



JAPAN TEST REPORT

Report No:FCS202503435W01

Issued for

Applicant:	Shenzhen Zongguan Innovation Co., Ltd.
Address:	Room 225, Galaxy Lingchuang World Phase II, Longgang District, Shenzhen
Product Name:	Mowrator S1 21" AWD,Mowrator sS1 21"
Brand Name:	Mowrator
Test Model Name:	ZMLMS214WG1
Series Model:	ZMLMS212WG1
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: 0769-27280901 Fax:769-27280901 http://www.FCS-lab.com	

TEST RESULT CERTIFICATION

Applicant's Name.....: Shenzhen Zongguan Innovation Co., Ltd.
Address.....: Room 225, Galaxy Lingchuang World Phase II, Longgang District, Shenzhen
Manufacture's Name.....: Shenzhen Zongguan Innovation Co., Ltd.
Address.....: Room 225, Galaxy Lingchuang World Phase II, Longgang District, Shenzhen

Test Specification:

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

Product Description

Product Name.....: Mowrator S1 21" AWD, Mowrator sS1 21"
Trade Mark.....: Mowrator
Test Model Name.....: ZMLMS214WG1
Series Model.....: ZMLMS212WG1

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.....: March 19, 2025 ~April 9, 2025

Date of Issue.....: April 9, 2025

Test Result.....: Pass

Tested by



(Scott Shen)

Reviewed by



(Duke Qian)

Approved by



(Jack Wang)



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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	April 9, 2025	FCS202503435W01	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%) Spread-spectrum Bandwidth (90%)	--	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:	+86-0769-27280901
Fax:	+86-769-27280901
Laboray Accreditations:	
FCC Test Firm Registration Number:	514908
CNAS Number:	L15566
Designation number:	CN0127
A2LA accreditation number:	5545.01
ISED Number:	25801
CAB ID:	CN0097

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	$\pm 0.3\text{ dB}$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

Equipment	Mowrator S1 21" AWD,Mowrator sS1 21"	
Band Name	Mowrator	
Model Name	ZMLMS214WG1	
Series Model	ZMLMS212WG1	
Model Difference	The above product with same circuit, PCB layout, electrical parts, materials and wiring structures, the materials of decorative accessories is same, the size is the same, but the color of the product is different	
Product Description	Operation Frequency:	2402.3MHz-2479.7MHz
	Modulation Technology:	☒ FLRC(GMSK)
	Number Of Channel:	☒ 128 CH
	Channel Separation:	600kHz
	Antenna Type	Internal antenna
	Antenna Gain(Peak):	ANT1: 3.99dBi Max, ANT2: 3.67dBi Max
Channel List	Please refer to the Note 2.	
Power supply	51.2V powered by battery	
Battery	51.2V powered by battery	
Hardware version	V1.0.5.0	
Software version	V1.0.9.5	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. Remark: ANT1 and ANT2 cannot transmitting simultaneously.

2. Channel List

2402.3	2402.9	2403.5	2404.1	2404.7	2405.3	2405.9	2406.5	2407.1	2407.7
2408.3	2408.9	2409.5	2410.1	2410.7	2411.3	2411.9	2412.5	2413.1	2413.7
2414.3	2414.9	2415.5	2416.1	2416.7	2417.3	2417.9	2418.5	2419.1	2419.7
2420.3	2420.9	2421.5	2422.1	2422.7	2423.3	2423.9	2424.5	2425.1	2425.7
2426.3	2426.9	2427.5	2428.1	2428.7	2429.3	2429.9	2430.5	2431.1	2431.7
2432.3	2432.9	2433.5	2434.1	2434.7	2435.3	2435.9	2436.5	2437.1	2437.7
2438.3	2438.9	2439.5	2440.1	2440.7	2441.3	2441.9	2442.5	2443.1	2444.9
2445.5	2446.1	2446.7	2447.3	2447.9	2448.5	2449.1	2449.7	2450.3	2450.9
2451.5	2452.1	2452.7	2453.3	2453.9	2454.5	2455.1	2455.7	2456.3	2456.9
2457.5	2458.1	2458.7	2459.3	2459.9	2460.5	2461.1	2461.7	2462.3	2462.9
2463.5	2464.1	2464.7	2465.3	2465.9	2466.5	2467.1	2467.7	2468.3	2468.9
2469.5	2470.1	2470.7	2471.3	2471.9	2472.5	2473.1	2473.7	2474.3	2474.9
2475.5	2476.1	2476.7	2477.3	2477.9	2478.5	2479.1	2479.7		

3. Table for Filed Antenna

Ant.	Antenna Brand	Antenna Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	SZ23363IB77-3	Internal antenna	N/A	3.99dBi	Antenna

Ant.	Antenna Brand	Antenna Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
2	N/A	SZ23363IB77-3	Internal antenna	N/A	3.67dBi	Antenna

2.2 DESCRIPTION OF THE TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible 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(CH01)
Mode 2	TX Mode(CH59)
Mode 3	TX Mode(CH128)

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%)
		51.2V	56.32V	46.08V
Module Vdd Power		Normal	Hight	Low
Measurement Value (Vdc)		3.3V	3.3V	3.3V
Voltage error (%)	Result	Ref. level	0	0
	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	E495	N/A	Test use

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	2024.08.28	2025.08.27
Signal Analyzer	R&S	FSV40-N	FCS-E012	2024.08.28	2025.08.27
Active loop Antenna	ZHINAN	ZN30900C	FCS-E013	2024.08.28	2025.08.27
Bilog Antenna	SCHWARZBECK	VULB 9168	FCS-E002	2024.08.28	2025.08.27
Horn Antenna	SCHWARZBECK	BBHA 9120D	FCS-E003	2024.08.28	2025.08.27
SHF-EHF Horn Antenna (18G-40GHz)	A-INFO	LB-180400-KF	FCS-E018	2024.08.28	2025.08.27
Pre-Amplifier(0.1M-3G Hz)	EMCI	EM330N	FCS-E004	2024.08.28	2025.08.27
Pre-Amplifier (1G-18GHz)	N/A	TSAMP-0518SE	FCS-E014	2024.08.28	2025.08.27
Pre-Amplifier (18G-40GHz)	TERA-MW	TRLA-0400	FCS-E019	2024.08.28	2025.08.27
Temperature & Humidity	HTC-1	victor	FCS-E005	2024.08.28	2025.08.27

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESPI	FCS-E020	2024.08.28	2025.08.27
LISN	R&S	ENV216	FCS-E007	2024.08.28	2025.08.27
LISN	ETS	3810/2NM	FCS-E009	2024.08.28	2025.08.27
Temperature & Humidity	HTC-1	victor	FCS-E008	2024.08.28	2025.08.27

