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Report Template Version: V05
Report Template Revision Date: 2021-11-03

TEST REPORT

Application No.:	CQASZ20230901718E
Applicant:	Shenzhen jumei Technology Co., Ltd
Address of Applicant:	Six Floor Xingguangbao Industrial park Huaning Road Dalang Longhua Shenzhen China
Manufacturer:	Shenzhen jumei Technology Co., Ltd
Address of Manufacturer:	Six Floor Xingguangbao Industrial park Huaning Road Dalang Longhua Shenzhen China
Factory:	Shenzhen jumei Technology Co., Ltd
Address of Factory:	Six Floor Xingguangbao Industrial park Huaning Road Dalang Longhua Shenzhen China
Equipment Under Test (EUT):	
Product:	SMART BAND
Model No.:	F57L, F57, F57Pro, F21Pro, F67, F67S, F67Pro,F207, F207R, F22R, F33, (Please refer clause 4.1)
Test Model No.:	F57L
Brand Name:	N/A
Standards:	Item 19 of Article 2 Paragraph 1
Date of Receipt:	2023-06-01
Date of Test:	2023-06-01 to 2023-06-15
Date of Issue:	2023-10-07
Test Result :	**PASS***

Tested By: lewis zhou
(Lewis Zhou)

Reviewed By: Timo Lei
(Timo Lei)

Approved By: Jack
(Jack Ai)

SHENZHEN HUAXIA TESTING TECHNOLOGY CO., LTD. CQA 华夏淮测 APPROVED

* In the configuration tested, the EUT complied with the standards specified above.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20230901718E	Rev.01	Initial report	2023-10-07

Note:

This test report (Ref. No.: CQASZ20230901718E)

All test data comes from source test reports (Ref. No.: CQASZ20230600939E).

Only on the basis of the original report Change Model No.. The tested samples have not been changed.

2 Test Summary

Test	Test Requirement	Result
Frequency Error	Item 19 of Article 2-1	PASS
Occupied Bandwidth	Item 19 of Article 2-1	PASS
Spread-spectrum Bandwidth	Item 19 of Article 2-1	PASS
Antenna Power	Item 19 of Article 2-1	PASS
Spurious Emission of Tx	Item 19 of Article 2-1	PASS
Interference prevention capability	Item 19 of Article 2-1	PASS
RF accessibility	Item 19 of Article 2-1	PASS
Spurious Emission of Rx	Item 19 of Article 2-1	PASS

Remark:
EUT: In this whole report EUT means Equipment Under Test.
Tx: In this whole report Tx (or tx) means Transmitter.
Rx: In this whole report Rx (or rx) means Receiver.
RF: In this whole report RF means Radio Frequency.
Other: NV-Normal voltage, HV-High voltage, LV-Low voltage, NTNV-Normal temperature & normal voltage

3 Contents

4 General Information

4.1 General Description of E.U.T.

Product Name:	SMART BAND
Model No:	F57L, F57, F57Pro, F21Pro, F67, F67S, F67Pro,F207, F207R, F22R, F33, F307, F307S, F307Pro, F407, F507, F607, F807, F907, F58, F96, F89, F108, F109, F206, F208, F209, F306, F308, F309, F506, F508, F100, F200, F300, F400, F500, F600, F700, F800, F900, F59, F60, F61, F62, F63, F64, F65, F66, F68, F69, F70, F71, F72, F73, F74, F75, F76, F77, F78, F79, F80, F81, F82, F83, F84, F85, F86, F88, F90, F91, F92, F93, F94, F95, F96, F98, F99
Test Model No:	F57L
Trade Mark:	N/A

4.2 Details of E.U.T.

Operating Frequency:	2402 MHZ to 2480 MHZ
Type of Modulation:	GFSK
Number of Channels:	40 Channels
Bluetooth Version:	5.1
Software version:	01.29.02.00
Hardware version:	D02_MB_V1.3
Radio type:	☐ FHSS ☐ DSSS ☐ OFDM ☒ Other
Antenna Type:	Internal antenna
Antenna gain:	-0.47dBi
Rated power:	1.5631mW
Speciality:	BLE
Transfer Rate:	1Mbps
Sample Type:	Portable product
Power Supply:	☒ For EUT operation: lithium battery, DC3.7V, 250mAh, 0.925Wh ☐ For other: Charge by DC5.0V
Test Voltage:	☐ Normal voltage (EUT operation): DC3.7V ☐ Low voltage (Normal voltage -10%): ☐ High voltage (Normal voltage+10%):

Note:

Model No.: F57L, F57, F57Pro, F21Pro, F67, F67S, F67Pro, F207, F207R, F22R, F33, F307, F307S, F307Pro, F407, F507, F607, F807, F907, F58, F96, F89, F108, F109, F206, F208, F209, F306, F308, F309, F506, F508, F100, F200, F300, F400, F500, F600, F700, F800, F900, F59, F60, F61, F62, F63, F64, F65, F66, F68, F69, F70, F71, F72, F73, F74, F75, F76, F77, F78, F79, F80, F81, F82, F83, F84, F85, F86, F88, F90, F91, F92, F93, F94,

F95, F96, F98, F99

Their electrical circuit design, layout, components used and internal wiring are identical,

Only the name is different.

4.3 Description of Support Units

The EUT has been tested independently.

Description	Manufacturer	Model No.	Remark
/	/	/	/

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.

4.7 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

4.8 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• CNAS (No. CNAS L5785)

CNAS has accredited Shenzhen Huaxia Testing Technology Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• ISED Registration No.: 22984-1

The 3m Semi-anechoic chamber of Shenzhen Huaxia Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

• A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

5 Equipment List

Test Equipment List					
Test Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date**	**Cal. Due Date**
Humi/ Temp Indicator	VICTOR	VC330	CQA-S070	2022/9/9	2023/9/8
Spectrum Analyzer	Rohde & Schwarz	FSU26	CQA-038	2022/9/9	2023/9/8
DC Power Supply	KEYSIGHT	E3631A	CQA-028	2022/9/9	2023/9/8
Multi Meter	Fluke	15B	CQA-S011	2022/9/9	2023/9/8
Signal generator	ANRITSU	MG3692B	CQA-019	2022/9/9	2023/9/8

Remark:

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

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

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

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

From JRL Article 24-2, paragraph 4, Item 2

Notice: Calibration duration for above equipments is 1 year.

6 Test Results

6.1 Radio Technical Requirements Specification

Table 1: Radio Technical Requirements Specification for 2.4 GHz band wide-band low-power data communication system (Item 19 of Article 2-1)

Items	Technical standard
Assigned frequency or designated frequency	2400-2483.5MHz
Communication method	One-way communication, simplex, semi-duplex, or duplex operation of digital signal transmission including spread spectrum
Tolerance of frequency ($\times 10^{-6}$)	±50
Tolerance of occupied bandwidth	FH: 83.5MHz or less FH + DS: 83.5MHz or less FH + OFDM: 83.5MHz or less OFDM: 38MHz or less Others: 26MHz or less
Antenna power	Designated value (1) FH, FH+DS, FH+OFDM: 3mW/MHz (used in the range of 2427 - 2470.75 MHz) (2) OFDM, DS other than (1) 10mW/MHz (3) Other than (1) & (2) 10mW (4) OFDM OBW 26 - 38MHz: 5mW/MHz Tolerance:+20%,-80%
Antenna gain	1) 12.14 dBi or less in principle 2) In case of directional antenna (1) FH, FH+DS or FH+OFDM using 2427-2470.75 MHz EIRP≤ 16.91 dBm/MHz (2) OFDM or DS other than (1) EIRP≤ 22.14 dBm/MHz (3) Other than (1) and (2): 22.14 dBm or less (4) OFDM OBW 26 - 38MHz: 19.14dBm/MHz (5) Half-power angle of directional antenna (e) in case of the item 2):e ≤ 360/A (The A is 10 in maximum.)
Tolerance of spurious emission intensity	(1) Below 2387 MHz: 2.5μW (2) 2387 to 2400 MHz: 25μW (3) 2483.5 through 2496.5 MHz: 25μW (4) Over 2496.5 MHz: 2.5μW
Spreading bandwidth	DS,FH,FH+DS,FH+OFDM: 500kHz or more
Spreading rate of spectrum	For DS system;(Spreading bandwidth) / (Frequency corresponding to

	transmission rate) ≥ 5
imit of secondary radiated emissions	(1) Below 1 GHz: 4nW (2) 1 GHz or higher: 20nW
Interference prevention function	Shall have the function of automatic transmission and reception of identification sign.
Structure	Shall be of the structure that the RF and modulator sections excluding antenna cannot easily be opened.
Note	DS: Direct spread FH: Frequency hopping OFDM: Orthogonal frequency division multiplexing

6.2 E.U.T. Test Conditions

Power Supply: The fluctuation of input voltage to the circuit of RF unit of test equipment is under ±1%, when input voltage to the test equipment is fluctuated by ±10%, So, all measurement has been conducted by only rated voltage.

The measurement result of the voltage fluctuation at RF circuit	
DC Input	RF Circuitry Voltage
High voltage	4.07V
Normal voltage	3.7V
Low voltage	3.33V

Temperature: 5 -35.0 °C

Humidity: 45-85 % RH

Atmospheric Pressure: 1000 -1010 mbar

Test Frequencies: If the EUT can be set to 3 of more different (carrier) frequencies in 1 allocated band, testing shall be performed using the Lowest, Middle and the Highest frequency (L, M and H). If there are 2 or fewer frequencies, testing shall be performed with the available frequencies.

Operation Frequency each of channel

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

Test frequencies are the lowest channel: 0 channel(2402MHz), middle channel: 19 channel(2440MHz) and the highest channel:39 channel(2480 MHz).

