

Japan - TEST REPORT

Report Number : **68.950.20.0364.01** Date of Issue: **August 6, 2020**

Model : LS431-B, M5, 21200

Product Type : Activity Tracker

Applicant : Guangdong Transtek Medical Electronics Co., Ltd.

Address : Zone A, No.105, Dongli Road, Torch Development District,
Zhongshan, 528437, Guangdong, China

Production Facility : Guangdong Transtek Medical Electronics Co., Ltd.

Address : Zone A, No.105, Dongli Road, Torch Development District,
Zhongshan, 528437, Guangdong, China

Test Result : **n Positive** **o Negative**

Total pages including
Appendices : **28**

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch is a subcontractor to TÜV SÜD Product Service GmbH according to the principles outlined in ISO 17025.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch issued reports.

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Table of Content

1	General Information	3
1.1	Notes.....	3
1.2	Testing Laboratory.....	4
1.3	Details of Applicant.....	4
1.4	Application Details	4
1.5	Test Item	4
1.6	Applied Standard	5
1.7	Test Summary	5
2	Equipment Specification	6
2.1	General Description	6
2.2	Technical Data.....	6
2.3	Test conditions and test Connections	7
2.4	Auxiliary Equipment Used during Test	8
2.5	Lists of Test Instruments	8
2.6	Measurement Uncertainty (95% confidence levels, k=2).....	9
3	Measurements Result.....	10
3.1	Antenna Power & EIRP	10
3.2	Tolerances for Antenna Power	11
3.3	Frequency Tolerance.....	12
3.4	Occupied Frequency Bandwidth	14
3.5	Spread Bandwidth	16
3.6	Transmitter Spurious Emissions (Conducted) (For transmitter)	19
3.7	Secondary Radiated Emissions (Conducted) (For receiver).....	24
3.8	Interference prevention function.....	27
4	Photographs of Test Set-ups.....	28



1 General Information

1.1 Notes

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Prepared by
Project Engineer

2020-08-6
Date

Moon Xiong
Name


Signature



Approved by
Project Manager

2020-07-30
Date

John Zhi
Name


Signature



1.2 Testing Laboratory

Address of Test Laboratory:

Site 1 :

TÜV SÜD Certification and Testing (China) Co., Ltd. – Shenzhen Branch
Address: Building 12&13, Zhiheng Wisdomland Business Park,
Nantou Checkpoint Road 2, Nanshan District,
Shenzhen City, 518052,
P. R. China

Phone: +86-755-8828 6998

Fax: +86-755-8828 5299

1.3 Details of Applicant

Applicant: Guangdong Transtek Medical Electronics Co., Ltd.

Address: Zone A, No.105, Dongli Road, Torch Development District, Zhongshan, 528437, Guangdong, China

Product Description: Activity Tracker

Manufacturers Model No.: LS431-B, M5, 21200

1.4 Application Details

Date of receipt of order:	July 14,2020
Date of receipt of test item:	July 14,2020
Date of test:	July 15, 2020 – July 25, 2020

1.5 Test Item

Refer to table 1

1.6 Applied Standard

APPLIED PRODUCT STANDARD

ARIB STD-T66 Version 3.7/2014-10

1.7 Test Summary

Table 1. Summary of results

Conformance requirement according to ARIB STD-T66 Version 3.7/2014-10		No.88 Annex 43 Article	Result
Essential parameter	Corresponding technical requirements		
Transmitter requirements	3.2 (2) Antenna Power	Article 14	PASS
	3.2 (3) Tolerances for Antenna Power	Article 14	PASS
	3.2 (4) Frequency Tolerance	Article 5, Table 1	PASS
	3.2 (5) Transmission Rate	Article 6, Table 2 & Article 49-20, Item1-h & 1-i	N/A*
	3.2 (7) Occupied Frequency Bandwidth	Article 6, Table 2 & Article 49-20, Item1-h & 1-i	PASS
	3.2 (8) Spread Bandwidth	Article 6, Table 2 & Article 49-20, Item1-h & 1-i	PASS
	3.2 (9) Process gain	Article 49-20(1);f(1)	N/A**
	3.2 (10) Number of Carriers	Article 49-20(1);g	N/A*
	3.2 (11) Dwell Time	Article 49-20(1);j	N/A*
	3.4 (1) Interference prevention function	Article 9-4, Item 9-C Article 6-2, Item 3 of the Regulation for Enforcement of the Radio Law	PASS
	3.2 (6) Spurious Emissions	Article 24	PASS
Receiver requirements	3.5 (1) Secondary Radiated Emissions	Article 24, Paragraph 2	PASS

NOTE 1: Measurement taken is within the measurement uncertainty of measurement system.

NOTE 2: "*" N/A is an abbreviation for Not Applicable.

NOTE 3: "**BLE is special and it is not DS, not HS, so it is others. "Transmission Rate" & "Process gain" is Not Applicable"

2 Equipment Specification

2.1 General Description

LS431-B is an Activity Tracker with Bluetooth LE function.

2.2 Technical Data

Description	Activity Tracker
Models	LS431-B, M5, 21200
Brand name	TRANSTEK
Radio Specification	Bluetooth LE
Operation frequency	2402-2480MHz
BT Antenna type	Built-in antenna
Antenna gain	BLE: -2.7dBi
Rated Input	DC5V 80mA by USB port
Modulation	GFSK

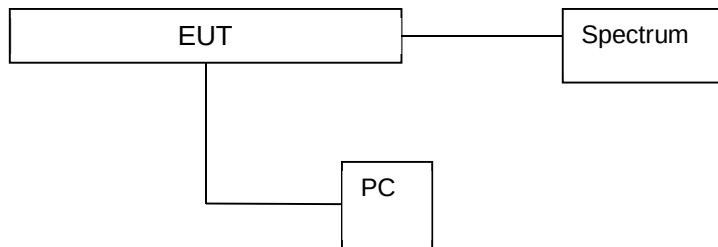
2.3 Test conditions and test Connections

2.3.1 Test Conditions

The EUT will be connected to test system in order to simulate normal operating conditions (with reference to the guidance given in the standard for this type of equipment).

The EUT power supplied by an internal battery, it was confirmed that input voltage variation at the radio in the radio equipment to be tested is less than +1% against a variation of +10% at the input voltage from the external power supply to the radio equipment. All test items were performed at normal voltage.