RF Connected Test

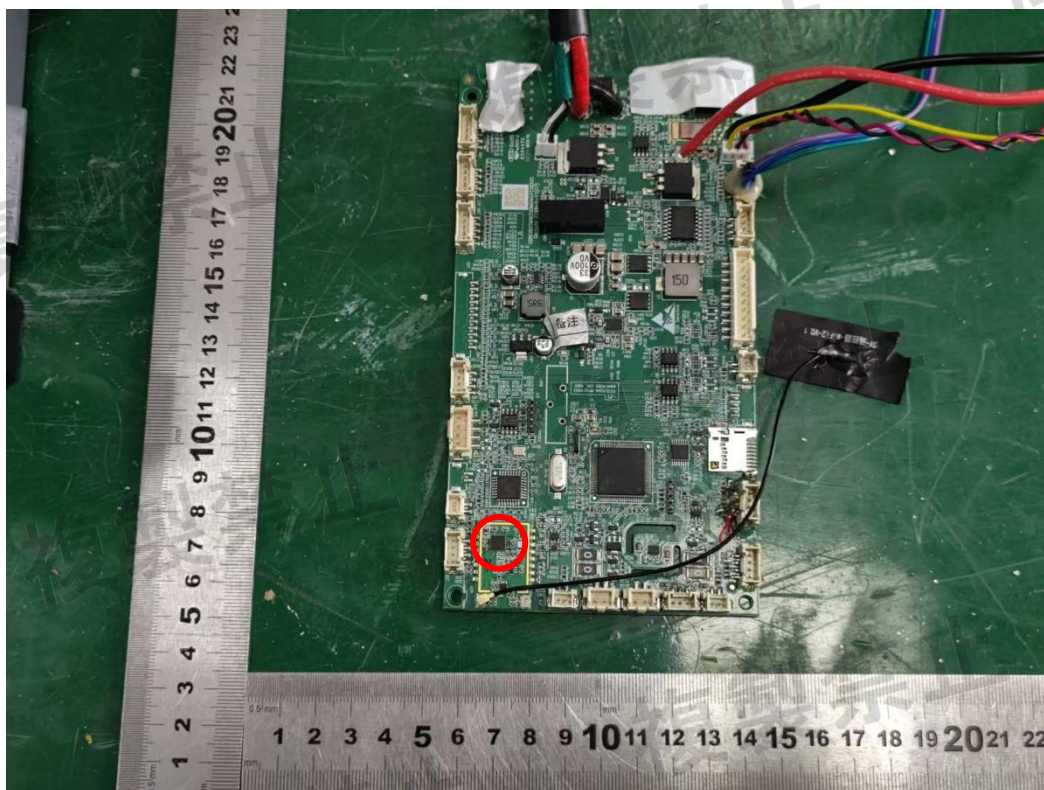
Kind of Equipment	Manufacturer	Type No.	Company No.	Last calibration	Calibrated until
MXA SIGNAL Analyzer	Keysight	N9020A	FCS-E015	2024.08.28	2025.08.27
Spectrum Analyzer	Agilent	E4447A	MY50180039	2024.08.28	2025.08.27
Spectrum Analyzer	R&S	FSV-40	101499	2024.08.28	2025.08.27
Power meter	Anritsu	ML2495A	FCS-W021	2024.08.28	2025.08.27

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

Our products apply for Japanese Radio frequency (rf) certification, The chip has 24 chip pins and a pin distance of 1.1 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

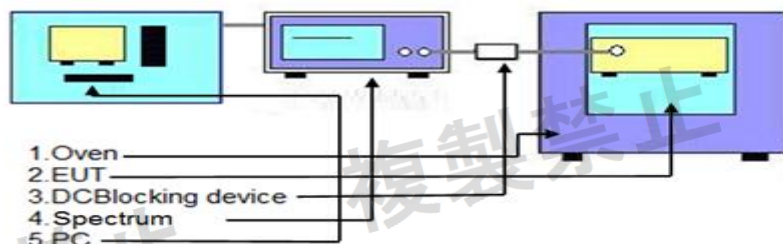
The following table is the setting of Spectrum Analyzer.

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.