6.3 Test Environment

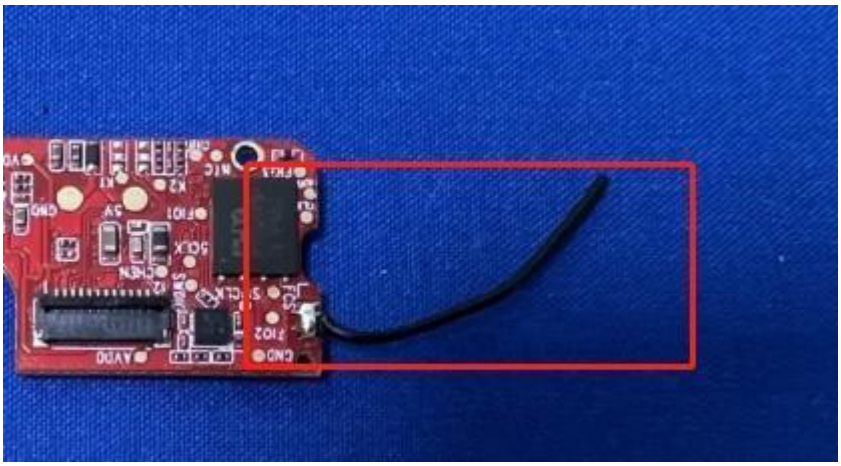
Operating Environment:	
Temperature:	24.5°C
Humidity:	54 % RH
Atmospheric Pressure:	1009 mbar

6.4 Antenna Requirement

Standard requirement

Applicable for equipment with an antenna terminal, including testing terminals) If an antenna connector is available, all relevant tests will be carried out conducted. If not, tests will be carried out in an anechoic room or with a suitable test-fixture.

EUT Antenna



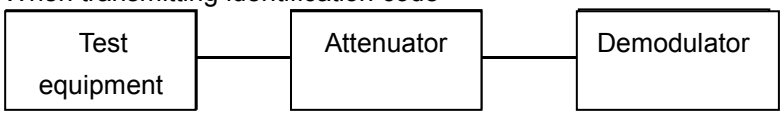
The EUT with internal antenna, the max peak gain of the antenna is -0.47dBi.

Note: An antenna connector is available, all relevant tests will be carried out conducted.

6.5 Interference Prevention Function

1） Measurement system diagram

(1) When transmitting identification code



2) Condition of measuring instrument

(1) Demodulator must be able to demodulate the transmitting signal emitted by test equipment and to indicate the identification code.

3) Condition of test equipment The mode of normal use.

4) Measuring operation procedure

(1) When test equipment has the function to transmit identification code automatically:

A) Transmit the predetermined identification code from test equipment.

B) Confirm the transmitted identification code by demodulator.

5) Test result: Record the identification code and test result.

Test result: PASS

The identification code is 56:9A:0E:1D:B6:02

The unit does meet the requirements.

6.6 Frequency Error

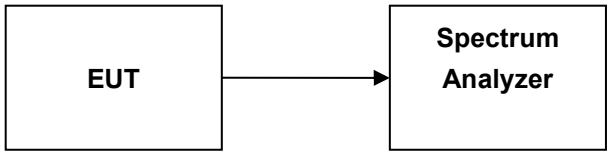
Test Requirement: Item 19 of Article 2-1

Tolerance of frequency: ±50×10^{-6}

Text Method: MIC Notice No.88 Appendix No.43

Test Status: Test the EUT in transmitting mode without modulation.

Test Configuration:



Test Procedure:

1. Test Conditions:

   Spectrum Analyzer is used for measurement.

2. EUT conditions:

   Modulation/Spread/Hopping OFF, CW Tx

3. Spectrum Analyzer conditions:

   Frequency: Test Frequency
   Span 1MHz
   RBW 10 kHz (Modulation OFF),
   VBW 10 kHz (Modulation OFF),
   Sweep Time Auto
   Detector mode Positive peak
   Indication mode Max hold

Test Result:

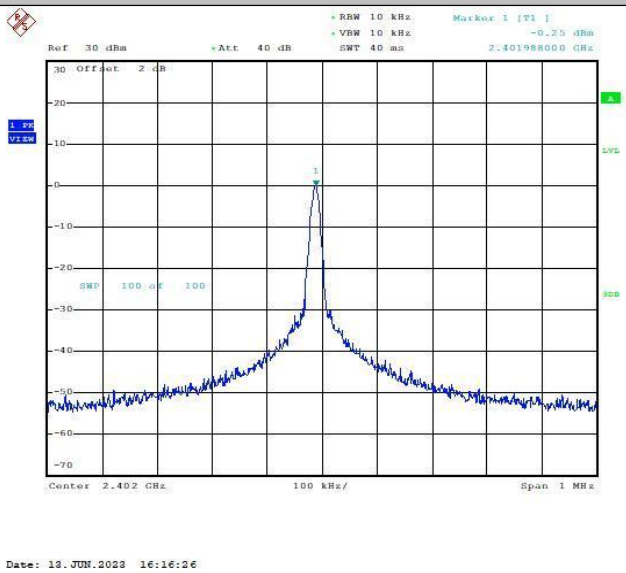
BLE :

TestCondition	TestMode	Antenna	Frequency (MHz)	Result[ppm]	Limit[ppm]	Verdict
NTNV	BLE_1M	Ant1	2402	-4.99584	±50	PASS
			2440	-4.91803	±50	PASS
			2480	-4.83871	±50	PASS

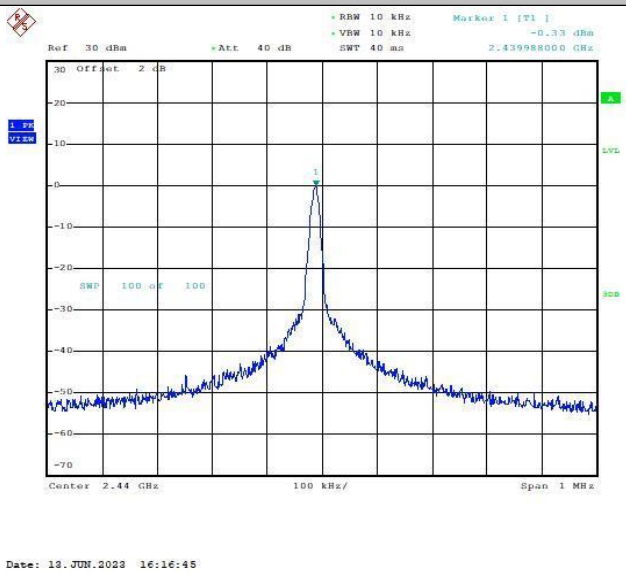
Note: The nominal frequency shall be confirmed by the applicant and test lab.

Result plot as follows:

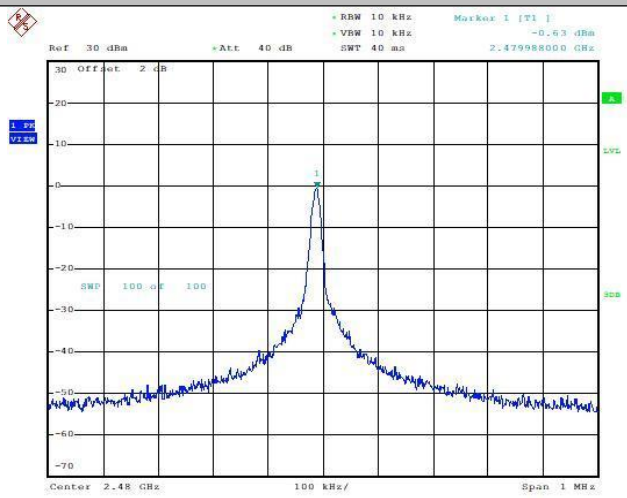
NTNV_BLE_1M_Ant1_2402



NTNV_BLE_1M_Ant1_2440



NTNV_BLE_1M_Ant1_2480

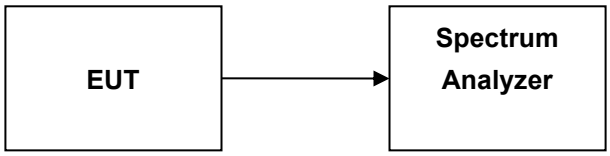


Test Result: The unit does meet the requirements.

6.7 Occupied Bandwidth (99%)

Test Requirement:	Item 19 of Article 2-1 26MHz or less
Text Method:	MIC Notice No.88 Appendix No.43
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Test Conditions:

   Spectrum Analyzer is used for measurement.

