
Model Difference:	**Antenna. Please see page 5 for detail**
Applicant:	**Fanstel Corporation, Taipei**
Address	**10F-10, No. 79, Sec. 1, Hsin Tai Wu Rd., Hsi-Chih, New Taipei City 221 Taiwan**

Test Performed by:

International Standards Laboratory Corp. LT Lab.
TEL: +886-3-263-8888 FAX: +886-3-263-8899
No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan

Report No.: **ISL-23LR0019JAP**
Issue Date : **April 11, 2023**

Testing Laboratory
0997

VERIFICATION OF COMPLIANCE

Applicant:	Fanstel Corporation, Taipei
Equipment Under Test:	Bluetooth 5.3, 802.15.4 module
Brand:	Fanstel
Main Model:	BT40N
Series Model:	BT40NE
Model Difference:	Antenna. Please see page 5 for detail
Date of Test:	February 2, 2023 ~ April 11, 2023
Date of EUT Received:	February 2, 2023

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
ARIB STD-T66	Complied

The above equipment was tested by International Standards Laboratory Corp. for compliance with the requirements in the Radio equipment stipulated in the certification ordinance Item 19, Paragraph 1, Article 2. The results of testing in this report apply to the product/system that was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties. The antenna specification is provided by the applicant, and ISL does not bear the relevant responsibility.

Test By: Weitin Chen ***Date:*** April 11, 2023

Weitin Chen / Senior Engineer

Prepared By: Gigi Yeh ***Date:*** April 11, 2023

Gigi Yeh / Senior Engineer

Approved By: Jerry Liu ***Date:*** April 11, 2023

Jerry Liu / Assistant Manager

Version

Version No.	Date	Description
00	April 11, 2023	Initial creation of document

TABLE OF CONTENTS

1. Description of Equipment under Test (EUT)

1.1 General Information

General Information	
Product Name:	Bluetooth 5.3, 802.15.4 module
Brand Name:	Fanstel
Model Name:	BT40N; BT40NE
Model Difference:	Antenna. Please see table below for detail.
Temperature Range	-40°C to +105°C
Power Supply:	5VDC
Information	
Frequency Range:	2402 – 2480MHz
Rated Transmit Power	8 mW
Channel number:	40 channels
Modulation type:	GFSK
Dwell Time	N/A
Operating Mode	Point-to-Point

Model Summaries

module	BT40N	BT40NE
SoC	nRF5340	nRF5340
Size, mm	15x29.9x2.0	15x29.9x2.0
32M,32.768kHz crystals	Integrated	Integrated
DCDC inductors,VDD,VDDH	Integrated	Integrated
BT Antenna	PA+PCB	PA+PCB+u.FL
Operating temp.	-40°C to +105°C	-40°C to +105°C
Evaluation board	EV-BT40NE	EV-BT40NE

1.2 Antenna Specification

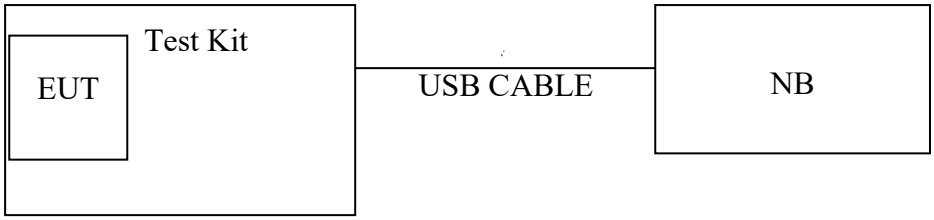
	Antenna Type	Brand	Model	Peak Gain	Frequency Range	Connector Type
1	Dipole	AFC	ANT0	0dBi	2400-2485 MHz	MMCX
3	PCB	Fanstel	F type	0.88dBi	2400-2485 MHz	MMCX

1.3 Assemble

There is a shielding soldered on the module.

1.4 Support Equipment

Configuration of Tested System



Equipment Used in Tested System

Item	Equipment	Mrf/Brand	Model name	Series No	Data Cable	Power Cable
1	Notebook	Lenovo	X220i	N/A	N/A	Non-shielded
2	Test Kit	N/A	N/A	N/A	N/A	N/A

2. Description of Test Modes

The EUT has been tested at continuous TX and RX modes. And software was used to control the EUT for staying in above description test modes.
Test data of model BT40N is the worst case which is reported.

A software tool or a built-in test-mode needs to be reported with the parameter settings for creating the appropriate selection. The software settings shall be reported because of the traceability requirement of the measurements. The settings are depending upon the IEEE standard & mode and the applied modulation. Most common settings are:

The settings for Bluetooth will be influenced by the throughput and the modulation. Most common settings are:

Bluetooth 5.2: GFSK modulation

Test channels in BT 5.2 LE mode

	TX
Channel Low	2402MHz
Channel Mid	2442MHz
Channel High	2480MHz

Test conditions

Temperature & humidity	Normal
Normal voltage	5.0 Vdc
Lower extreme voltage	5.5 Vdc
Higher extreme voltage	4.5 Vdc

3. General Description of Applied Standards

The EUT According to the Specifications, it must comply with the requirements of the following standards:

Radio equipment stipulated in the certification ordinance Item 19, Paragraph 1, Article 2.

4. Summary of Tests

Article reference	Parameter	Status (Note 1)
General provisions		
5	Frequency tolerance	C
6	Occupied bandwidth	C
7	Spurious emission	C
Transmitting equipment		
14	Antenna Power	C
14.2	SAR	N/A
15	Frequency stabilization	C
Transmitting equipment		
20	Type configuration etc of transmitting antenna	C
Receiving equipment		
24	Spurious emission of receiver	C
Operating frequency 2400-2483.5MHz		
49.20(1); a	High Frequency/modulation section cannot be operated easily	C
49.20(1); b	Communication method	C
49.20(1); c	Communication method	C
49.20(1); d	Spread Spectrum method	C
49.20(1); e	Antenna Power	C
49.20(1); f(1)	Absolute gain of transmitting antenna	C
49.20(1); f(2)	Angular width of principal radiation (AWPR)	C
49.20(1); g	Number of carriers within 1MHz bandwidth in OFDM	C
49.20(1); h	Diffusion bandwidth	C
49.20(1); i	Spreading factor	C
49.20(1); j	Frequency retention time (FH employed)	C
9.4	Interference Prevention Function	C
Note 1: C=Confirm NC=Not Confirm NT=Not Tested NA= Not Applicable		

4.1 Antenna Power and Tolerance

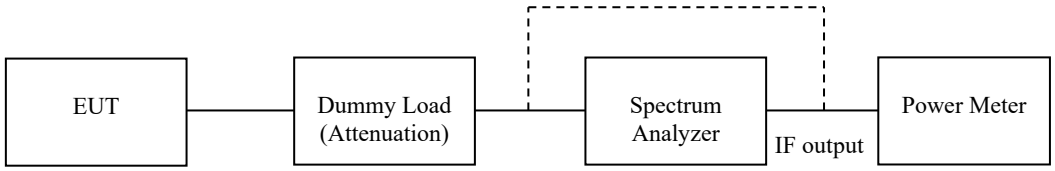
4.1.1 Limit

Modulation Method	Antenna Power Limit	Antenna Power Tolerance
FHSS	3mW/MHz	+20% to -80%
DSSS	10mW/MHz	
OFDM (20MHz System)	10mW/MHz	
OFDM (40MHz System)	5mW/MHz	
Other Digital methods	10mW/MHz	

4.1.2 Measurement Equipment Used

Refer to section Appendix A: Equipment List for detail.

4.1.3 Test Setup



Note: A high-frequency power meter is directly connected to the output of a dummy load (attenuator) when measuring the total power of a system other than the orthogonal frequency division multiplexing system or the spread spectrum system using direct spreading.