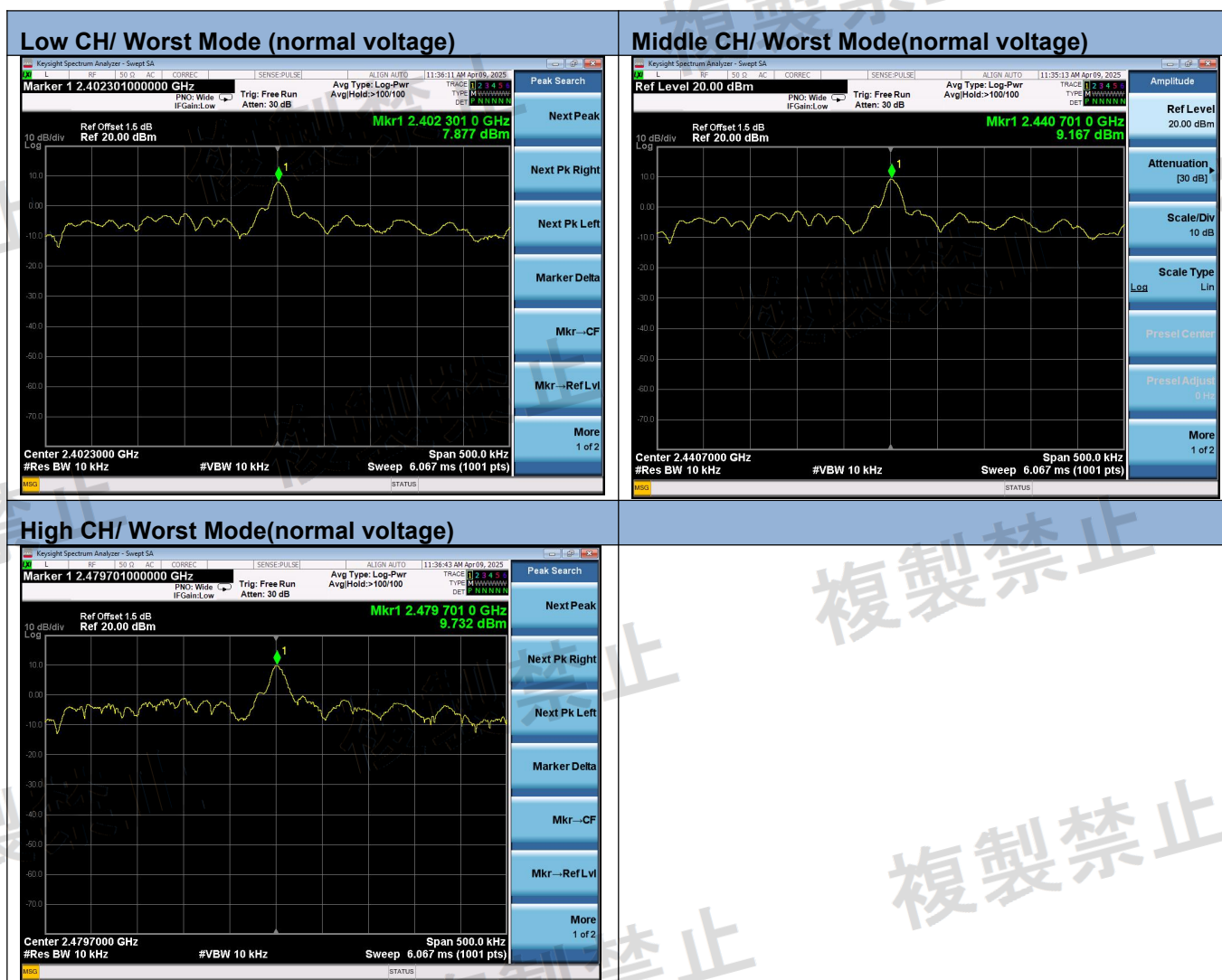
4.3 TEST SETUP



4.4 TEST RESULT

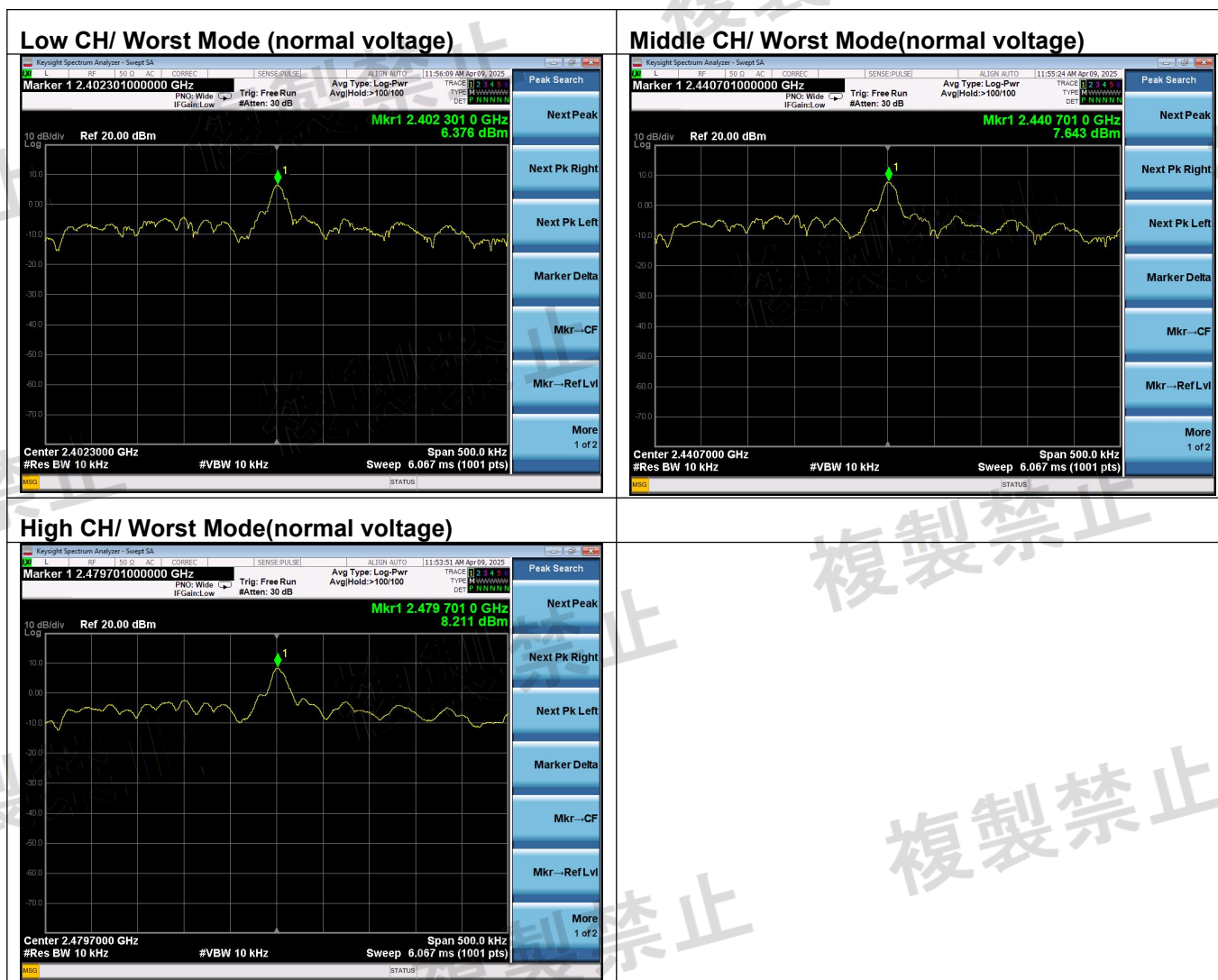
Temperature:	25°C	Humidity:	55 % RH
Pressure	101kPa	ANT1	3.99dBi

Test Conditions		Channel	F _c	Tolerance	Limit
		MHz	MHz	ppm	(ppm)
V nom (V)	DC 51.2V	2402.3	2402.3010	4.162	±50
		2440.7	2440.7010	4.097	±50
		2479.7	2479.7010	4.032	±50



Temperature:	25°C	Humidity:	55 % RH
Pressure	101kPa	ANT2	3.67dBi

Test Conditions		Channel	F _c	Tolerance	Limit
		MHz	MHz	ppm	(ppm)
V nom (V)	DC 51.2V	2402.3	2402.3010	4.162	±50
		2440.7	2440.7010	4.097	±50
		2479.7	2479.7010	4.032	±50



5. ANTENNA POWER

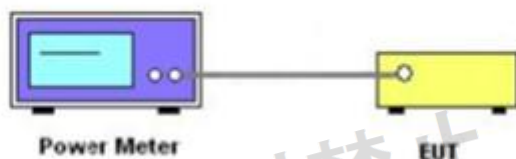
5.1 LIMIT

Item	Limits
Antenna Power Density	$\leq 3\text{mW/MHz}$ (FH form 2400 – 2483.5 MHz) $\leq 10\text{mW/MHz}$ (OFDM,DS from2400~2483.5MHz,802.11b/g/n HT20) $\leq 5\text{mW/MHz}$ (OFDM,DS from2400~2483.5MHz,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
Operation Mode:	Nor Voltage	ATM Pressure:	1011mbar
ANT 1	3.99dBi		

TEST CONDITIONS	Channel	Average Burst Power (dBm)	Average Burst Power (mW)	declared Antenna Power (mW)	Tolerance (%)
Nom (V) DC 51.2V	Low	7.52	5.649	9.00	-21.00
	Middle	7.55	5.688	9.00	-20.43
	High	7.22	5.272	9.00	-26.25
Limit : (1) Antenna Power Density Limit (10mW) (2) Tolerance +20%(Base on manufacturer declare Antenna Power Density)					

Temperature:	25°C	Humidity:	55 % RH
Operation Mode:	Nor Voltage	ATM Pressure:	1011mbar
ANT 2	3.67dBi		

TEST CONDITIONS	Channel	Average Burst Power (dBm)	Average Burst Power (mW)	declared Antenna Power (mW)	Tolerance (%)
Nom (V) DC 51.2V	Low	7.83	6.067	9.00	-32.59
	Middle	7.89	6.151	9.00	-31.65
	High	8.37	6.870	9.00	-23.66
Limit : (1) Antenna Power Density Limit (10mW) (2) Tolerance +20%(Base on manufacturer declare Antenna Power Density)					

6. EIRP POWER

Temperature:	25°C	Humidity:	55 % RH
Operation Mode:	Nor Voltage	ATM Pressure:	1011mbar
ANT 1	3.99dBi		

Test Mode	Result (mW)	(dBm)	Antenna Gain (dBi)	EIRP (dBm)	Verdict
Low	5.649	7.52	3.99	11.51	Pass
Middle	5.688	7.55	3.99	11.54	Pass
High	5.272	7.22	3.99	11.21	Pass

Temperature:	25°C	Humidity:	55 % RH
Operation Mode:	Nor Voltage	ATM Pressure:	1011mbar
ANT 2	3.67dBi		

Test Mode	Result (mW)	(dBm)	Antenna Gain (dBi)	EIRP (dBm)	Verdict
Low	6.067	7.83	3.67	11.50	Pass
Middle	6.151	7.89	3.67	11.56	Pass
High	6.870	8.37	3.67	12.04	Pass

Note: EIRP=Antenna power+antenna gain.