2. EUT conditions:

   Modulation/Spread/Hopping ON, Modulation Tx

   For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

   Frequency: Lowest, Middle and Highest Test Frequency

   Span 4 MHz

   RBW 300 KHz

   VBW 300 KHz

   Sweep Time Auto

   detector mode Positive peak

   Indication mode Max hold

   OBW 99%

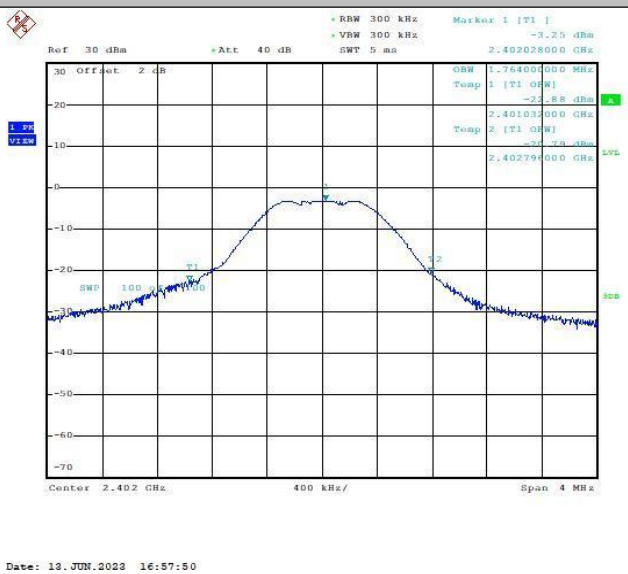
Test Result:

BLE :

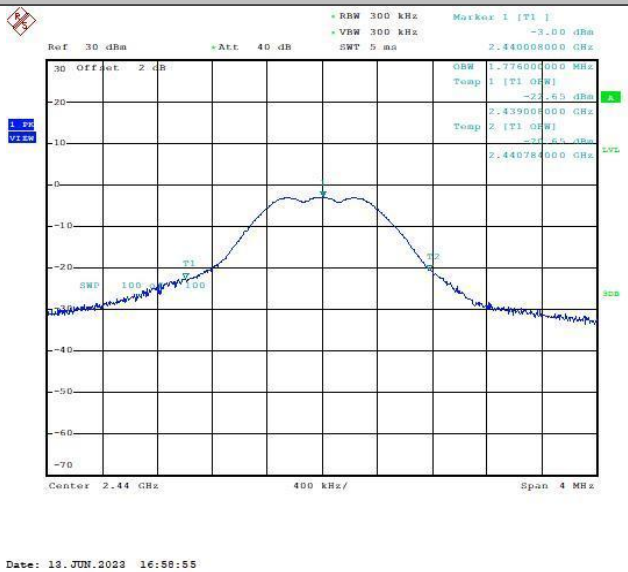
TestCondition	TestMode	Antenna	Frequency (MHz)	Result [MHz]	Limit [MHz]	Verdict
NTNV	BLE_1M	Ant1	2402	1.764	≤26	PASS
			2440	1.776	≤26	PASS
			2480	1.780	≤26	PASS

Result plot as follows:

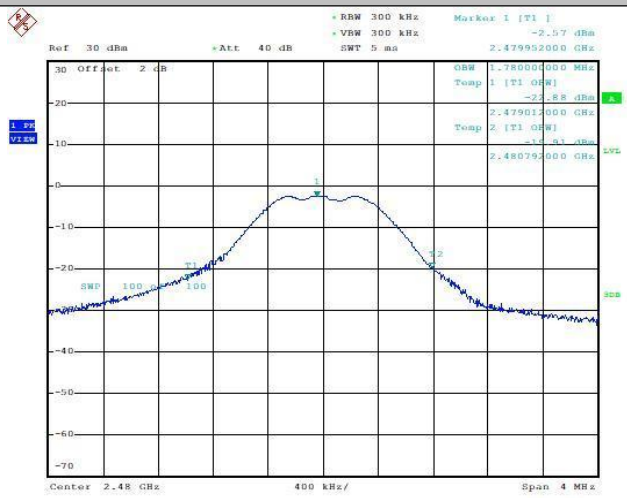
NTNV_BLE_1M_Ant1_2402



NTNV_BLE_1M_Ant1_2440



NTNV_BLE_1M_Ant1_2480

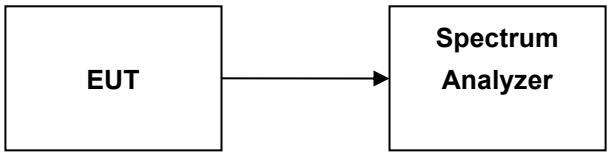


Test Result: The unit does meet the requirements.

6.8 Spread spectrum Bandwidth (90%)

Test Requirement:	Item 19 of Article 2-1 500 kHz or more
Text Method:	MIC Notice No.88 Appendix No.43
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Test Conditions:

   Spectrum Analyzer is used for measurement.

2. EUT conditions:

   Modulation/Spread/Hopping ON, Modulation Tx

   For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

   Frequency: Lowest, Middle and Highest Test Frequency

   Span 4 MHz

   RBW 300 KHz

   VBW 300 KHz

   Sweep Time Auto

   detector mode Positive peak

   Indication mode Max hold

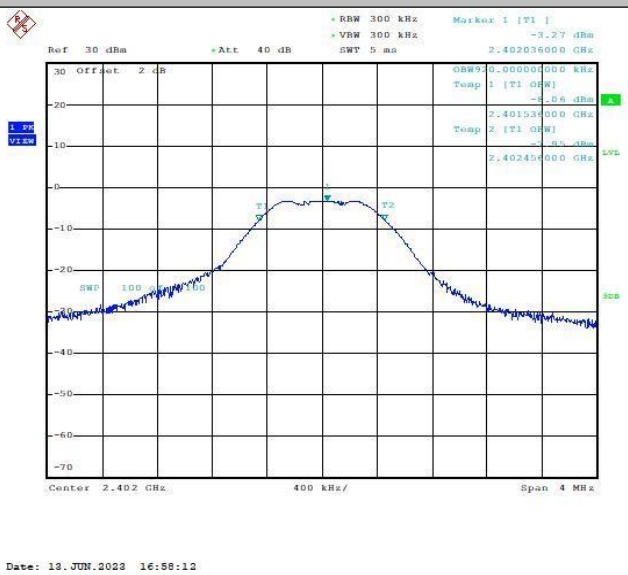
   OBW 90%

Test Result:

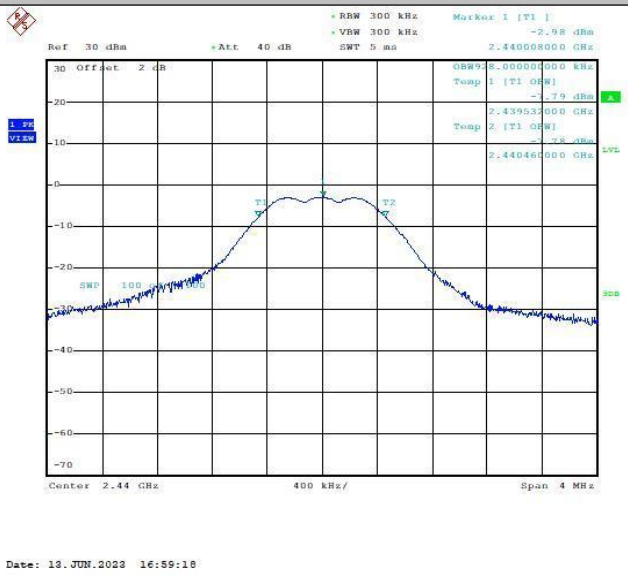
TestCondition	TestMode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTNV	BLE_1M	Ant1	2402	0.920	≥0.5	PASS
			2440	0.928	≥0.5	PASS
			2480	0.940	≥0.5	PASS

Result plot as follows:

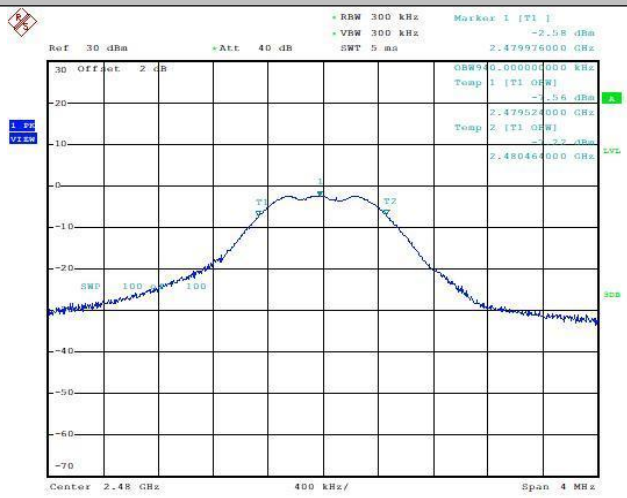
NTNV_BLE_1M_Ant1_2402



NTNV_BLE_1M_Ant1_2440



NTNV_BLE_1M_Ant1_2480

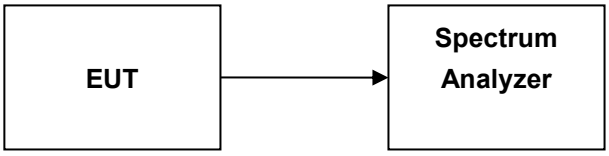


Test Result: The unit does meet the requirements.

6.9 Antenna Power

Test Requirement:	Item 19 of Article 2-1
Text Method:	MIC Notice No.88 Appendix No.43
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Test Conditions:

   Spectrum Analyzer is used for measurement.

2. EUT conditions:

   Modulation/Spread/Hopping ON, Modulation Tx

   For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

Step 1:

Connect the UUT to the spectrum analyzer as TEST CONFIGURATION and use the following settings:

- Centre Frequency: The centre frequency of the channel under test.
- RBW: 1 MHz
- VBW: 1 MHz
- Span: Wide enough to cover the complete power envelope of the signal of the UUT.
- Detector: Peak
- Trace Mode: Max Hold

Step 2:

When the trace is complete, find the peak value of the power envelope and record the frequency.