2.3.2 Test Connections



Test Configuration

2.4 Auxiliary Equipment Used during Test

Table 3. Auxiliary Equipment Used during Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
PC	X240	LENOVO	---	---

2.5 Lists of Test Instruments

Table 4. Lists of Test Instruments

DESCRIPTION	MANUFACTURE R	MODEL NO.	EQUIPMENT ID	SERIAL NO.	CAL INTERVA L (YEAR)	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMB100A	68-4-48-14-001	108272	1	2021-6-21
Vector Signal Generator	Rohde & Schwarz	SMBV100A	68-4-48-18-001	262825	1	2021-6-21
Communication Synthetical Test Instrument	Rohde & Schwarz	CMW 270	68-4-48-18-003	101251	1	2021-6-21
Signal Analyzer	Rohde & Schwarz	FSV40	68-4-74-14-004	101030	1	2021-6-21
Vector Signal Generator	Rohde & Schwarz	SMU 200A	68-4-48-14-003	105324	1	2021-6-22
RF Switch Module	Rohde & Schwarz	OSP120/O SP-B157	68-4-93-14-003	101226/100851	1	2021-6-21
Power Splitter	Weinschel	1580	68-4-85-14-001	SC319	1	2021-7-6
10dB Attenuator	Weinschel	4M-10	68-4-81-14-003	43152	1	2021-6-21
10dB Attenuator	R&S	DNF	68-4-81-14-004	DNF-001	1	2021-6-21
10dB Attenuator	R&S	DNF	68-4-81-14-005	DNF-002	1	2021-6-21
10dB Attenuator	R&S	DNF	68-4-81-14-006	DNF-003	1	2021-6-21
10dB Attenuator	R&S	DNF	68-4-81-14-007	DNF-004	1	2021-6-21
Test software	Rohde & Schwarz	EMC32	68-4-48-14-003-A10	Version 10.38.00	N/A	N/A
Test software	Tonscend	System for BT/WIFI	68-4-74-14-006-A13	Version 2.5.77.0418	N/A	N/A
Shielding Room	TDK	TS8997	68-4-90-19-003	----	1	2020-11-07

2.6 Measurement Uncertainty (95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Conducted RF test	RF Power Conducted: 1.16dB Frequency test involved: 0.6×10^{-7} or 1%
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3 Measurements Result

3.1 Antenna Power & EIRP

3.1.1 Test condition

Channel:	Low: 2402MHz; Middle: 2440MHz; High: 2480MHz
Test position:	Transmitting
Ambient temperature:	23.5°C
Relative humidity:	53.4 %
Atmosphere Pressure:	100.9 KPa

3.1.2 Limit (ARIB STD-T66, Clause 3.2 (2)-b)

- The antenna power of a transmitting equipment (with a frequency band of 2,427 – 2,470.75 MHz, for spread spectrum systems using FH systems, hybrid systems of DS and FH, or hybrid systems of FH and OFDM) shall be such that the mean power within a bandwidth of 1 MHz is 3 mW or less in the case of modulation using a standard coding test signal with the same transmission rate as that of the modulation signal.
- The antenna power of a transmitting equipment using a spread spectrum system other than any of those in “a” and the OFDM system shall be such that the mean power within a bandwidth of 1 MHz is 10 mW or less in the case of modulation using a standard coding test signal with the same transmission rate as that of the modulation signal.

Modulation system	Frequency band used	Antenna power (max.)	EIRP (max.)	
			Omnidirectional case	Directional case
DS, OFDM	2,400 - 2,483.5 MHz	10 mW/MHz	12.14 dBm/MHz	22.14 dBm/MHz
FH, DS-FH FH-OFDM	2,400 - 2,483.5 MHz	3 mW/MHz	6.91 dBm/MHz	16.91 dBm/MHz
	Excluding 2,427 - 2,470.75 MHz	10 mW/MHz	12.14 dBm/MHz	22.14 dBm/MHz
Other than the above	2,400 - 2,483.5 MHz	10 mW	12.14 dBm	22.14 dBm

3.1.3 Test result

Frequency (MHz)	Voltage (VDC)	Result Antenna power (mW)	Antenna power Limit (mW)	Result EIRP (dBm)	EIRP limit (dBm)
2402	5VDC	0.443	10	-6.24	12.14
2440	5VDC	0.532	10	-5.44	12.14
2480	5VDC	0.415	10	-6.52	12.14

3.1.4 Result

The equipment met the requirement of this clause.

3.2 Tolerances for Antenna Power

3.2.1 Test condition

Channel:	Low: 2402MHz; Middle: 2440MHz; High: 2480MHz
Test position:	Transmitting
Ambient temperature:	23.5°C
Relative humidity:	53.1 %
Atmosphere Pressure:	100.9 KPa

3.2.2 Limit (ARIB STD-T66, Clause 3.2 (3))

Upper and lower limits of the tolerance for antenna power shall be 20% and 80%, respectively. Note that they represent the tolerance for the maximum rated antenna power and that no upper and lower limits of the tolerance are regulated in the case of antenna power reduction for communications reasons.

3.2.3 Test result

Frequency (MHz)	Voltage (VDC)	Declared Output Power (mW)	Result (mW)	Tolerances	Limit (mW)
2402	5VDC	0.6	0.443	-26.11	+20%~-80%
2440	5VDC	0.6	0.532	-11.31	+20%~-80%
2480	5VDC	0.6	0.415	-30.76	+20%~-80%
Conclusion: PASS					

Note: Deviation = (Output power – Declared Output Power) / Declared Output Power * 100%

3.2.4 Result

The equipment met the requirement of this clause.

3.3 Frequency Tolerance

3.3.1 Test condition

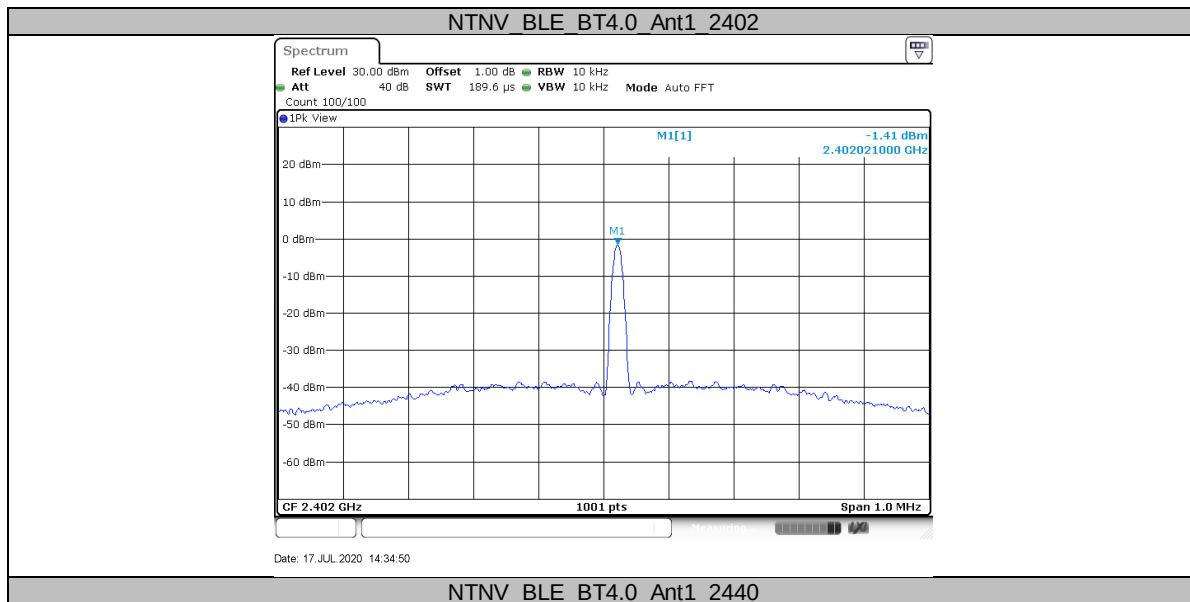
Channel:	Low: 2402MHz; Middle: 2440MHz; High: 2480MHz
Test position:	Transmitting
Ambient temperature:	22.4 °C
Relative humidity:	58.9 %
Atmosphere Pressure:	101.5 KPa