7. OCCUPIED BANDWITH (99%)&SPREAD BANDWITH (90%)

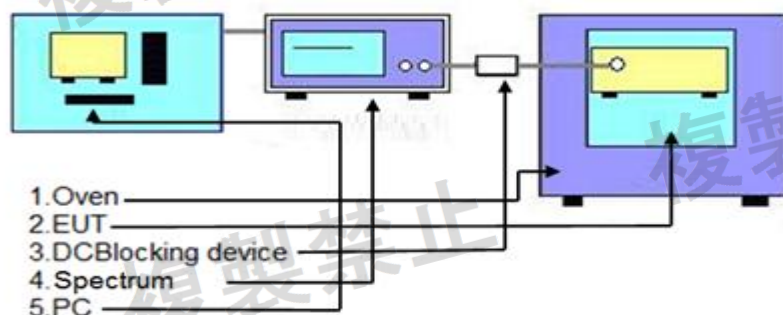
7.1 LIMIT

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:100KHz / 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.

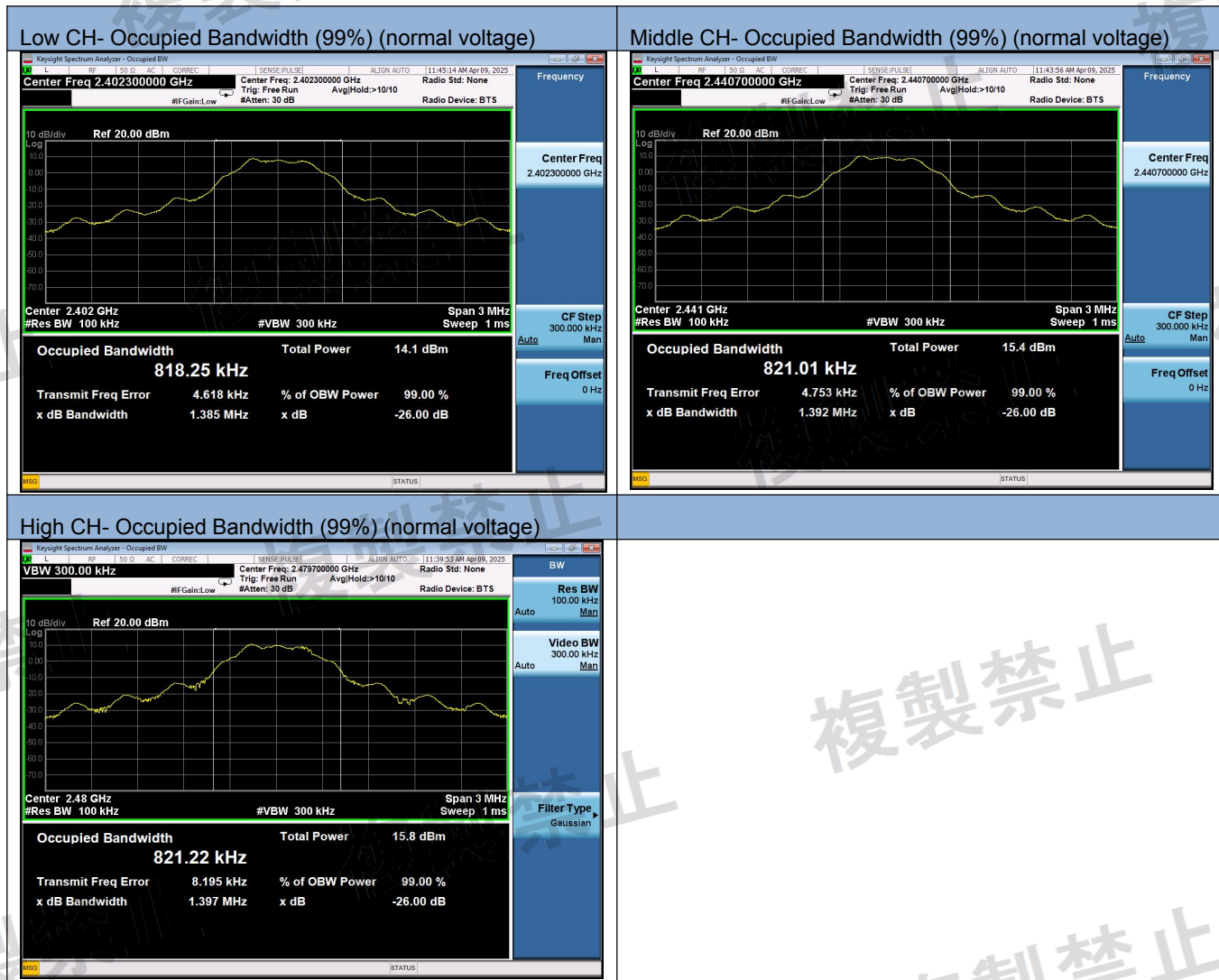
7.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

7.6 TEST RESULT

Temperature:	25°C	Humidity:	55 % RH
Pressure	101kPa	ANT 1	3.99dBi

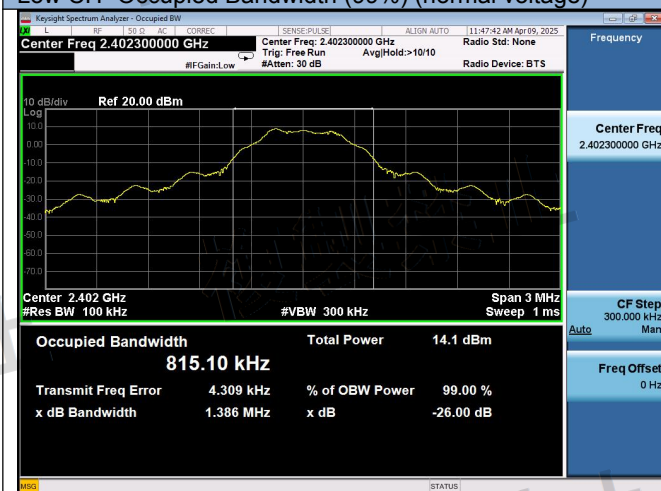
Voltage	Channel (MHz)	OCCUPIED BANDWIDTH (99%)MHz
Nor Voltage DC 51.2V	2402.3	0.81825
	2440.7	0.82101
	2479.7	0.82122