Step 3:

Make the following changes to the settings of the spectrum analyzer:

- Centre Frequency: Equal to the frequency recorded in step 2.
- Span: 0 MHz
- RBW: 1 MHz
- VBW: 1 MHz
- Detector: RMS
- Trace Mode: Max Hold

Test Result:

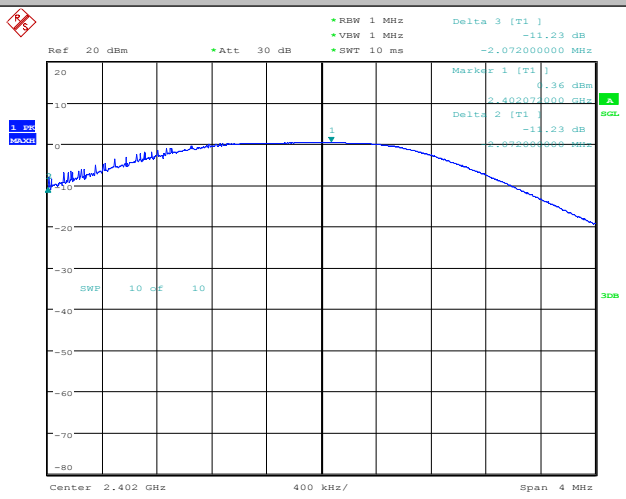
Antenna Power							
TestCondition	TestMode	Antenna	Freq(MHz)	Result(dBm)	Result(mW)	Limit(mW)	Verdict
NTNV	BLE_1M	Ant1	2402	0.22	1.05	≤10	PASS
			2440	-0.11	0.97	≤10	PASS
			2480	-0.48	1.12	≤10	PASS

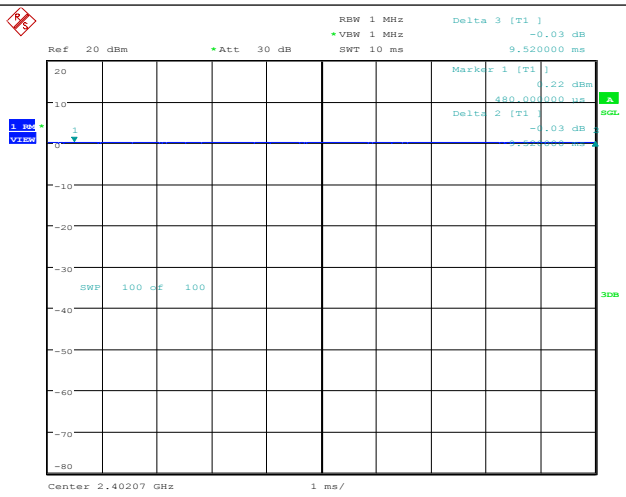
Tolerance								
Test Condition	Test Mode	Antenna	Freq(MHz)	Power (mW)	RatedPower (mW)	Result (%)	Limit (%)	Verdict
NTNV	BLE_1M	Ant1	2402	1.05	1.5631	-32.83	-80 to +20	PASS
			2440	0.97	1.5631	-37.94	-80 to +20	PASS
			2480	1.12	1.5631	-28.35	-80 to +20	PASS

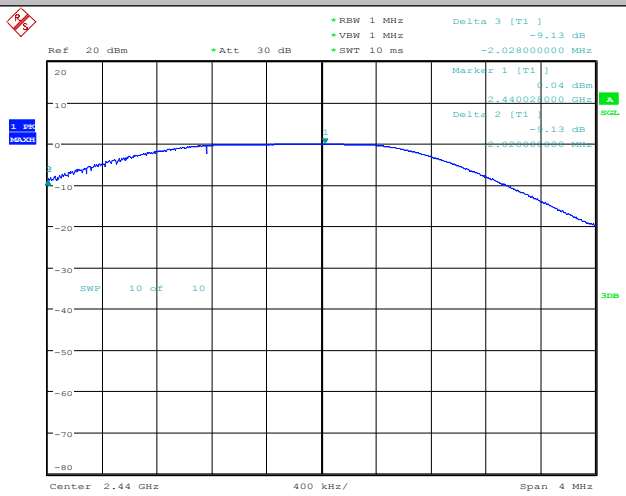
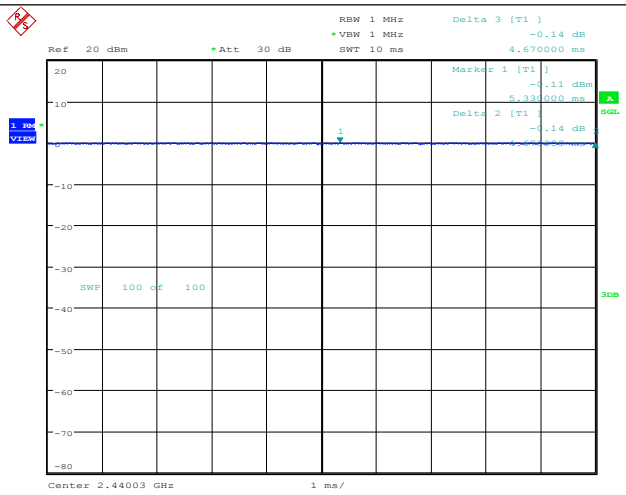
Rated power: 1.5631mW

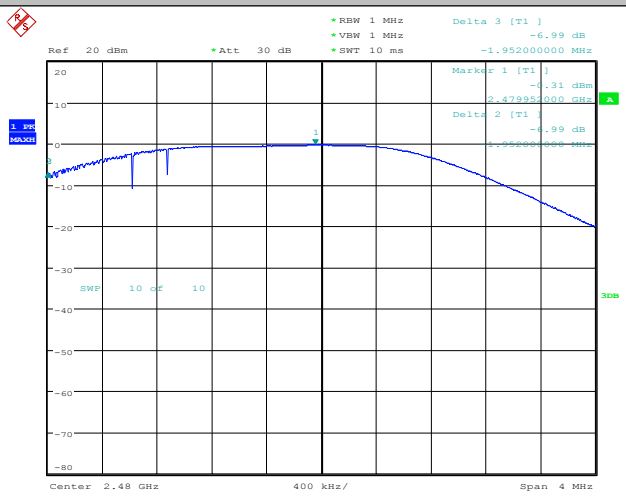
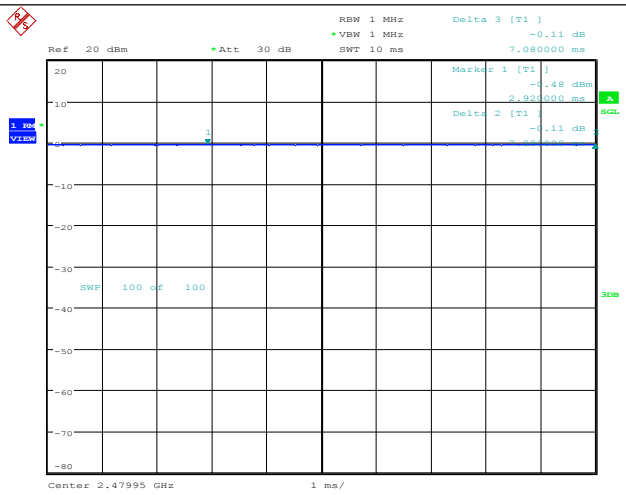
Result plot as follows:

NTNV_BLE_1M_Ant1_2402





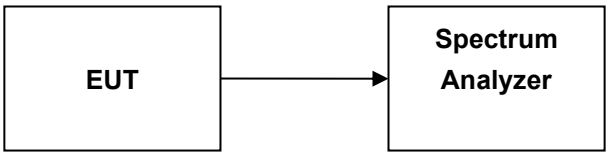
NTNV_BLE_1M_Ant1_2440



NTNV_BLE_1M_Ant1_2480



6.10 Spurious Emissions of Tx

Test Requirement:	Item 19 of Article 2-1
Text Method:	MIC Notice No.88 Appendix No.43 (1) Below 2387 MHz: 2.5μW/MHz (2) 2387 to 2400 MHz: 25μW/MHz (3) 2483.5 through 2496.5 MHz: 25μW/MHz (4) Over 2496.5 MHz: 2.5μW/MHz
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1. Test Conditions:
   Spectrum Analyzer is used for measurement.
2. EUT conditions:
   Modulation/Spread/Hopping ON, , Modulation Tx
   For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.
3. Spectrum Analyzer conditions:
   Step 1
   All spurious are measured from 30 MHz to 13 GHz by peak mode.
   Step 2
   IF the value measured by Step1 is 2 dB or less, measure in average mode.

Test setup for Step 1:
Frequency: 30 MHz – 1000 MHz
RBW 100 KHz
VBW 100 KHz
Sweep Time Auto
detector mode Positive peak
Indication mode Max hold

Frequency: 1000 MHz – 2400 MHz , 2483.5 MHz –13 GHz
RBW 1 MHz
VBW 1 MHz
Sweep Time Auto
detector mode Positive peak
Indication mode Max hold

Test setup for Step 2:
Frequency: Spurious Frequency
RBW 1 MHz
VBW 1 MHz
Sweep Time Auto
detector mode Sample
Indication mode Max hold

