

JAPAN SPECIFIED RADIO EQUIPMENT

TEST REPORT

For

Outdoor Wi-Fi Gateway

Trade Name: Verkada

Model: GW31-E-HW

Issued to

Verkada Inc

406 E 3rd Ave, San Mateo, CA 94401 United States

Issued by

Compliance Certification Services Inc.

Wugu Laboratory

No.11, Wugong 6th Rd., Wugu Dist.,

New Taipei City, Taiwan

Issued Date: August 13, 2025

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	August 13, 2025	Initial Issue	ALL	Peggy Tsai

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1. TEST RESULT CERTIFICATION

Applicant: Verkada Inc
406 E 3rd Ave, San Mateo, CA 94401 United States

Manufacturer: Verkada Inc
406 E 3rd Ave, San Mateo, CA 94401 United States

Equipment Under Test: Outdoor Wi-Fi Gateway

Trade Name: Verkada

Model Number: GW31-E-HW

Detailed EUT Description: See Item 3 of this report

EUT Receive Date: January 2, 2025

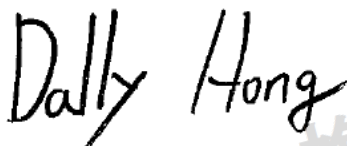
Date of Test: June 17 ~ 18, 2025

APPLICABLE STANDARDS	
CLASSIFICATION	TEST RESULT
ARIB STD T-66 Ver.3.7	Compliance
Statements of Conformity	
Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.	

The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in ARIB STD T-66 Ver.3.7. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Measurement was conducted by the following test method: the test method of Ordinance Concerning Technical Regulations Conformity Certification etc. of Specified Radio Equipment in Annex 1, the Ministry of Internal Affairs and Communication notification in Annex 43 of Article 88, the Paragraph 1 test method more than equivalent.

Approved by:



Dally Hong
Sr. Engineer
Compliance Certification Services Inc.

2. SUMMARY OF TEST RESULTS

2.1 BLE (CH0~CH39) (FOR GFSK)

APPLIED STANDARD: ARIB STD T-66 Ver.3.7			
Standard Section	Report Section	Test Type and Limit	Test Result
General provisions			
5	6.1	Frequency Error	PASS
6	6.4	Occupied Bandwidth	PASS
7	6.3	Unwanted Emission Strength	PASS
Transmitting equipment			
14	6.2	Antenna Power	PASS
14.2	-	SAR	-
Transmitting antenna			
20	3	Type, Configuration, etc., of Transmitting Antenna	PASS
22	-	Direction Pattern of Transmitting Antenna (Provided at Individual Antenna Report)	PASS
Receiving antenna			
24	6.5	Limitation of Collateral Emission of Receiver	PASS
26	3	Refer to All Articles for Transmitting Antenna	PASS
Operating frequency 2400~2483MHz			
49.20(1);a	4.4	RF Shielding Method	PASS
49.20(1);a	-	Communication Method	-
49.20(1);b	3	Spread-spectrum Method	PASS
49.20(1);d	-	Absolute Antenna Gain (Provided at Individual Antenna Report)	PASS
49.20(1);e	-	Spread-Spectrum Bandwidth	-
49.20(1);g	-	Hopping Frequency Dwell Time (FH employed)	-
-	7	Interference Prevention Function	Pass

3. EUT DESCRIPTION

Product	Outdoor Wi-Fi Gateway		
Model Number	GW31-E-HW		
Trade Name	Verkada		
Power Supply	1. Powered from Adapter (APD / DA-80A54) I/P: 100-240Vac, 50-60Hz, 1.5A MAX O/P: 54.0Vdc, 1.48A, 79.92W 2. Powered from PoE (EnGenius / PNA90BGS-54-TG) I/P: 100-240Vac, 1.5A, 50-60Hz O/P: 56Vdc, 1.7A 3. Powered from Power Supply(AC 100V)		
Model Discrepancy	N/A		
Frequency Range	Bluetooth: 2402~2480MHz		
Rated Antenna Power (mW, mW/MHz)	BLE 1M:	1.069	mW
	BLE 2M:	1.072	mW
Measured Antenna Power (mW, mW/MHz)	BLE 1M:	1.069	mW
	BLE 2M:	1.072	mW
Modulation Technique	BLE 1M & BLE 2M: GFSK		
Number of Channels	BLE 1M & BLE 2M: 40 channels		
Antenna Specification	Antenna-1: Brand / Model: Senao / 7102A1338000 Type: Dipole Antenna Gain: 2.38 dBi Antenna-2: Brand / Model: Verkada / ACC-ANT-20 Type: Directional Antenna (*Worst) Gain: 11.4 dBi		
Hardware Version	0.1		
Software Version	0.1		

Remark:

1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

4. TEST METHODOLOGY & CONDITIONS

4.1 TEST CONDITIONS

Temperature: 24.2 ~ 25°C

Test date: June 17 ~ 18, 2025

Humidity: 55 ~ 57% RH

Tested by: Marco Chan

Voltage Fluctuation Test	Normal Voltage	High Voltage + 10% of Normal Voltage	Low Voltage - 10% of Normal Voltage
Input AC Power	100	110	90
Output DC Power	3.25	3.25	3.25
Voltage Variation (%)	0	0	0
Note: Voltage Variation (%) = (Output High or Low Voltage - Output Normal Voltage) / Output Normal Voltage X 100			
During the input supply voltage to the EUT from the external power source is varied by +/- 10%, if output voltage had been confirmed that the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than +/- 1%. Exempt extremely high and low supply voltage condition tests, EUT only operated in normal voltage to test all regulations.			

