

TEST REPORT

ARIB STD T-66 Ver.3.7 Item 19 of Article 2 Paragraph 1

Report Reference No...... : MTEB26080093-R1

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Date of issue..... : **Aug.12,2026**

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Address..... : No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park, Nanshan, Shenzhen, China

Applicant's name..... : **Shen Zhen Shi Xin Yi Shi Ye You Xian Gong Si**

Address..... : Long Hua Qu Min Zhi Jie Dao, Xin Niu She Qu Xin Niu Lu Gang
Shen Guo Ji Zhong Xin A12-07, Shen Zhen Shi, Guang Dong
Sheng, CHINA

Test specification..... :

Standard..... : **ARIB STD T-66 Ver.3.7**
Item 19 of Article 2 Paragraph 1

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Test item description..... : Multimedia Radio with Bluetooth Transmitter

Trade Mark..... : ZHIWHIS

Model/Type reference..... : ZWS-939TX

Listed Models : ZWS-886TX、ZWS-R801、ZWS-R802、ZWS-R803、

ZWS-R919、ZWS-R909、ZWS-R155、

ZWS-R15、ZWS-R16、ZWS-R17、ZWS-R18

Ratings..... : DC 3.7V by Battery

DC 5V by USB Port

Modulation : GFSK

Frequency..... : 2402MHz -2480MHz

HW Ver..... : V1.0

SW Ver..... : V1.0

Result..... : **PASS**

TEST REPORT

Equipment under Test : Multimedia Radio with Bluetooth Transmitter

Model /Type : ZWS-939TX

Listed Models : ZWS-886TX、ZWS-R801、ZWS-R802、ZWS-R803、
ZWS-R919、ZWS-R909、ZWS-R155、
ZWS-R15、ZWS-R16、ZWS-R17、ZWS-R18

Remark : Only the model “ZWS-939TX” was tested, Their electrical circuit design, layout, components used and internal wiring are identical, Only the model name and appearance colour is different.

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Manufacturer : **Shen Zhen Shi Xin Yi Shi Ye You Xian Gong Si**

Address : Long Hua Qu Min Zhi Jie Dao, Xin Niu She Qu Xin Niu Lu Gang
Shen Guo Ji Zhong Xin A12-07, Shen Zhen Shi, Guang Dong
Sheng, CHINA

Test Result:	PASS
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The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1 SUMMAR

1.1 Test Standards

The tests were performed according to following standards:

[ARIB STD-T66](#): Second-Generation Low-Power Data Communication System/Wireless LAN System
[MIC Notice No.88 Appendix No. 43](#): 2.4 GHz band wide-band low-power data communication system

1.2 Test Description

MIC Notice No.88 Appendix No.43	
Test Item	Result
Antenna Power	PASS
Tolerances for Antenna Power	PASS
Frequency Tolerance	PASS
Transmission Rate	PASS
Occupied Frequency Bandwidth	PASS
Spurious Emissions	PASS
Transmission Antenna Gain (EIRP Antenna Power)	PASS
Transmission Radiated Angle Width (3dB Beam width)	N/A
Interference prevention function	PASS
Carrier Sensing function	N/A ^{Note(2)}
Receiver Parameters	
Secondary Radiated Emissions	PASS
Note: (1) N/A is an abbreviation for Not Applicable. (2)Not apply to this device, since EIRP does not require compensation through Antenna Power.	

1.3 TEST ENVIRONMENT

1.3.1 Address of the test laboratory

Shenzhen Most Technology Service Co., Ltd.

No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park, Nanshan, Shenzhen, China

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.3.2 Test Facility

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

CNAS-Lab Code: L3573

1.4 Measurement Uncertainty

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR100028-1 [2] and shall correspond to an expansion factor (coverage factor) $K=1.96$ or $K=2$ (which provide confidence levels of respectively 95% and 95.5% in the case where the distributions characterizing the actual measurement uncertainties are normal).

Parameter	Uncertainty
Frequency error / 99%&90% bandwidth	$\pm 1.62 \cdot 10^{-6}$
Total RF power, conducted	$\pm 0.8\text{dB}$
Spurious emissions, conducted	$\pm 0.8\text{dB}$
DC and low frequency voltages	$\pm 0.05\%$
Humidity	$\pm 5\%$
Temperature	$\pm 1^\circ\text{C}$

2 GENERAL INFORMATION

2.1 General Remarks

Date of receipt of test sample	:	2026.07.29
Testing commenced on	:	2026.07.30
Testing concluded on	:	2026.08.12

2.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Voltage	Normal Voltage	DC 3.7V
	High Voltage	DC 4.07V
	Low Voltage	DC 3.33V
Other	Normal Temperature	25°C
	Relative Humidity	55 %
	Air Pressure	989 hPa

Note: As the EUT was powered by DC 3.7V and with the voltage stabilizing circuit used, the chip voltage received floating not exceed $\pm 1\%$ of nominal condition when working on extreme voltage, so all test performed at nominal voltage only.