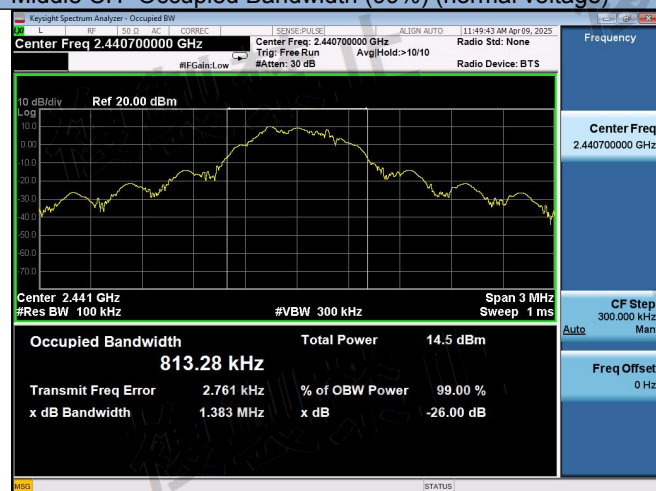
Temperature:	25°C	Humidity:	55 % RH
Pressure	101kPa	ANT 2	3.67dBi

Voltage	Channel (MHz)	OCCUPIED BANDWIDTH (99%)MHz
Nor Voltage DC 51.2V	2402.3	0.81510
	2440.7	0.81328
	2479.7	0.82042

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

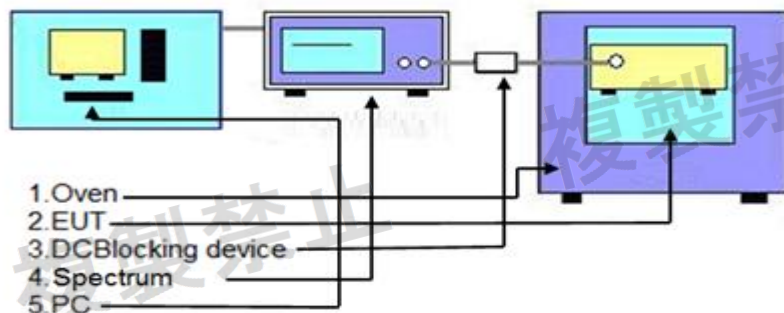
Item	Limits
TX Spurious Emission	$\leq -26\text{dBm}$ ($30\text{MHz} \leq f \leq 1000\text{MHz}$) $\leq 2.5 \mu\text{W}$ ($30\text{MHz} \leq f \leq 1000\text{MHz}$)
	$\leq -26\text{dBm}$ ($1000\text{MHz} < f \leq 2387\text{MHz}$) $\leq 2.5 \mu\text{W}$ ($1000\text{MHz} < f \leq 2387\text{MHz}$)
	$\leq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

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 2.5μW.
- Setting of SA is following as 1000MHz and stop frequency 2387MHz Then to mark peak reading value + cable loss shall be less than 2.5μW.
- SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25μW.
- SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz Then to mark peak reading value + cable loss shall be less than 25μW
- SA adjusted to start frequency 2496.5MHz and stop frequency 12750MHz Then to mark peak reading value + cable loss shall be less than 2.5μW
- 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	ANT 1	3.99dBi

Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm/MHz]	Result [μW]	Limit [μW]	Verdict
NTNV	FLRC (GMSK)	Ant1	2402.3	30~1000	-63.16	≤-26	0.00048	≤2.5	PASS
				1000~2387	-50.858	≤-26	0.00820	≤2.5	PASS
				2387~2400	-29.481	≤-16	1.12693	≤25	PASS
				2483.5~2496.5	-56.867	≤-16	0.00205	≤25	PASS
				2496.5~13000	-47.930	≤-26	0.01610	≤2.5	PASS
			2440.7	30~1000	-63.099	≤-26	0.00048	≤2.5	PASS
				1000~2387	-50.840	≤-26	0.00824	≤2.5	PASS
				2387~2400	-56.016	≤-16	0.00250	≤25	PASS
				2483.5~2496.5	-53.739	≤-16	0.00422	≤25	PASS
				2496.5~13000	-37.811	≤-26	0.16553	≤2.5	PASS
			2479.7	30~1000	-63.082	≤-26	0.00049	≤2.5	PASS
				1000~2387	-50.428	≤-26	0.00906	≤2.5	PASS
				2387~2400	-55.954	≤-16	0.00253	≤25	PASS
				2483.5~2496.5	-36.056	≤-16	0.24797	≤25	PASS
				2496.5~13000	-38.324	≤-26	0.14709	≤2.5	PASS

Temperature:	25°C	Humidity:	55 % RH
Pressure	101kPa	ANT 2	3.67dBi

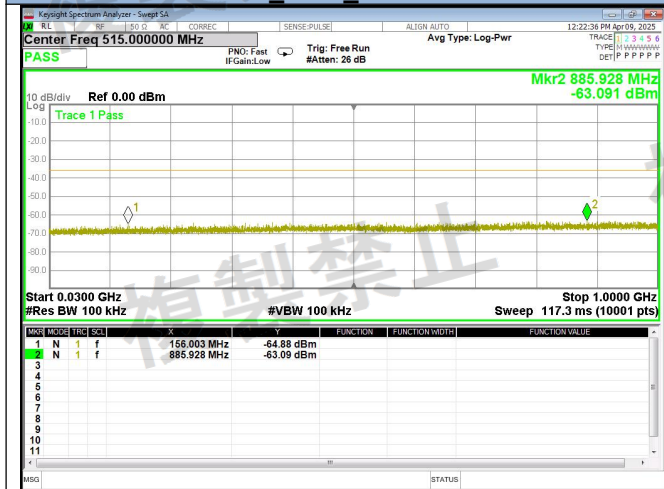
Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm/MHz]	Result [μW]	Limit [μW]	Verdict
NTNV	FLRC (GMSK)	Ant2	2402.3	30~1000	-63.091	≤-26	0.00049	≤2.5	PASS
				1000~2387	-49.746	≤-26	0.01060	≤2.5	PASS
				2387~2400	-30.555	≤-16	0.88003	≤25	PASS
				2483.5~2496.5	-57.276	≤-16	0.00187	≤25	PASS
				2496.5~13000	-39.919	≤-26	0.10188	≤2.5	PASS
			2440.7	30~1000	-62.750	≤-26	0.00053	≤2.5	PASS
				1000~2387	-50.597	≤-26	0.00871	≤2.5	PASS
				2387~2400	-56.190	≤-16	0.00240	≤25	PASS
				2483.5~2496.5	-55.826	≤-16	0.00261	≤25	PASS
				2496.5~13000	-38.278	≤-26	0.14866	≤2.5	PASS
			2479.7	30~1000	-62.961	≤-26	0.00050	≤2.5	PASS
				1000~2387	-50.163	≤-26	0.00963	≤2.5	PASS
				2387~2400	-57.939	≤-16	0.00160	≤25	PASS
				2483.5~2496.5	-36.576	≤-16	0.21998	≤25	PASS
				2496.5~13000	-38.586	≤-26	0.00049	≤2.5	PASS