4.1.4 Test Procedure

1. Condition of measuring instrument

(1) Measure the equivalent noise bandwidth at the resolution bandwidth of 1 MHz of the spectrum analyzer, correct the bandwidth to the 1 MHz equivalent bandwidth, and read the displayed value. However, when the spread bandwidth is 1 MHz or less, correction shall be performed only when "spread bandwidth (MHz)/equivalent noise bandwidth (MHz)" exceeds 1.

(2) The attenuation of the dummy load (attenuator) shall be the value that gives the optimum operating input level to the spectrum analyzer.

(3) Set the spectrum analyzer as follows when searching for the frequency that gives the maximum antenna power.

Center frequency	Test frequency
Sweep frequency width	About twice the occupied frequency bandwidth
Resolution bandwidth	1MHz
Video bandwidth	About three times the resolution bandwidth
Sweep time	Minimum time for guaranteed measurement accuracy (In the case of burst waves, the time at which one or more bursts are included per sample)
Trigger condition	Free run
Sweep mode	Continuous sweep
Detection mode	Positive peak
Display mode	Max hold

(4) Set the spectrum analyzer as follows when measuring the antenna power.

Center frequency	The frequency that gives the maximum power (searched frequency)
Sweep frequency width	0Hz
Resolution bandwidth	1MHz
Video bandwidth	Same as resolution bandwidth
Sweep mode	Continuous sweep

2. Condition of test equipment

(1) Set to the test frequency and enter the continuous transmission state or continuous burst transmission state.

(2) If a spread code is used, set it to the test spread code and modulate it with the standard coded test signal.

(3) If the orthogonal frequency division multiplexing system is used, it shall be in a burst transmission state and in a modulation state in which the proportion of time in which the number of subcarriers is the smallest is maximized. At this time, it is performed within a range that can occur continuously in the actual operation. However, when the modulation cannot be set, it can be performed in continuous burst transmission state or continuous transmission state.

3. Measurement procedure

(1) Those using frequency hopping method (including DSSS or composite method with OFDM)

a. Confirming in the submitted document that the frequency hopping intervals in the frequency distribution of frequency hopping are equal intervals of 1 MHz or less, and that the probability of occurrence at each hopping frequency is uniform, and that the probability of occurrence at each hopping frequency is uniform. If it is, it is implemented by the following method.

(a) Connect a high frequency power meter to the output of the dummy load (attenuator) and measure the total power.

(b) Divide the total power by the spreading bandwidth to calculate the average power per 1 MHz.

(c) Antenna power shall be as follows.

A) Value of (b) for continuous wave

B) For burst wave Average power in burst is calculated from the value of (b) and the transmission time rate.

b. If the frequency distribution of frequency hopping or the probability of occurrence at each hopping frequency is not uniform, set the spectrum analyzer as in 1(3) to search for the frequency that gives the maximum antenna power, and then perform spectrum analysis. Set the device as in 1(4), and measure the antenna power at the frequency that gives the maximum power.

(2) In the case of those using OFDM or DSSS

a. Set the spectrum analyzer as in 1(3).

b. After repeating the sweep until no change is observed in the display, measure the frequency at which the power per 1 MHz gives the maximum value.

c. Set the spectrum analyzer as in 1(4).

d. Connect the high frequency power meter to the IF output terminal of the spectrum analyzer.

e. Antenna power shall be as follows.

(a) For continuous wave: The value corrected by 1(1) from the indication of the high-frequency power meter.

(b) Burst wave: Calculated average power in a burst from values corrected in the same way as for continuous waves and the transmission time rate.

f. In the case of using the orthogonal frequency division multiplexing system, when there are multiple subcarrier modulation systems, measure the antenna power at each time and take the largest value as the measured value.

(3) In the case of items using other methods

a. Connect a high-frequency power meter to the output of the dummy load (attenuator) and measure the total power.

b. Antenna power shall be as follows.

(a) For continuous wave: The antenna power is the value of a.

(b) Burst wave: The average power in the burst is calculated from the value of (a) and the transmission time rate.

4.1.5 Test Results

Ambient temperature: 19℃ Relative humidity: 58% Test Date: 2023/02/20

BLE
Rated Power =8
Antenna Gain=0.88

		Channel Low	Channel Mid	Channel High	Limit
Normal Voltage 5 V	Conducted Power (dBm)	9.042	8.792	6.039	N/A
	Conducted Power (mW)	8.02	7.572	4.017	10mW
	Power Tolerance	0.256	-5.352	-49.788	+20% to -80%
Upper Voltage 5.5V	Conducted Power (dBm)	9.021	8.766	6.033	N/A
	Conducted Power (mW)	7.982	7.527	4.011	10mW
	Power Tolerance	-0.228	-5.917	-49.857	+20% to -80%
Lower Voltage 4.5V	Conducted Power (dBm)	9.028	8.757	6.039	N/A
	Conducted Power (mW)	7.995	7.511	4.017	10mW
	Power Tolerance	-0.067	-6.112	-49.788	+20% to -80%

Remark:
1. Conducted Power (mW/MHz)= 10^(Conducted Power(dBm/MHz)/10)
2. P (mW/MHz) = Raw power (in mW, measured by power sensor) / [spreading bandwidth (MHz) x duty-cycle]

4.2 Frequency Tolerance

4.2.1 Limit:

50ppm

4.2.2 Measurement Equipment Used

Refer to section Appendix A: Equipment List for detail.

4.2.3 Test Setup

Refer to section 4.1.3 for detail.

4.2.4 Test Procedure

1. Set the EUT modulation off.
2. Set the ETU operates at channel low, mid and high and normal voltage.
3. Set the spectrum analyzer RBW = 300Hz, VBW=300Hz and Span = 20kHz
4. Max hold, View, Peak High, Mark and snap the screen and record the mark.
5. Varied input voltage to + 10% and - 10% normal voltage and repeat procedure 1 to 4 again.

4.2.5 Test Results

Ambient temperature: 19℃ Relative humidity: 58% Test Date: 2023/02/20

BLE

		Channel Low	Channel Mid	Channel High	Limit
Normal Voltage 5 V	Measured Frequency (MHz)	2402.009	2442.009	2480.009	+/-50ppm
	Frequency Tolerance (ppm)	3.83	3.767	3.79	
Upper Voltage 5.5V	Measured Frequency (MHz)	2402.009	2442.009	2480.009	+/-50ppm
	Frequency Tolerance (ppm)	3.83	3.767	3.79	
Lower Voltage 4.5V	Measured Frequency (MHz)	2402.009	2442.009	2480.009	+/-50ppm
	Frequency Tolerance (ppm)	3.83	3.767	3.79	

4.3 Occupied Bandwidth

4.3.1 Limit

Modulation Method	OBW Limit
FHSS	< 83.5MHz
DSSS	< 26MHz
OFDM (20MHz System)	< 26MHz
OFDM (40MHz System_	26MHz - 40MHz
Other Digital methods	< 26MHz

4.3.2 Measurement Equipment Used

Refer to section Appendix A: Equipment List for detail.

4.3.3 Test Setup

Refer to section 4.1.3 for detail.

4.3.4 Test Procedure:

1. Set the EUT modulation on.
2. Set the ETU operate at channel low, mid and high and normal voltage.
3. Set the spectrum analyzer RBW = 300kHz, VBW= 300kHz
4. Set span large enough to capture all products of the modulation process.
5. Turn on 99% spectrum OBW function on, Max hold, View, and snap the screen and record the mark.
6. Varied input voltage to + 10% and - 10% normal voltage and repeat procedure 1 to 4 again.