BLE 1M

Environment of Test Room	Temperature	24.2~25	°C
	Humidity	55~57	%

Peak Antenna Gain	11.4	dBi
Declaration Output Power	1.069	mW
Declaration Output Power	0.289	dBm
E.I.R.P.	11.689	dBm
Input Voltage	100	VAC

Tested Circuit Insertion Loss		0.94	dB
Burst	ON TIME	0.003	sec
	OFF TIME	0	sec
	Ratio	100.00	%
Packet Type (Mode)		BT LE_1M	mode

Test Category ; 2.4GHz Band Wideband Low-Power Data Communication System

The reason why test are performed only rated voltage

When the input voltage to receiver RF circuit varies below $\pm 1\%$ as the input voltage from the external power supply to the receiver varies $\pm 10\%$ (excluding power supply).

BLE 2M

Environment of Test Room	Temperature	24.2~25	°C
	Humidity	55~57	%

Peak Antenna Gain	11.4	dBi
Declaration Output Power	1.072	mW
Declaration Output Power	0.302	dBm
E.I.R.P.	11.702	dBm
Input Voltage	100	VAC

Tested Circuit Insertion Loss		0.94	dB
Burst	ON TIME	0.003	sec
	OFF TIME	0	sec
	Ratio	100.00	%
Packet Type (Mode)		BT LE_2M	mode

Test Category ; 2.4GHz Band Wideband Low-Power Data Communication System

The reason why test are performed only rated voltage

When the input voltage to receiver RF circuit varies below $\pm 1\%$ as the input voltage from the external power supply to the receiver varies $\pm 10\%$ (excluding power supply).

4.2 DESCRIPTION OF TEST MODES

The EUT (model: GW31-E-HW) had been tested under operating condition.
Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

BLE: Measurement was conducted by the following test method.
The worst case data rate is determined as the data rate with highest output power.

4.3 TESTING APPLIED STANDARDS

MIC Notice No.88 Appendix No. 1
MIC Notice No.88 Appendix No.43 (Latest Update of test method: Nov. 8, 2023)
MIC Certification Rule, Article 2 Paragraph 1 Item 19
ARIB STD-66

4.4 RF SHIELDING METHOD

The RF part is not easily accessible because the EUT is using a special screw as below.



4.5 SETUP OF EQUIPMENT UNDER TEST

Setup Diagram

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

Support Equipment

Conducted TELECC (All)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
NB(B)	Lenovo	T470	N/A	N/A	N/A
Lan Cable	ATAKE	AC6-FL10	N/A	N/A	N/A
Adapter	APD	DA-80A54	N/A	N/A	N/A

5. INSTRUMENT AND CALIBRATION

5.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

5.2 TEST AND MEASUREMENT EQUIPMENT

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and other equivalent standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective manual.

Equipment Used for Emission Measurement

Conducted TELECOM (All)								
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due	Calibration Lab	Accreditation Organization of the-Cal. Lab	Calibration Method
PXA Signal Analyzer	Keysight	N9030B	MY62291089	2024/10/04	2025/10/03	ETC	TAF	c
Power Sensor	Anritsu	MA2411B	1911387	2024/08/30	2025/08/29	ETC	TAF	c
Power Sensor	Anritsu	MA2411B	1911386	2024/07/19	2025/07/18	ETC	TAF	c
Power Meter	Anritsu	ML2496A	2136002	2024/07/19	2025/07/18	ETC	TAF	c
DC Blocks	Marvelous Microwave	MVE6411	MVE-001	2024/08/08	2025/08/07	ETC	TAF	c
Vector Signal Generator	KEYSIGHT	N5138B	MY59100973	2024/08/12	2025/08/11	ETC	TAF	c
Software	Radio Test Software Ver. 21							

Remark:

- Each piece of equipment is scheduled for calibration once a year.
- Calibration Method:
 - Calibration conducted by the National Institute of Information and Communications Technology (NICT) (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1)
 - Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992)
 - Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1)
 - Calibration conducted by using measuring instruments and other equipment listed in the right column of Table No. 3 attached hereto, which shall have been given any of calibration, etc. listed above from a) to c)

5.3 MEASUREMENT UNCERTAINTY

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028-1 [2] and shall correspond to an expansion factor (coverage factor) $k = 1,96$ or $k = 2$ (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Table 6 is based on such expansion factors.