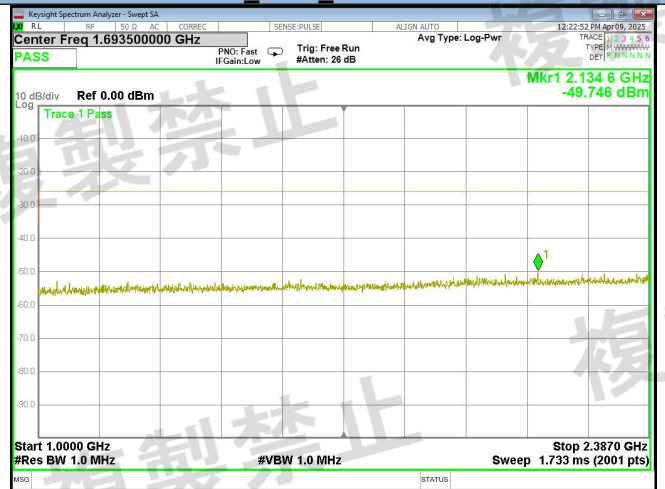




Low CH_Ant2_30~1000MHz



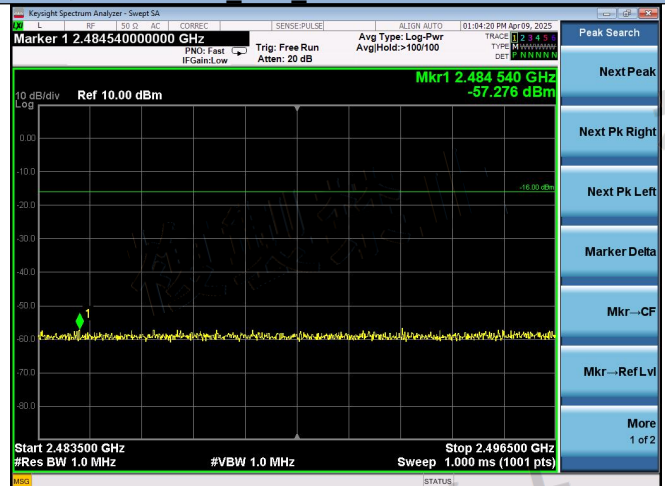
Low CH_Ant2_1000~2387MHz



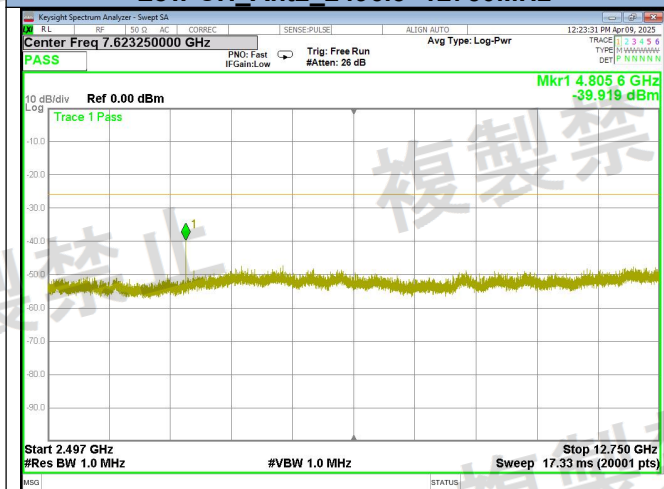
Low CH_Ant2_2387~2400MHz



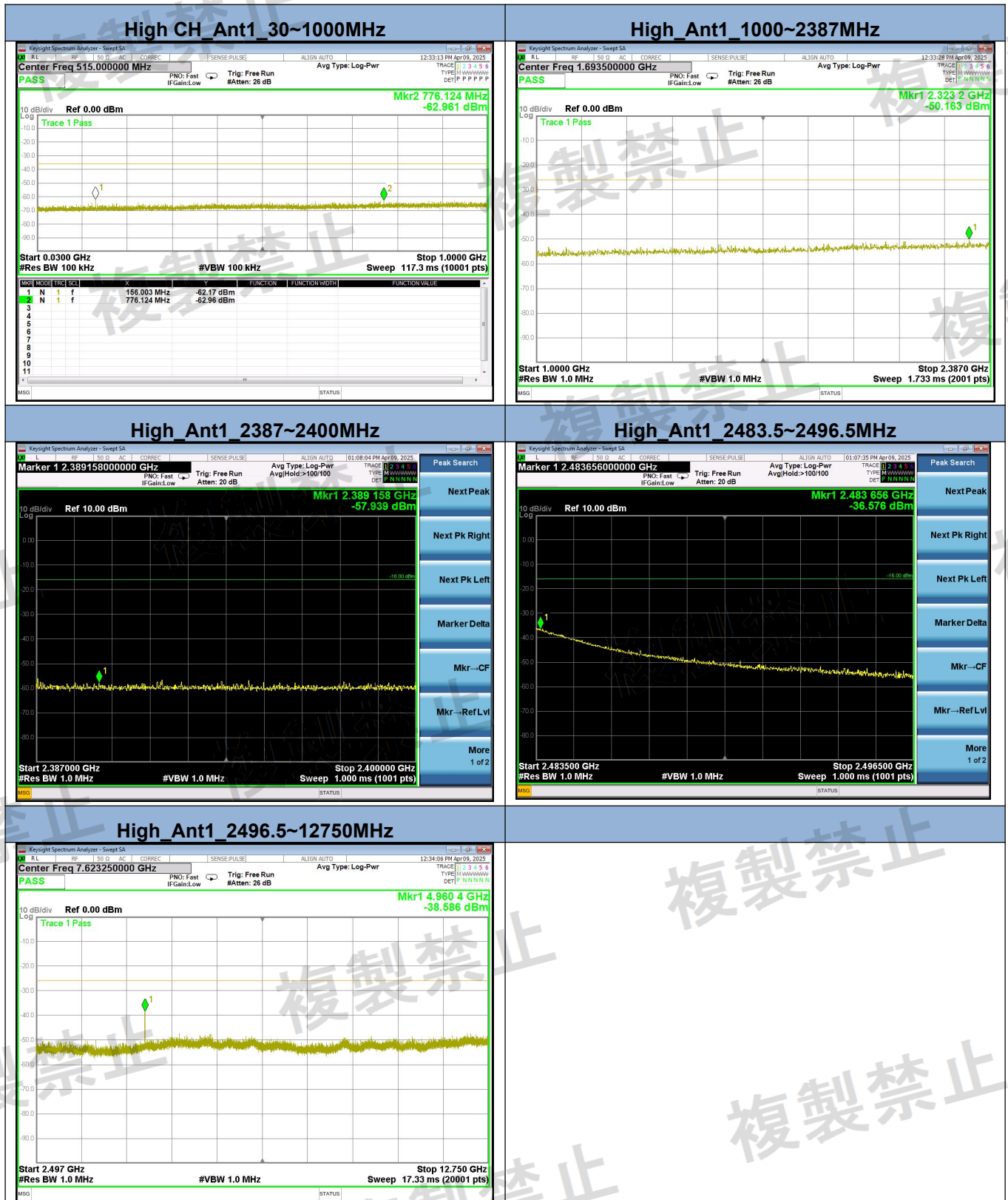
Low CH_Ant2_2483.5~2496.5MHz



Low CH_Ant2_2496.5~12750MHz







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

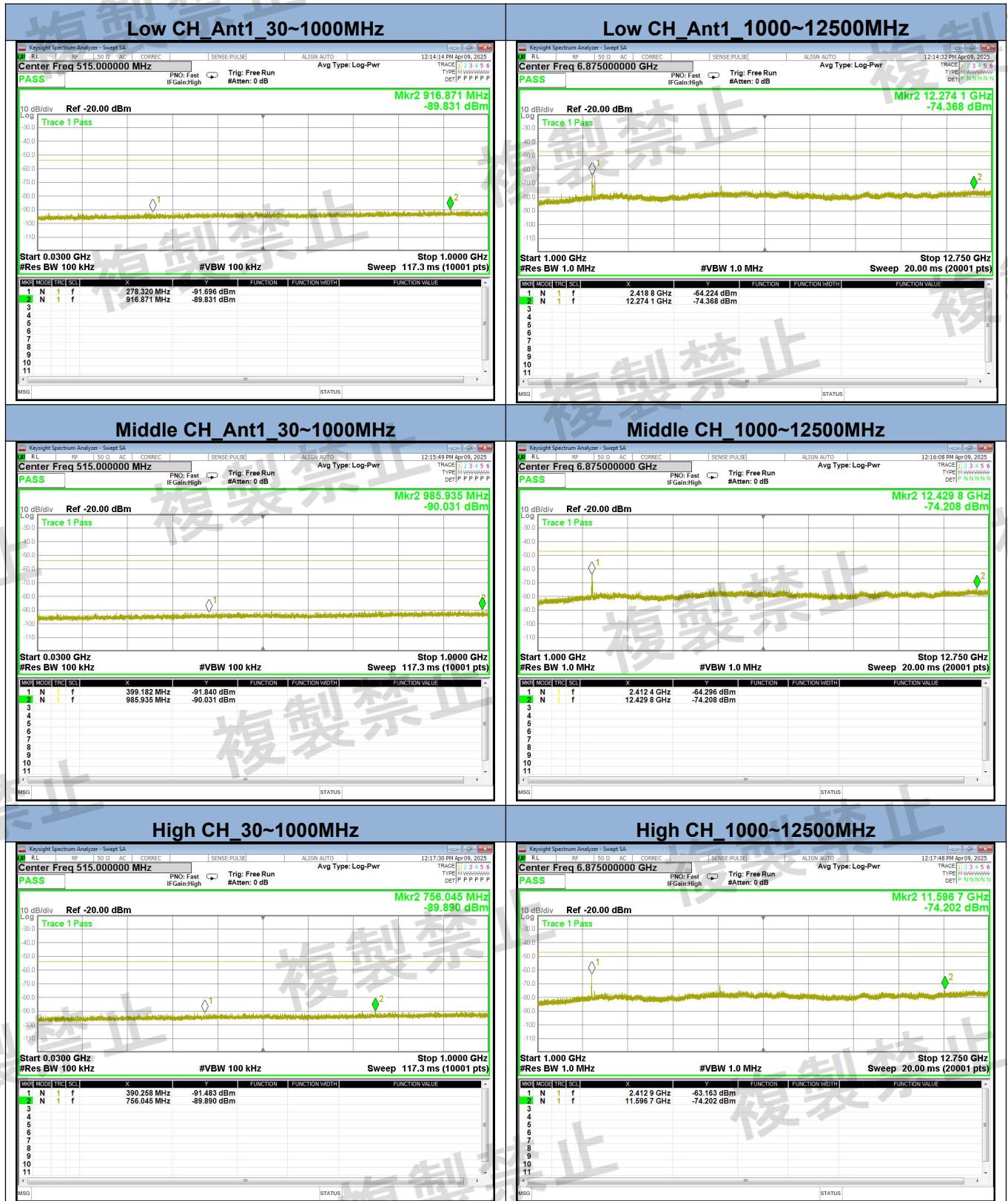
Temperature:	25°C	Humidity:	55 % RH
Pressure	101kPa	ANT 1	3.99dBi

Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	FLRC (GMSK)	Ant1	2402.3	30~1000	-89.831	≤-54	000000.1	≤4	PASS
				1000~12500	-64.224	≤-47	0.00037	≤20	PASS
			2440.7	30~1000	-90.031	≤-54	000000.1	≤4	PASS
				1000~12500	-64.296	≤-47	0.00037	≤20	PASS
			2479.7	30~1000	-89.890	≤-54	000000.1	≤4	PASS
				1000~12500	-63.163	≤-47	0.00048	≤20	PASS

