



JAPAN TEST REPORT

Report No:FCS202604325W01

Issued for

Applicant:	Guangdong Zhaotian Agricultural Technology Co.,Ltd.
Address:	1st Floor,Building10,Fengying Intelligent Manufacturing Industrial Park, No.7Chuangxing 6th Road,Henghe Subdistrict,Qingcheng District,Qingyuan City,Guangdong Province,China
Product Name:	Battery pack Bluetooth module
Brand Name:	N/A
Test Model Name:	DL-B40-D
Series Model:	N/A
Test Standard:	Article 2 Paragraph 1 of Item 19, annex 43 and annex 1
Issued By: Flux Compliance Service Laboratory Add: Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan Tel: 769-27280901 Fax:769-27280901 http://www.FCS-lab.com	

TEST RESULT CERTIFICATION

Applicant's Name.....: Guangdong Zhaotian Agricultural Technology Co.,Ltd.
Address.....: 1st Floor,Building 10,Fengying Intelligent Manufacturing Industrial Park, No.7Chuangxing 6th Road,Henghe Subdistrict,Qingcheng District,Qingyuan City,Guangdong Province,China

Manufacture's Name.....: Hengke Energy (Guangdong) Co.,Ltd
Address.....: Building 3,No.2,Yinling 1st Road,Guancang,Zhangmutou Town,Dongguan City, Guangdong Province

Test Specification:
Standard.....: Article 2 Paragraph 1 of Item 19, annex 43 and annex 1

Product Description

Product Name.....: Battery pack Bluetooth module
Trade Mark.....: N/A
Test Model Name.....: DL-B40-D
Series Model.....: N/A

This device described above has been tested by FCS, the test results show that the equipment under test (EUT) is in compliance with Article 2 Paragraph 1 of Item 19, annex 43 and annex 1 requirements. And it is applicable only to the tested sample identified in the report.

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Testing

Date (s) of performance of tests.....: Apr 27, 2026~June 18 ,2026
Date of Issue.....: June 18 ,2026
Test Result.....: Pass

Tested by

orange Ou Yang

(orange Ou Yang)

Reviewed by

Jayden

(Jayden)

Approved by

Jack Wang

(Jack Wang)

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Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	June 18 ,2026	FCS202604325W01	N/A	Initial Issue

1. SUMMARY OF TEST RESULTS

Rule Section	Description of Test	Result	judgement
3.2(4)	Frequency Error	--	PASS
3.2(7),(8)	Occupied Bandwidth (99%) 90% bandwidthOnly for reported	--	PASS
3.2(6)	Unwanted Emission Intensity	--	PASS
3.2(3)	Power Error	--	PASS
3.3	Limitation of Collateral Emission of Receiver	--	PASS
3.6	Transmission Radiation power	--	PASS
3.2	Transmission Radiation Angle Width (3DB Beamwidth)	N/A	N/A
3.4	Radio Interference Prevention Capability	--	PASS
3.2(9)	Spreading Factor	N/A	N/A
Note(4)	Carrier Sense Capability	--	N/A
3.7	Construction Protection Confirmation	--	PASS

NOTE:

(1) N/A means test is not applicable in this Test Report

(2) Article 2 Paragraph 1 of Item 19, annex 43 and annex 1

(3) Section 4.17 Radio Equipment of Radio Stations of a Low-Power Data Communication System (Article 49.20)

(4) Carrier Sensing Function 1: Application to transmitting devices which EIRP is less than 2.14dBi +antenna power limit and the shortage of EIRP is compensated by the antenna power. Not applicable to this product.

1.1 TEST FACTORY

Company Name:	Flux Compliance Service Laboratory
Address:	Room 105 Floor Bao hao Technology Building 1 NO.15 Gong ye West Road Hi-Tech Industrial, Song shan lake Dongguan
Telephone:	+86-769-27280901
Fax:	+86-769-27280901
FCC Test Firm Registration Number: 514908 Designation number: CN0127 A2LA accreditation number: 5545.01	

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	RF output power, conducted	$\pm 0.71 \text{ dB}$
2	Unwanted Emissions, conducted	$\pm 2.98 \text{ dB}$
3	Conducted Emission (9KHz-150KHz)	$\pm 4.13 \text{ dB}$
4	Conducted Emission (150KHz-30MHz)	$\pm 4.74 \text{ dB}$
5	All emissions, radiated (<1G) 30MHz-1000MHz	$\pm 3.2 \text{ dB}$
6	All emissions, radiated (1GHz -18GHz)	$\pm 3.66 \text{ dB}$
7	All emissions, radiated (18GHz -40GHz)	$\pm 4.31 \text{ dB}$
8	Frequency Error	$\pm 0.1 \text{ Hz}$
9	Occupied bandwidth	4(%)

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Equipment	Battery pack Bluetooth module	
Band Name	N/A	
Model Name	DL-B40-D	
Series Model	N/A	
Model Difference	N/A	
Product Description	Operation Frequency:	2402~2480 MHz
	Modulation Technology:	☒ GFSK
	Number Of Channel:	☒ 40 CH
	Data rate:	1Mbps
	Antenna Type	PCB Antenna
	Antenna Gain(Peak):	-0.59dBi
Channel List	Please refer to the Note 2.	
Power supply	DC 5V	
Battery	N/A	
Hardware version	V1.0	
software version	V1.0	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2. Channel List

Channel List for BLE							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	10	2422	20	2442	30	2462
01	2404	11	2424	21	2444	31	2464
02	2406	12	2426	22	2446	32	2466
03	2408	13	2428	23	2448	33	2468
04	2410	14	2430	24	2450	34	2470
05	2412	15	2432	25	2452	35	2472
06	2414	16	2434	26	2454	36	2474
07	2416	17	2436	27	2456	37	2476
08	2418	18	2438	28	2458	38	2478
09	2420	19	2440	29	2460	39	2480

3. Table for Filed Antenna

Ant.	Antenna Brand	Antenna Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	PCB Antenna	N/A	-0.59	Antenna

2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX Mode(CH00)
Mode 2	TX Mode(CH19)
Mode 3	TX Mode(CH39)

Note:

1. All modes were tested and only the worst case scenario is shown in the report

2.3 TEST CONDITIONS

The BT module was tested while in a continuous transmitter/receiver mode.

The EUT was tuned to a low, middle, and high channel for all tests. For all test case pre-scans were completed in all Modes to determine worst case levels.

EUT and Module Power tables				
EUT Setup Value (Vac)		Normal	Hight(+10%)	Low(-10%)
		5V	5.5V	4.5V
Module Vdd Power		Normal	Hight	Low
Measurement Value (Vdc)		3.3V	3.31V	3.29V
Voltage error (%)	Result	Ref. level	0.3	-0.3
	Limit	----	± 1	
Judgment		----	normal	normal

Note: Judgment: Since the input voltage of the RF module changes by less than 1% when the EUT input power supply varies by $\pm 10\%$, only the normal voltage needs to be tested

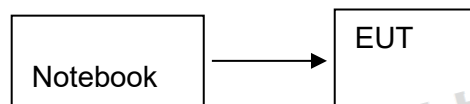
2.4 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product

Run software name: BT tool

2.5 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Mode 1:



2.6 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
1	Notebook	Lenovo	HC2401-1202000E	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.7 EQUIPMENTS LIST FOR ALL TEST ITEMS

Test Equipment

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESRP 3	FCS-E001	2025.08.25	2026.08.24
Signal Analyzer	R&S	FSV40-N	FCS-E012	2025.08.25	2026.08.24
Active loop Antenna	ZHINAN	ZN30900C	FCS-E013	2025.08.25	2026.08.24
Bilog Antenna	SCHWARZBECK	VULB 9168	FCS-E002	2025.08.25	2026.08.24
Horn Antenna	SCHWARZBECK	BBHA 9120D	FCS-E003	2025.08.25	2026.08.24
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	FCS-E018	2025.08.25	2026.08.24
Pre-Amplifier(0.1M-3G Hz)	EMCI	EM330N	FCS-E004	2025.08.25	2026.08.24
Pre-Amplifier (1G-18GHz)	N/A	TSAMP-0518SE	FCS-E014	2025.08.25	2026.08.24
Pre-Amplifier (18G-40GHz)	TERA-MW	TRLA-0400	FCS-E019	2025.08.25	2026.08.24
Temperature & Humidity	HTC-1	victor	FCS-E005	2025.08.25	2026.08.24

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESPI	FCS-E020	2025.08.25	2026.08.24
LISN	R&S	ENV216	FCS-E007	2025.08.25	2026.08.24
LISN	ETS	3810/2NM	FCS-E009	2025.08.25	2026.08.24
Temperature & Humidity	HTC-1	victor	FCS-E008	2025.08.25	2026.08.24

RF Connected Test

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
MXA SIGNAL Analyzer	Keysight	N9020A	FCS-E015	2025.08.25	2026.08.24
Spectrum Analyzer	Agilent	E4447A	MY50180039	2025.08.25	2026.08.24
Spectrum Analyzer	R&S	FSV-40	101499	2025.08.25	2026.08.24
Power meter	Anritsu	ML2495A	FCS-W021	2025.08.25	2026.08.24

Remark:

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

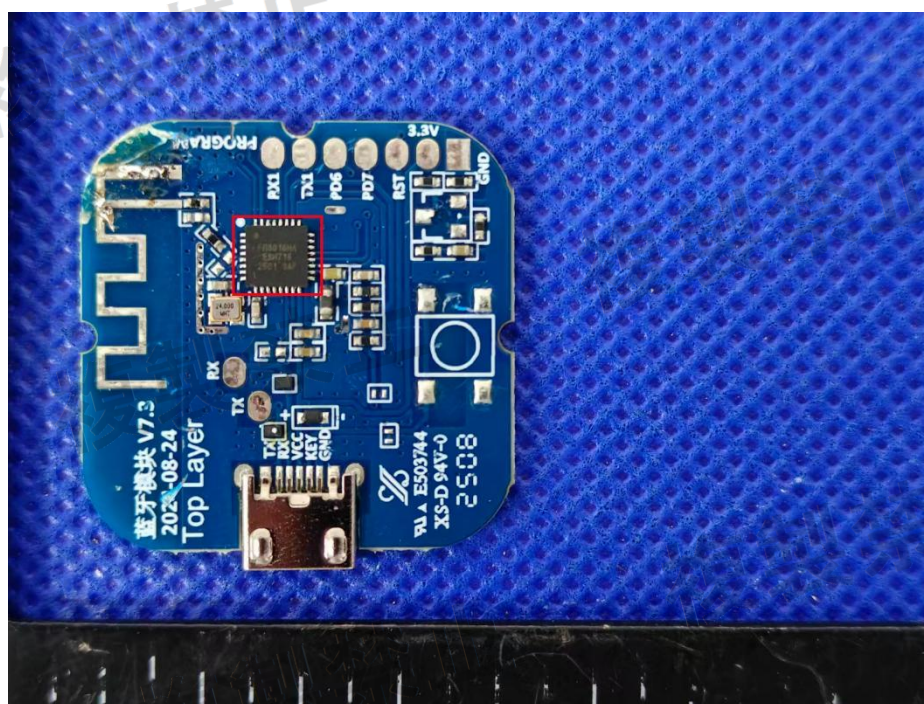
Test Equipment Calibration

All of the test equipment is effective use and calibration certification institution, GRGT, the address is 163 tianhe district in Huangpu road Xiping cloud road .Guangzhou,China

3. CONSTRUCTION PROTECTION CONFIRMATION

We declare that the above mentioned radio equipment submitted for certification and registration at Japan MIC will contain RF and modulation portions that are protected against forced and illegal access or modification by the following method:

Our products apply for Japanese Radio frequency (rf) certification, The chip has 32 chip pins and a pin distance of 1 mm. Thank you for your attention to this matter.