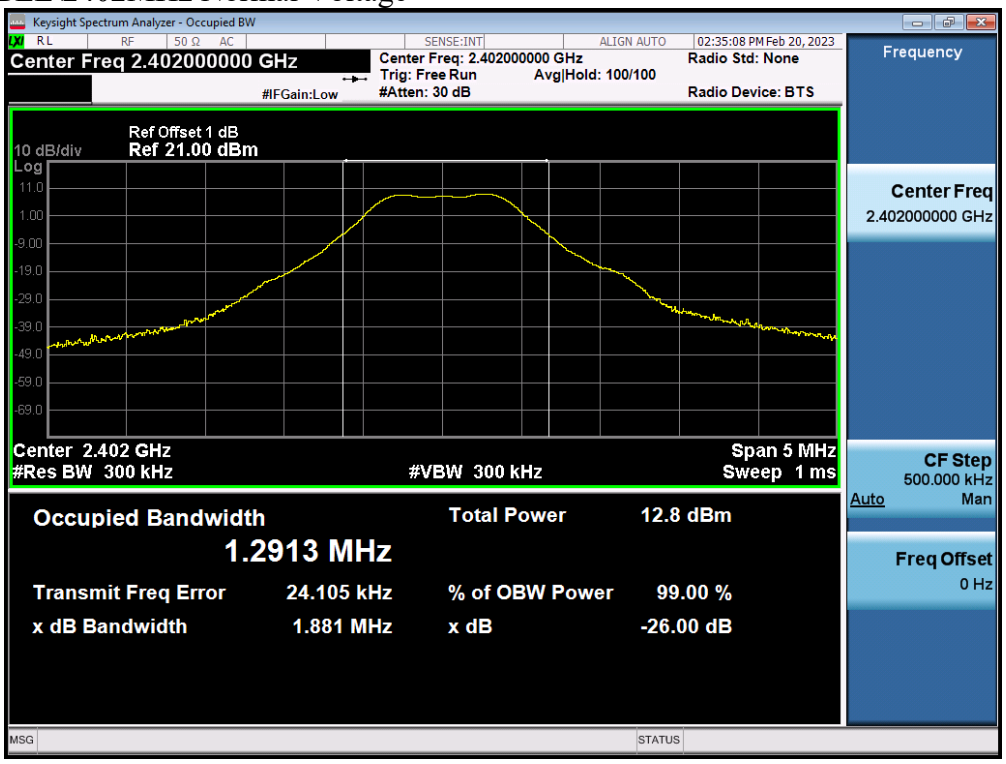
4.3.5 Test Result

Ambient temperature: 19℃ Relative humidity: 58% Test Date: 2023/02/20

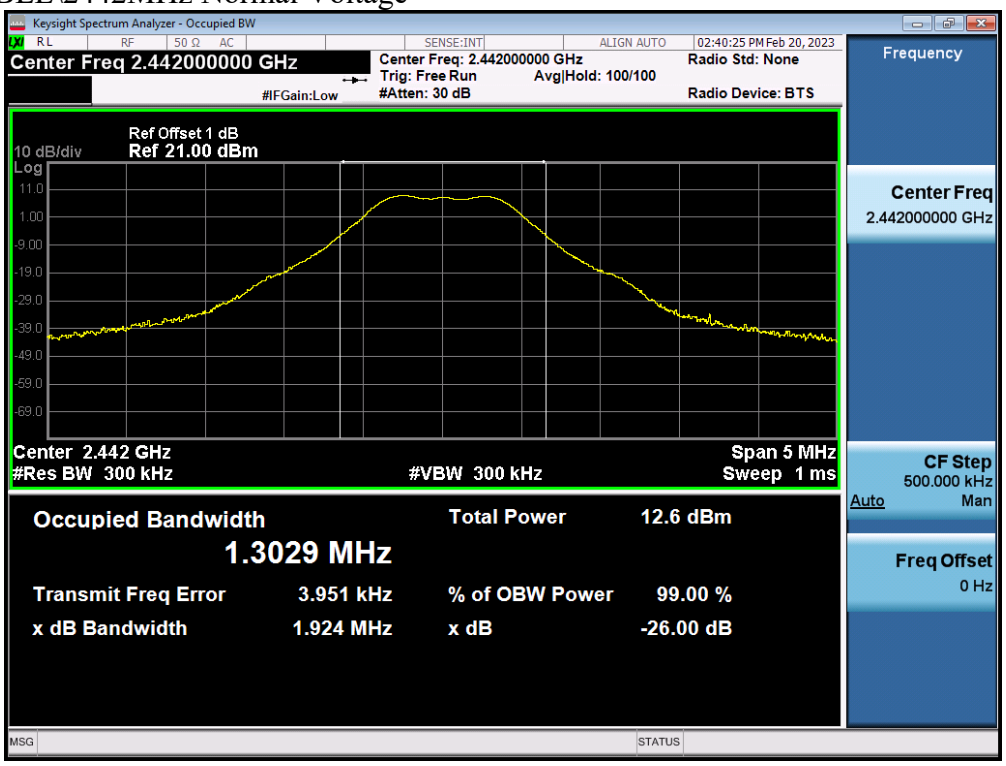
BLE

	Low channel (MHz)	Mid channel (MHz)	High channel (MHz)	Limit	Remark
Normal Voltage 5 V	1.291	1.303	1.295	<26MHz	PASS
Upper Voltage 5.5 V	1.292	1.304	1.295	<26MHz	PASS
Lower Voltage 4.5 V	1.291	1.304	1.293	<26MHz	PASS

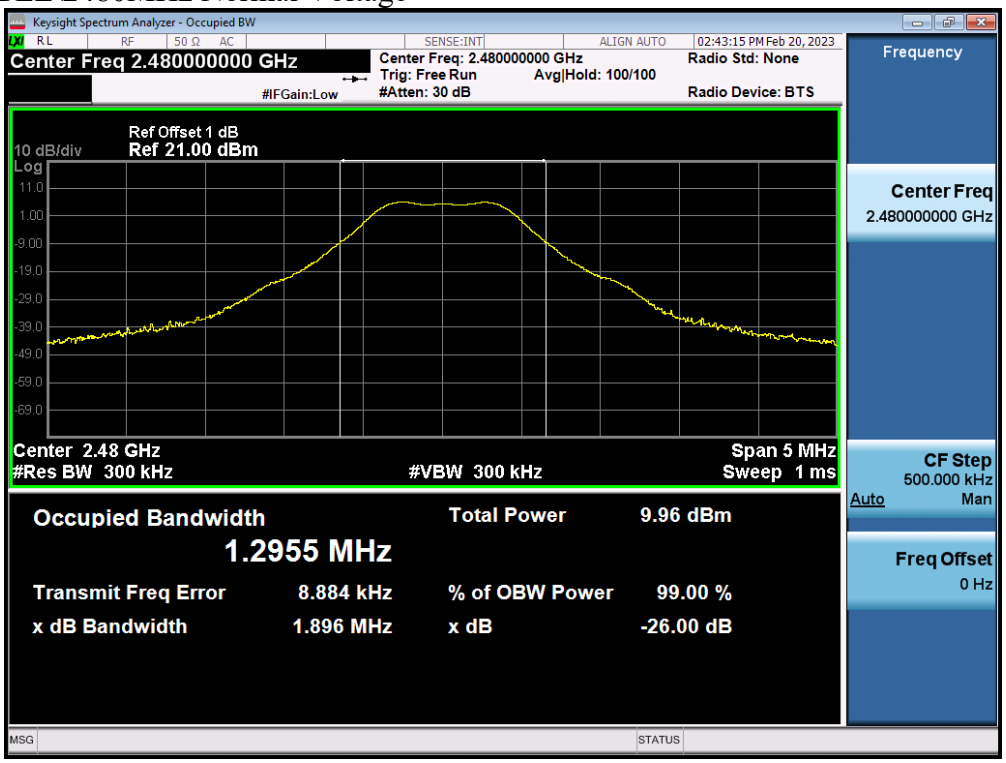
Test Data: BLE\2402MHz Normal Voltage



Test Data: BLE\2442MHz Normal Voltage



Test Data: BLE\2480MHz Normal Voltage



4.4 Spreading Bandwidth (90%)

4.4.1 Limit

> 500kHz
Spread Factor: 1~13ch>5, 14ch >10

4.4.2 Measurement Equipment Used

Refer to section Appendix A: Equipment List for detail.