2.3 General Description of EUT

Product Name:	Multimedia Radio with Bluetooth Transmitter
Model:	ZWS-939TX
Power supply:	DC 3.7V by Battery DC 5V by USB Port
BT	
Modulation Type	GFSK
Operation frequency	2402MHz -2480MHz
Channel number	40
Antenna Gain	PCB Antenna -0.68dBi

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

2.4 Description of Test Modes

The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List:

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

For Radiated Emission	
Final Test Mode	Description
Mode 1	GFSK Mode(CH00 CH19 CH39)

2.5 Measurement Instruments List

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
1	Spectrum Analyzer	Agilent	9020A	MY48010446	2026/02/28	2027/02/27
2	Power Meter	R&S	NRVS	100696	2026/02/28	2027/02/27
3	Power Meter	R&S	NRVS	100697	2026/02/28	2027/02/27
4	Test Software	Censheng	WCS-WCN	2024.7.25	N/A	N/A

Note: Calibration by the calibration agencies listed in the table correspond to paragraph 4 (ii) (c) of Article 24-2 in the Radio Law".

Calibration Information:	Article24-2,Paragraph 4 of the Radio Act
Calibration unit:	Ti Testing & Certification Group Co., Ltd. Shenzhen Branch
Address:	Room 103, Building B, Hongji High tech Intelligent Industrial Park, No. 1008 Songbai Road, Nanshan District, Shenzhen
CNAS:	L17117

2.6 Table for Parameters of Test 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.

Test software Version	Test program: FCC Test tool		
Frequency	2402 MHz	2440 MHz	2480 MHz
Parameter	DEF	DEF	DEF

2.7 Test Voltage

POWER SUPPLY VOLTAGE FLUCTUATION TEST

Voltage Fluctuation Test	Normal Voltage	High Voltage +10% of Normal Voltage	Low Voltage -10% of Normal Voltage
Input To EUT	DC 3.7V	DC 4.07V	DC 3.33V
Output To RF Module	DC 3.30V	DC 3.30V	DC 3.30V
Voltage Variation (%)	--	--	--

Note:

Voltage Variation (%)

= (Output high or Low Voltage - Output Normal Voltage)/ Output Normal Voltage* 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 test, EUT only operated in normal voltage to test all regulations.

The sample power supply was confirmed that input voltage variation at the radio unit 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, and the radio equipment was designed so as to be operated in a specified voltage variation limit within +10%, Radio can only tested at rated voltage.

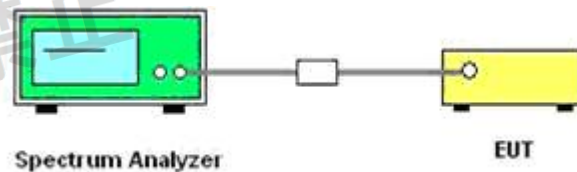
3 Test conditions and Results

3.1 Frequency Error

LIMIT

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

TEST CONFIGURATION



TEST PROCEDURE

- Set EUT work in test mode as described in clause 2.4.
- Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
 - Centre Frequency: The centre frequency of the channel under test.
 - Resolution BW: 10 KHz.
 - Video BW: 10 KHz.
 - Span: 1MHz.
 - Detector: Peak.
 - Trace Mode: Max Hold.
- When the trace is complete, find the peak value of the power envelope and record.