4. FREQUENCY ERROR

4.1 LIMIT

Item	Limits
Frequency Error	$\pm 50\text{ppm}$

4.2 TEST PROCEDURES

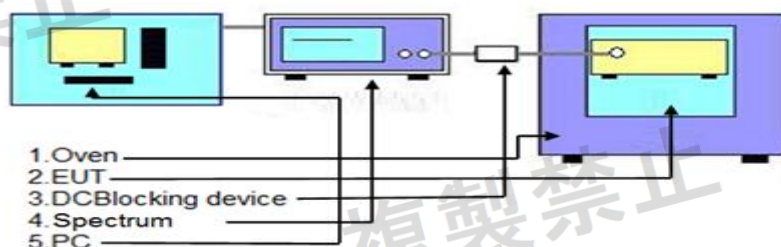
The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	10KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

- (1) In the case of unmodulated signal (continuous or continuous burst), measure the frequency directly by a frequency meter.
- (2) In the case of burst waves, the measurement shall be done for enough time in order to obtain the enough measuring accuracy, and the average of the measured values becomes the final value.
- (3) In the case of a test mode with a specific frequency spectrum, measure the frequency of the specific spectrum by a spectrum analyzer.
- (4) In the cases above, if the frequency equivalent to the test frequency is not directly measured in principle, it shall be obtained by necessary calculation.

In the case of modulated signal, if there is no specific spectrum measurable by a spectrum analyzer but a specific dip is observed, it is allowed to measure the frequency with the signal generator (synthesized). That is, observe a signal of the signal generator concurrently (or alternately) with the tested signal using the spectrum analyzer while setting the frequency of the signal generator to the position of the dip on the screen of the spectrum analyzer, and determine the frequency of the signal generator at the time as a measured value.

4.3 TEST SETUP



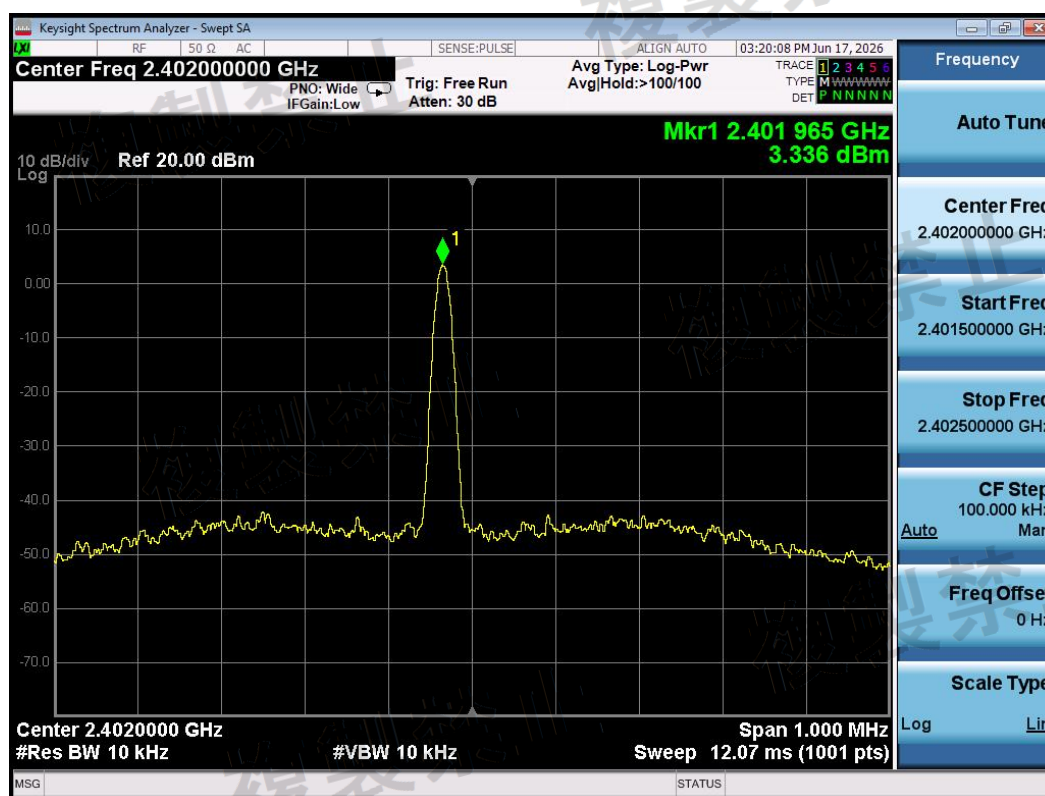
4.4 TEST RESULT

Temperature:	25°C	Humidity:	55 % RH
Pressure	101kPa		

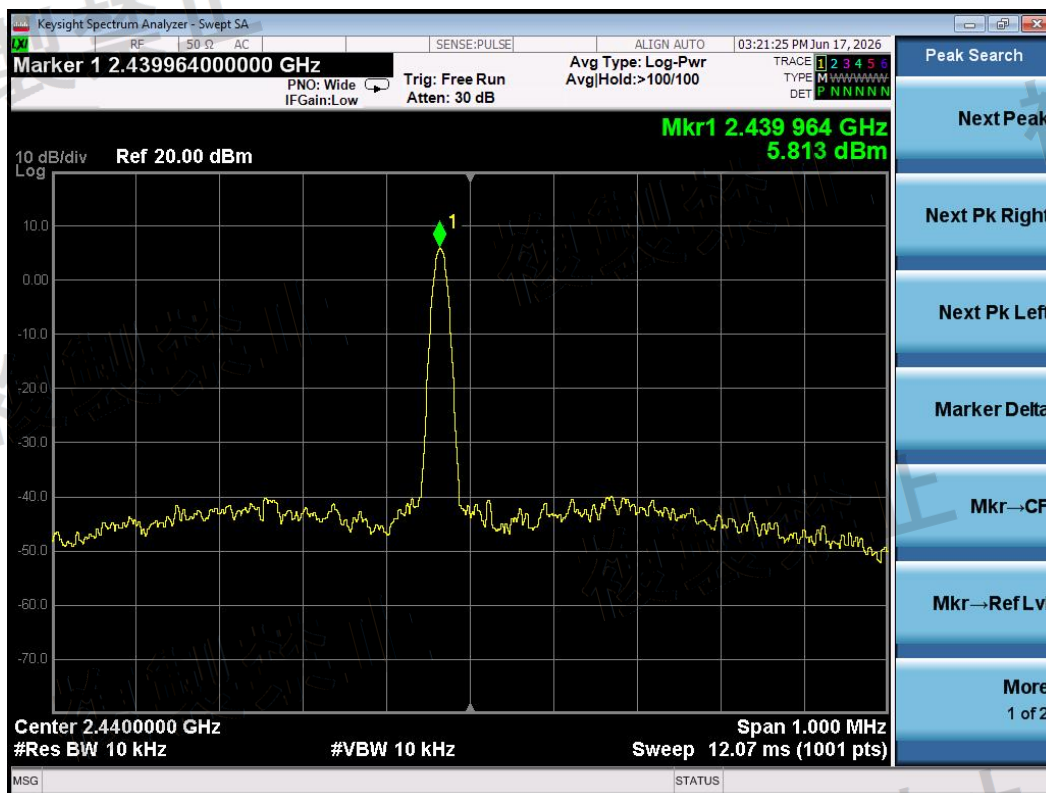
GFSK

Test Conditions		Channel	F _c	Tolerance	Limit
		MHz	MHz	ppm	(ppm)
V _{nom} (V)	DC 5V	2402	2401.965	-14.57	±20
		2440	2439.964	-14.75	±20
		2480	2479.964	-14.52	±20

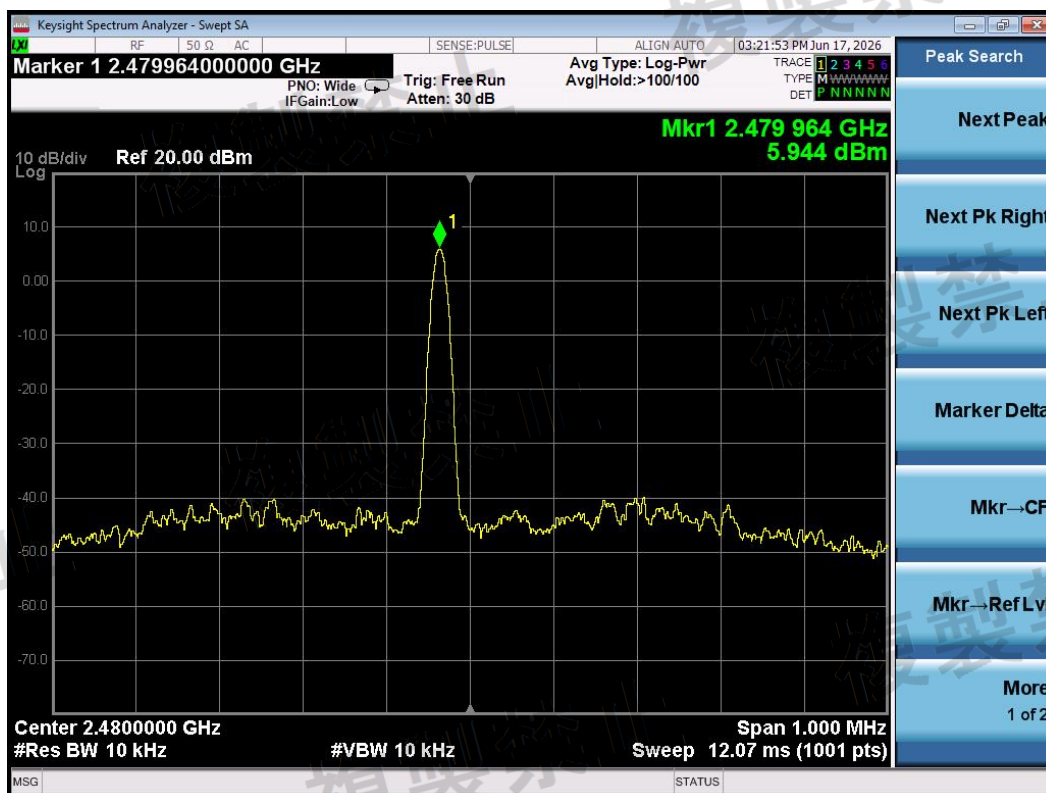
CH00(normal voltage)



CH 19(normal voltage)



CH39(normal voltage)



5. ANTENNA POWER

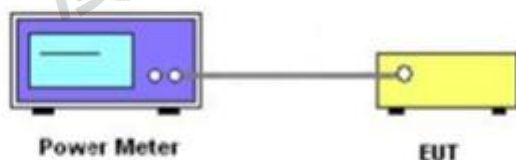
5.1 LIMIT

Item	Limits
Antenna Power Density	$\leq 3\text{mW/MHz}$ (FH form 2400 – 2483.5 MHz) $\leq 10\text{mW/MHz}$ (OFDM,DS from 2400~2483.5MHz, 802.11b/g/n HT20) $\leq 5\text{mW/MHz}$ (OFDM,DS from 2400~2483.5MHz, 802.11n HT40) $\leq 10\text{mW}$ (Other from 2400~2483.5MHz)
Power Error	+20%(Base on manufacturer declare power)

5.2 TEST PROCEDURE

1. EUT turn to test frequency channel and keep continuous transmitting
2. Reading the output power from the Power meter as P_{EUT}

5.3 TEST SETUP



5.3 TEST DEVIATION

There is no deviation with the original standard.