4.4.3 Test Setup

Refer to section 4.1.3 for detail.

4.4.4 Test Procedure

1. Set the EUT modulation on.
2. Set the ETU operate at channel low, mid and high and normal voltage.
3. Set the spectrum analyzer RBW = 300kHz, VBW= 300kHz, and Set span large enough to capture all products of the modulation process.
4. Turn on 90% spectrum OBW function, Max hold, View, and snap the screen and record the mark.
5. Varied input voltage to + 10% and - 10% normal voltage and repeat procedure 1 to 4 again.

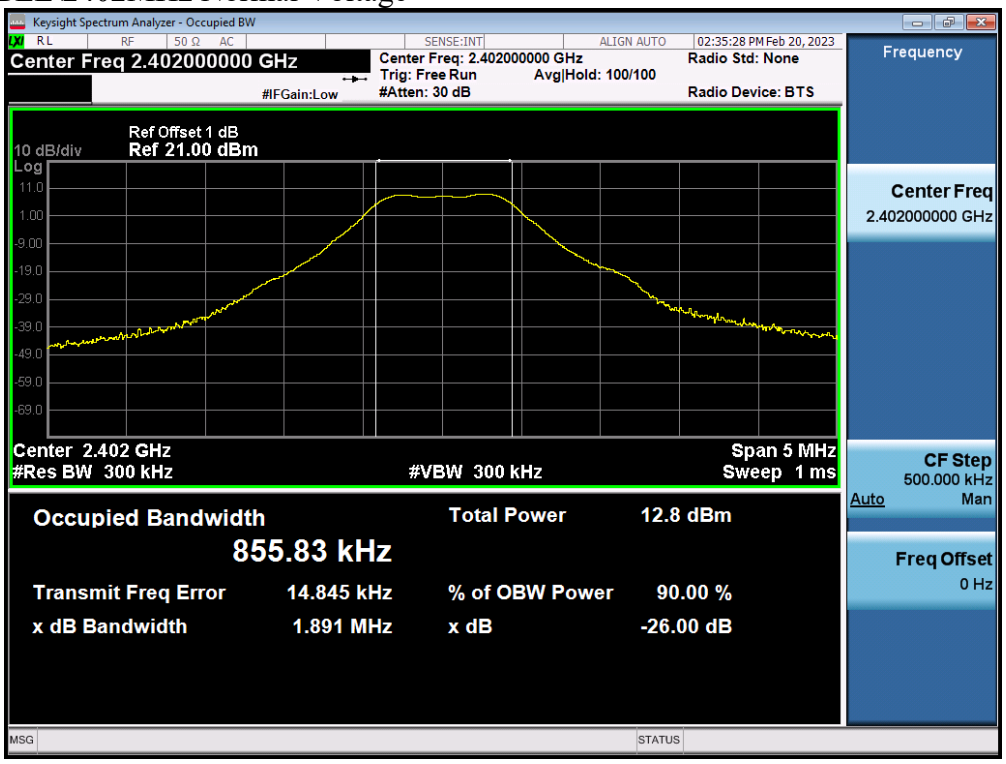
4.4.5 Test Results

Ambient temperature: 19℃ Relative humidity: 58% Test Date: 2023/02/20

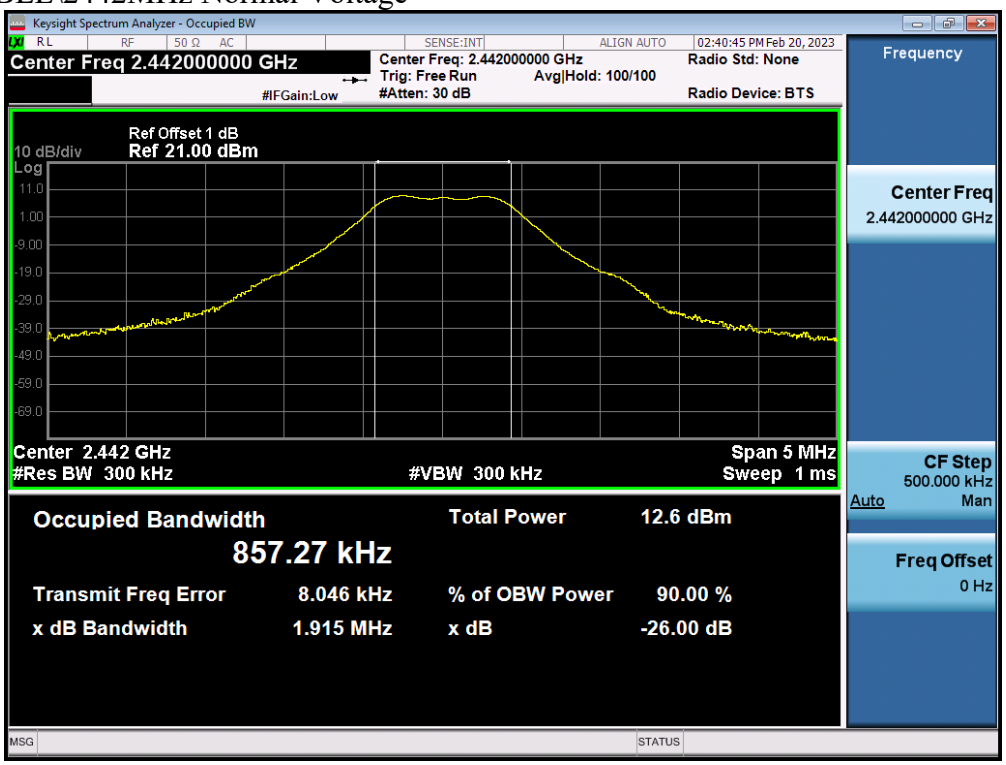
BLE

	Low channel (MHz)	Mid channel (MHz)	High channel (MHz)	Limit (KHz)	Remark
Normal Voltage 5 V	0.856	0.857	0.853	>500	PASS
Upper Voltage 5.5 V	0.855	0.857	0.854	>500	PASS
Lower Voltage 4.5 V	0.854	0.857	0.853	>500	PASS