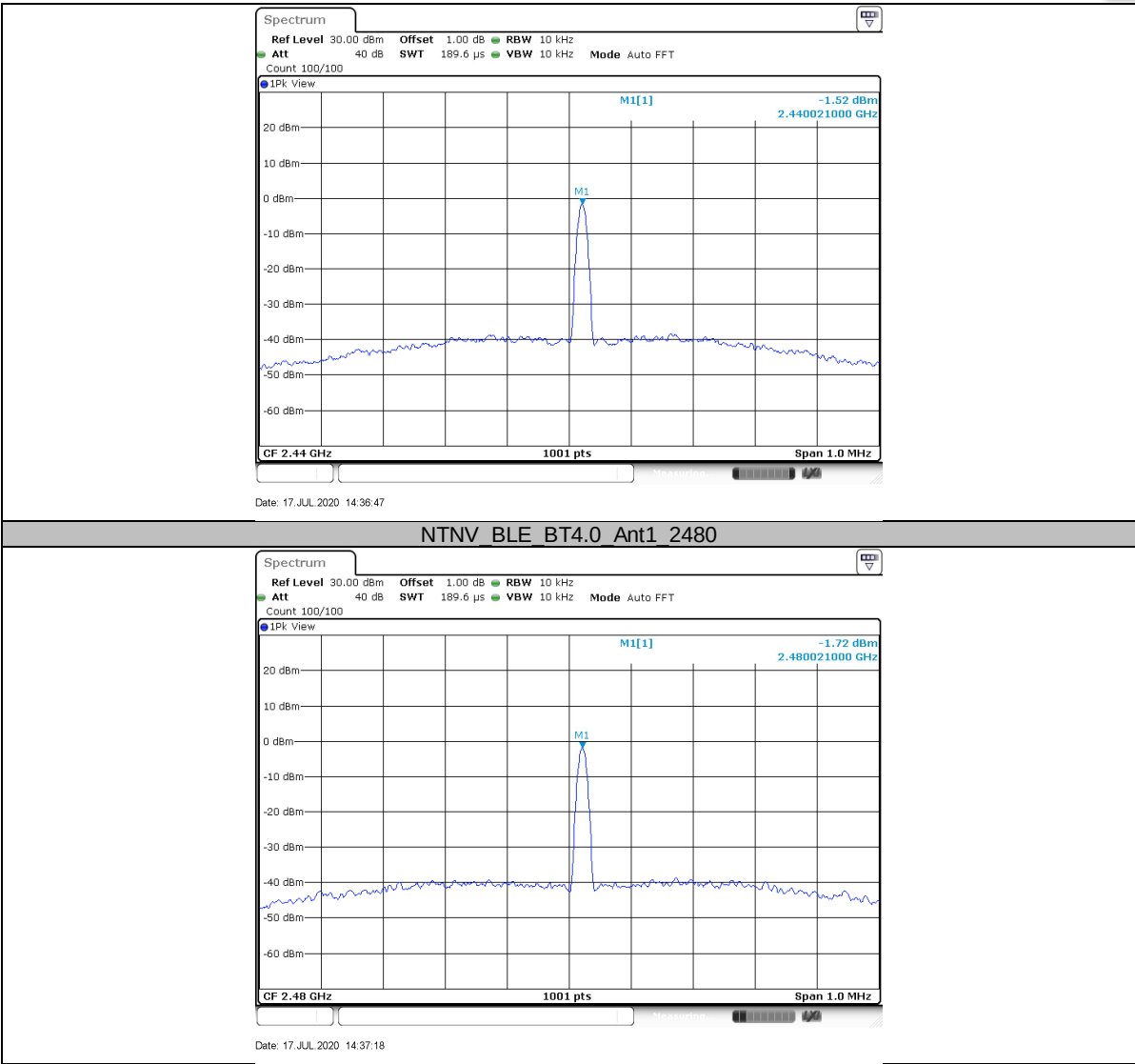
3.3.2 Limit (ARIB STD-T66, Clause 3.2 (4))

Tolerance of frequency: $\pm 50 \times 10^{-6}$.

3.3.3 Test Result

Test Frequency (MHz)	Voltage (VDC)	Result (KHz)	Tolerance (KHz)	Tolerance (ppm)	Limit (ppm)
2402	5VDC	2402021	21	8.74271	± 50
2440	5VDC	2440021	21	8.60656	± 50
2480	5VDC	2480021	21	8.46774	± 50
Conclusion: PASS					





3.3.4 Result

The equipment met the requirement of this clause.

3.4 Occupied Frequency Bandwidth

3.4.1 Test condition

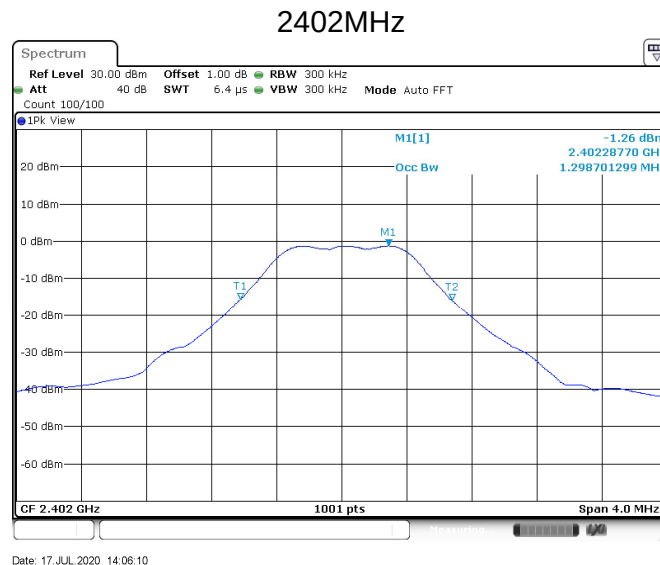
Channel:	Low: 2402MHz; Middle: 2440MHz; High: 2480MHz
Test position:	Transmitting
Ambient temperature:	23.5 °C
Relative humidity:	53.1 %
Atmosphere Pressure:	100.9 KPa

3.4.2 Limit (ARIB STD-T66, Clause 3.2 (7))

Permissible value for occupied bandwidth using the FH system, a hybrid system combining DS and FH systems, or a hybrid system combining FH and OFDM systems shall be 83.5 MHz or less, while necessary bandwidth (minimum occupied bandwidth sufficient to ensure information transmission of required quality at a required transmission rate for the system used under specified conditions for a given emission type) using a system other than any of the above shall be 26 MHz or less.