5.4 TEST RESULT

Temperature:	25°C	Humidity:	55 % RH
Pressure	101kPa		

TEST CONDITI ONS	Channel	antenna power (dBm)	antenna power (mW)	declared Antenna Power (mW)	Tolerance (%)	Limit (dBm)
Nom (V) DC 5V	Low	3.149	2.0649	3	-37.382	10
	Middle	2.859	1.9315	3	-40.943	10
	High	1.581	1.4391	3	-55.852	10
Limit : (1) Antenna Power Density Limit (10mW) (2) Tolerance +20%, (Base on manufacturer declare Antenna Power Density)						

6. EIRP POWER

6.1 LIMIT

Item	Limits
Radiation power EIRP	FH form 2400 – 2483.5 MHz ,EIRP $\leq$ 6.91dBm/MHz CCK/OFDM/DBPSK (2400~2483.5MHz) OFDM or DS other than (802.11b/g/n HT20) EIRP $\leq$ 12.14 dBm/MHz OFDM or DS other than (802.11n HT40) EIRP $\leq$ 9.13dBm/MHz Other from 2400~2483.5MHz: 12.14 dBm or less
Power Error	+20% (Base on manufacturer declare power)

6.2 TEST RESULT

Temperature:	25°C	Humidity:	55 % RH
Pressure	101kPa		

TEST CONDITI ONS	Channel	EIRP (dBm)	Gain (dBi)	EIRP output (dBm)	EIRP output (mW)	Limit (dBm)
Nom (V) DC 5V	Low	3.149	-0.59	2.559	1.8026	12.14
	Middle	2.859	-0.59	2.269	1.6862	12.14
	High	1.581	-0.59	0.991	1.2563	12.14

7. OCCUPIED BANDWIDTH (99%)

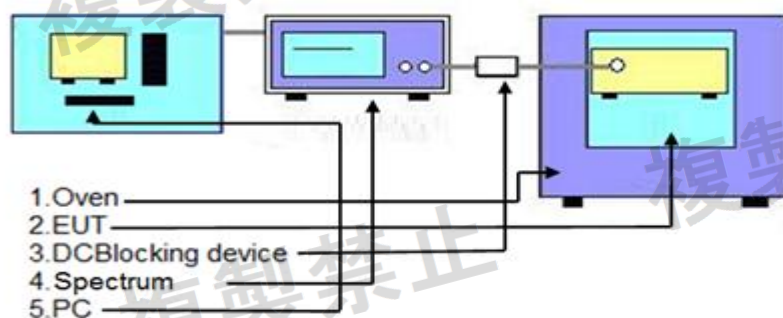
7.1 LIMIT

Item	Limits
Occupied Band Width:	$\leq 83.5\text{MHz}$ (FH;FH+DS;FH+OFDM) $\leq 26\text{MHz}$ (Others)

7.2 TEST PROCEDURE

- Setting of SA is following as: GFSK RB: 100KHz / VB:300KHz / SPAN: 3MHz / AT: 25dB Ref:10dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
- EUT have transmitted the maximum modulation signal and fixed channelize (For DSSS or OFDM Device) or continuous maximum power of hopping mode(For FHSS Device). SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 26MHz(For FH or OFDM Device) or 83.5MHz(For FHSS Device).

7.3 TEST SETUP



7.4 TEST DEVIATION

There is no deviation with the original standard.

7.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

7.6 TEST RESULT

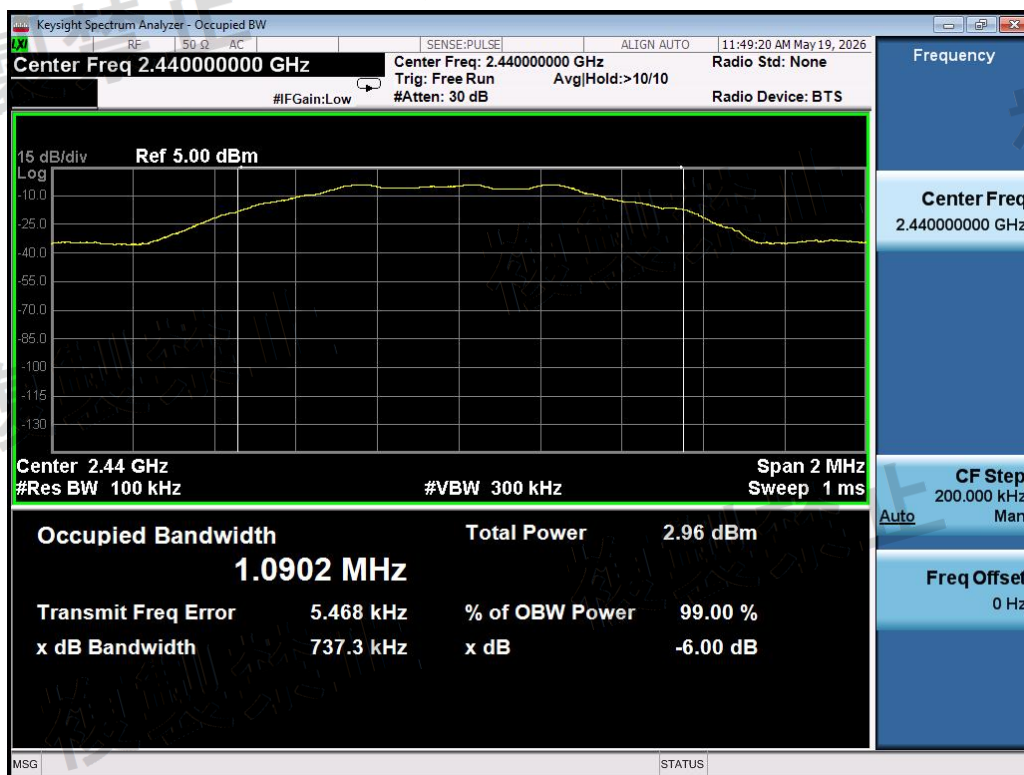
Temperature:	25°C	Humidity:	55 % RH
Pressure	101kPa		

Voltage	Channel (MHz)	OCCUPIED BANDWIDTH (99%)MHz
Nor Voltage DC 5V	2402	1.0992
	2440	1.0902
	2480	1.0866

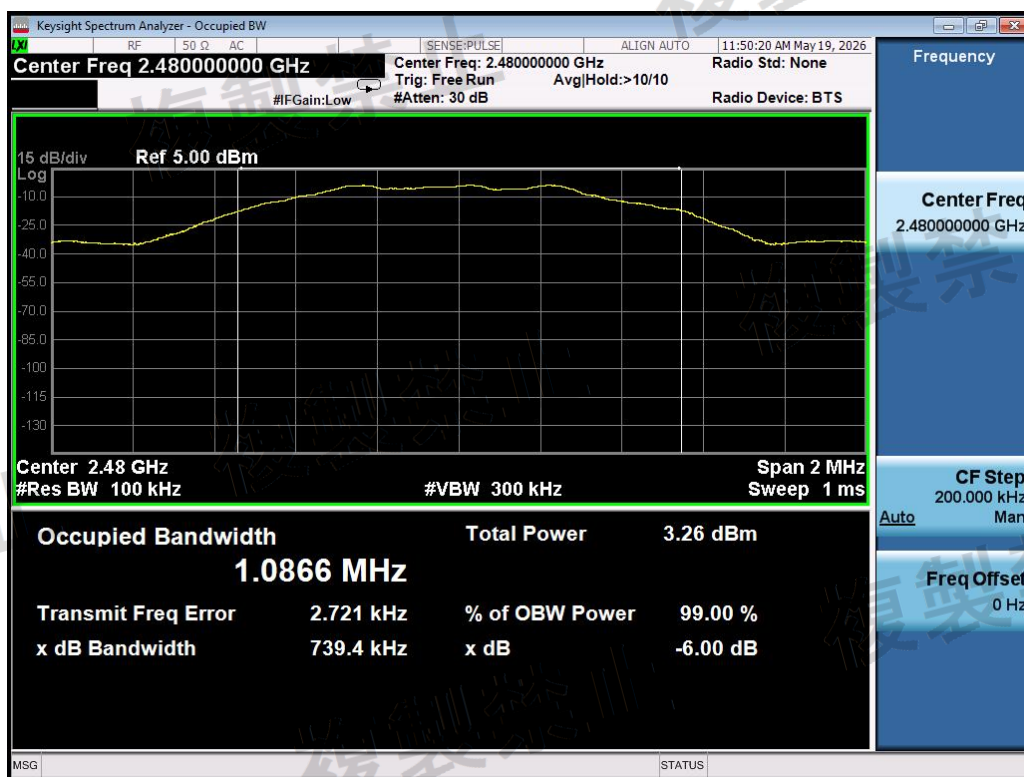
Low CH- Occupied Bandwidth (99%) (normal voltage)



Middle CH- Occupied Bandwidth (99%) (normal voltage)



High CH- Occupied Bandwidth (99%) (normal voltage)



8. UNWANTED EMISSION INTENSITY MEASUREMENT

8.1 LIMIT

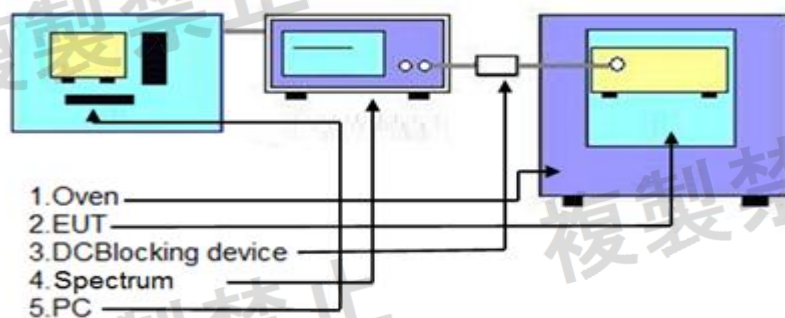
Item	Limits
TX Spurious Emission	$\leq -26\text{dBm}$ ($30\text{MHz} \leq f \leq 1000\text{MHz}$)
	$\leq 2.5 \mu\text{W/MHz}$ ($30\text{MHz} \leq f \leq 1000\text{MHz}$)
	$\leq -26\text{dBm}$ ($1000\text{MHz} < f \leq 2387\text{MHz}$)
	$\leq 2.5 \mu\text{W/MHz}$ ($1000\text{MHz} < f \leq 2387\text{MHz}$)
	$\leq -16\text{dBm}$ ($2387\text{MHz} < f \leq 2400\text{MHz}$)
	$\leq 25 \mu\text{W/MHz}$ ($2387\text{MHz} < f \leq 2400\text{MHz}$)
	$\leq -16\text{dBm}$ ($2483.5\text{MHz} \leq f < 2496.5\text{MHz}$)
	$\leq 25 \mu\text{W/MHz}$ ($2483.5\text{MHz} \leq f < 2496.5\text{MHz}$)
	$\leq -26\text{dBm}$ ($2496.5\text{MHz} \leq f < 12500\text{MHz}$)
	$\leq 2.5 \mu\text{W/MHz}$ ($2496.5\text{MHz} \leq f < 12500\text{MHz}$)

8.2 TEST PROCEDURE

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	30-1000MHz: 1MHz/1MHz
	Above 1GHz: 1MHz/1MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

- EUT have transmitted the maximum modulation signal and fixed channelize.
- Setting of SA is following as: Below 1GHz RB:1MHz / VB:1MHz
Above 1GHz RB:1MHz / VB:1MHz / AT: 10dB Ref: 0dBm / Sweep time: Auto
Sweep Mode: Continuous sweep / Detect mode: Positive peak
Trace mode: Max hold
- Setting of SA is following as 30MHz and stop frequency 1000MHz Then to mark peak reading value + cable loss shall be less than 2.5 $\mu\text{W/MHz}$.
- Setting of SA is following as 1000MHz and stop frequency 2387MHz Then to mark peak reading value + cable loss shall be less than 2.5 $\mu\text{W/MHz}$.
- SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25 $\mu\text{W/MHz}$.
- SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz Then to mark peak reading value + cable loss shall be less than 25 $\mu\text{W/MHz}$.
- SA adjusted to start frequency 2496.5MHz and stop frequency 12750MHz Then to mark peak reading value + cable loss shall be less than 2.5 $\mu\text{W/MHz}$.
- Measure side band spurious as follows: For 2.4GHz band: 2374MHz~2400MHz and 2483.5MHz~2509.5MHz RBW = VBW = 30kHz, Result_Value = Measured_Value + 15.2 [dBm]
- If the Result_Value is over the requirement, take total sum of 1MHz band centered at the spur frequency like ACLP measurement as Result_Value.