Temperature:	25°C	Humidity:	55 % RH
Pressure	101kPa	ANT 2	3.67dBi

Test Condition	Test Mode	Antenna	Freq. [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	FLRC (GMSK)	Ant2	2402.3	30~1000	-90.23	≤-54	000000.1	≤4	PASS
				1000~12500	-66.279	≤-47	0.000235	≤20	PASS
			2440.7	30~1000	-89.858	≤-54	000000.1	≤4	PASS
				1000~12500	-64.448	≤-47	0.00035	≤20	PASS
			2479.7	30~1000	-89.991	≤-54	000000.2	≤4	PASS
				1000~12500	-66.211	≤-47	0.000239	≤20	PASS

RX Test the worst mode



RX Test the worst mode



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

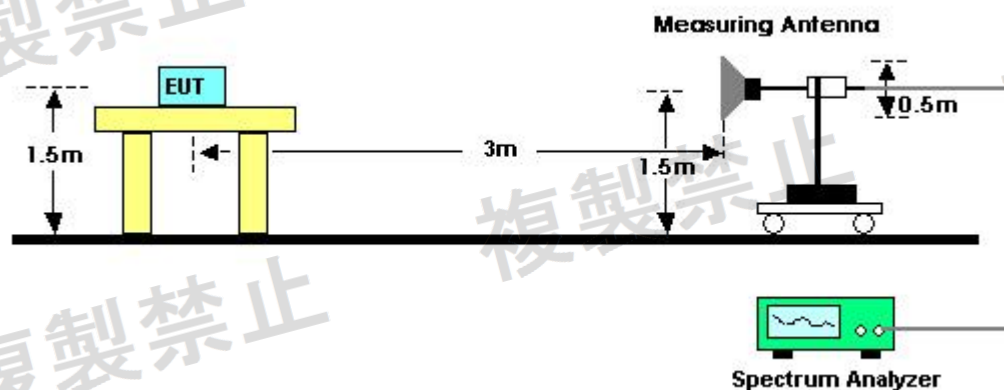
Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	0 MHz
RB	1 MHz
VB	1 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

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 $A = 1$).