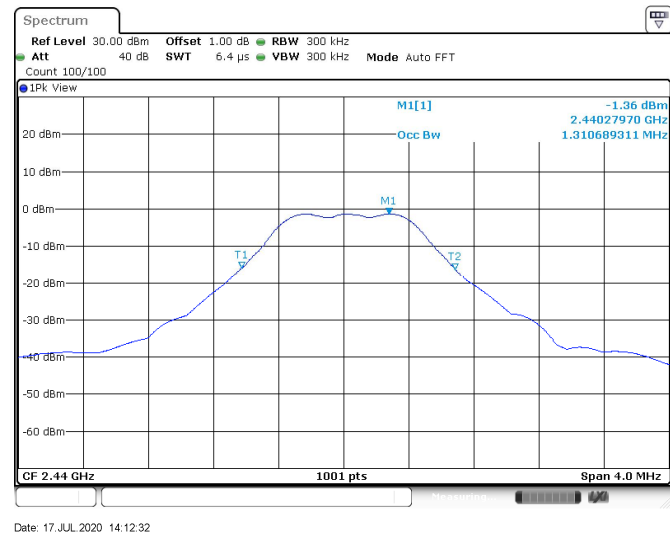
3.4.3 Test Result

Test Frequency (MHz)	Voltage (VDC)	Result (MHz)	Limit (MHz)
2402	5VDC	1.299	<26MHz
2440	5VDC	1.311	<26MHz
2480	5VDC	1.311	<26MHz

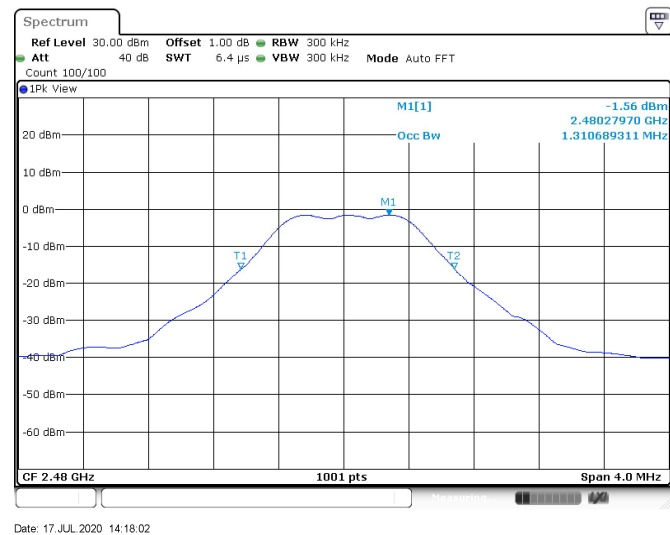




2440MHz



2480MHz



3.4.4 Result

The equipment met the requirement of this clause.

3.5 Spread Bandwidth

3.5.1 Test condition

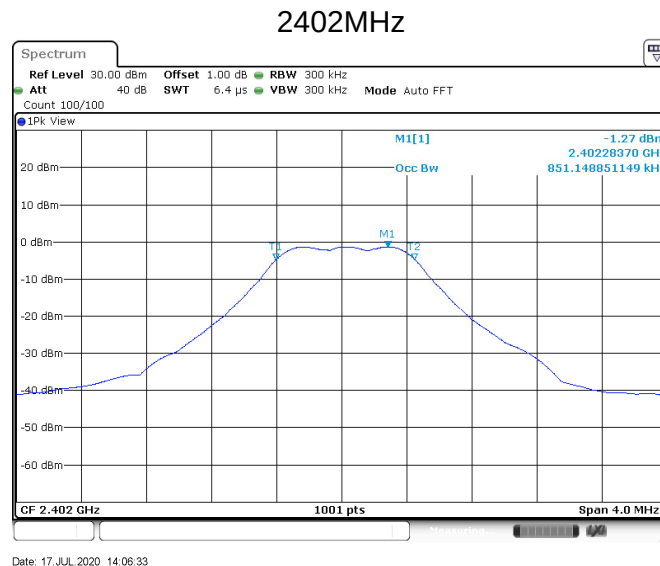
Channel:	Low: 2402MHz; Middle: 2440MHz; High: 2480MHz
Test position:	Transmitting
Ambient temperature:	23.5 °C
Relative humidity:	53.1 %
Atmosphere Pressure:	100.9 KPa

3.5.2 Limit (ARIB STD-T66, Clause 3.2 (8))

In spread spectrum systems, spread bandwidth (which refers to a frequency bandwidth with an upper limit and lower limit such that each of the mean powers radiated above the upper frequency limit and below the lower frequency limit is equal to 5 % of the total mean power radiated; this also applies hereafter) shall be 500 kHz or more

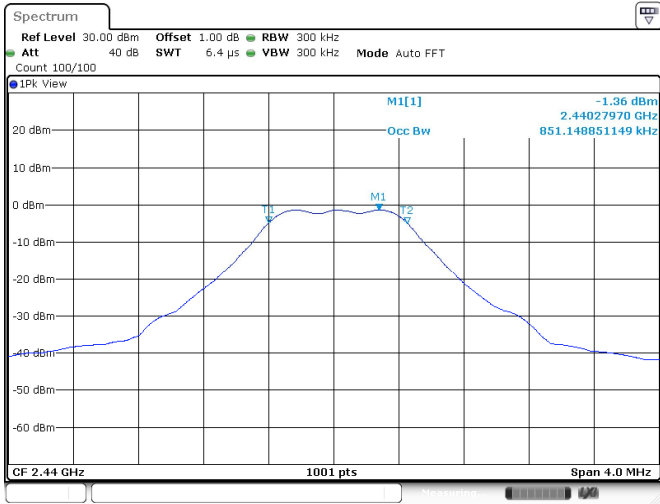
3.5.3 Test Result

Test Frequency (MHz)	Voltage (VDC)	Result (kHz)	Limit (kHz)
2402	5VDC	0.851	>500
2440	5VDC	0.851	>500
2480	5VDC	0.851	>500