TEST RESULTS

See Appendix II

3.2 Antenna Power

Standard Applicable

Type	Limit
DTS	10mW
OFDM OBW<26MHz, DS	10mW/MHz
OFDM OBW 26-40MHz	5mW/MHz
Tolerance	+20%

Upper Limit of EIRP for Modulation Systems

Modulation System	Frequency Band used	Antenna power (Max.)	EIRP (max.)	
			Omnidirectional case	Directional case
DS, OFDM	2400~2483.5MHz	10mW/MHz	12.14 dBm/MHz	22.14 dBm/MHz
FH, DS-FH, FH-OFDM	2400~2483.5MHz	3mW/MHz	6.91 dBm/MHz	16.91 dBm/MHz
	Excluding 2427~2470.75MHz	10mW/MHz	12.14 dBm/MHz	22.14 dBm/MHz
Other than the above	2400~2483.5MHz	10mW	12.14 dBm	22.14 dBm

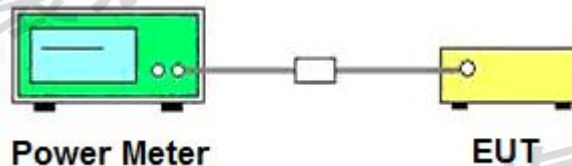
Measuring Instruments

Please refer to section 6 of equipments list in this report.

Test Procedures

- EUT have transmitted continuous maximum power
- Antenna Power Error is definition that actual measure antenna power tolerance +20% power range that base on manufacturer declare the conducted power density.
- When the trace is complete, find the peak value of the power envelope and record.

Test Setup



EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

TEST RESULTS

See Appendix III

3.3 Occupied Frequency Bandwidth

Standard Applicable

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.

Measuring Instruments

Please refer to section 6 of equipments list in this report.

Test Procedures

a. Set EUT work in test mode as described in clause 2.4.

b. Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The centre frequency of the channel under test.

RBW/VBW= 300 KHz/300KHz

Span: Wide enough to cover the complete power envelope of the signal of the EUT.

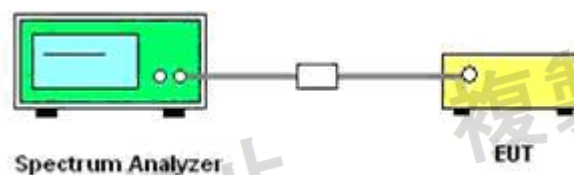
Sweep mode: Continuous sweeping.

Detector: Peak.

Trace Mode: Max Hold.

c. When the trace is complete, measure the occupied bandwidth (99% bandwidth) with spectrum analyzer's bandwidth measure function.

Test Setup Layout



EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

TEST RESULTS

See Appendix IV

3.4 Transmitter Spurious Emissions (conducted)

Standard Applicable

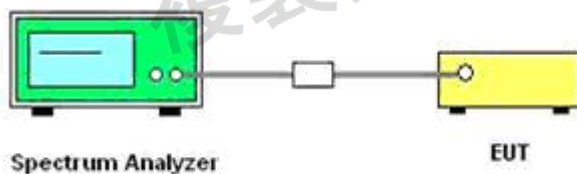
Permissible mean power of spurious emission of each frequency supplied to a feeder, that is, mean power of spurious emission in the 1 MHz bandwidth at frequency f other than frequency band used shall be as follows:
Item 19:

- (1).30MHz-2387MHz;2.5 μ W/MHz or less
- (2).2387MHz-2400MHz;25 μ W/MHz or less
- (3).2483.5MHz-2496.5MHz;25 μ W/MHz or less
- (4).2496.5MHz-12.5GHz;2.5 μ W/MHz or less

Test Procedures

- a. Set EUT work in test mode as described in clause 2.4.
- b. Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
Below 1GHz: RBW/VBW= 1MHz / 1MHz.
Above 1GHz: RBW/VBW= 1MHz / 1MHz.
Detector: Peak.
Trace Mode: Max Hold.
- c. All the emissions from 30MHz to 13GHz were measured and record.

Test Setup Layout



EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

TEST RESULT

See Appendix VI

3.5 Secondary Radiated Emissions

Standard Applicable

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, 4nW(-54dBm) or less at a frequency below 1 GHz and 20 nW(-47dBm) or less at a frequency of 1 GHz or higher as measured using the circuit

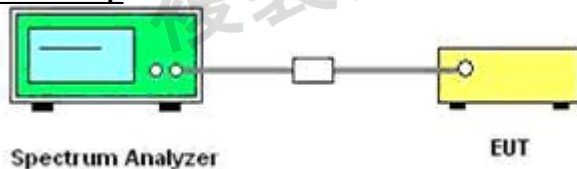
Measuring Instruments

Please refer to section 6 of equipments list in this report.

Test Procedures

- Set EUT work in test mode as described in clause 2.4.
- Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
Resolution BW: 1MHz for frequency below 1GHz and
1MHz for frequency above 1GHz
Video BW: 1MHz for frequency below 1GHz and
1MHz for frequency above 1GHz
Detector: Peak.
Trace Mode: Max Hold.
- All the emissions from 30MHz to 13GHz were measured and record.