Table: Maximum measurement uncertainty

PARAMETER	UNCERTAINTY
RF Output Power	$\pm 1.871\text{dB}$
Frequency Tolerance	$\pm 1.872\text{dB}$
Unwanted Emission strength	$\pm 1.871\text{dB}$
Occupied Bandwidth (99%)	$\pm 1.931\text{dB}$
Spread-Spectrum Bandwidth (90%)	$\pm 1.931\text{dB}$
Limitation of collateral emissions of receiver	$\pm 1.871\text{dB}$

Remark:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

6. TEST RESULT FOR BLE (CH0~CH39)(FOR GFSK)

TEST RESULT

Temperature: 24.2 ~ 25°C
Humidity: 55 ~ 57% RH

Test date: June 17 ~ 18, 2025
Tested by: Marco Chan

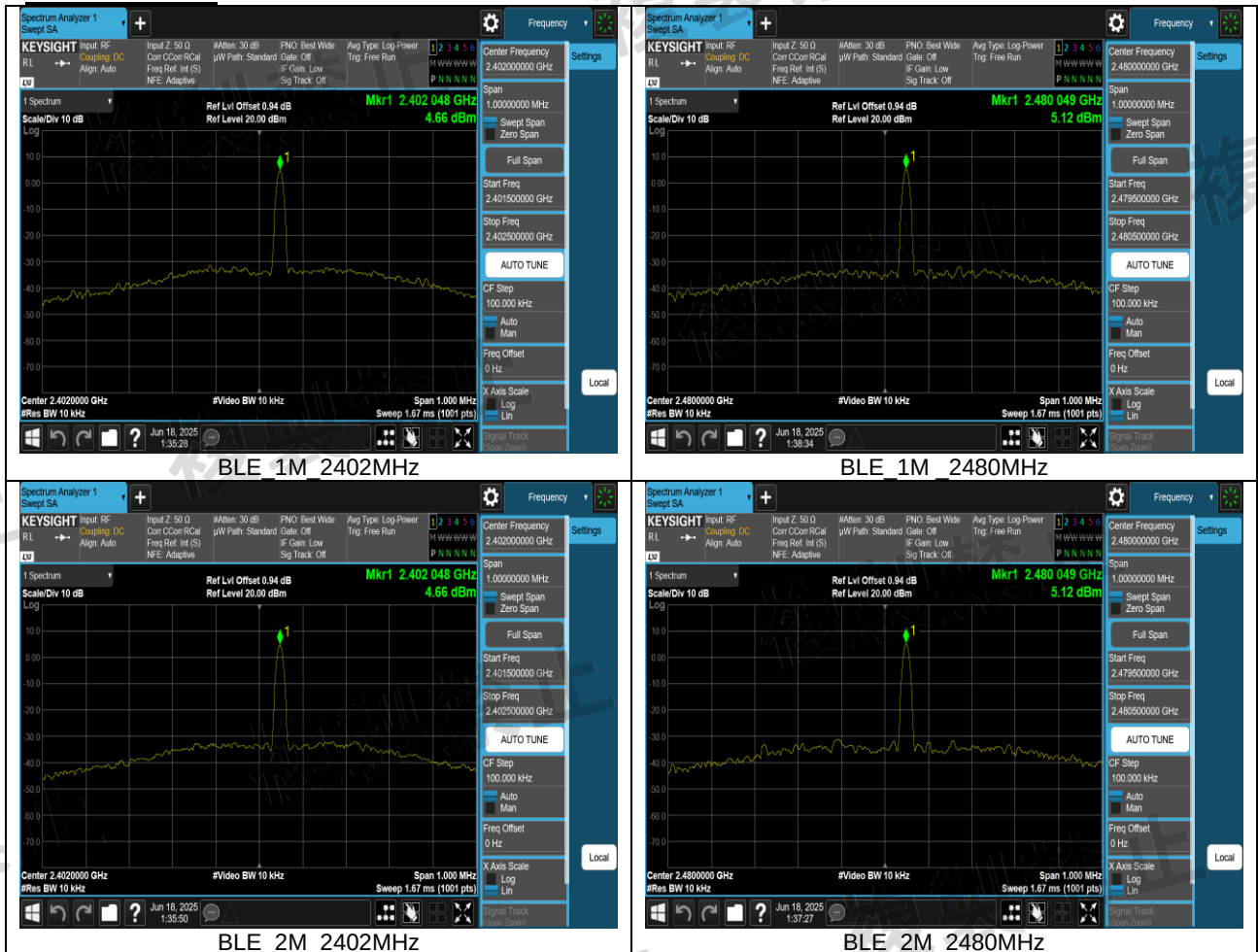
BLE 1M

Measurement Frequency		MHz	2402	2480	Limit	Result	NOTES
Channel Number		Ch.	0	39	-----	-----	
Reading Frequency		MHz	2402.048	2480.049	-----	-----	
Frequency Tolerance		ppm	19.98335	19.75806	-50≤x≤+50	PASS	
Occupied Bandwidth		MHz	1.0690	1.0675	≤26 MHz	PASS	
RF Output Power		mW	1.069	1.011	≤10 mW	PASS	
		dBm	0.28915	0.045874	-----		
RF Output Power Tolerance		%	0.02	-5.41	≤20	PASS	
Unwanted Emission Strength (TX1)	Under 2387MHz	μW/MHz	0.020324	0.021777	≤2.5uW/MHz	PASS	
		dBm/MHz	-46.92	-46.62	-----		
		MHz	2345.1	2336.0	-----		
	2387-2400MHz	μW/MHz	0.391742	0.013521	≤25uW/MHz	PASS	
		dBm/MHz	-34.07	-48.69	-----		
		MHz	2399.97	2399.05	-----		
	2483.5-2496.5MHz	μW/MHz	0.015171	0.049317	≤25uW/MHz	PASS	
		dBm/MHz	-48.19	-43.07	-----		
		MHz	2491.47	2483.53	-----		
	2496.5 - 12.5GHz	μW/MHz	0.036058	0.044875	≤2.5uW/MHz	PASS	
		dBm/MHz	-44.43	-43.48	-----		
		MHz	3767.5	4025.5	-----		
Secondarily Emitted Radio Wave Strength (RX Spurious) (RX1)	Under 1GHz	nW	0.0036	0.0034	≤4 nW	PASS	
		dBm/100kHz	-84.49	-84.69	-----		
		MHz	777.1	777.1	-----		
	1 - 12.5GHz	nW	0.0358	0.0414	≤20 nW	PASS	
		dBm/MHz	-74.46	-73.83	-----		
		MHz	4011	3789	-----	-----	
Interference Prevention Function		-----	Good			PASS	