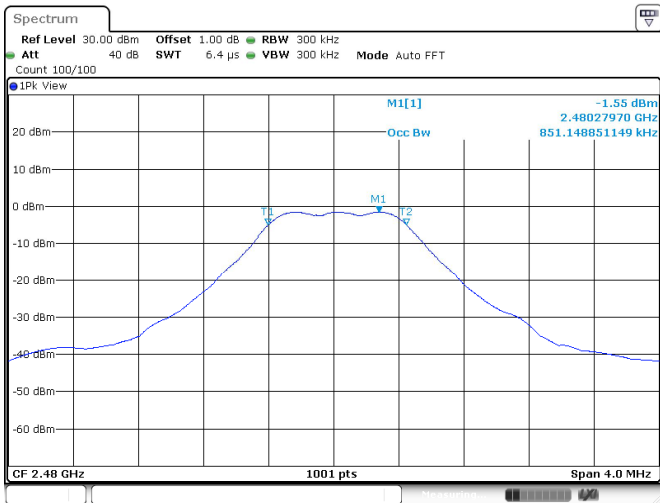


2440MHz



Date: 17 JUL 2020 14:12:55

2480MHz



Date: 17 JUL 2020 14:18:25



3.5.4 Result

The equipment met the requirement of this clause

3.6 Transmitter Spurious Emissions (Conducted) (For transmitter)

3.6.1 Test condition

Channel:	Low: 2402MHz; Middle: 2440MHz; High: 2480MHz
Test position:	Transmitting
Ambient temperature:	23.5 °C
Relative humidity:	53.2 %
Atmosphere Pressure:	100.9 KPa

3.6.2 Limit (ARIB STD-T66, Clause 3.2 (6))

Permissible mean power of spurious emission of each frequency supplied to a feeder, that is, mean power of spurious emission in the 1 MHz bandwidth at frequency f other than frequency band used shall be as follows: a. $2,387\text{MHz} \leq f \leq 2,400\text{MHz}$ and $2,483.5\text{MHz} < f \leq 2,496.5\text{MHz}$ 25 μW or less b. $2,387\text{MHz} > f$ and $2,496.5\text{MHz} < f$ 2.5 μW or less

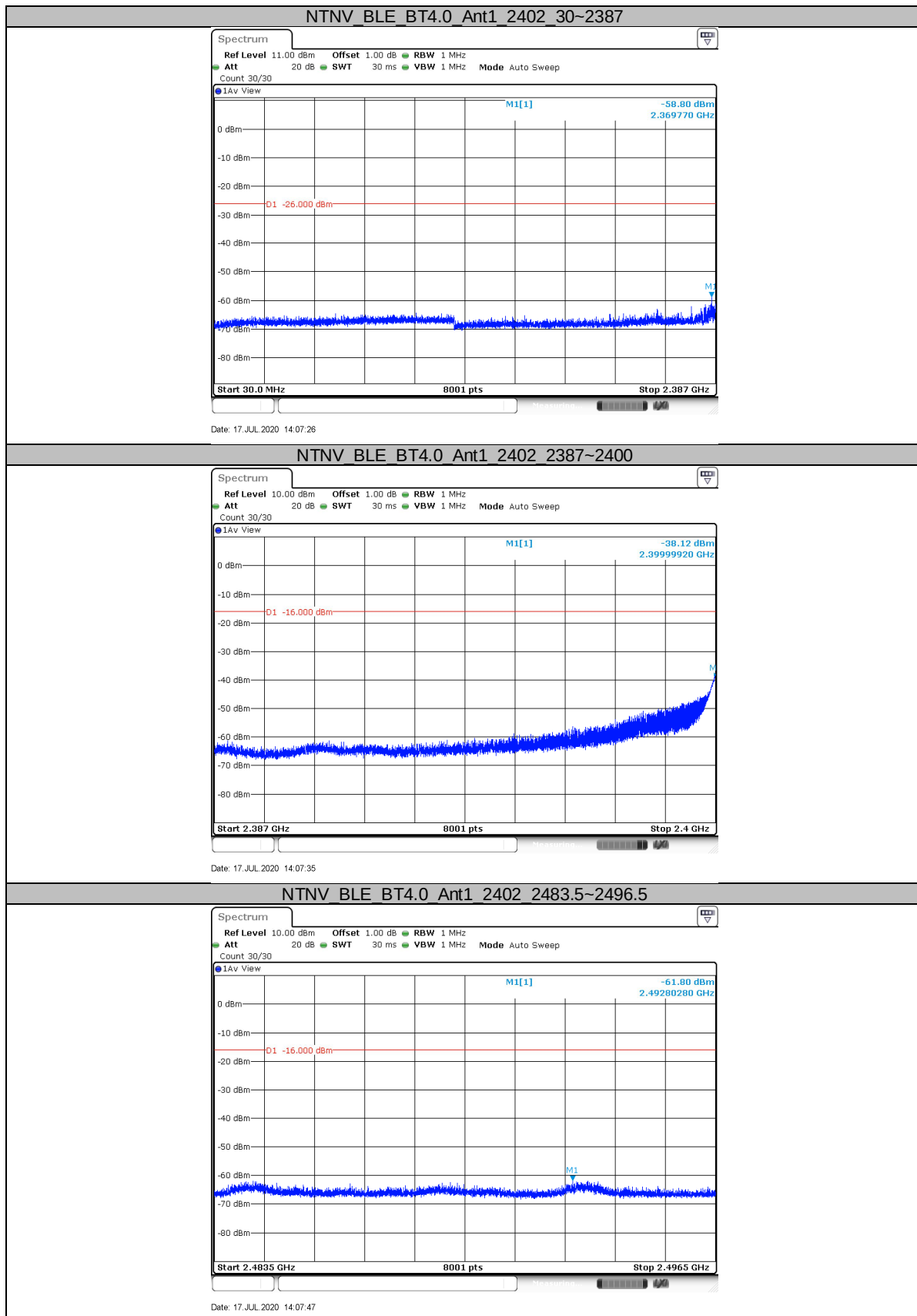
3.6.3 Test Result

TestCondition	TestMode	Channel(MHz)	Freq.Range(MHz)	Result(dBm)	Limit(dBm)	Verdict
NTNV	BLE_BT4.0	2402	30~2387	-58.8	≤ -26	PASS
NTNV	BLE_BT4.0	2402	2387~2400	-38.12	≤ -16	PASS
NTNV	BLE_BT4.0	2402	2483.5~2496.5	-61.8	≤ -16	PASS
NTNV	BLE_BT4.0	2440	30~2387	-62.16	≤ -26	PASS
NTNV	BLE_BT4.0	2440	2387~2400	-60.55	≤ -16	PASS
			2483.5~2496.5	-60.79	≤ -16	PASS
NTNV	BLE_BT4.0	2440	2496.5~13000	-58.86	≤ -26	PASS
NTNV	BLE_BT4.0	2480	30~2387	-61.34	≤ -26	PASS
NTNV	BLE_BT4.0	2480	2387~2400	-61.75	≤ -16	PASS
NTNV	BLE_BT4.0	2480	2483.5~2496.5	-52.1	≤ -16	PASS
			2496.5~13000	-58.6	≤ -26	PASS