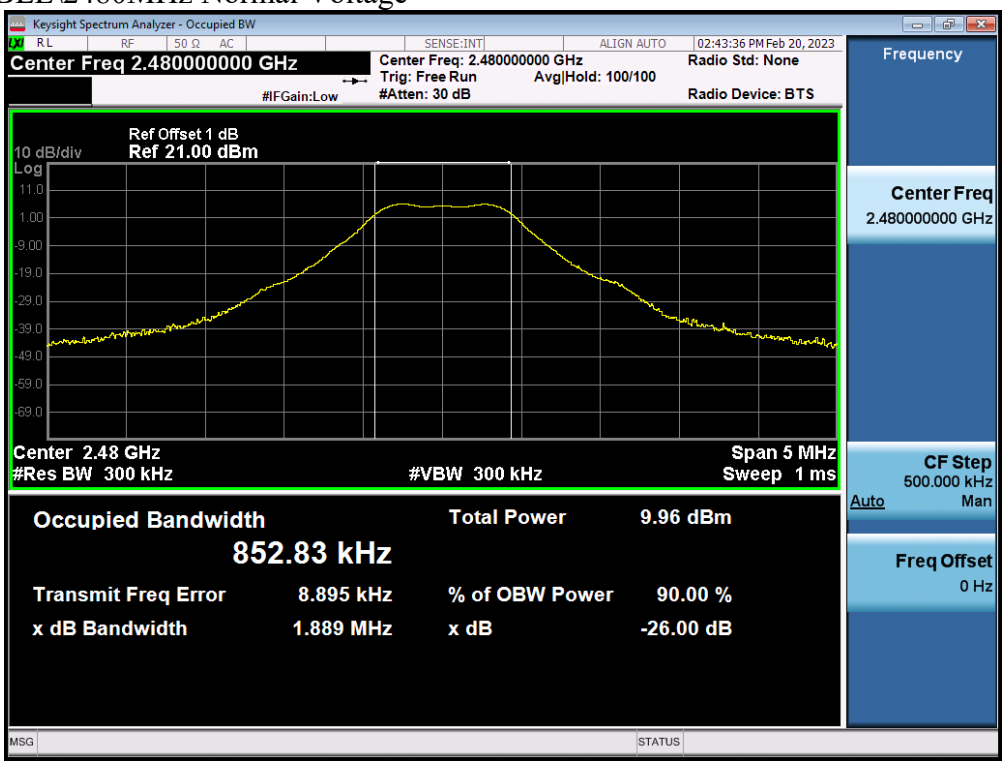
Test Data: BLE\2402MHz Normal Voltage



Test Data: BLE\2442MHz Normal Voltage



Test Data: BLE\2480MHz Normal Voltage



4.5 Transmitter Spurious Emissions

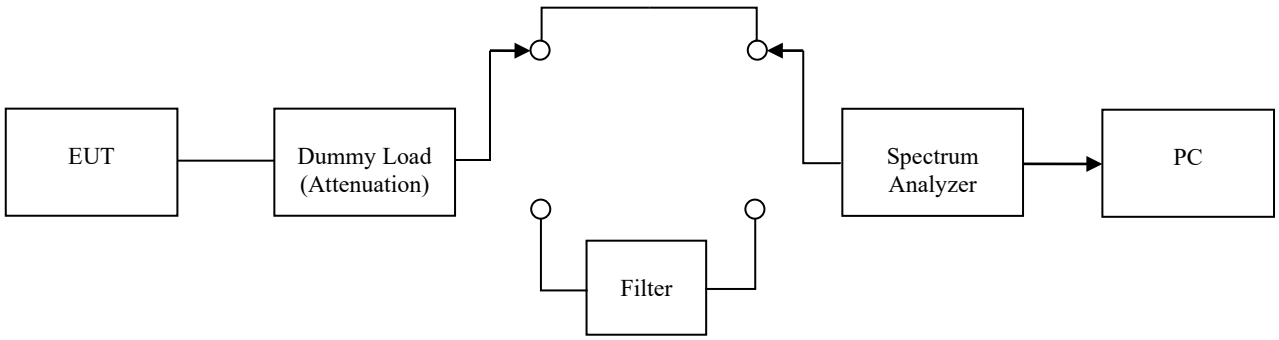
4.5.1 Limit

Frequency Range	Limit
30MHz – 2387MHz	≤ 2.5uW
2387MHz – 2400MHz	≤ 25uW
2483.5MHz – 2496.5MHz	≤ 25uW
2496.5MHz – 12.5GHz	≤ 2.5uW

4.5.2 Measurement Equipment Used

Refer to section Appendix A: Equipment List for detail.

4.5.3 Test Setup



4.5.4 Test Procedure

1. Use a carrier suppression filter as necessary.
2. Spectrum Analyzer Setting:
   (1) Set the spectrum analyzer as follows when searching.

Sweep frequency width	Search for spurious from the lowest possible frequency to three times or more of the carrier frequency.
Resolution bandwidth	100kHz (for f < 1GHz) 1MHz (for f ≥ 1GHz)
Video bandwidth	Same as resolution bandwidth
Y-axis scale	10dB/Div
Input level	Maximum dynamic range value
Sweep Time	Minimum time for guaranteed measurement accuracy
Number of data points	400 or more data points
Sweep mode	Single sweep
Detection mode	Positive peak

   (2) Set the spectrum analyzer for spurious measurement as follows

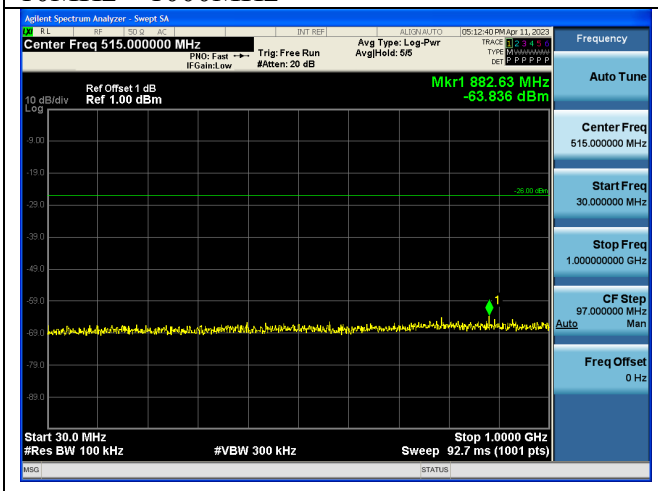
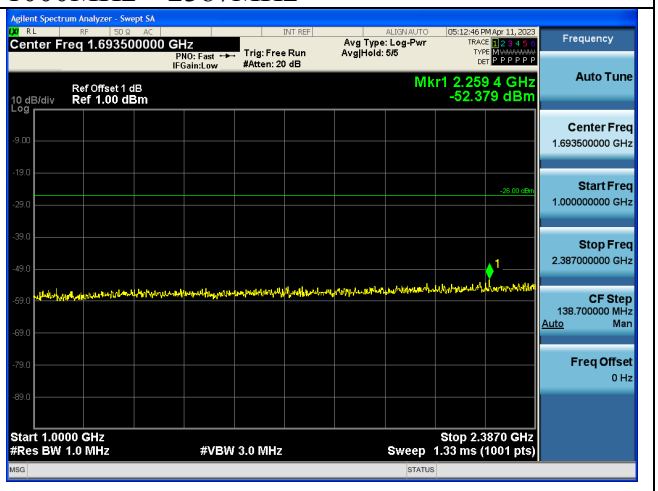
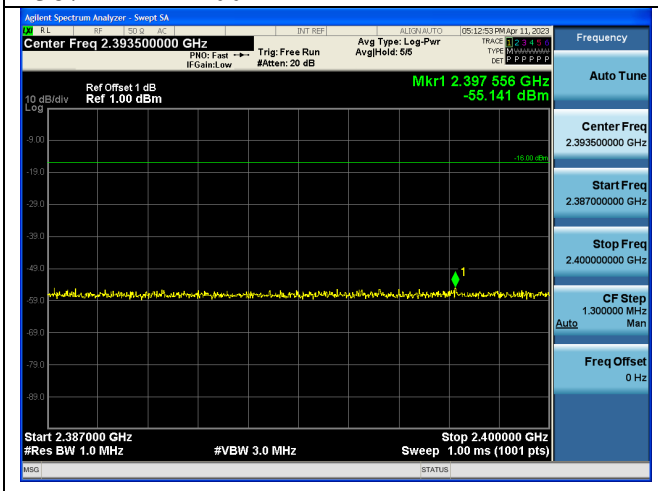
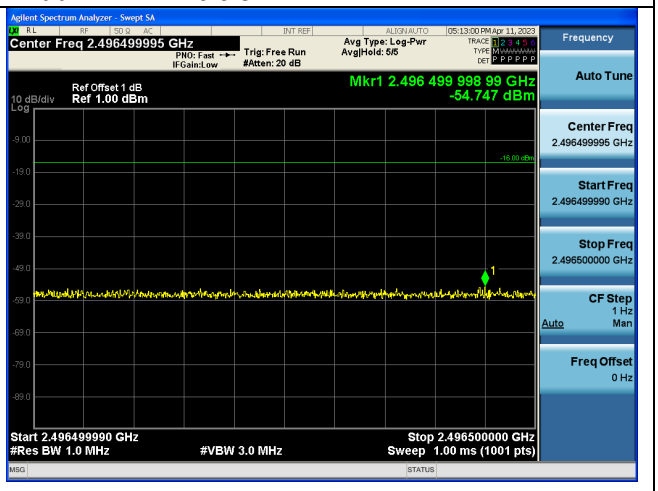
Center frequency	Searched spurious frequency
Sweep frequency width	0Hz
Resolution bandwidth	10kHz (for f < 30MHz) 100kHz (for 30MHz ≤ f < 1GHz) 1MHz (for f ≥ 1GHz)
Video bandwidth	Same as resolution bandwidth
Y-axis scale	10dB/Div
Input level	Set the amplitude of the carrier wave near the maximum in the linear region of the mixer.
Sweep time	Minimum time for guaranteed measurement accuracy
Sweep mode	Single sweep
Detection mode	Sample