Test Setup



EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

TEST RESULT

See Appendix VII

3.6 Carrier sensing function

Standard Applicable

Item	Limits
Carrier Sense	Good - EUT stop RF transmission signal after carrier inject to EUT. (On $22.79 + Gr - 20 \cdot \log(f)$ [dBm] (Gr: dBi; f: MHz) or 100mV/m)

Measuring Instruments

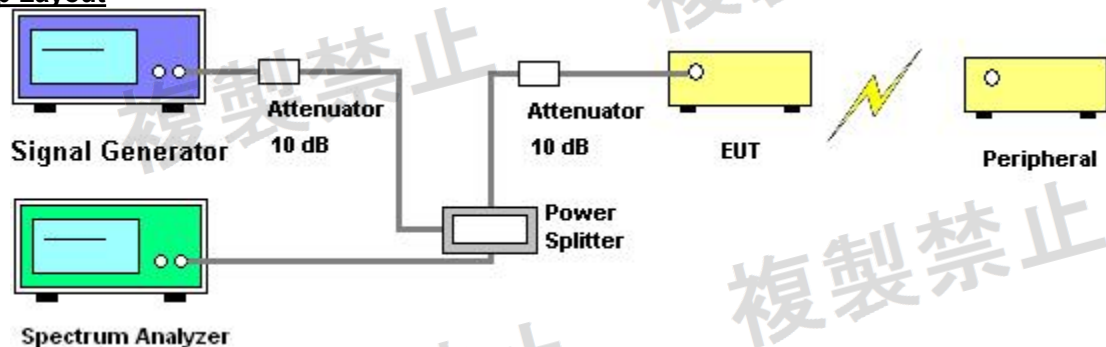
Please refer to section 6 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	1 MHz
Span	0 MHz
Sweep	Continuous
Detector	Peak
Trigger mode	Video

Test Procedures

- SSG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SSG and power level is (On $22.79 + Gr - 20 \cdot \log(f)$ [dBm] (Gr: dBi; f: MHz). Then turn off the RF signal of SSG.
- EUT have transmitted the maximum modulation signal and fixed channelize.
- Setting of SA is following as; RB: 1MHz / VB: 1MHz / SPAN: 50MHz / AT: 10dB / Ref: 0dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak.
- SSG RF Signal On.
- EUT shall be stop the transmitted any signal and SSG RF Signal Off. Then EUT will be continuous transmitted signal.

Test Setup Layout



EUT Operation during Test

The EUT was programmed to be in normal transmitting mode.

Test Result

Not Applicable

3.7 Interference prevention function

Standard Applicable

Item	Limits
Identification code	≥ 48 bits

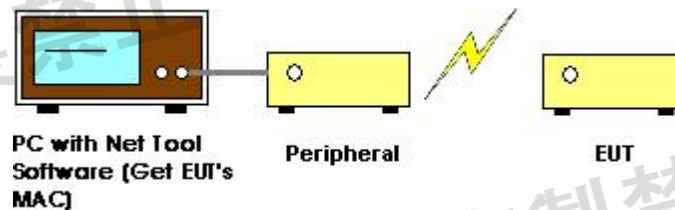
Measuring ID Code Software

PC with NetTool MAC IP List	Setting MAC Scan
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Test Procedures

- 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.
- 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 other signals 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.

Test Setup Layout



EUT Operation during Test

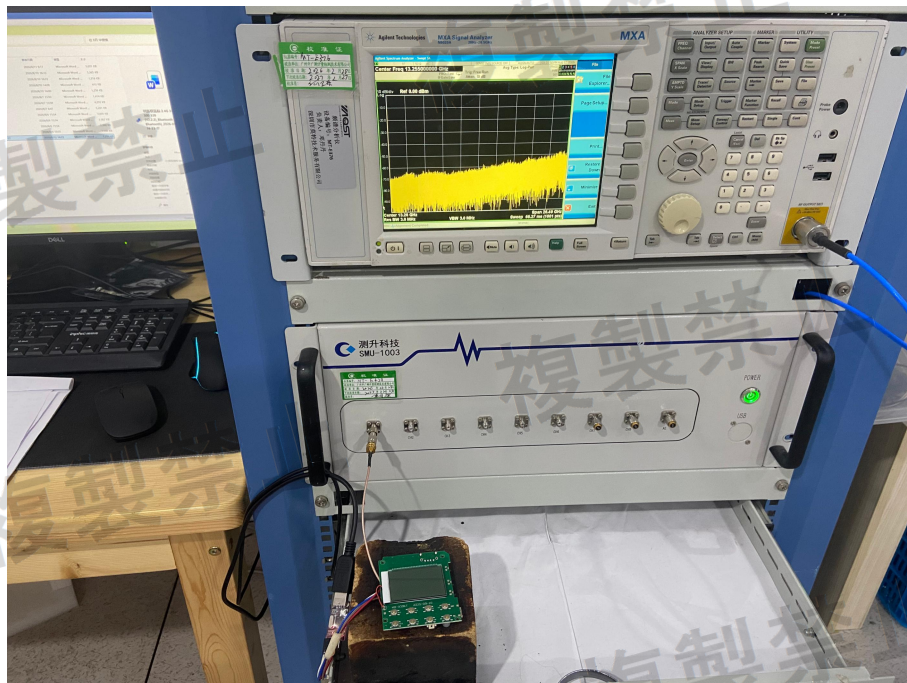
The EUT was programmed to be in normal transmitting mode.