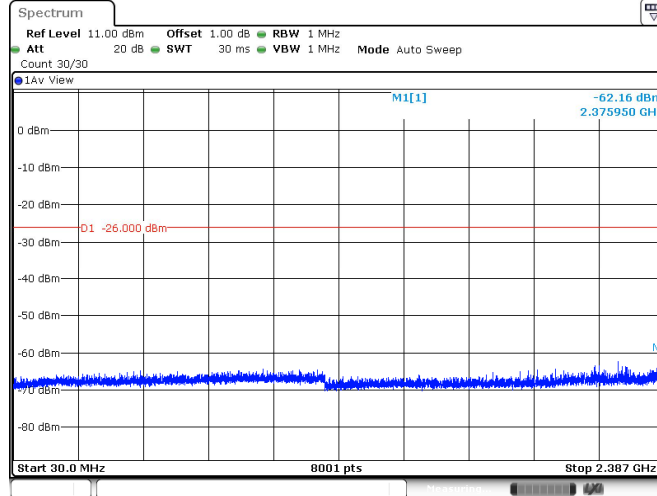
3.6.4 Result

The equipment met the requirement of this clause.

3.6.5 Test Graphs

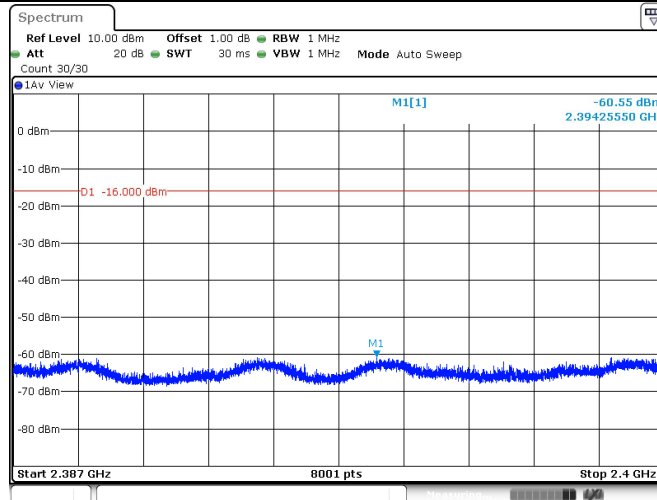


NTNV_BLE_BT4.0_Ant1_2440_30~2387



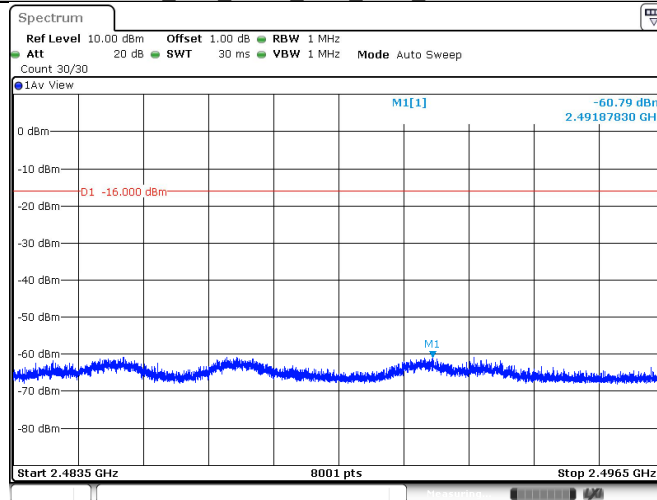
Date: 17 JUL 2020 14:13:48

NTNV_BLE_BT4.0_Ant1_2440_2387~2400



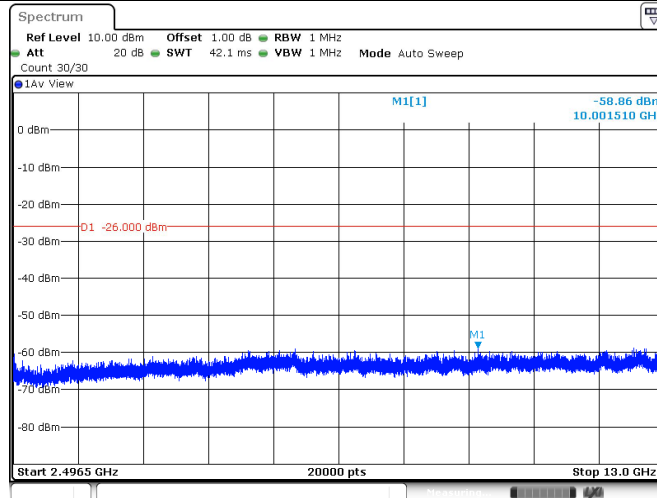
Date: 17 JUL 2020 14:13:57

NTNV_BLE_BT4.0_Ant1_2440_2483.5~2496.5



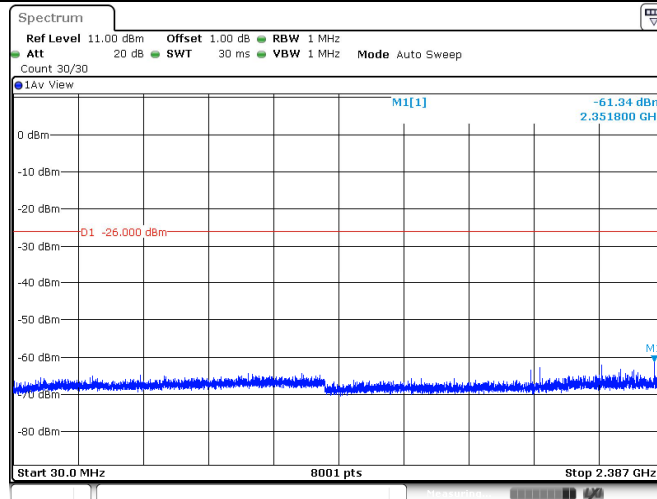
Date: 17 JUL 2020 14:14:08

NTNV_BLE_BT4.0_Ant1_2440_2496.5~13000



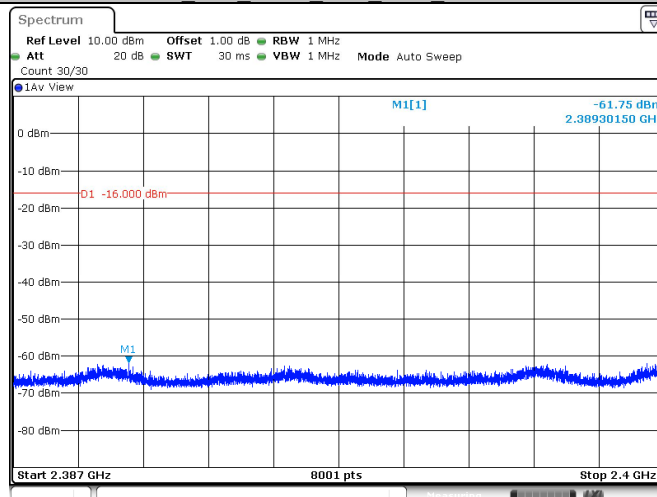
Date: 17 JUL 2020 14:14:18

NTNV BLE BT4.0 Ant1 2480 30~2387