8.3 TEST SETUP



8.4 TEST DEVIATION

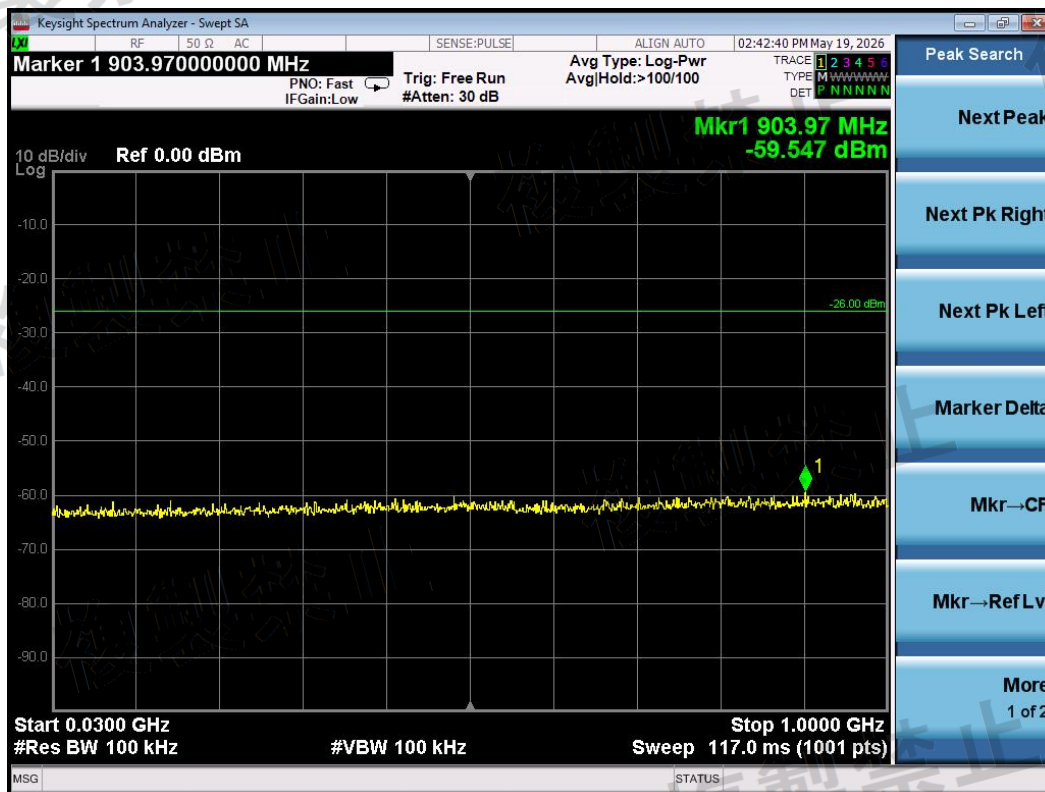
There is no deviation with the original standard.

8.5 TEST RESULT

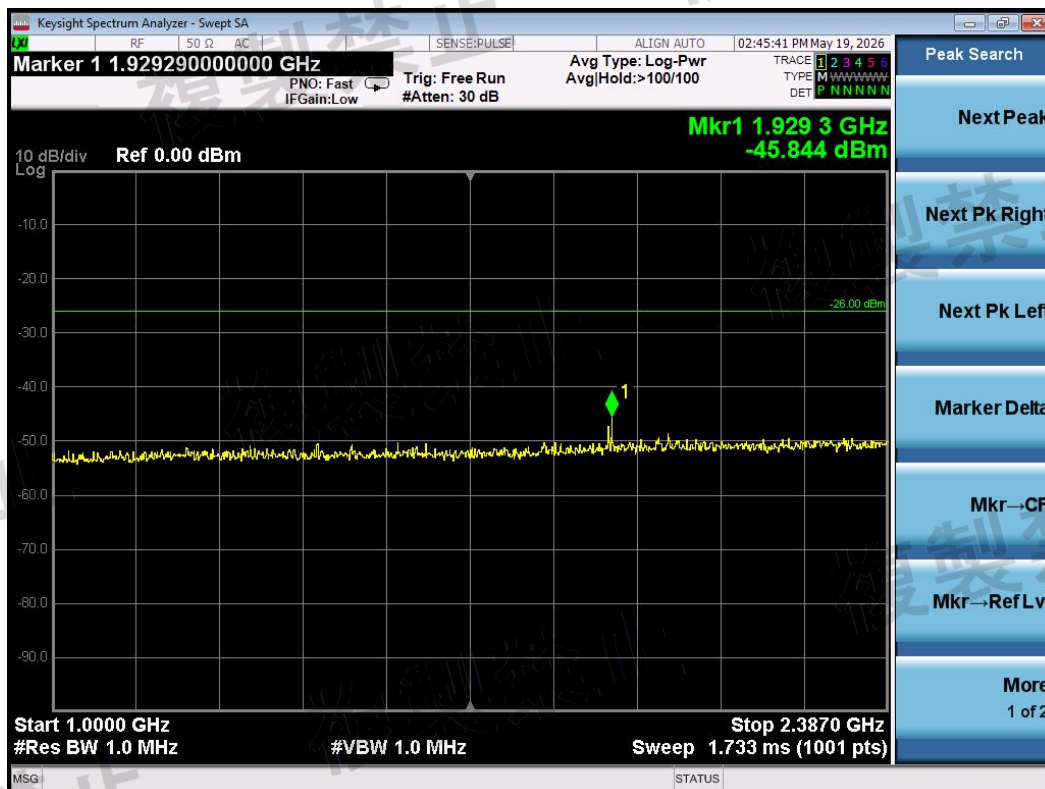
Temperature:	25°C	Humidity:	55 % RH
Pressure	101kPa		

Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW/MHz]	Limit [μW/MHz]	Verdict
NTNV	BLE	Ant1	2402	903.97	-59.547	≤-26	0.001109941	≤2.5	PASS
				9293	-45.844	≤-26	0.026037543	≤2.5	PASS
				2395.645	-48.538	≤-16	0.01400232	≤25	PASS
				2495.1983	-48.579	≤-16	0.013870752	≤25	PASS
				5542	-47.718	≤-26	0.016912196	≤2.5	PASS
			2440	828.31	-60.293	≤-26	0.00093476	≤2.5	PASS
				2213.6	-49.455	≤-26	0.011337048	≤2.5	PASS
				2397.231	-48.861	≤-16	0.012998702	≤25	PASS
				2495.879	-48.033	≤-16	0.01572896	≤25	PASS
				5091	-48.308	≤-26	0.014763863	≤2.5	PASS
			2480	852.56	-59.724	≤-26	0.001065614	≤2.5	PASS
				2349.6	-48.697	≤-26	0.01349895	≤2.5	PASS
				2387.884	-48.900	≤-16	0.012882496	≤25	PASS
				2495.0149	-49.268	≤-16	0.011835865	≤25	PASS
				12299	-47.915	≤-26	0.016162182	≤2.5	PASS