6.10.1 Test Result

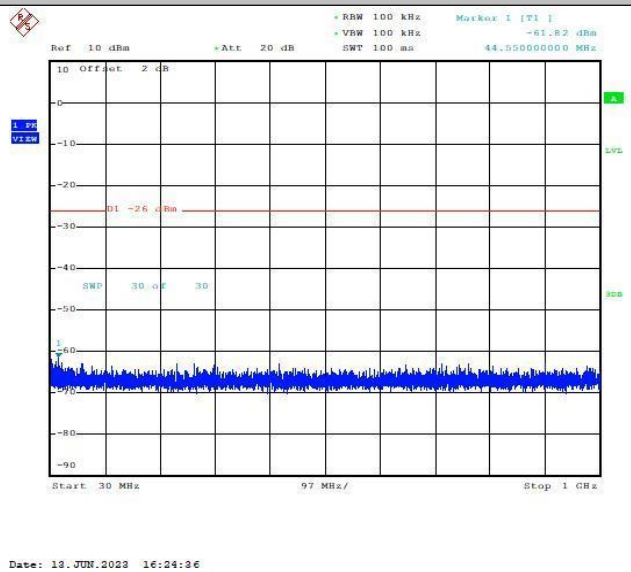
TestCondition	TestMode	Freq(MHz)	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTNV	BLE_1M	2402	30~1000	-61.82	≤-26	0.00066	≤2.5	PASS
			1000~2387	-38.03	≤-26	0.15740	≤2.5	PASS
			2387~2400	-18.99	≤-16	12.61828	≤25	See table below
			2483.5~2496.5	-44.36	≤-16	0.03664	≤25	PASS
			2496.5~13000	-38.97	≤-26	0.12677	≤2.5	PASS
		2440	30~1000	-60.54	≤-26	0.00088	≤2.5	PASS
			1000~2387	-43.97	≤-26	0.04009	≤2.5	PASS
			2387~2400	-40.79	≤-16	0.08337	≤25	PASS
			2483.5~2496.5	-41.14	≤-16	0.07691	≤25	PASS
			2496.5~13000	-34.63	≤-26	0.34435	≤2.5	PASS
		2480	30~1000	-60.72	≤-26	0.00085	≤2.5	PASS
			1000~2387	-46.37	≤-26	0.02307	≤2.5	PASS
			2387~2400	-43.91	≤-16	0.04064	≤25	PASS
			2483.5~2496.5	-23.35	≤-16	4.62381	≤25	PASS
			2496.5~13000	-35.87	≤-26	0.25882	≤2.5	PASS

6.10.2 Test Result_Step2

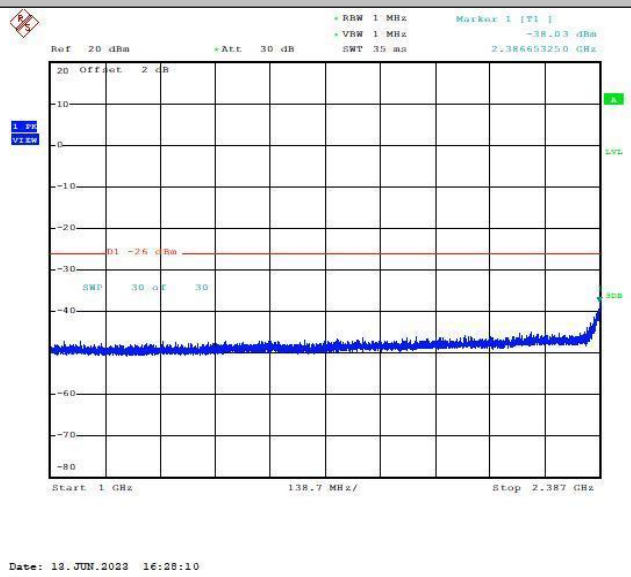
TestCondition	TestMode	Freq(MHz)	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTNV	BLE_1M	2402	2399.98	-27.79	≤-16	1.66341	≤25	PASS

6.10.3 Test Graphs

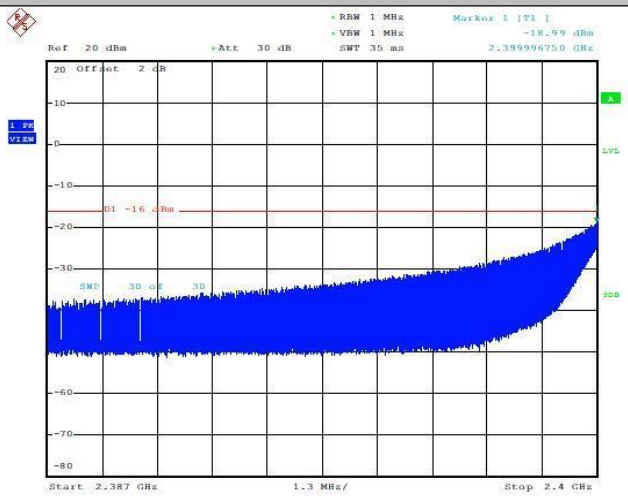
NTNV_BLE_1M_Ant1_2402_30~1000



NTNV_BLE_1M_Ant1_2402_1000~2387

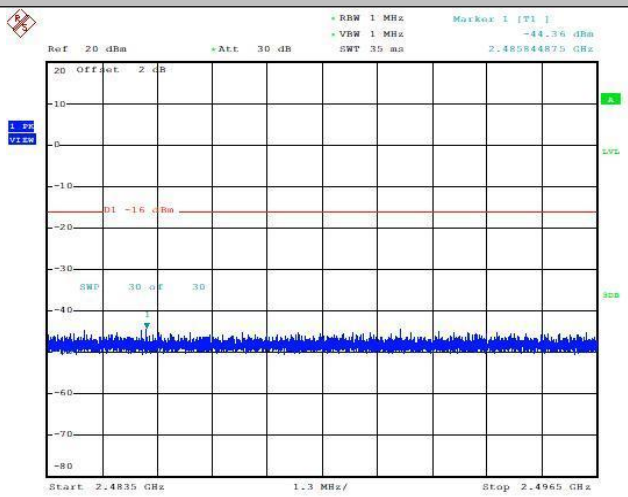


NTNV_BLE_1M_Ant1_2402_2387~2400



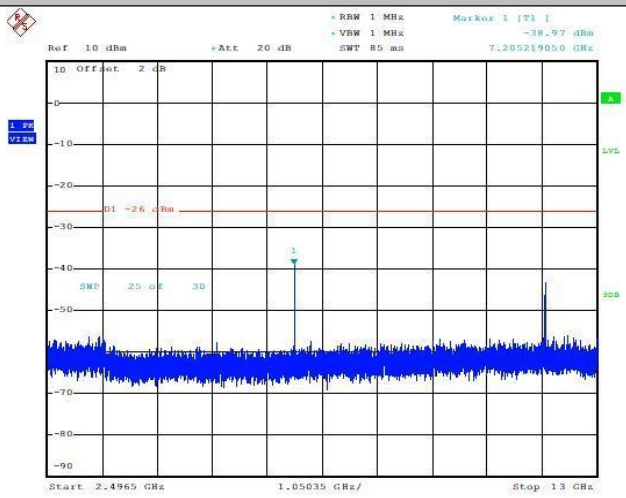
Date: 13.JUN.2023 16:28:18

NTNV_BLE_1M_Ant1_2402_2483.5~2496.5



Date: 13.JUN.2023 16:29:24

NTNV_BLE_1M_Ant1_2402_2496.5~13000



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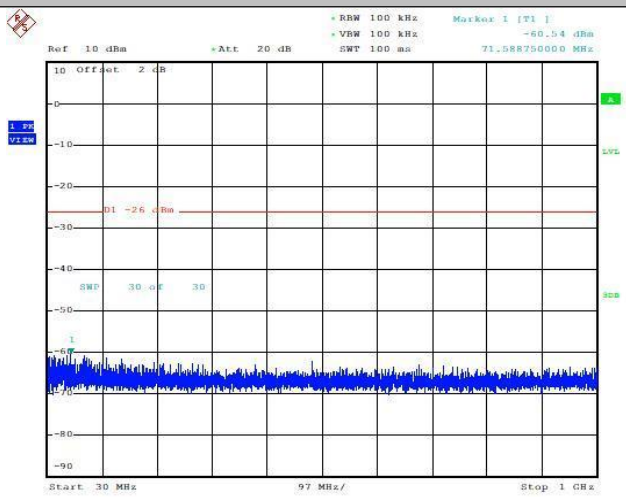
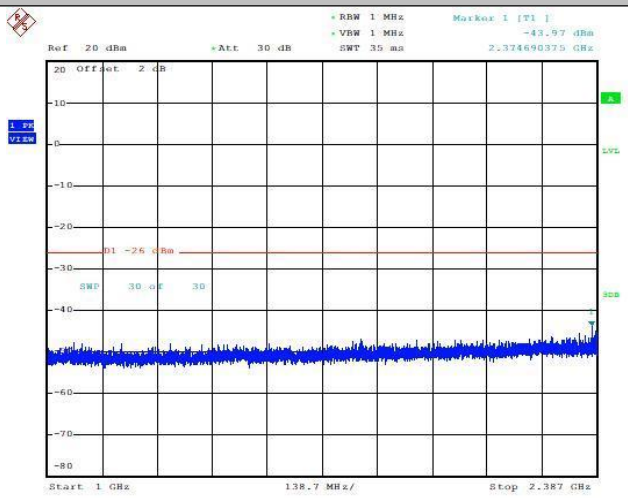
NTNV_BLE_1M_Ant1_2440_30~1000