3. Set the spectrum analyzer to 2(1) and sweep to search for spurious.
4. If the searched spurious signal satisfies the standard value, the measurement of 2(2) is not performed, and the obtained amplitude value is used as the measured value.
5. If the amplitude value of the searched spurious exceeds the standard value, in order to increase the frequency accuracy of the spectrum analyzer, narrow the sweep frequency to 10 MHz and then 1 MHz to obtain the spurious frequency accurately. Next, set the spectrum analyzer to 2(2) above, and find the average value of the spurious amplitude to use as the measured value.

The worst data was recorded.

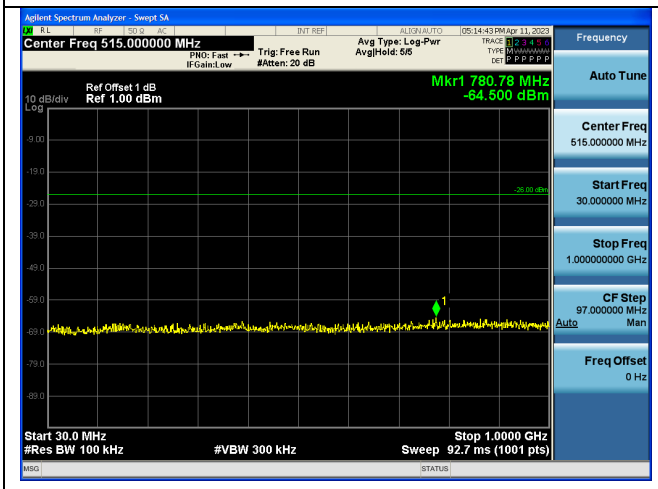
4.5.5 Test Results

Test Data: BLE\2402MHz

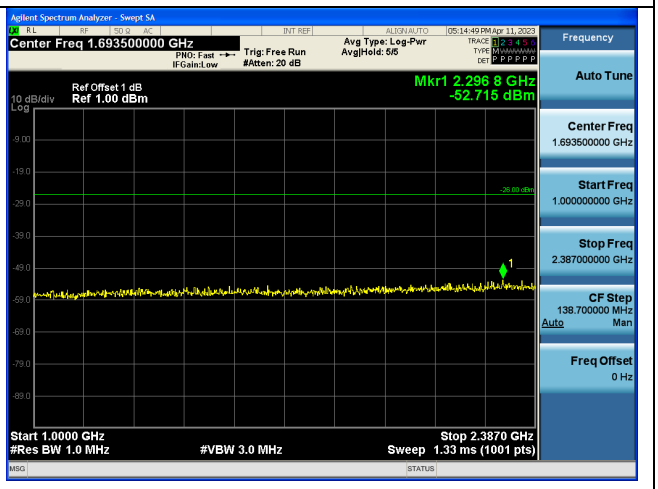
10MHz – 1000MHz	1000MHz – 2387MHz
	
2387MHz – 2400MHz	**2400MHz – 2496.5MHz**
	
2496.5MHz – 26GHz	
	

Test Data: BLE\2442MHz

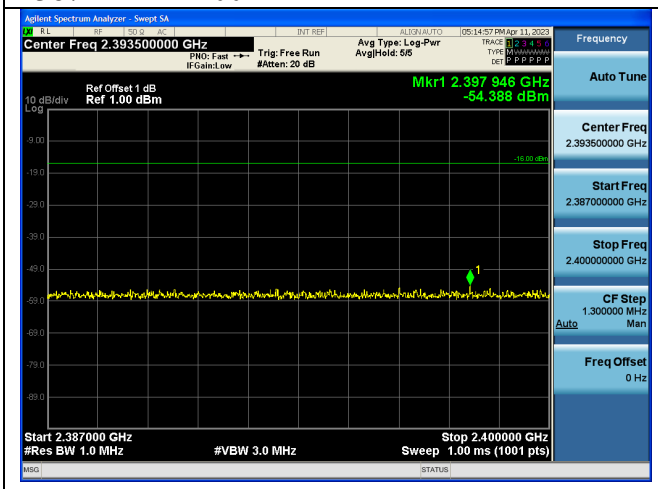
10MHz – 1000MHz



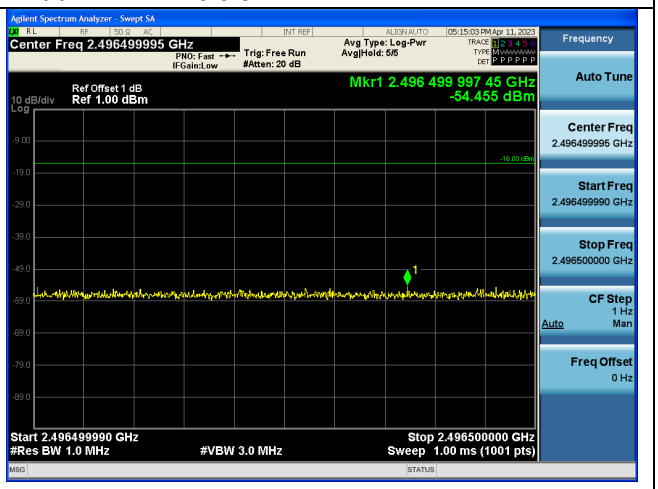
1000MHz – 2387MHz



2387MHz – 2400MHz



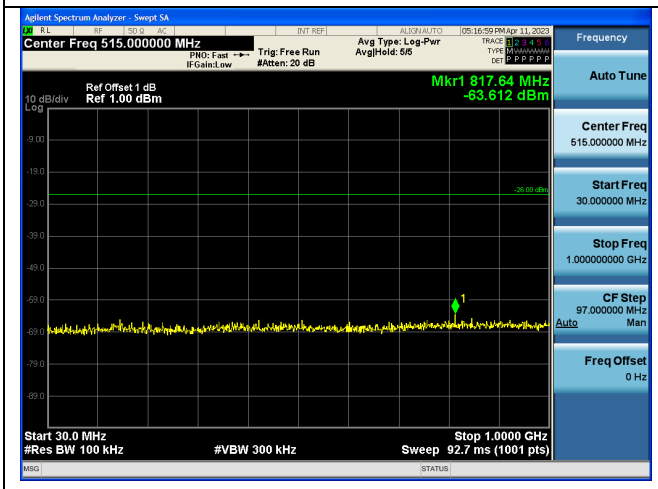
2400MHz – 2496.5MHz



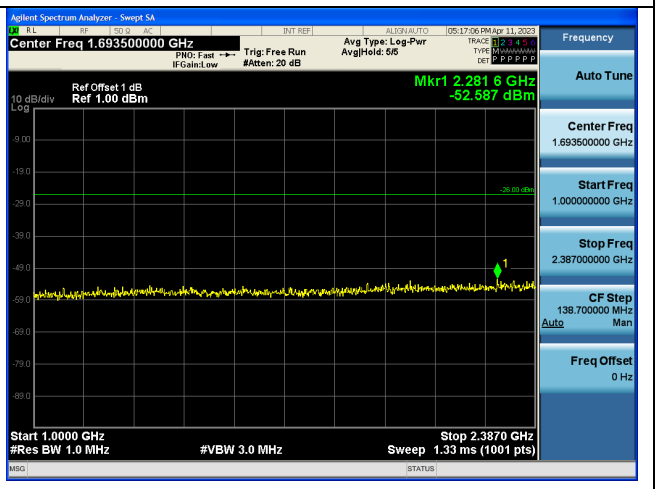
2496.5MHz – 26GHz

Test Data: BLE\2480MHz

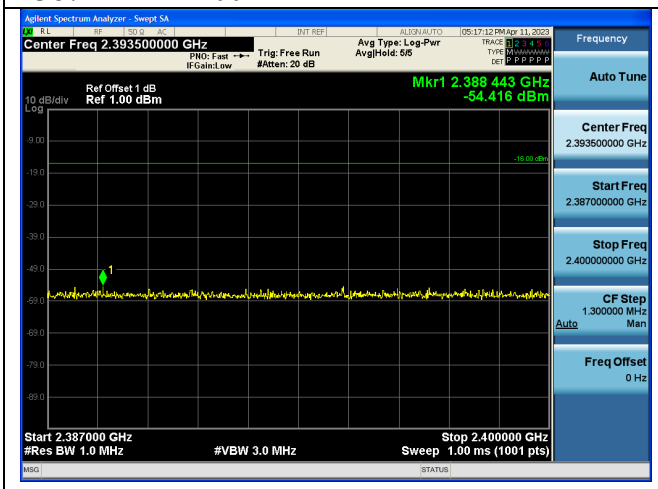
10MHz – 1000MHz



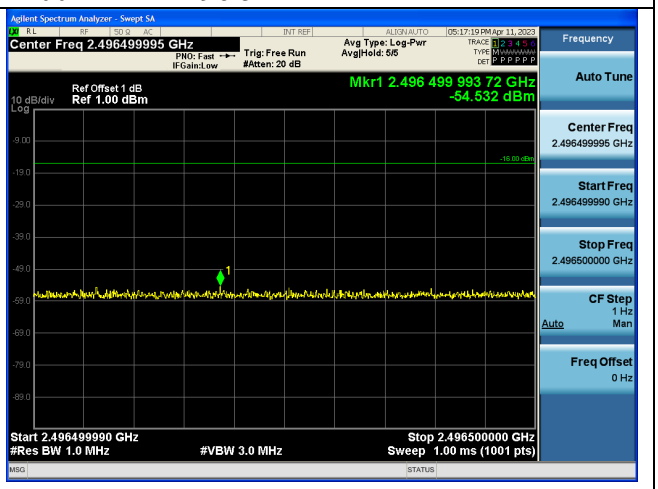
1000MHz – 2387MHz



2387MHz – 2400MHz



2400MHz – 2496.5MHz



2496.5MHz – 26GHz

4.6 Limitation of Collateral Emission of Receiver

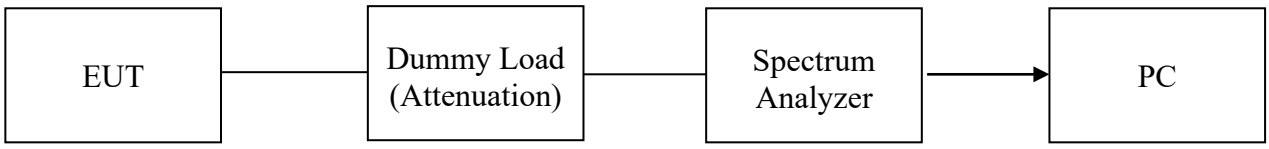