Test Result

MAC Address: E3:D4:A1:67:27:35
Complies.

4 Test Setup Photos of the EUT

RF TEST SETUP



5 Photos of the EUT

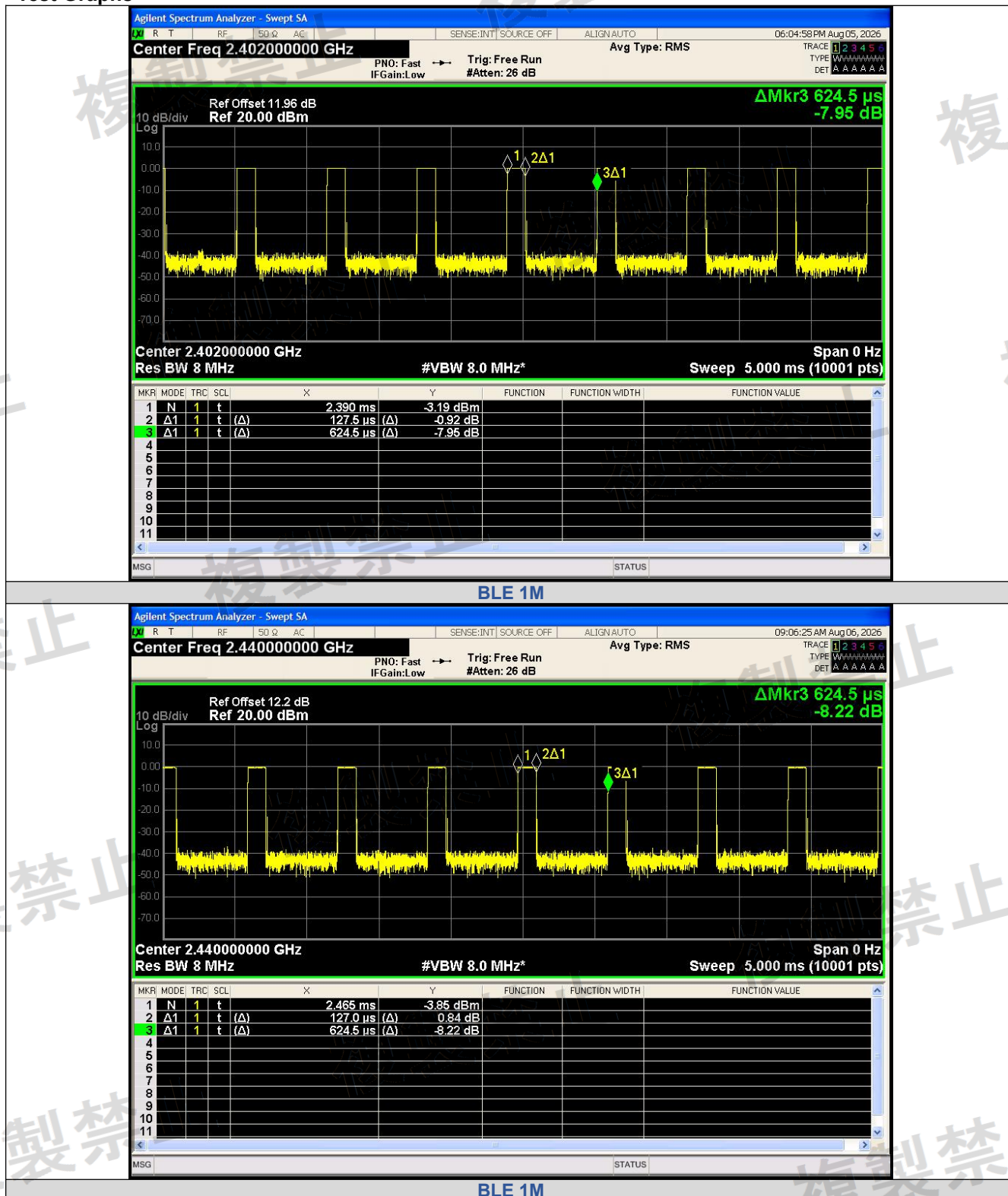
See EUT Reports.