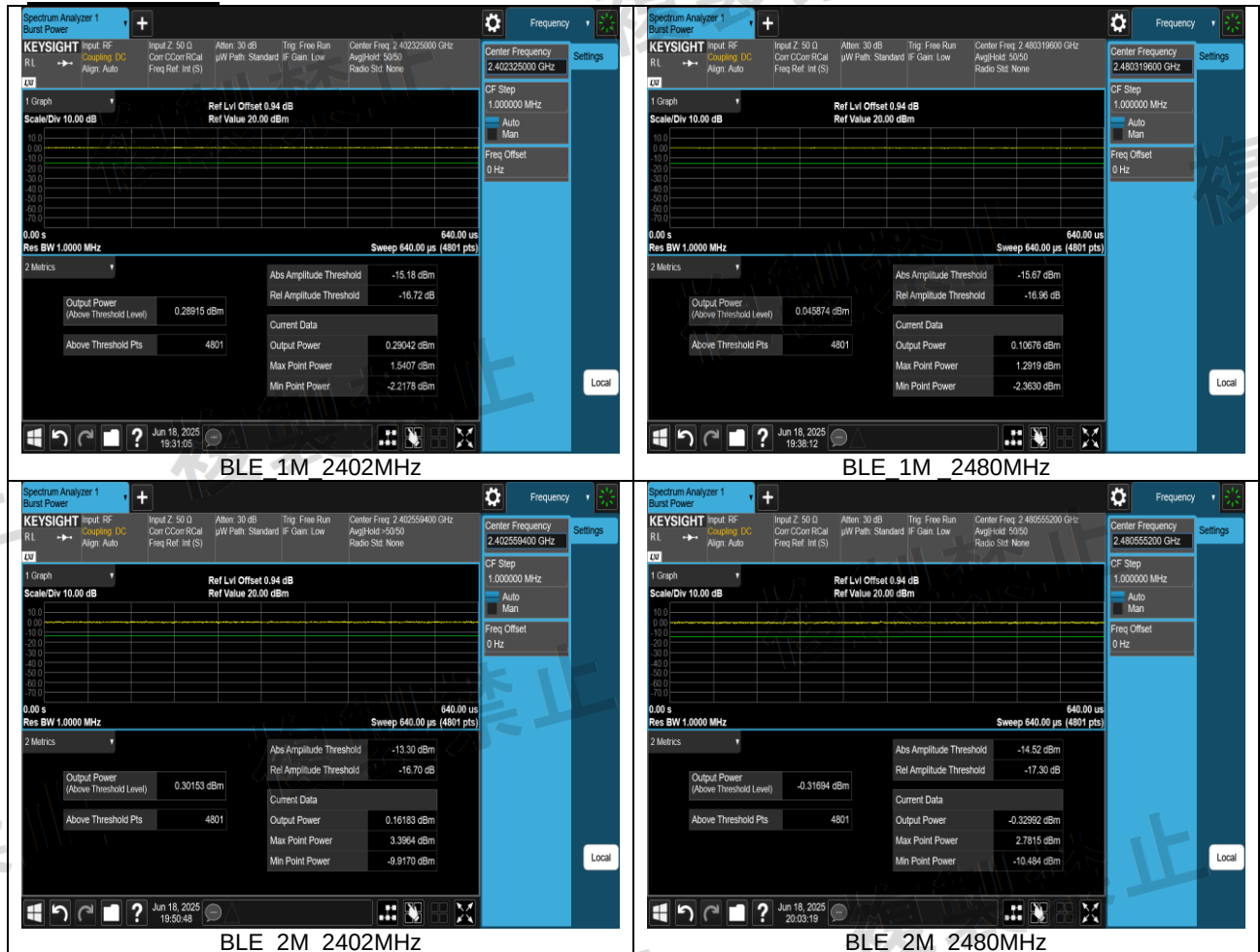
BLE 2M

Measurement Frequency	MHz	2402	2480	Limit	Result	NOTES
Channel Number	Ch.	0	39	----	----	
Reading Frequency	MHz	2402.048	2480.049	----	----	
Frequency Tolerance	ppm	19.98335	19.75806	$-50 \leq x \leq +50$	PASS	
Occupied Bandwidth	MHz	2.0767	2.0962	≤ 26 MHz	PASS	
RF Output Power	mW	1.072	0.930	≤ 10 mW	PASS	
	dBm	0.30153	-0.31694	----		
RF Output Power Tolerance	%	0.00	-13.25	≤ 20	PASS	
Unwanted Emission Strength (TX1)	Under 2387MHz	$\mu\text{W/MHz}$	0.026546	0.022856	$\leq 2.5\mu\text{W/MHz}$	PASS
		dBm/MHz	-45.76	-46.41	----	
		MHz	2383.4	2295.5	----	
	2387-2400MHz	$\mu\text{W/MHz}$	11.428783	0.015849	$\leq 25\mu\text{W/MHz}$	PASS
		dBm/MHz	-19.42	-48.00	----	
		MHz	2400.00	2396.13	----	
	2483.5-2496.5MHz	$\mu\text{W/MHz}$	0.019999	0.119399	$\leq 25\mu\text{W/MHz}$	PASS
		dBm/MHz	-46.99	-39.23	----	
		MHz	2483.89	2483.50	----	
	2496.5 - 12.5GHz	$\mu\text{W/MHz}$	0.043351	0.037068	$\leq 2.5\mu\text{W/MHz}$	PASS
		dBm/MHz	-43.63	-44.31	----	
		MHz	4060.0	3801.5	----	
Secondarily Emitted Radio Wave Strength (RX Spurious) (RX1)	Under 1GHz	nW	0.0024	0.0025	≤ 4 nW	PASS
		dBm/100kHz	-86.18	-85.97	----	
		MHz	777.1	777.1	----	
	1 - 12.5GHz	nW	0.0449	0.0460	≤ 20 nW	PASS
		dBm/MHz	-73.48	-73.37	----	
		MHz	3804	3837	----	
Interference Prevention Function	----	Good			PASS	