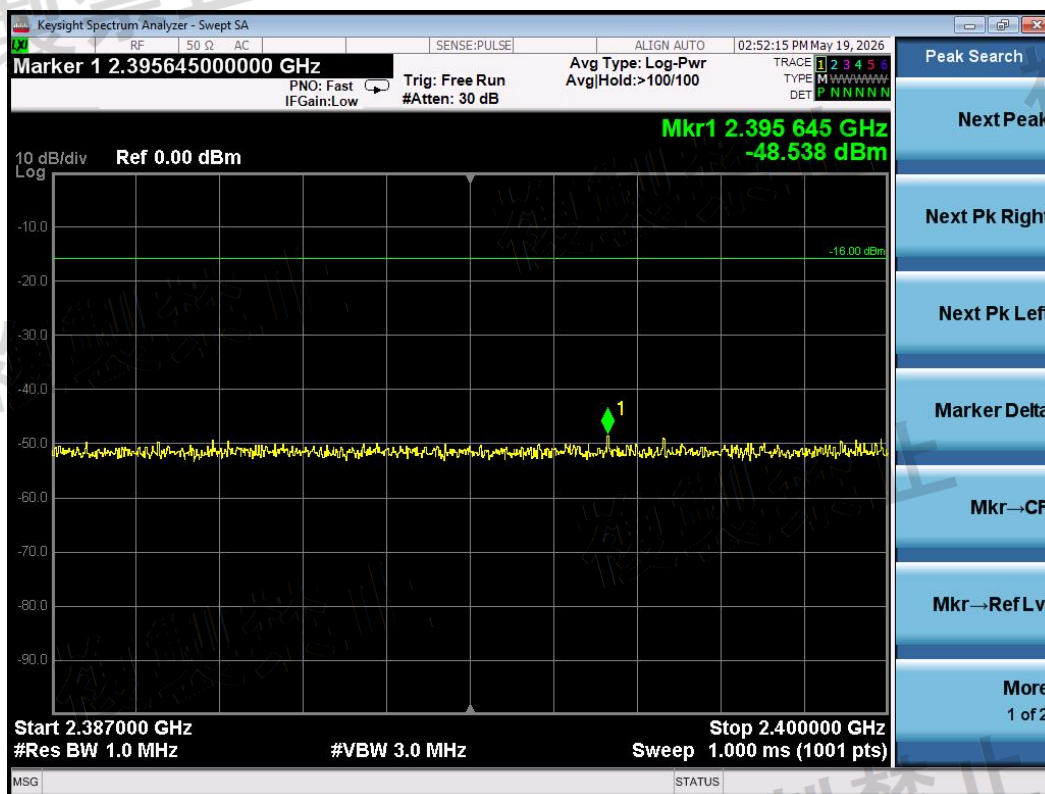
NTNV_BLE_Ant1_2402_30~1000



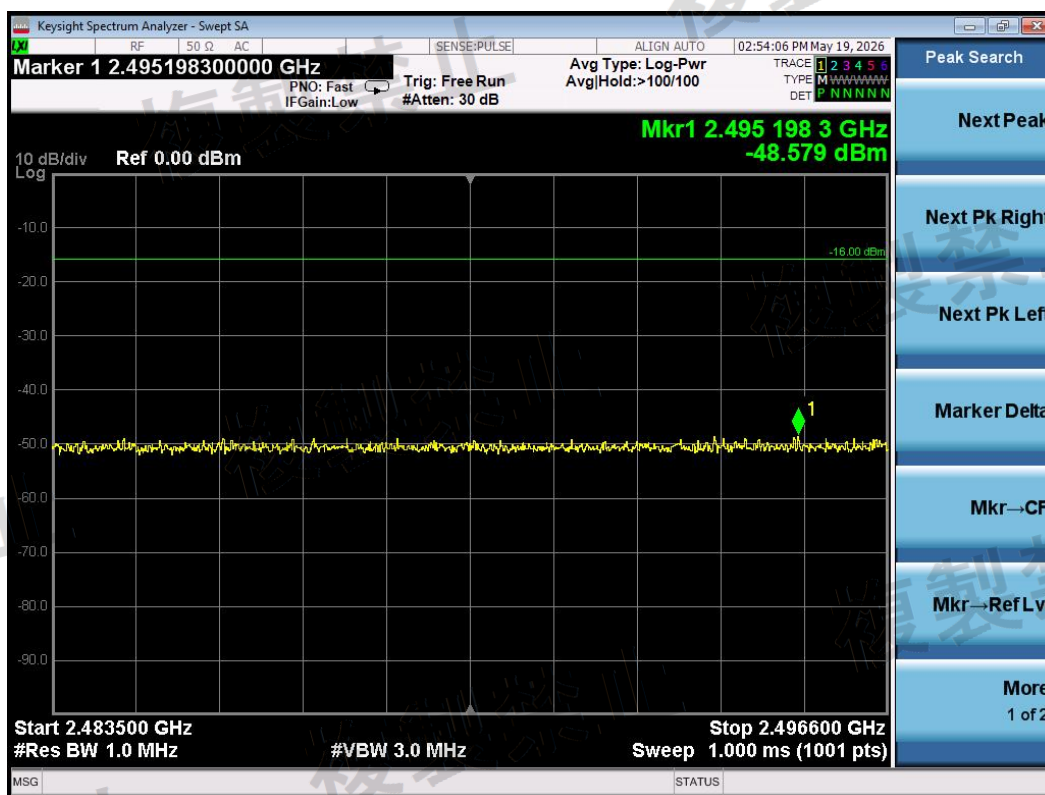
NTNV_BLE_Ant1_2402_1000~2387



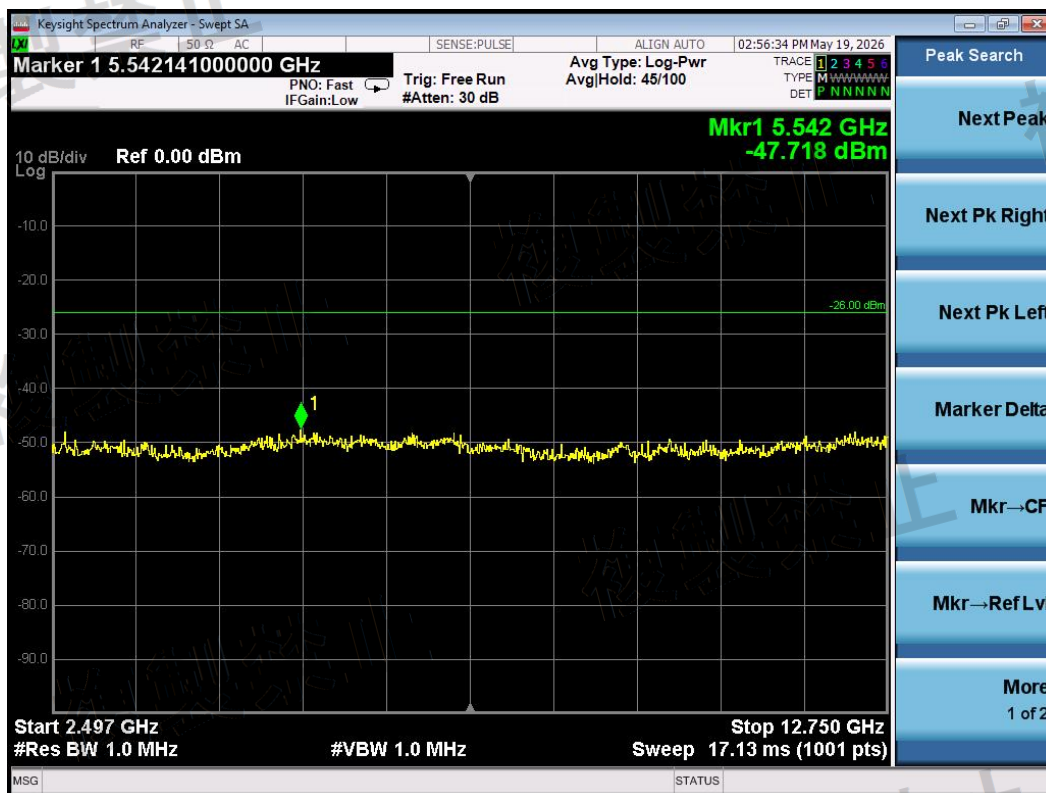
NTNV_BLE_Ant1_2402_2387~2400



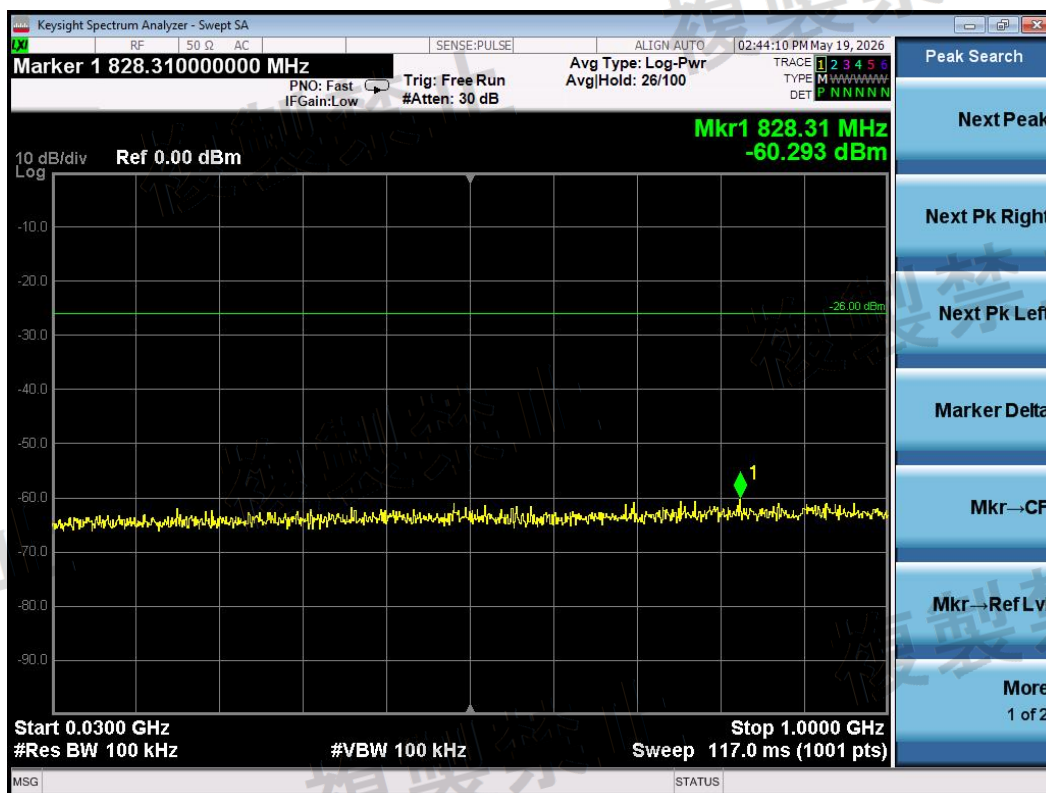
NTNV_BLE_Ant1_2402_2483.5~2496.5



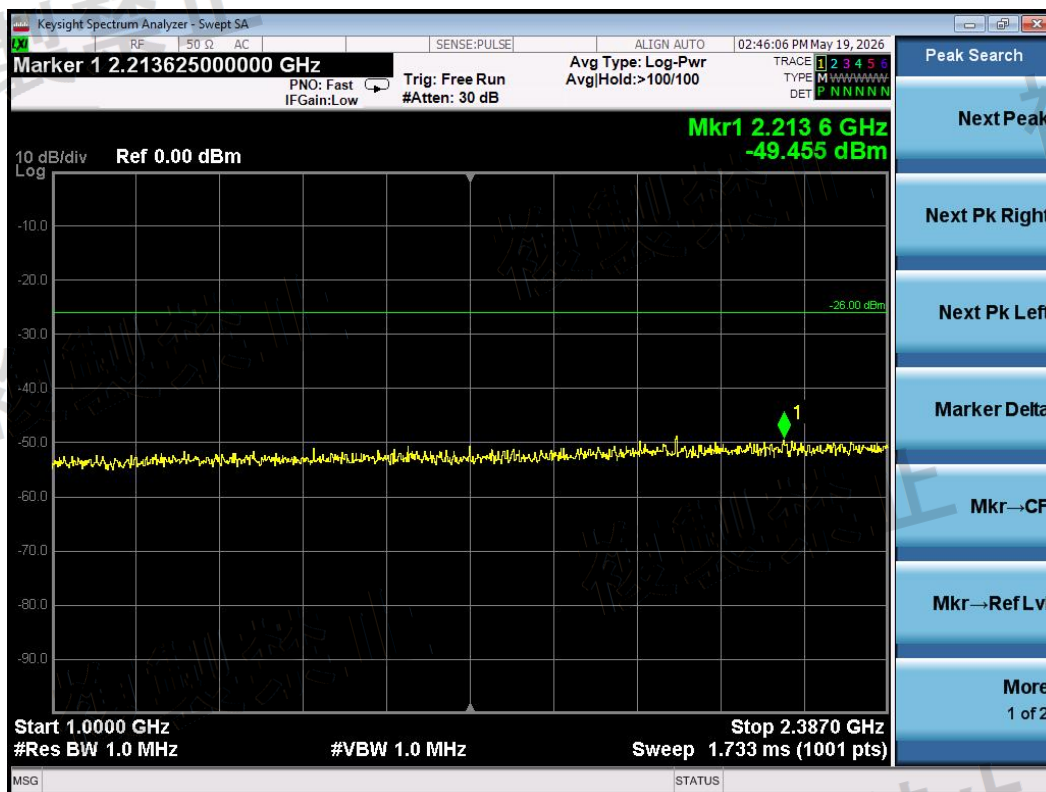
NTNV_BLE_Ant1_2402_2496.5~12750



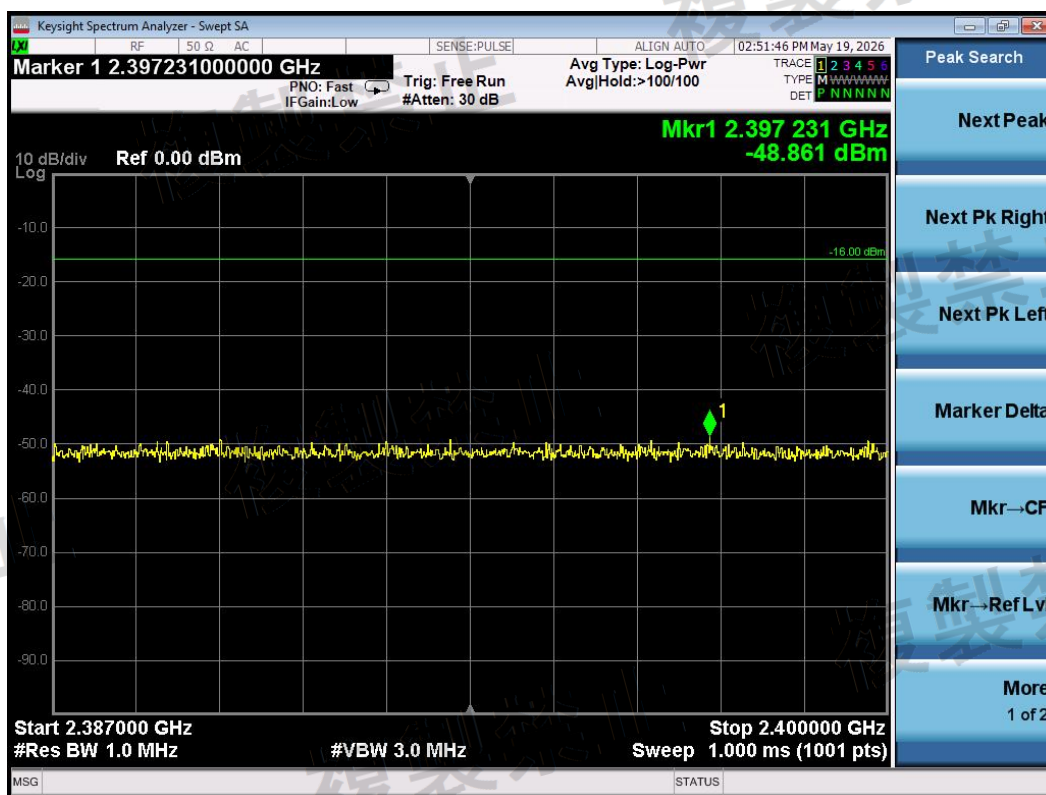
NTNV_BLE_Ant1_2440_30~1000



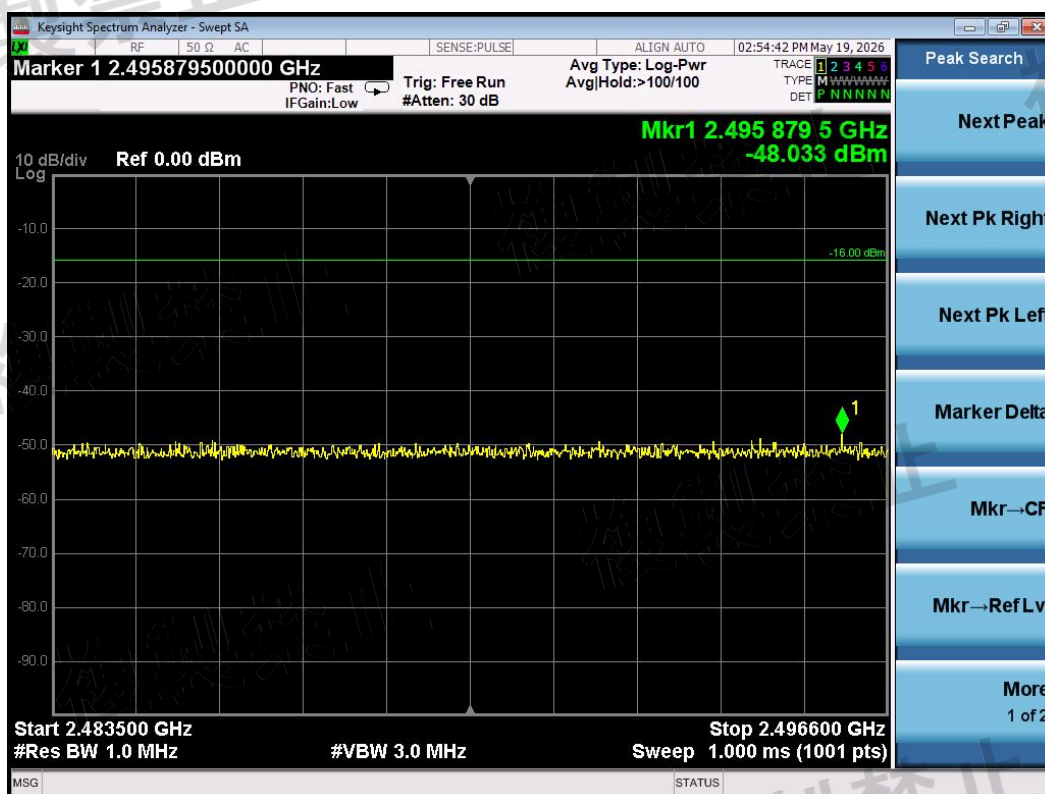
NTNV_BLE_Ant1_2440_1000~2387



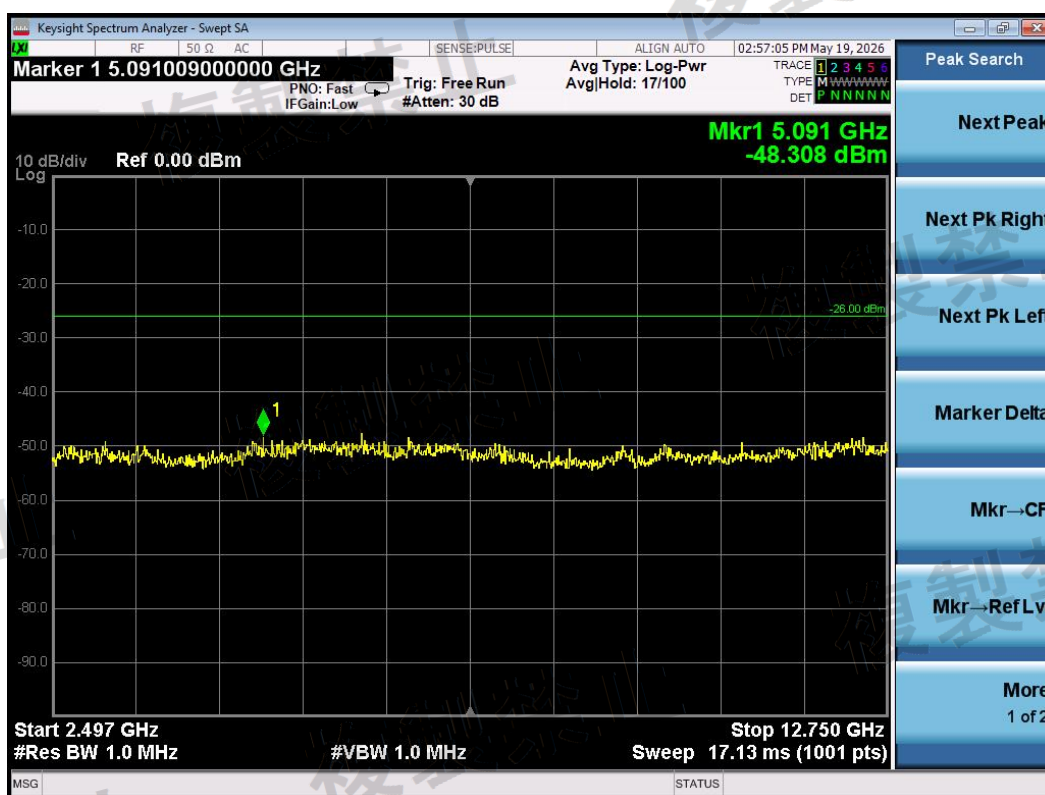
NTNV_BLE_Ant1_2440_2387~2400



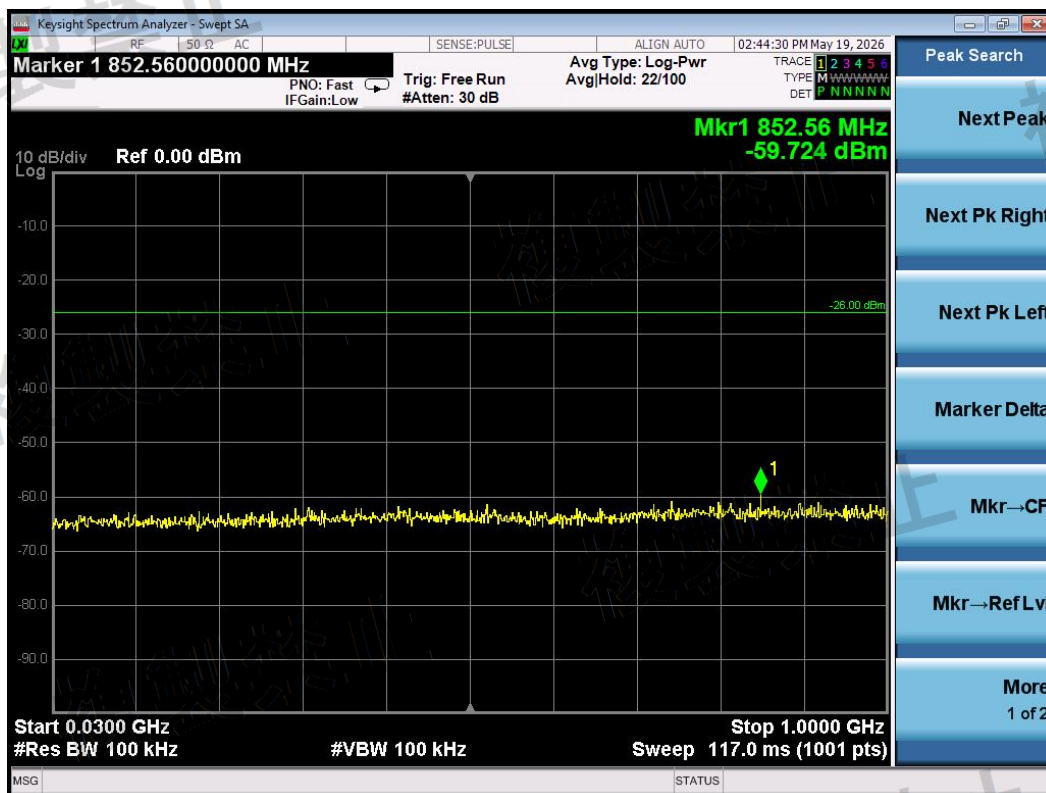
NTNV_BLE_Ant1_2440_2483.5~2496.5



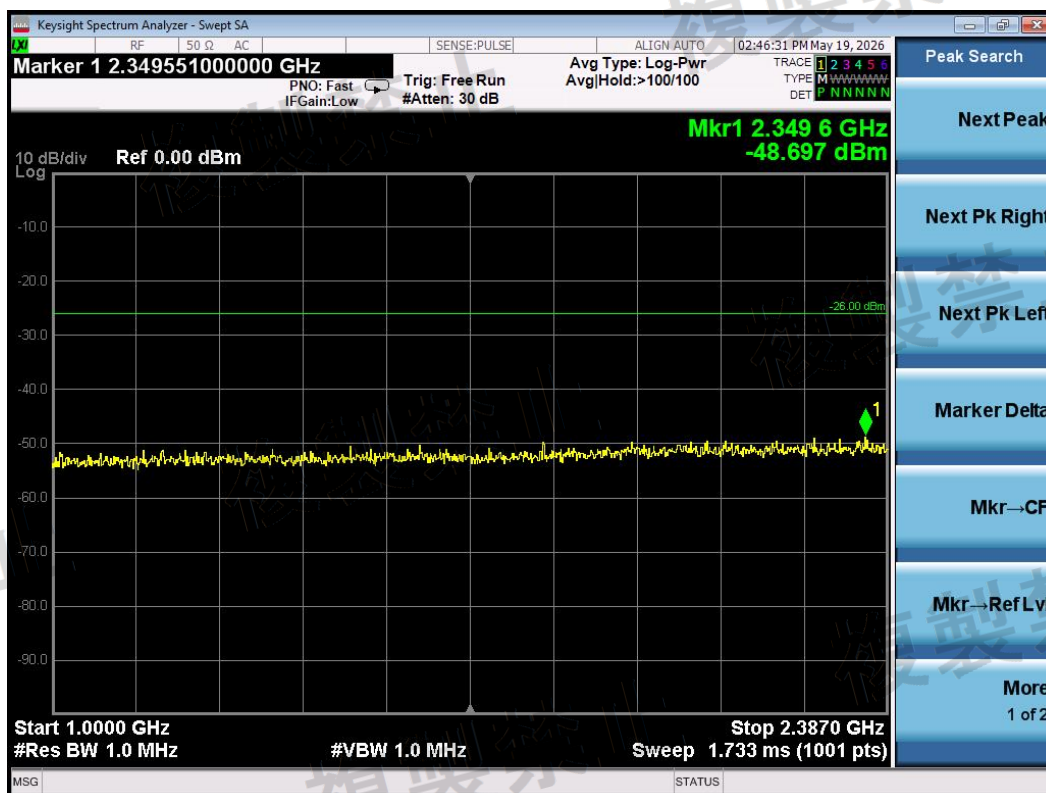
NTNV_BLE_Ant1_2440_2496.5~12750



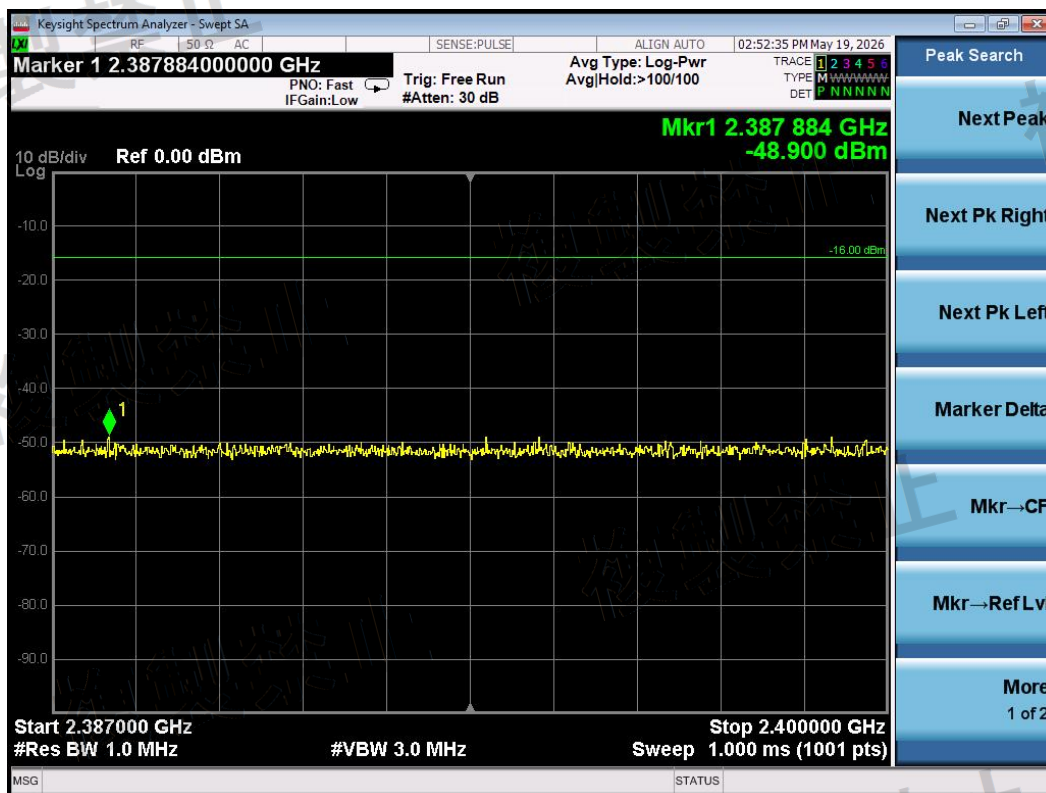
NTNV_BLE_Ant1_2480_30~1000



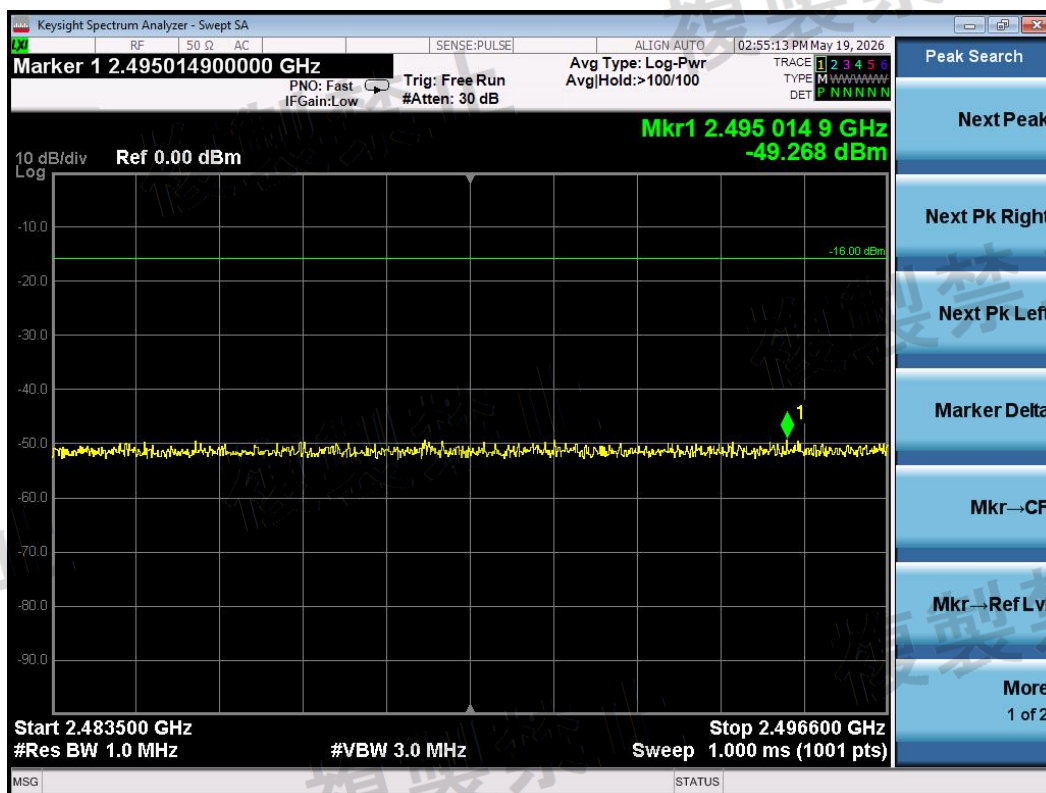
NTNV_BLE_Ant1_2480_1000~2387