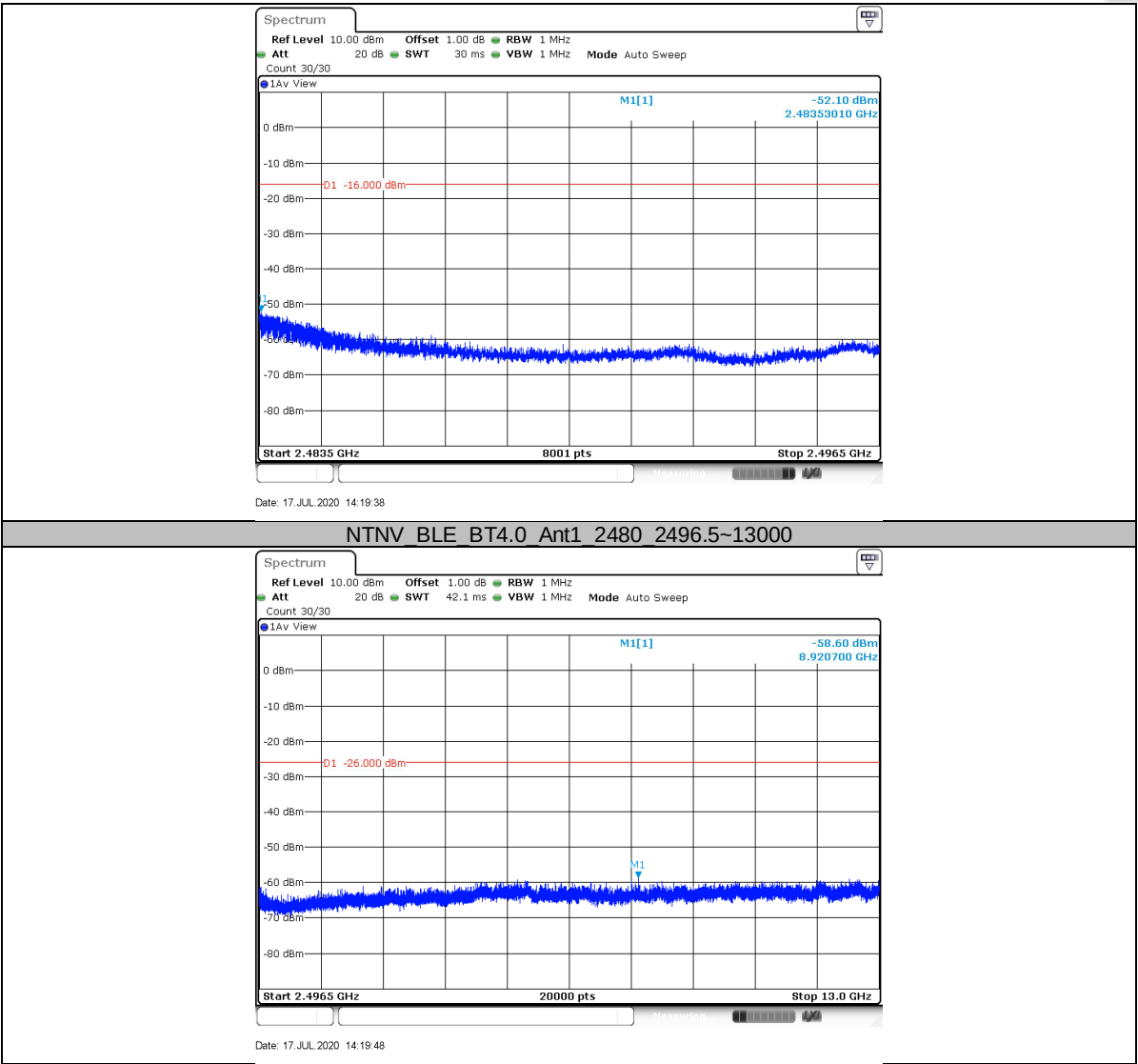
Date: 17 JUL 2020 14:19:18

NTNV BLE BT4.0 Ant1 2480 2387~2400



Date: 17 JUL 2020 14:19:27

NTNV BLE BT4.0 Ant1 2480 2483.5~2496.5



3.7 Secondary Radiated Emissions (Conducted) (For receiver)

3.7.1 Test condition

Channel:	Low: 2402MHz; Middle: 2440MHz; High: 2480MHz
Test position:	Transmitting
Ambient temperature:	23.5 °C
Relative humidity:	52.8 %
Atmosphere Pressure:	100.9 KPa

3.7.2 Limit (ARIB STD-T66, Clause 3.5 (1))

The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, 4 nW or less at a frequency below 1 GHz and 20 nW or less at a frequency of 1 GHz or higher as measured using the circuit.