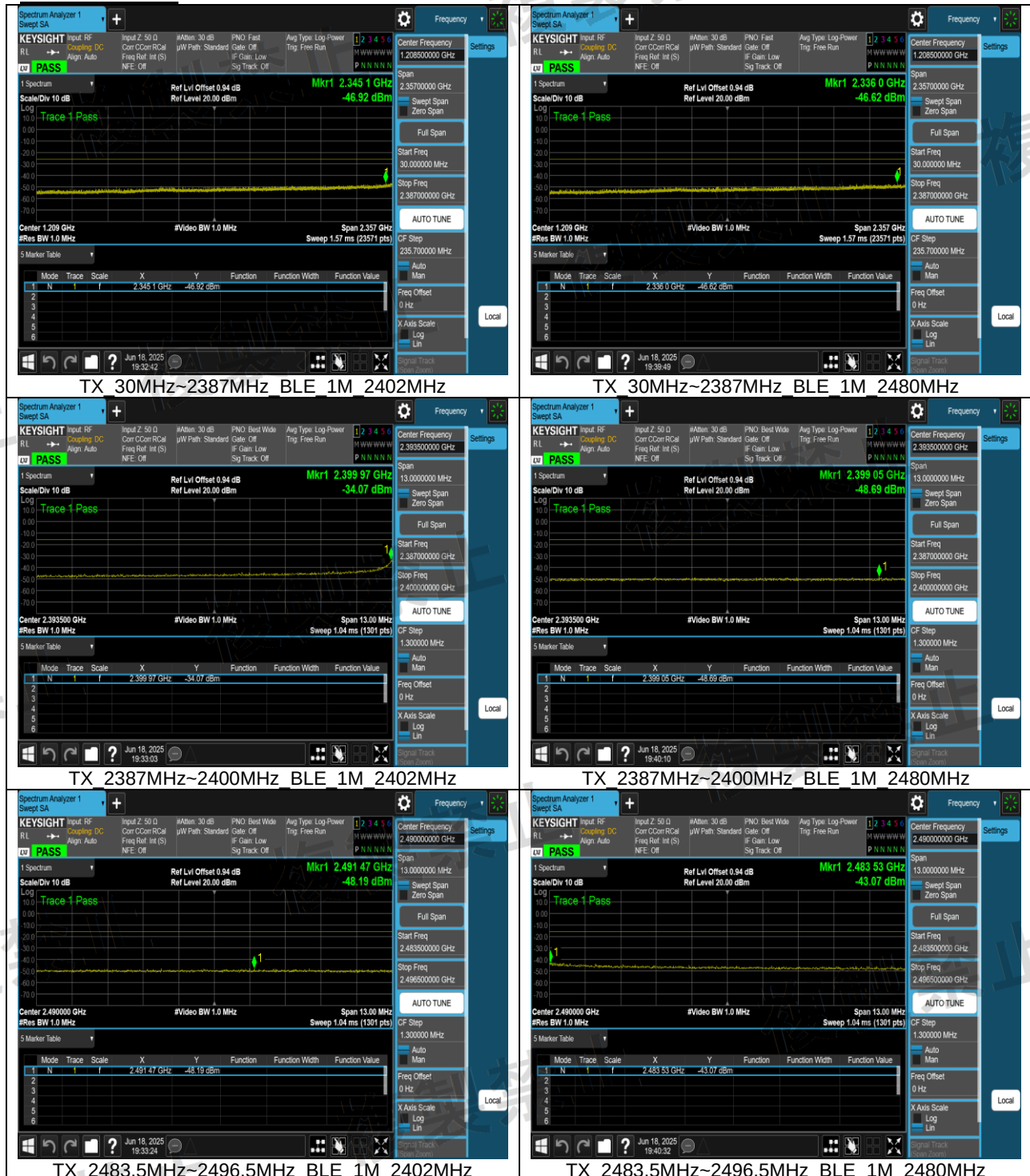
6.1 FREQUENCY ERROR TEST PLOTS

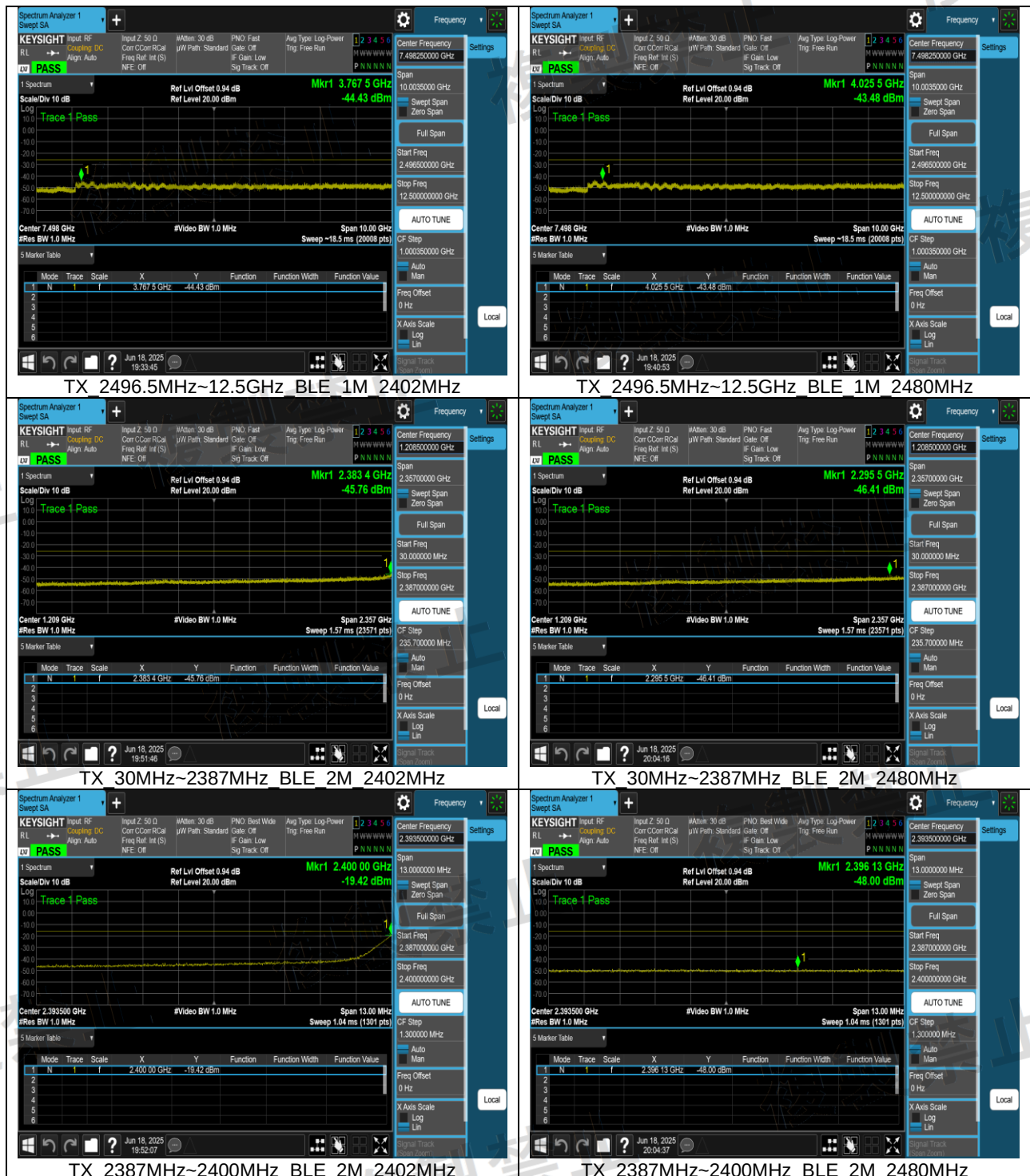


6.2 ANTENNA POWER TEST PLOTS



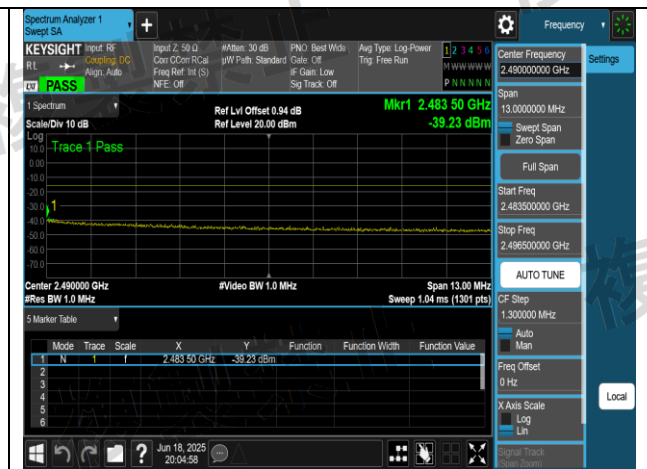
6.3 UNWANTED EMISSION STRENGTH TEST PLOTS