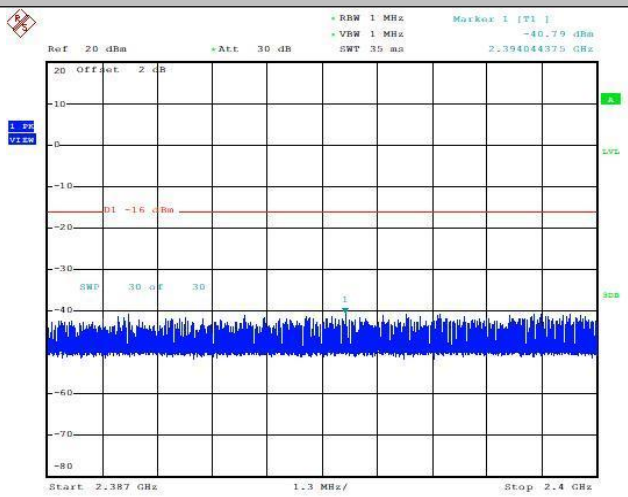
Date: 13.JUN.2023 16:34:31

NTNV_BLE_1M_Ant1_2440_1000~2387



Date: 13.JUN.2023 16:34:39

NTNV_BLE_1M_Ant1_2440_2387~2400



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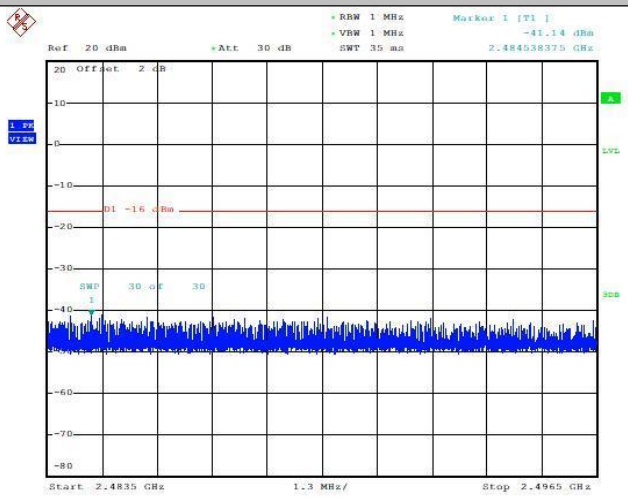
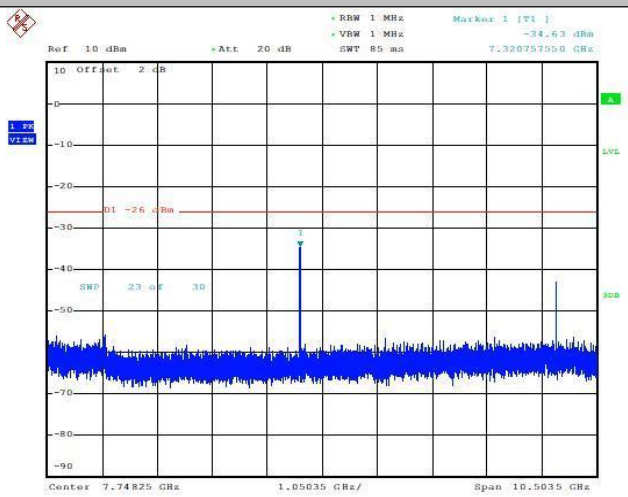
NTNV_BLE_1M_Ant1_2440_2483.5~2496.5



Date: 13.JUN.2023 16:34:54

NTNV_BLE_1M_Ant1_2440_2496.5~13000



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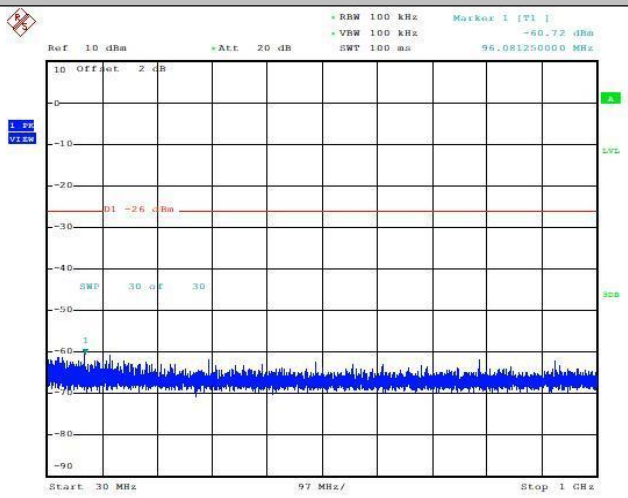
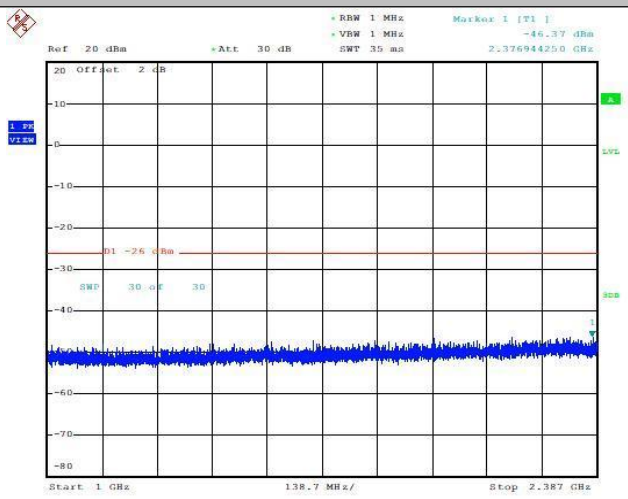
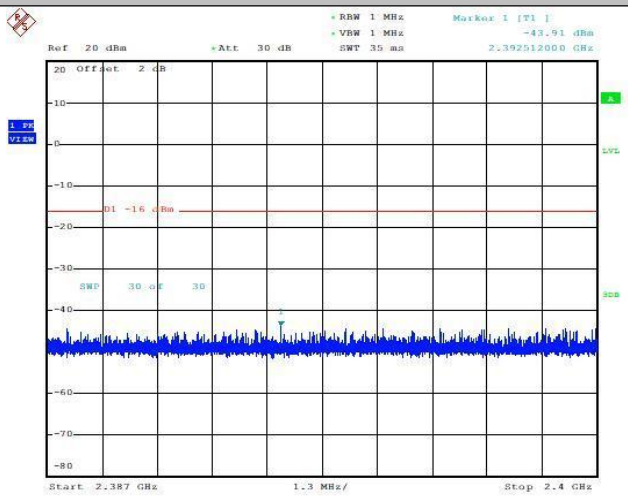
NTNV_BLE_1M_Ant1_2480_30~1000



NTNV_BLE_1M_Ant1_2480_1000~2387

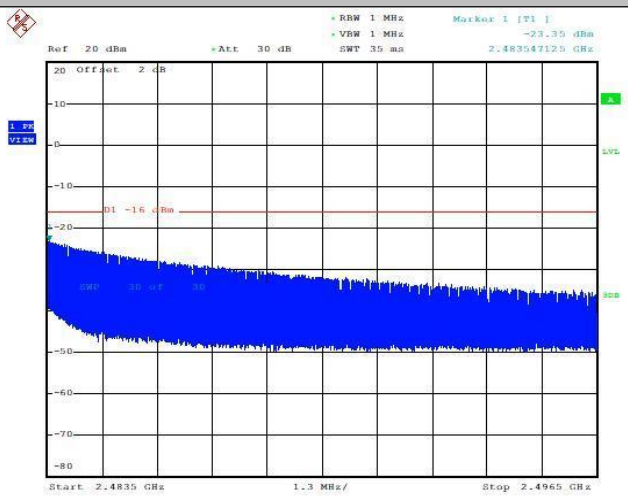


NTNV_BLE_1M_Ant1_2480_2387~2400



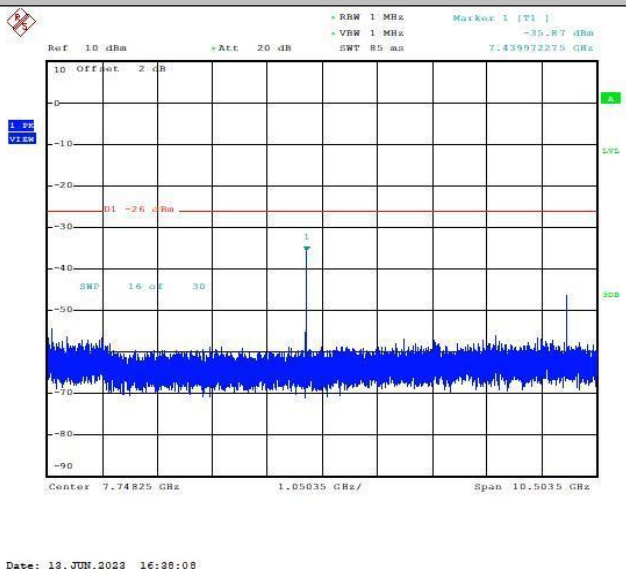
Date: 13.JUN.2023 16:37:45

NTNV_BLE_1M_Ant1_2480_2483.5~2496.5



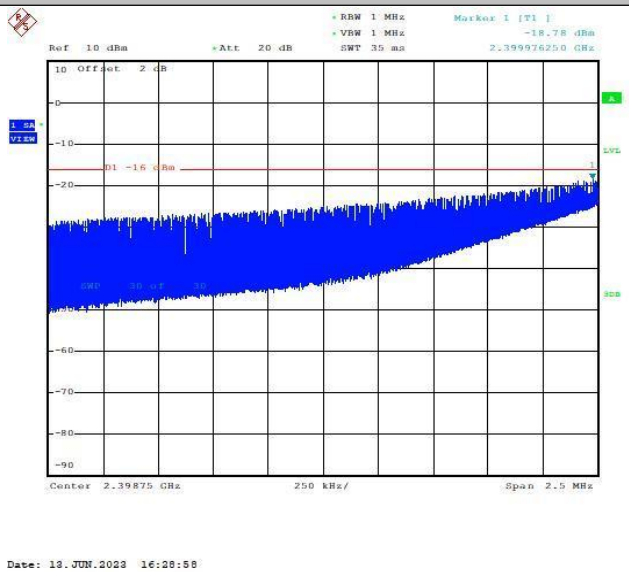
Date: 13.JUN.2023 16:37:53

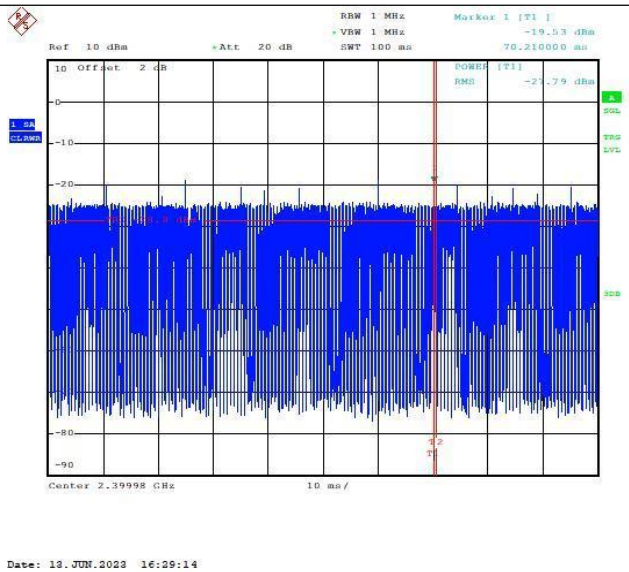
NTNV_BLE_1M_Ant1_2480_2496.5~13000



6.10.4 Test Graphs_Step2

NTNV_BLE_1M_Ant1_2402_2399.98





Test Result: The unit does meet the requirements.