4.6.1 Limit

Frequency Range	Limit
30MHz – 1GHz	≤ 4nW
1GHz – 12.5GHz	≤ 20nW

4.6.2 Measurement Equipment Used

Refer to section Appendix A: Equipment List for detail.

4.6.3 Test Setup



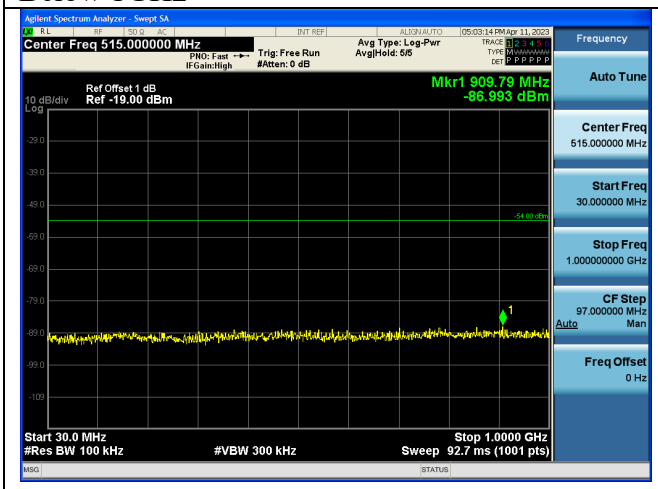
4.6.4 Test Procedure

1. Spectrum Analyzer Setting:
   (1) Set the spectrum analyzer as follows when searching.
   Sweep frequency width 30MHz to 5 times the carrier frequency
   Resolution bandwidth 100kHz (for f < 1GHz), 1MHz (for f ≥ 1GHz)
   Video bandwidth Same as resolution bandwidth
   Sweep time Minimum time for guaranteed measurement accuracy
   Sweep mode Single sweep
   Detection mode Positive peak
   (2) Set the spectrum analyzer for secondary emission measurement as follows.
   Center frequency Secondary emission frequency
   Sweep frequency width 0Hz
   Resolution bandwidth 100kHz (for f < 1GHz), 1MHz (for f ≥ 1GHz)
   Video bandwidth Same as resolution bandwidth
   Sweep time Minimum time for guaranteed measurement accuracy
   Sweep mode Single sweep
   Detection mode Sample

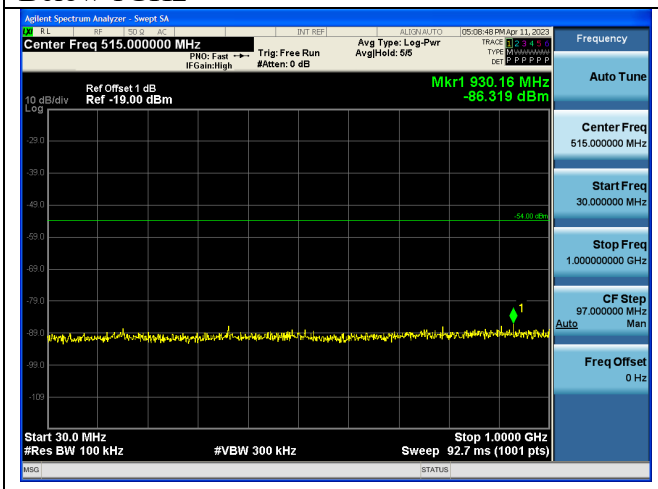
2. The worst data was recorded.

4.6.5 Test Results

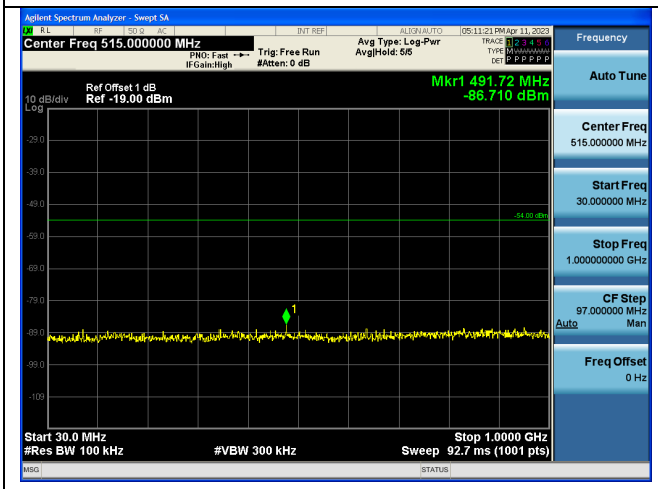
Test Data: BLE\2402MHz

Below 1GHz	Above 1GHz
	

Test Data: BLE\2442MHz

Below 1GHz	Above 1GHz
	

Test Data: BLE\2480MHz

Below 1GHz	Above 1GHz
	

4.7 Hopping Dwell Time

4.7.1 Limit

≤ 0.4s in one 28.5 sec period

4.7.2 Measurement Equipment Used

Refer to section Appendix A: Equipment List for detail.