TX 2483.5MHz~2496.5MHz BLE 2M 2402MHz



TX 2483.5MHz~2496.5MHz BLE 2M 2480MHz

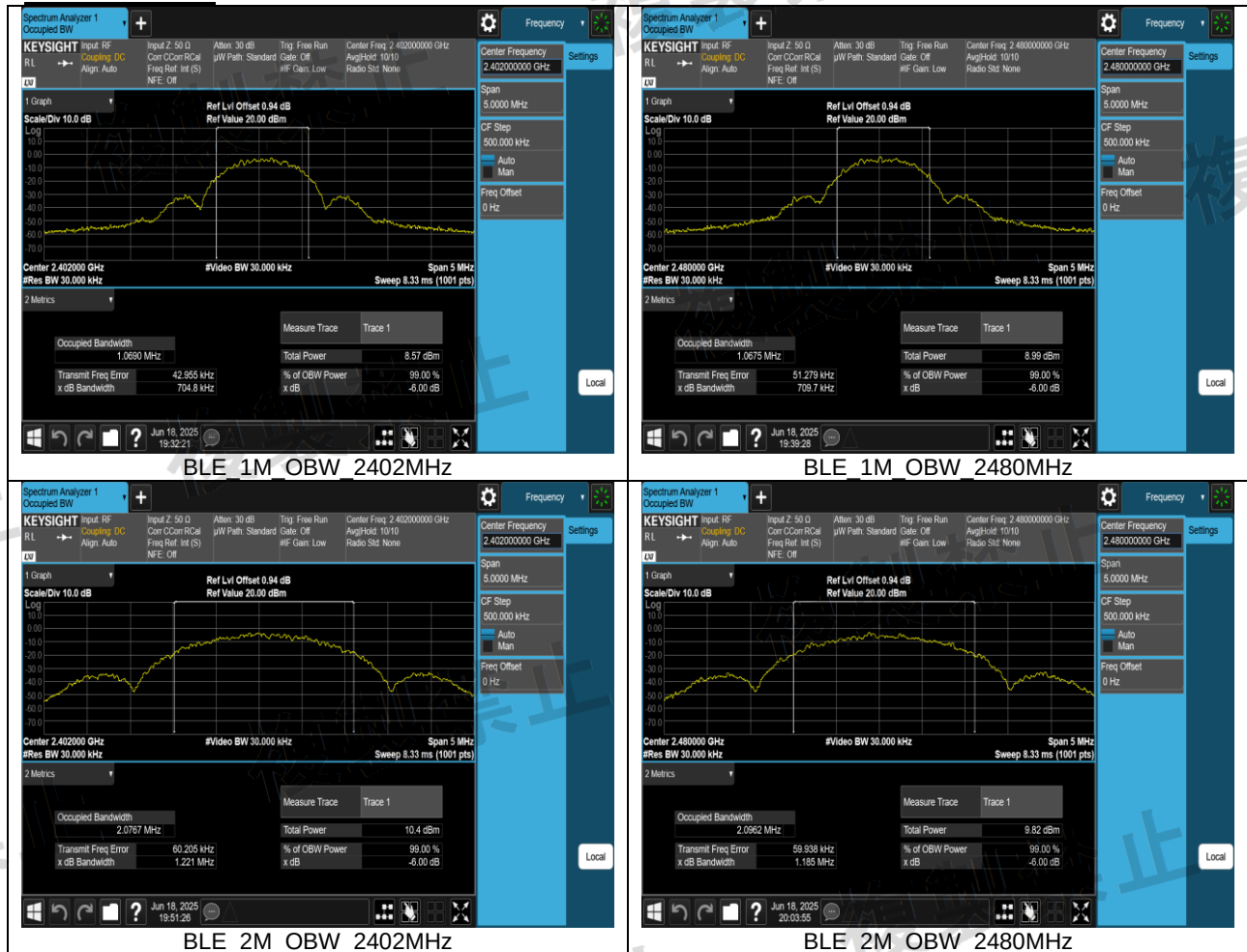


TX 2496.5MHz~12.5GHz BLE 2M 2402MHz

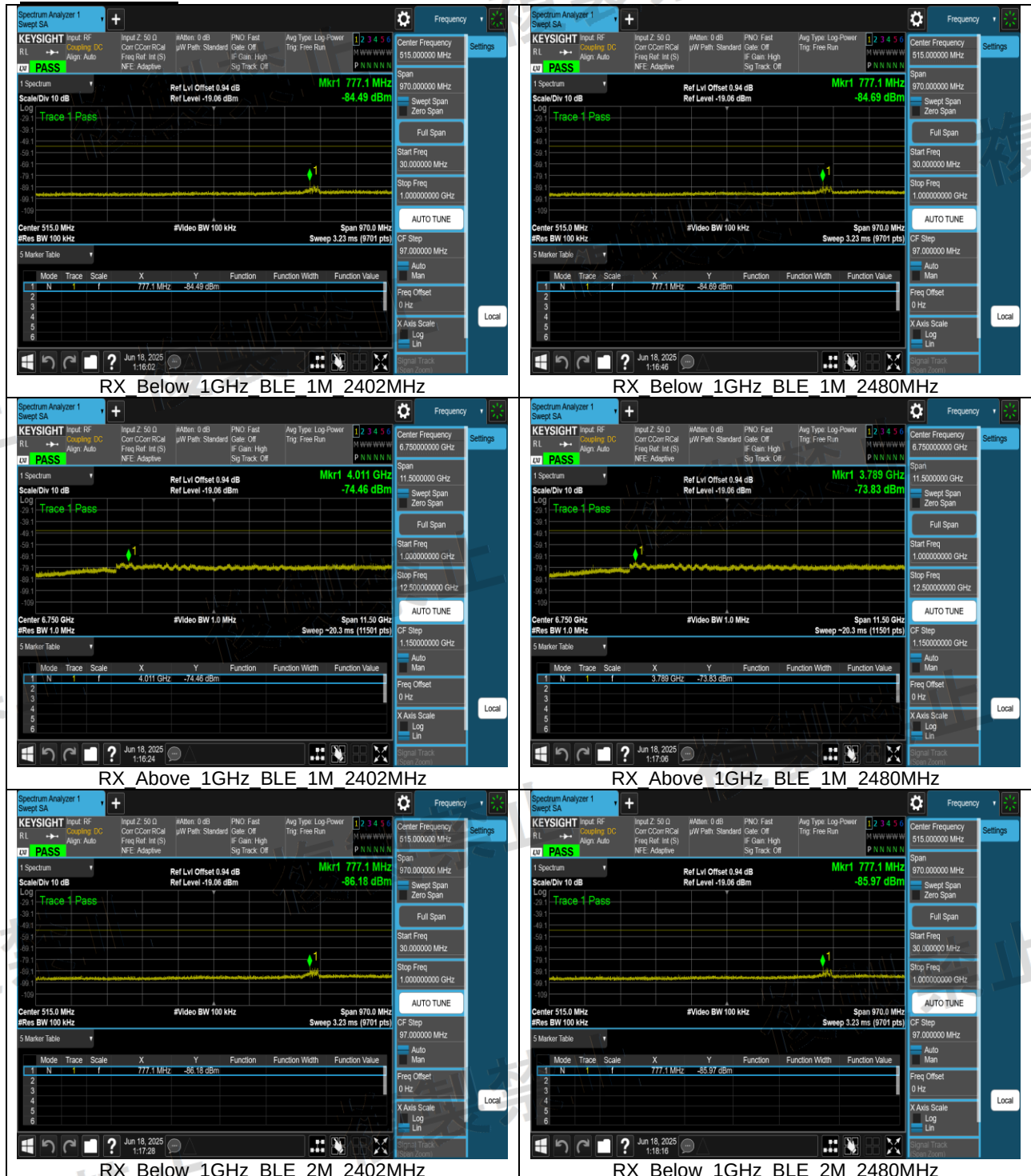


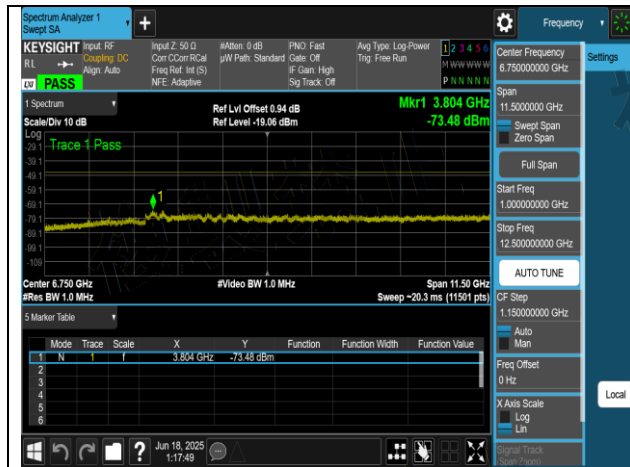
TX 2496.5MHz~12.5GHz BLE 2M 2480MHz

6.4 OCCUPIED BANDWIDTH –NORMAL (99%) TEST PLOTS



6.5 LIMITATION OF COLLATERAL EMISSIONS OF RECEIVER TEST PLOTS



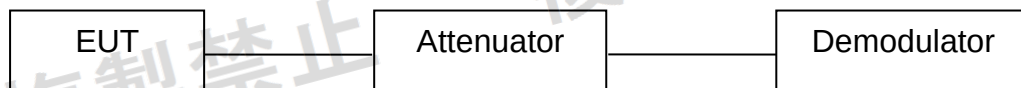


RX Above 1GHz BLE 2M 2402MHz



RX Above 1GHz BLE 2M 2480MHz

7. Interference Prevention Function



Interference Prevention Function	By identifying the characteristics of the modulation scheme of the received radio waves and others, shall be able to identify the reflected waves of the radio waves which local station transmitted and the radio waves transmitted by other radio stations.
MAC address	00:02:6F:00:00:02
Result	Pass

- End of Test Report -