6.11 RF accessibility

Standard requirement

Article 49-20, paragraph 1 (a)

The EUT shall be constructed in such a way that sensitive RF parts, (like modulation and oscillator parts) cannot be reached easily by the user. These parts shall be covered by soldered metal caps or glue or by other mechanical covers. If the covers are fixed with screws, these shall be not the common type(s) like a Phillips, but special versions like Torx, so that the user cannot open the device with common tools.

Tamper proof Declaration:

☐ 1. Sealed with special screws.

☐ 2. Plastic chassis is being welded using ultrasonic waves.

☐ 3. Chassis is glued using a special adhesive.

☐ 4. Metal covers are spot-fused.

☐ 5. Cover is specially interlocked.

☐ 6. RF and Modulation components are covered with shielding case and this shielding case is soldered.

☐ 7. Shield case is welded at RF and modulation parts, and ID-ROM is welded using the BGA Method.

☐ 8. Shield case is welded at RF and modulation parts, and ID-ROM is glued at its lead with a special adhesive.

☐ 9. Shield case is welded at RF and modulation parts, and ID-ROM is glued with a non-transparent laminating agent.

☒ 10. RF and Modulation parts are mounted on PCB with surface mount technology, and there is no any adjustable parts on PCB or adjustable parts are not exposed.

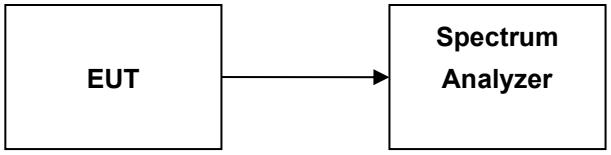
The method used to meet the "cannot be opened easily" is to use a shielding cover to seal it.

Any attempt to modify the RF chip will invalidate the normal operation of the device.

6.12 Spurious Emissions of Rx

Test Requirement:	Item 19 of Article 2-1
Text Method:	MIC Notice No.88 Appendix No.43 (1) Below 1 GHz : 4 nW or less (2) 1 GHz and over : 20 nW or less
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

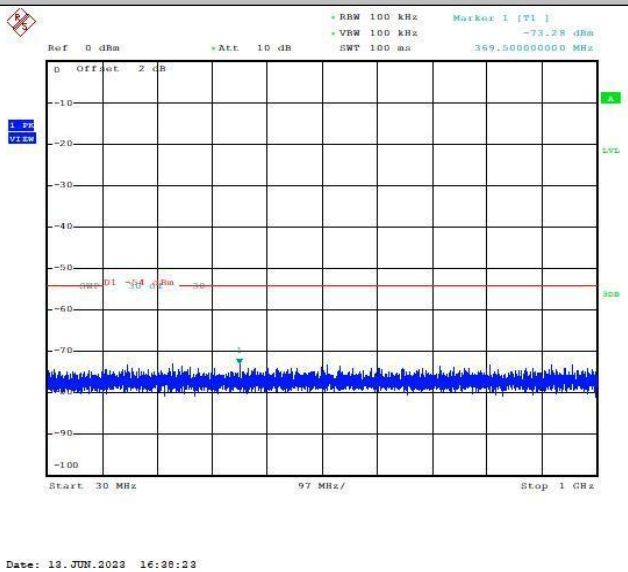
1. Test Conditions:
   Spectrum Analyzer is used for measurement.
2. EUT conditions:
   Modulation/Spread/Hopping ON
   For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.
3. Spectrum Analyzer conditions:
   Step 1
   All spurious are measured from 30 MHz to 13 GHz by peak mode.
   Step 2
   IF the value measured by Step1 is 2 dB or less, measure in average mode.
   Test setup for Step 1:
   Frequency: 30 MHz – 2400 MHz , 2483.5 MHz –13 GHz
   RBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)
   VBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)
   Sweep Time Auto
   detector mode Positive peak
   Indication mode Max hold
   Test setup for Step 2:
   Frequency: Spurious Frequency
   Span 0 Hz
   RBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)
   VBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)
   Sweep Time Auto
   detector mode Sample
   Indication mode Max hold

Test Result:

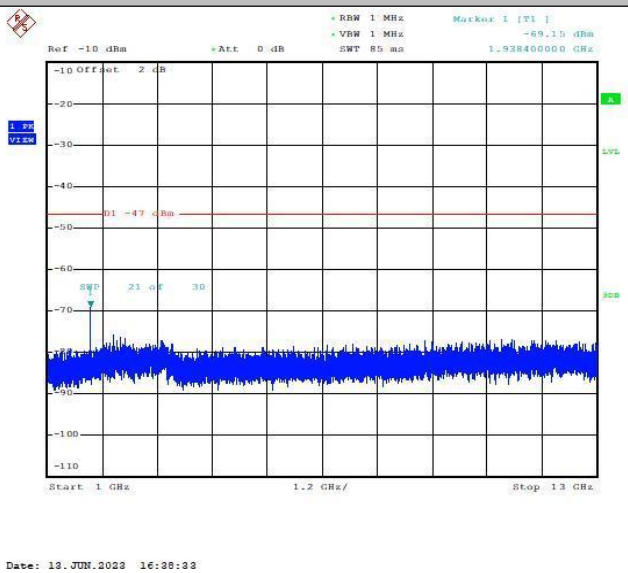
TestCondition	TestMode	Freq(MHz)	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	BLE_1M	2402	30~1000	-73.28	≤-54	0.04699	≤4	PASS
			1000~13000	-69.15	≤-47	0.12162	≤20	PASS
		2440	30~1000	-72.92	≤-54	0.05105	≤4	PASS
			1000~13000	-71.38	≤-47	0.07278	≤20	PASS
		2480	30~1000	-72.83	≤-54	0.05212	≤4	PASS
			1000~13000	-72.52	≤-47	0.05598	≤20	PASS

Result plot as follows:

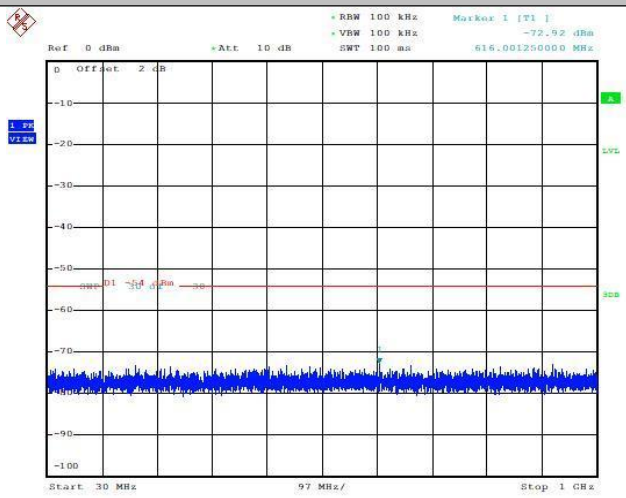
NTNV_BLE_1M_Ant1_2402_30~1000



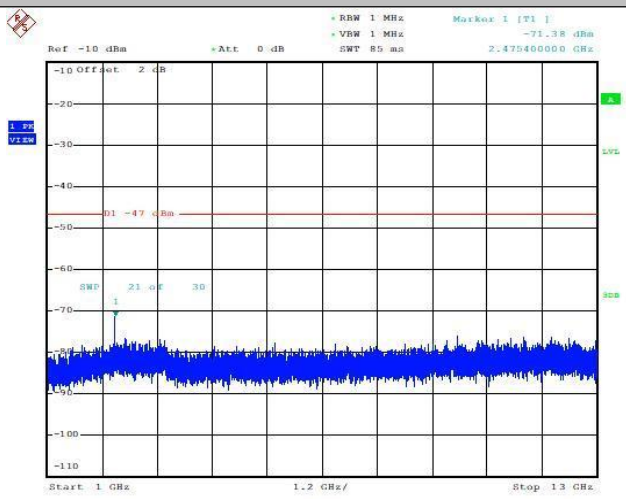
NTNV_BLE_1M_Ant1_2402_1000~13000



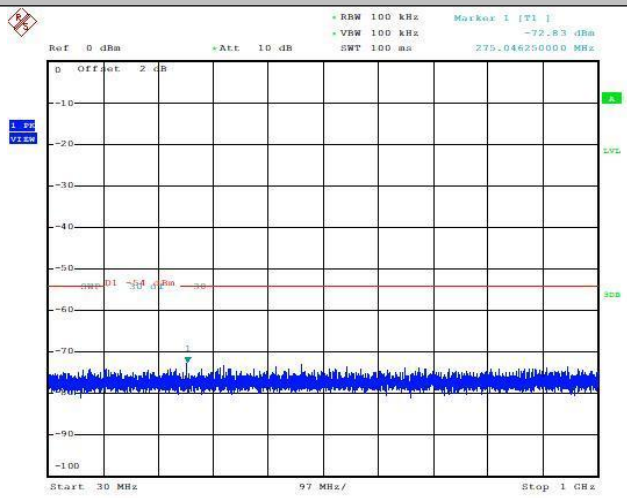
NTNV_BLE_1M_Ant1_2440_30~1000



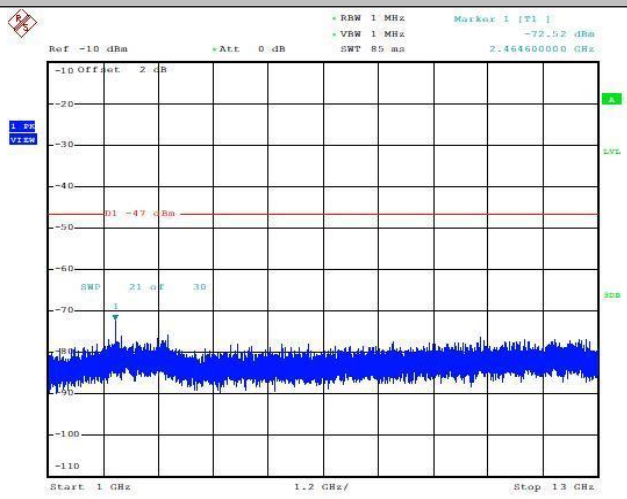
NTNV_BLE_1M_Ant1_2440_1000~13000



NTNV_BLE_1M_Ant1_2480_30~1000



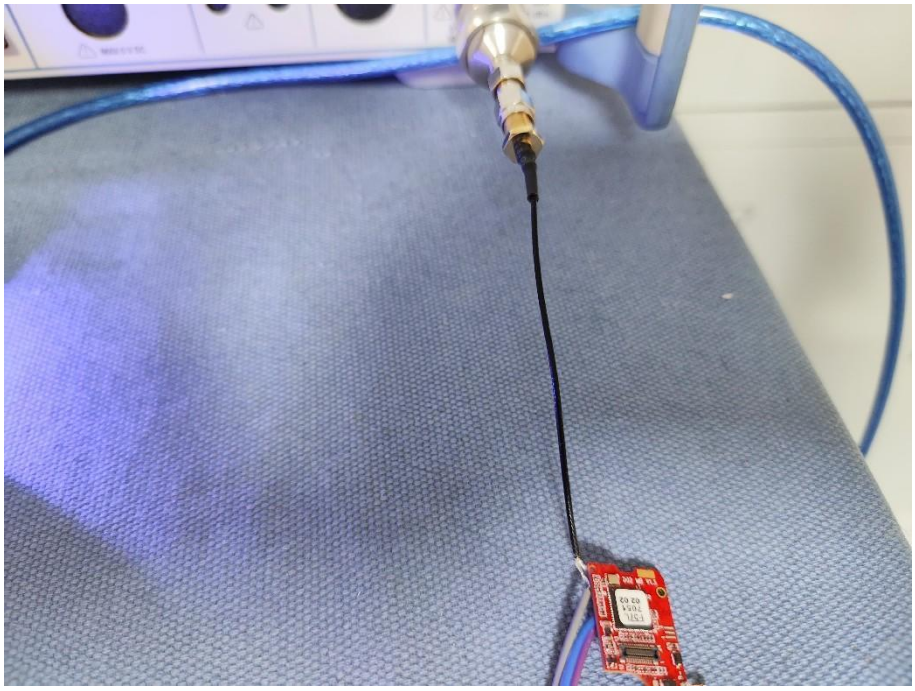
NTNV_BLE_1M_Ant1_2480_1000~13000

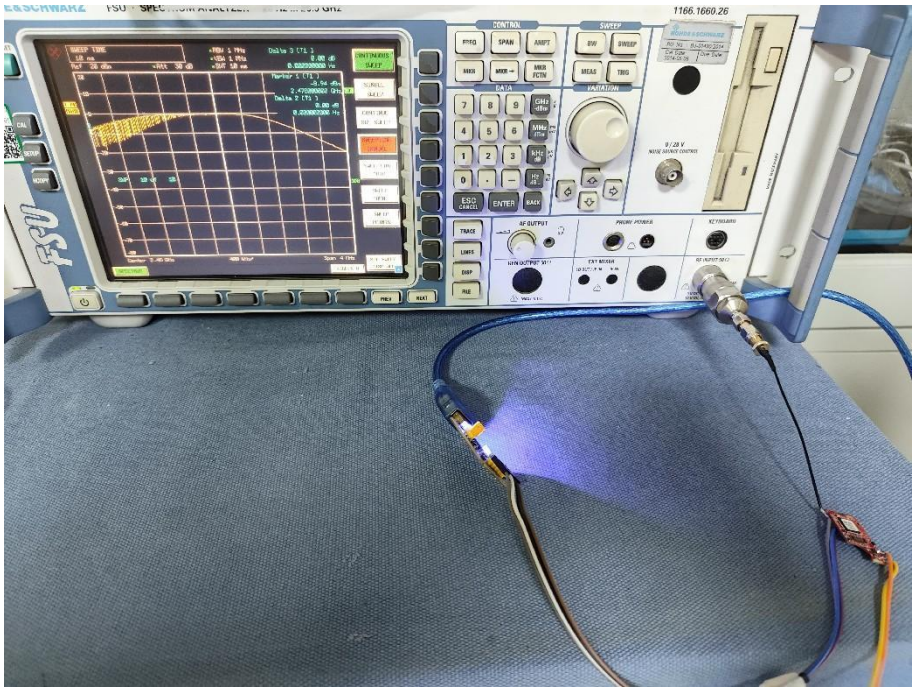


Test Result: The unit does meet the requirements.

7 Photographs

7.1 EUT Test Setup





8 Photographs - EUT Constructional Details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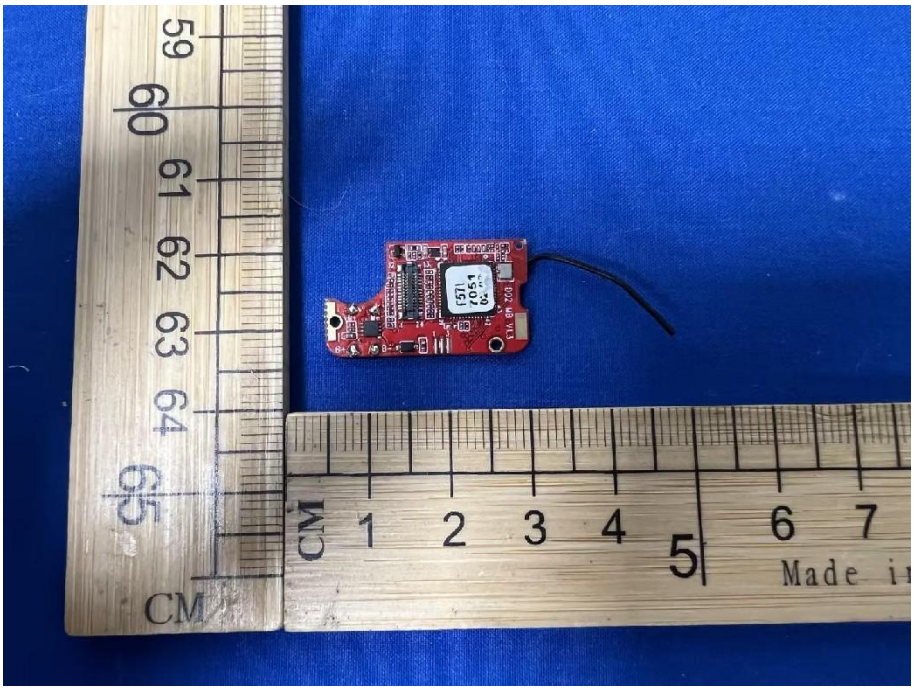
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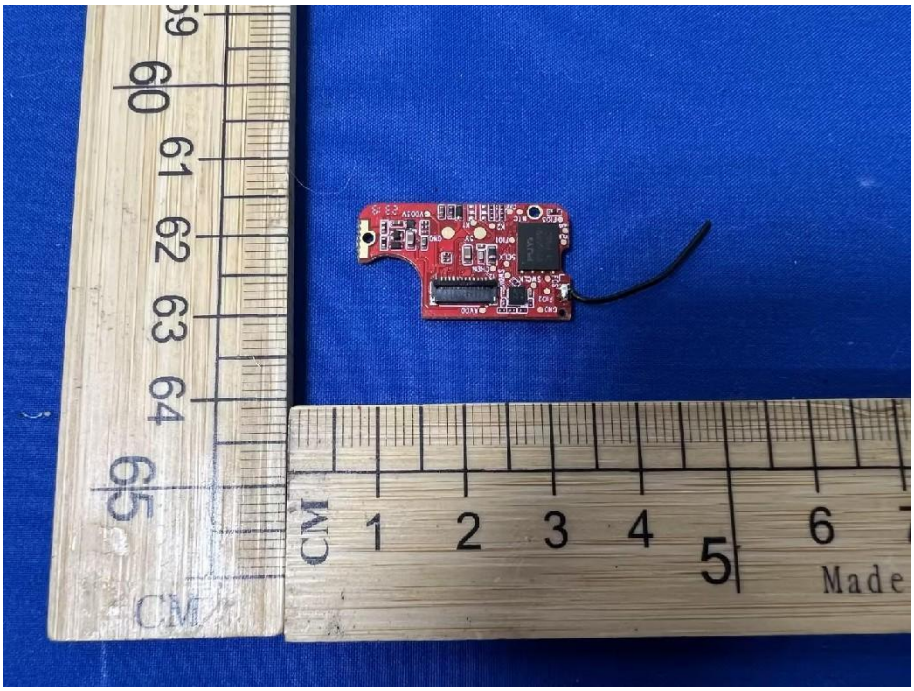
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*** END OF REPORT ***