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

 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

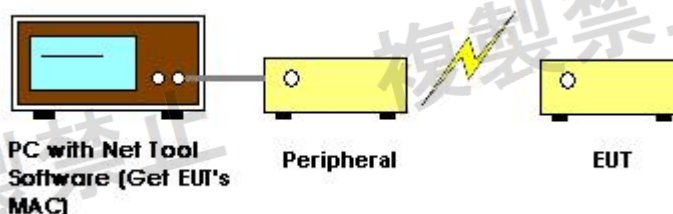
EIRP is less than 12.14dBm, Not applicable for this test item.

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 this device: 27:D6:45:R6: RC: 45

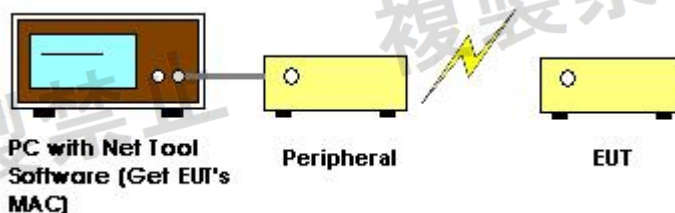
Note: test result comment: Good.

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 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.

12.2 TEST SETUP



12.3 TEST DEVIATION

There is no deviation with the original standard.

12.4 EUT OPERATION DURING TEST

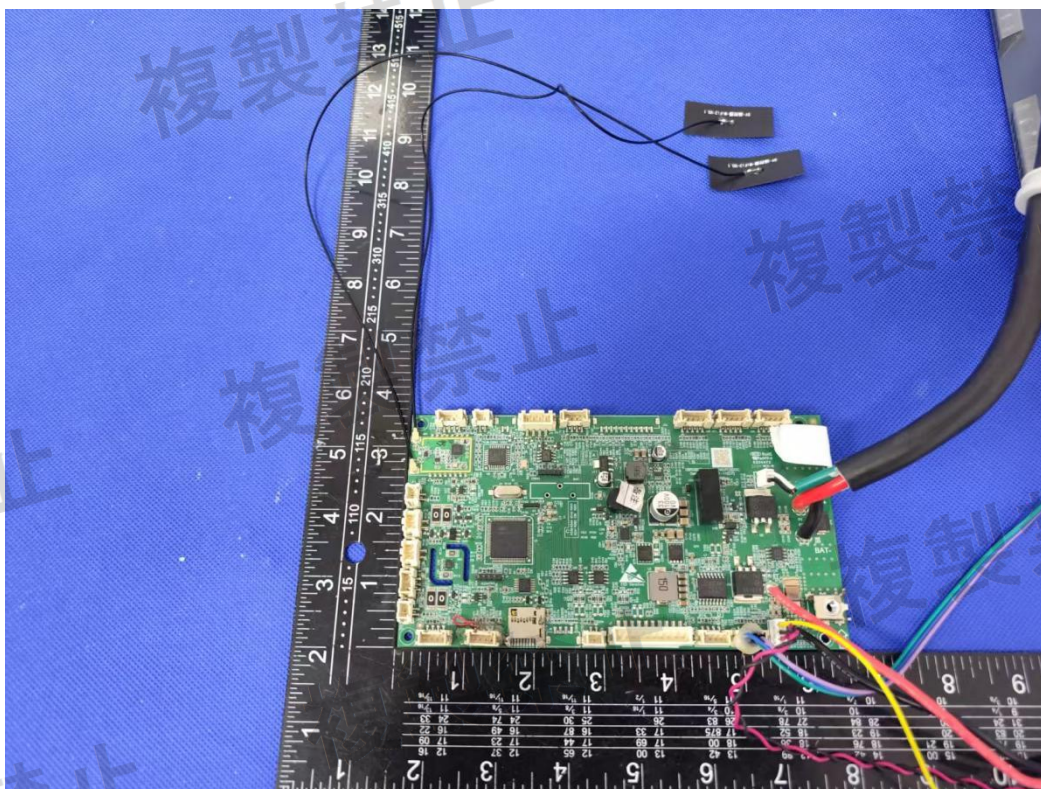
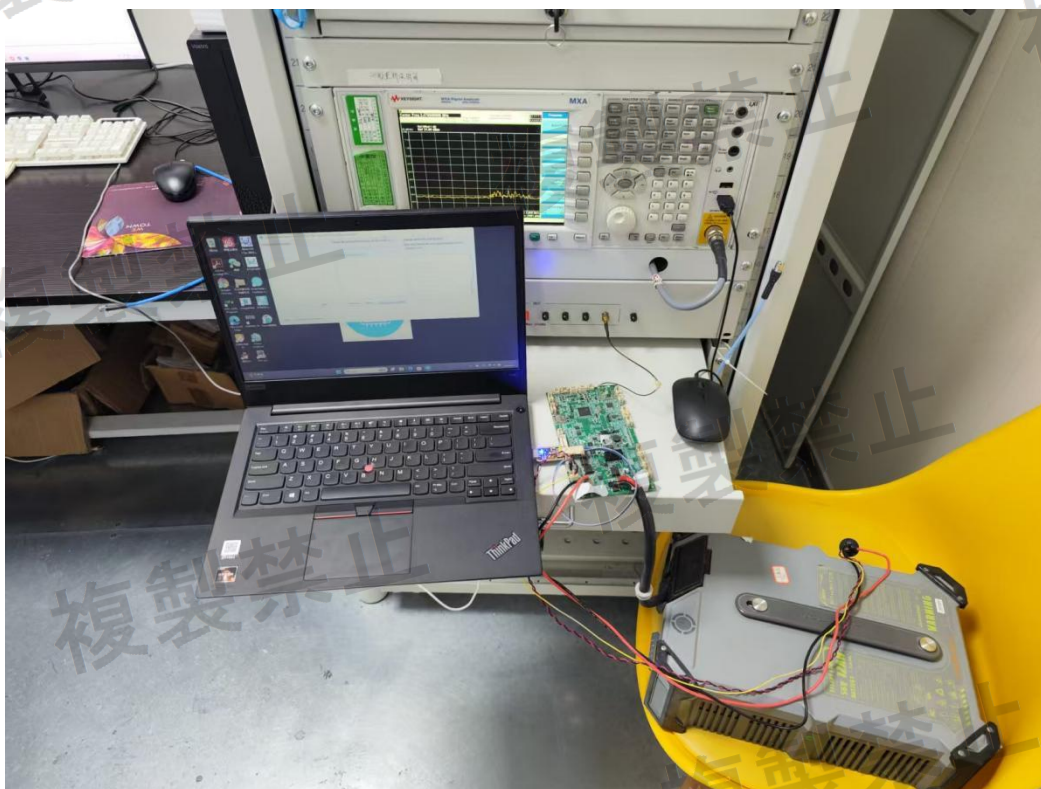
The EUT was programmed to be in normal transmitting mode.

12.5 TEST RESULT OF RADIO INTERFERENCE PREVENTION CAPABILITY

N/A

13. EUT TEST PHOTO

Measurement Photos



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