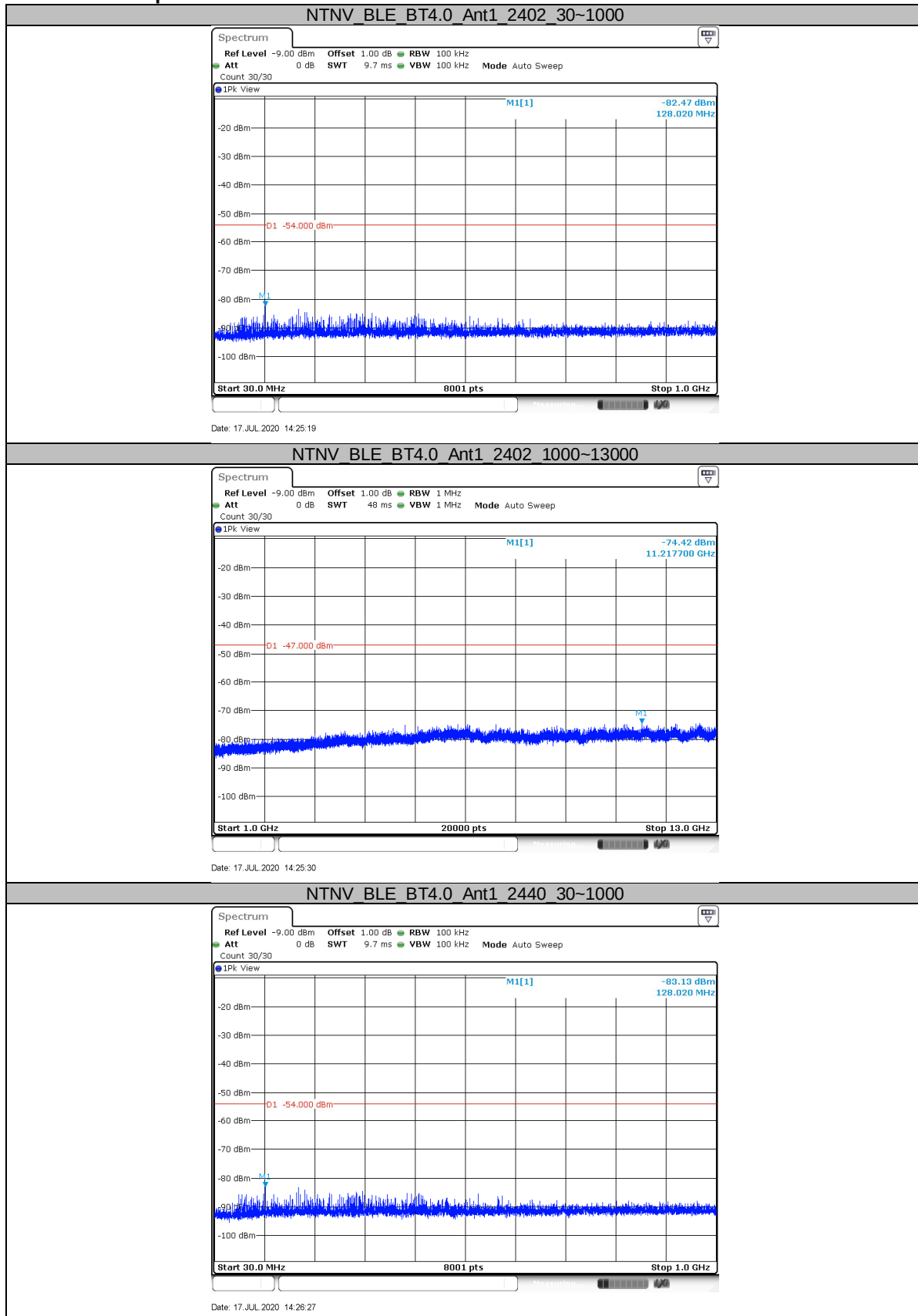
3.7.3 Test Result

TestCondition	TestMode	Channel(MHz)	Freq.Range(MHz)	Result(dBm)	Limit(dBm)	Verdict
NTNV	BLE_BT4.0	2402	30~1000	-82.47	<=-54	PASS
NTNV	BLE_BT4.0	2402	1000~13000	-74.42	<=-47	PASS
NTNV	BLE_BT4.0	2440	30~1000	-83.13	<=-54	PASS
NTNV	BLE_BT4.0	2440	1000~13000	-74.63	<=-47	PASS
NTNV	BLE_BT4.0	2480	30~1000	-83.11	<=-54	PASS
NTNV	BLE_BT4.0	2480	1000~13000	-71.92	<=-47	PASS

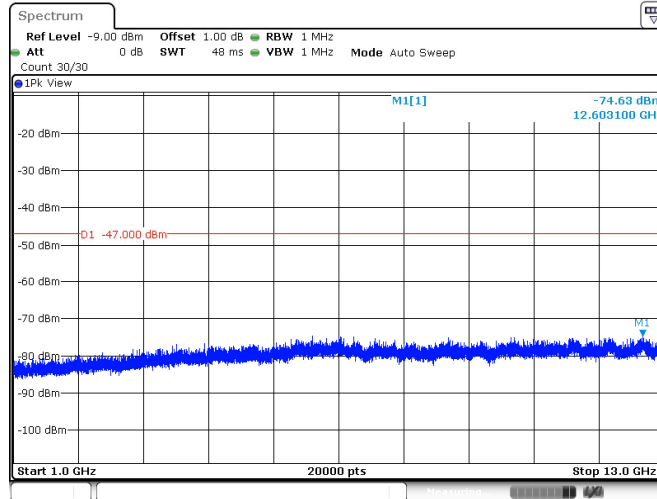
3.7.4 Result

The equipment met the requirement of this clause.

3.7.5 Test Graphs

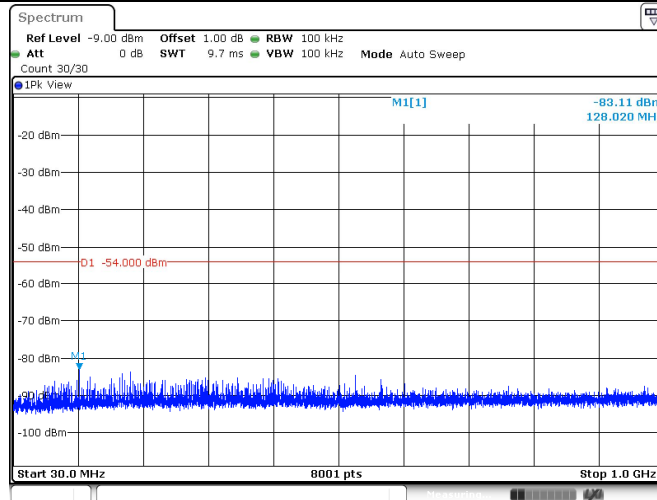


NTNV BLE BT4.0 Ant1 2440 1000~13000



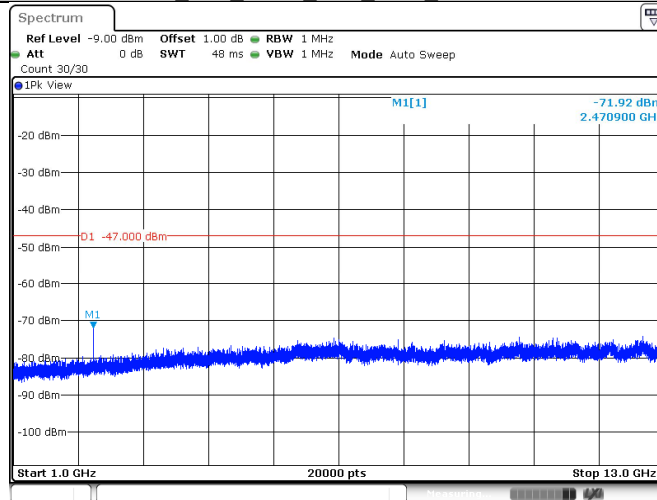
Date: 17 JUL 2020 14:26:37

NTNV BLE BT4.0 Ant1 2480 30~1000



Date: 17 JUL 2020 14:27:31

NTNV BLE BT4.0 Ant1 2480 1000~13000



Date: 17 JUL 2020 14:27:42

3.8 Interference prevention function

3.8.1 Test condition

Channel:	Low: 2402MHz; Middle: 2440MHz; High: 2480MHz
Test position:	Transmitting
Ambient temperature:	23.5 °C
Relative humidity:	52.8 %
Atmosphere Pressure:	100.9 KPa

3.8.2 Limit

Item	Limits
Identification Code	≥48 bits

Measured Result:

Test Conditions	Operation Frequency		
	2402 MHz	2440 MHz	2480 MHz
Normal Voltage (5VDC)	5	5	5

3.8.3 Result

The equipment met the requirement of this clause.

4 Photographs of Test Set-ups