4.7.3 Test Setup

Refer to section 4.1.3 for detail.

4.7.4 Test Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0Hz, Adjust Sweep = 30s.
5. Repeat above procedures until all frequency measured were complete.

4.7.5 Test Results

N/A

4.8 Angular Width of Principal Radiation (AWPR)

The angular width of principal radiation (AWPR), which follows from the antenna pattern specifications, shall satisfy the expression 360/A degree.

To be assessed:
AWPR < 360/A (degree)
A represent the value determined by dividing equivalent isotropic radiated power by the value obtained by applying an antenna power with the mean power (3mW for BT; 10mW for Wifi/ BLE) to the transmitting antenna with its absolute gain being 2.14 dBi.

Ambient temperature: 19℃ Relative humidity: 58% Test Date: 2023/02/20

BLE Antenna gain=0.88dBi

		Channel Low	Channel Mid	Channel High
Normal Voltage 5 V	Conducted power (mW)	8.02	7.572	4.017
	Radiated power (dBm)	9.922	9.672	6.919
	Radiated power (mW)	9.822	9.273	4.919
	Constant A	9.822/16.4<1	9.273/16.4<1	4.919/16.4<1
Upper Voltage 5.5 V	Conducted power (mW)	7.982	7.527	4.011
	Radiated power (dBm)	9.901	9.646	6.913
	Radiated power (mW)	9.775	9.217	4.912
	Constant A	9.775/16.4<1	9.217/16.4<1	4.912/16.4<1
Lower Voltage 4.5 V	Conducted power (mW)	7.995	7.511	4.017
	Radiated power (dBm)	9.908	9.637	6.919
	Radiated power (mW)	9.79	9.198	4.919
	Constant A	9.79/16.4<1	9.198/16.4<1	4.919/16.4<1

In these cases, according to article 49.20 (f)(2) of the Regulations the constant A should be equalized to 1.
As a result AWPR, 360 degrees, which is always satisfied.

4.9 Carrier Sense Capability

4.9.1 Limit

Shall not transmit when received signal level is above 100 mV

Automatic cessation of transmitting is required when the electric field strength is exceeding E (mV/m):
Antenna Voltage (in dBm) = 22.79 + max. antenna Gain - 20 x Log f (f in MHz)
This voltage will be generated in de direction of the max. Gain.

BLE

		Antenna Gain (dBi)		dBm
Channel Low 2402MHz:	Pcs = 22.79 +	0.88	- 20 * log (2402) =	-43.94
Channel Mid 2441MHz:	Pcs = 22.79 +	0.88	- 20 * log (2441) =	-44.08
Channel High 2480MHz:	Pcs = 22.79 +	0.88	- 20 * log (2480) =	-44.22

4.9.2 Measurement Equipment Used

Refer to section Appendix A: Equipment List for detail.

4.9.3 Test Setup

Refer to section 4.1.3 for detail.

4.9.4 Test Procedure

1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port through splitter to spectrum.
2. Set center frequency of spectrum analyzer = operating frequency.
3. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 50MHz, Sweep = Auto.
4. EUT link to device set it in normal mode.
5. Used spectrum analyzer trigger function and delta mark function.

4.9.5 Test Results

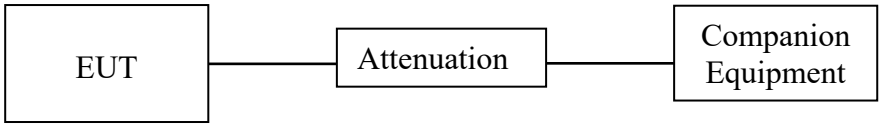
Pass

4.10 Interference Prevention Function

4.10.1 Limit

Radio equipment used mainly on the same premises and automatically transmits or receives identification code.

4.10.2 Test Setup



4.10.3 Test Procedure

1.Set EUT under operating mode and link up with companion equipment.
2.Check communication status between EUT and companion equipment.
3.Confirm the status.

4.10.4 Test Results

Pass

5. Appendix

5.1 Appendix A: Equipment List

Location Conducted	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date	Calibration Body	Calibration Method
Conducted	Power Meter	Anritsu	ML2495A	1116010	09/29/2022	09/29/2023	ETC	c
Conducted	Power Sensor	Anritsu	MA2411B	34NKF50	09/29/2022	09/29/2023	ETC	c
Conducted	Power Sensor	DARE	RPR3006W	13I00030SNO33	01/06/2023	01/06/2024	ETC	c
Conducted	Power Sensor	DARE	RPR3006W	13I00030SNO34	01/06/2023	01/06/2024	ETC	c
Conducted	Power Sensor	DARE	RPR3006W	14I00889SNO35	06/29/2022	06/29/2023	ETC	c
Conducted	Power Sensor	DARE	RPR3006W	14I00889SNO36	06/29/2022	06/29/2023	ETC	c
Conducted	Temperature Chamber	KSON	THS-B4H100	2287	05/20/2022	05/20/2023	ETC	c
Conducted	DC Power supply	ABM	8185D	N/A	01/04/2023	01/04/2024	ETC	c
Conducted	AC Power supply	EXTECH	CFC105W	NA	N/A	N/A	N/A	N/A
Conducted	Spectrum analyzer	Keysight	N9010A	MY56070257	09/28/2022	09/28/2023	ETC	c
Conducted	Test Software	DARE	Radiation Ver:2013.1.23	NA	NA	NA	N/A	N/A
Conducted	Wideband Radio Comm. Tester	R&S	CMW500	1201.002K50108793-JG	10/31/2022	10/31/2023	ETC	c
Conducted	BT Simulator	Agilent	N4010A	MY48100200	NA	NA	N/A	N/A
Conducted (TS8997)	Wideband Radio Comm. Tester	R&S	CMW500	168811	09/22/2022	09/22/2023	ETC	c
Conducted (TS8997)	UP/DOWN convertor	R&S	CMW-Z800A	100566	12/22/2022	12/22/2023	R&S	c
Conducted (TS8997)	Signal Generator	R&S	SMB100A	183701	01/18/2023	01/18/2024	R&S	c
Conducted (TS8997)	Vector Signal Generator	R&S	SMM100A	101908	11/23/2022	11/23/2023	R&S	c
Conducted (TS8997)	Signal analyzer 40GHz	R&S	FSV40	101884	09/22/2022	09/22/2023	ETC	c
Conducted (TS8997)	OSP150 extension unit CAM-BUS	R&S	OSP150	101107	09/21/2022	09/21/2023	ETC	c
Conducted (TS8997)	Test Software	R&S	EMC32 Ver: 11.50.00	NA	NA	NA	N/A	N/A

Calibration Method:

a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1)

b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992)

c) Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1)

d) Calibration conducted by using measuring instruments and other equipment listed in the right column of Table No. 3 attached hereto, which shall have been given any of calibration, etc. listed above from a) to c)

5.2 Appendix B: Uncertainty of Measurement

ISO/IEC 17025 requires that an estimate of measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Parameters	Uncertainty (k=2)
Radio frequency	±0.03 ppm
RF power, conducted	±1.386 dB
Power Spectral Density, conducted	±1.432 dB
Occupied Bandwidth	±0.46 %
Spurious emission, conducted	±0.852 dB
Temperature	±0.826 ℃

5.3 Appendix C: Photographs of Setup

5.4 Appendix D: Photographs of EUT

Please refer to the File of **ISL-23LR0019P**

--- END ---