NTNV_BLE_Ant1_2480_2387~2400



NTNV_BLE_Ant1_2480_2483.5~2496.5



NTNV_BLE_Ant1_2480_2496.5~12750



9. IMITATION OF COLLATERAL EMISSION OF RECEIVER MEASUREMENT

9.1 LIMIT

Item	Limits
RX Spurious Emission:	$\leq 4\text{nW}$ ($f < 1\text{GHz}$)
	$\leq -54\text{dBm}$ ($f < 1\text{GHz}$)
	$\leq 20\text{nW}$ ($1\text{GHz} \leq f$)
	$\leq -47\text{dBm}$ ($1\text{GHz} \leq f$)

9.2 TEST PROCEDURES

Spectrum Parameter	Setting
Attenuation	Auto
RB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
VB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

- EUT have the continuous reception mode and fixed only one channelize.
- Setting of SA is following as RB / VB: 100 kHz (below 1GHz emissions) / 1 MHz (above 1GHz emissions) / AT: 10dB / Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
- SA set RB: 100kHz and VB: 100kHz. Then adjust to start frequency 30MHz and stop frequency 1000MHz. Search to mark peak reading value + cable loss shall be less than 4nW
- SA set RB: 1MHz and VB: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12500MHz. Search to mark peak reading value + cable loss shall be less than 20nW
- If power level of lower emissions are more than 1/10 of limit (.0.4nW for $f < 1\text{GHz}$, 2nW for $f \geq 1\text{GHz}$), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.

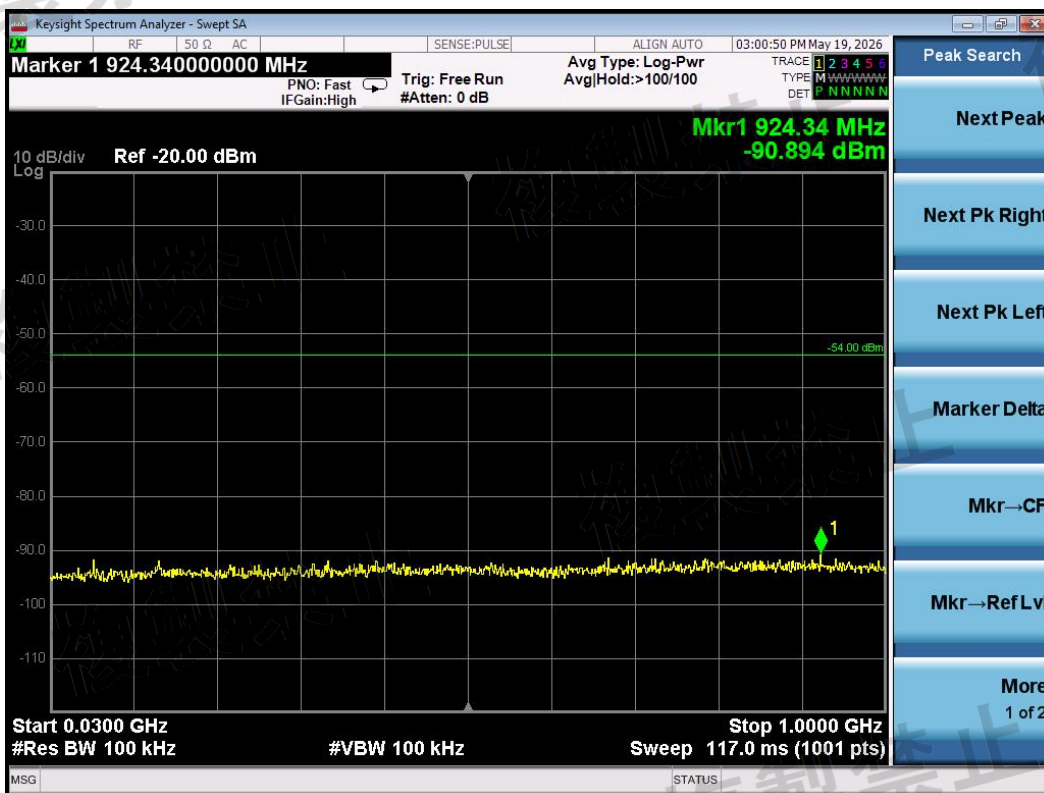
9.3 TEST RESULT

Temperature:	25°C	Humidity:	55 % RH
Pressure	101kPa		

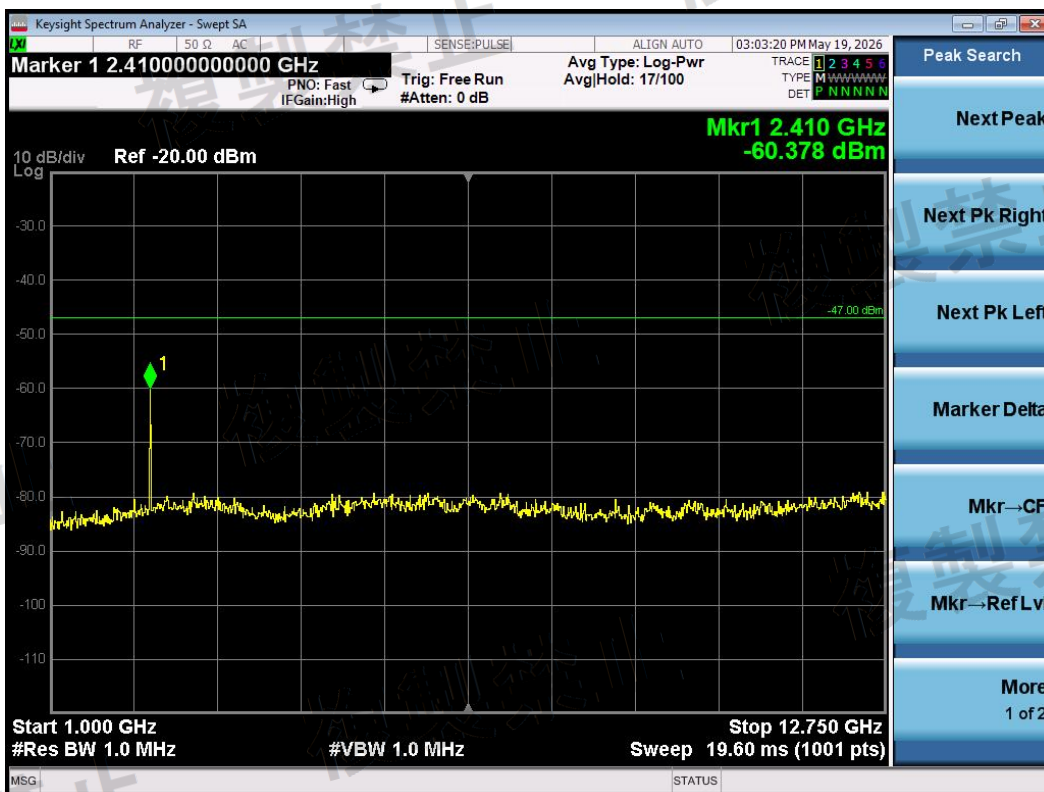
Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	BLE	Ant1	2402	924.34	-90.894	≤-54	< 0.0001	≤4	PASS
				2410	-60.378	≤-47	0.000916643	≤20	PASS
			2440	492.69	-90.474	≤-54	< 0.0001	≤4	PASS
				12456	-78.928	≤-47	< 0.0001	≤20	PASS
			2480	697.36	-91.726	≤-54	< 0.0001	≤4	PASS
				2410	-59.214	≤-47	0.001198395	≤20	PASS

RX Test the worst mode

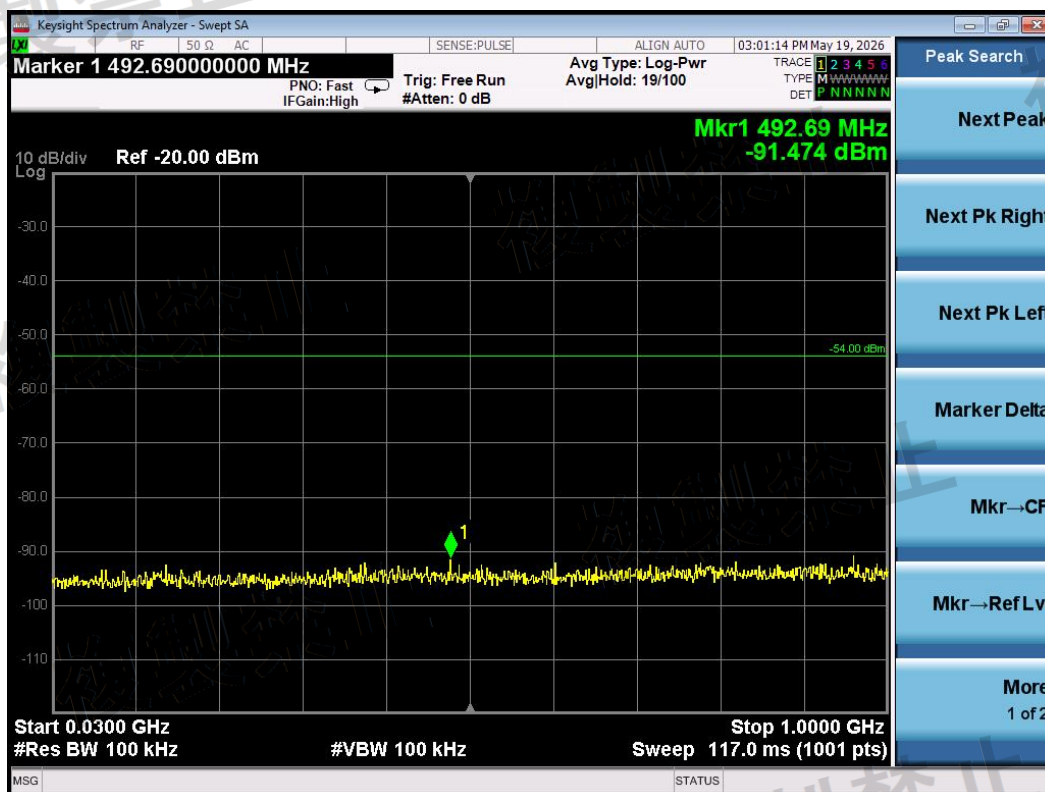
NTNV_BLE_Ant1_2402_30~1000



NTNV_BLE_Ant1_2402_1000~12500



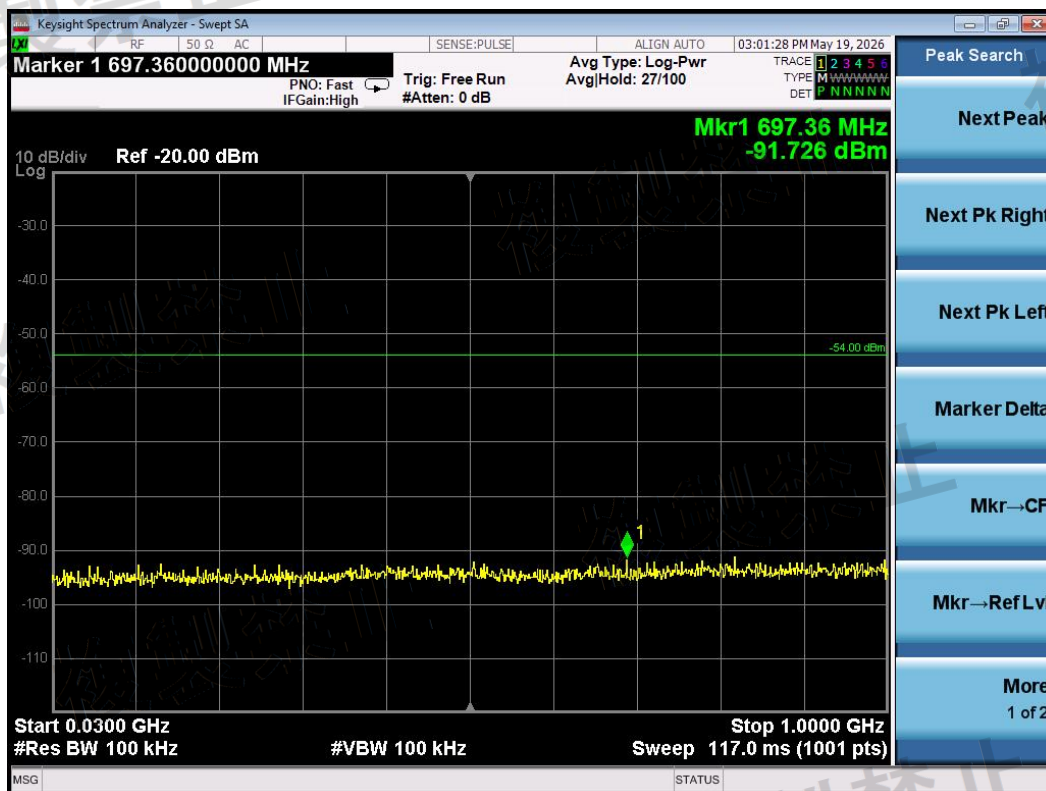
NTNV_BLE_Ant1_2440_30~1000



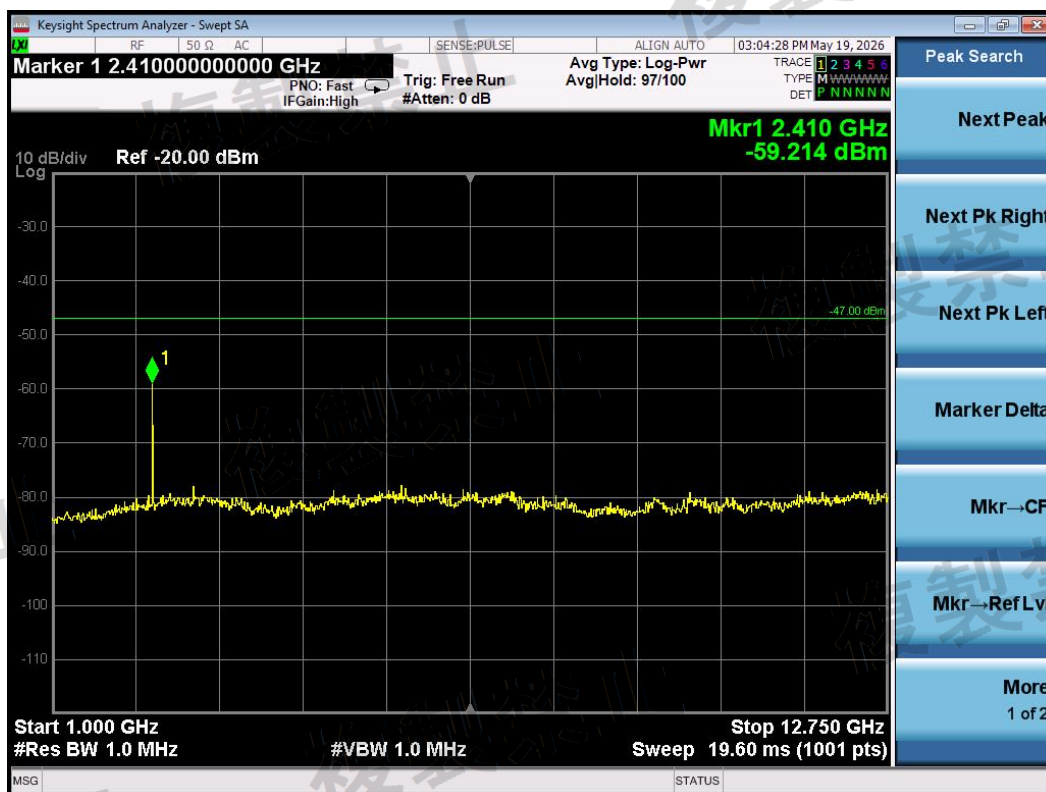
NTNV_BLE_Ant1_2440_1000~12500



NTNV_BLE_Ant1_2480_30~1000



NTNV_BLE_Ant1_2480_1000~12500



10. TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH) MEASUREMENT

10.1 LIMIT

Item	Limits
3dB antenna beam width	$e \leq 360/A$ (The A is 10 in maximum) $A = \{EIRP \text{ Power [mW/MHz]} / \{2.14\text{dBi} + \text{output power (10mW /MHz, 3mW/MHz)}\}\}$ Shall be 1 when A is lower than 1
Note: This test item is not applied for radio equipment with equivalent isotropic radiation power lower than 12.14dBm/MHz, but Antenna Power(Conducted) limit is 10 mW/MHz (10 dBm/MHz), So the test item will not be applied to the transmission antenna which has a gain of 2.14dBi or less	

10.2 TEST PROCEDURES

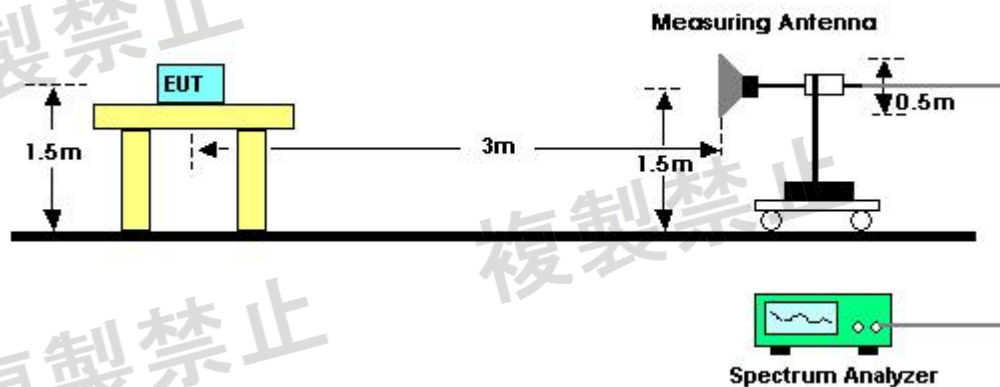
Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	0 MHz
RB	1 MHz
VB	1 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 4.7.2 and tune reference level to observe receiving signal position.
3. Rotate directions of the EUT horizontally and vertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of measuring antenna. "E" is the half-power beam width (angle between two points at which radiated power becomes 1/2)
5. Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below $360/A$ (If $A < 1$; then $A = 1$).

$$A = \{EIRP \text{ Power [mW/MHz]} / \{2.14\text{dBi} + \text{output power (10mW /MHz, 3mW/MHz)}\}\}$$

 Shall be 1 when A is lower than 1

10.3 TEST SETUP



10.4 TEST DEVIATION

There is no deviation with the original standard.

10.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

10.6 TEST RESULT

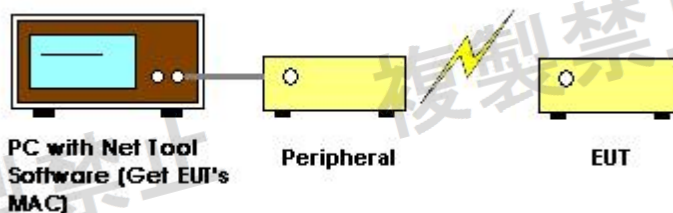
EIRP is less than 12.14dBm, this test item is not applicable.

11. RADIO INTERFERENCE PREVENTION CAPABILITY MEASUREMENT

11.1 TEST PROCEDURES

1. In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes from EUT. b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification code: a. Transmit the predetermined identification codes from the counterpart. b. Check if communication is normal. c. Transmit the signals other than predetermined ID codes from the counterpart. d. Check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

11.2 TEST SETUP



11.3 TEST DEVIATION

There is no deviation with the original standard.

11.4 EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmitting mode.

11.5 TEST RESULT OF RADIO INTERFERENCE PREVENTION CAPABILITY

MAC address of BT device: 33:C1:63:CC:BD:12

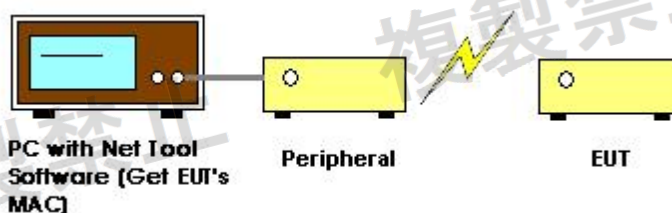
Note: test result comment: Good.

12. CARRIER SENSE CAPABILITY

12.1 TEST PROCEDURES

1. In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes form EUT. b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification ocde: a. Transmit the predetermined identification codes form the counterpart. b . Check if communication is normal. c. Transmit the signals other than predetermined ID codes form the counterpart. d. check if the EUT stops the transmission, or if it displays that idnetification codes are different from the predetermined ones.

12.2 TEST SETUP



12.3 TEST DEVIATION

There is no deviation with the original standard.

12.4 EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmitting mode.

12.5 TEST RESULT OF RADIO INTERFERENCE PREVENTION CAPABILIT

N/A

13. EUT TEST PHOTO

Measurement Photos



*****END OF THE REPORT*****