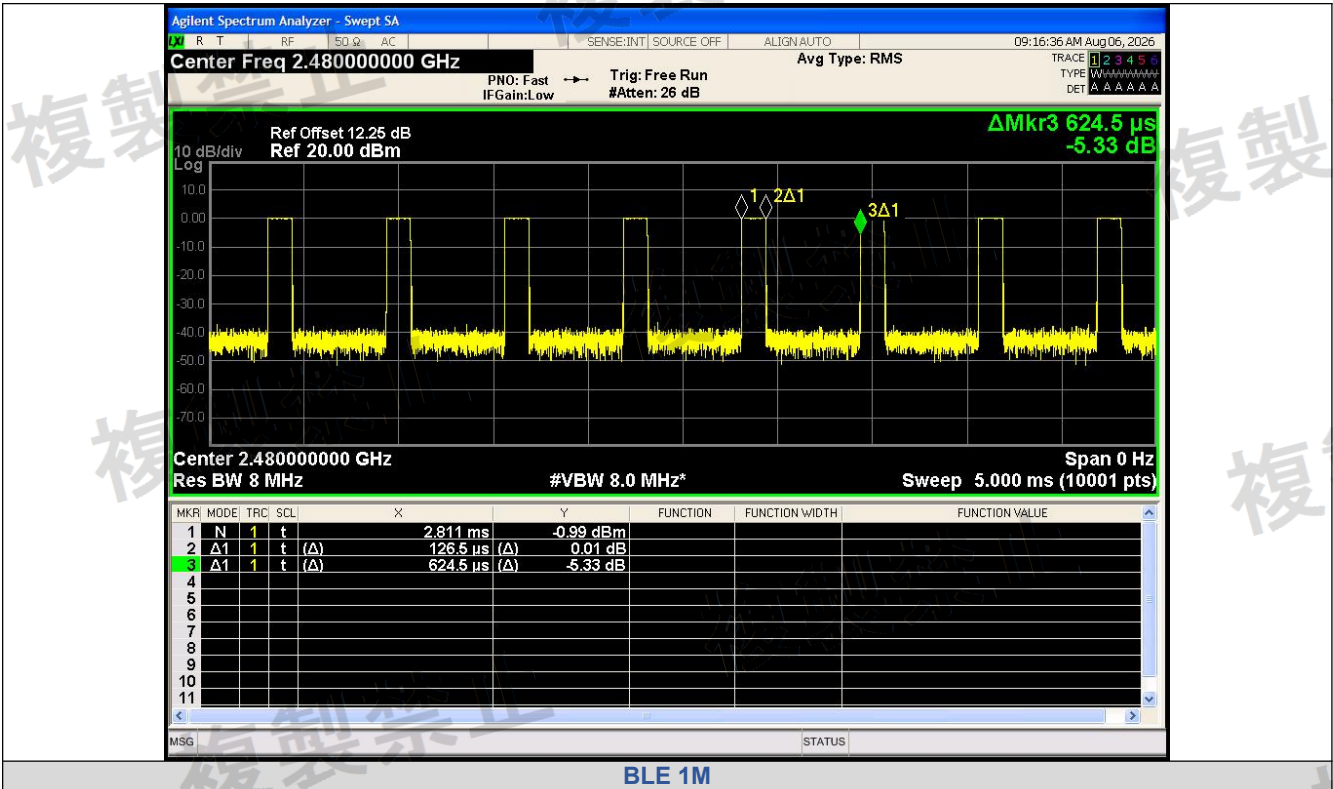
APPENDIX I. Duty Cycle

Test Result

Mode	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)
BLE 1M	0	0.127	0.624	20.42	0.2042	6.8994
	19	0.127	0.624	20.34	0.2034	6.9165
	39	0.126	0.625	20.26	0.2026	6.9336

Test Graphs





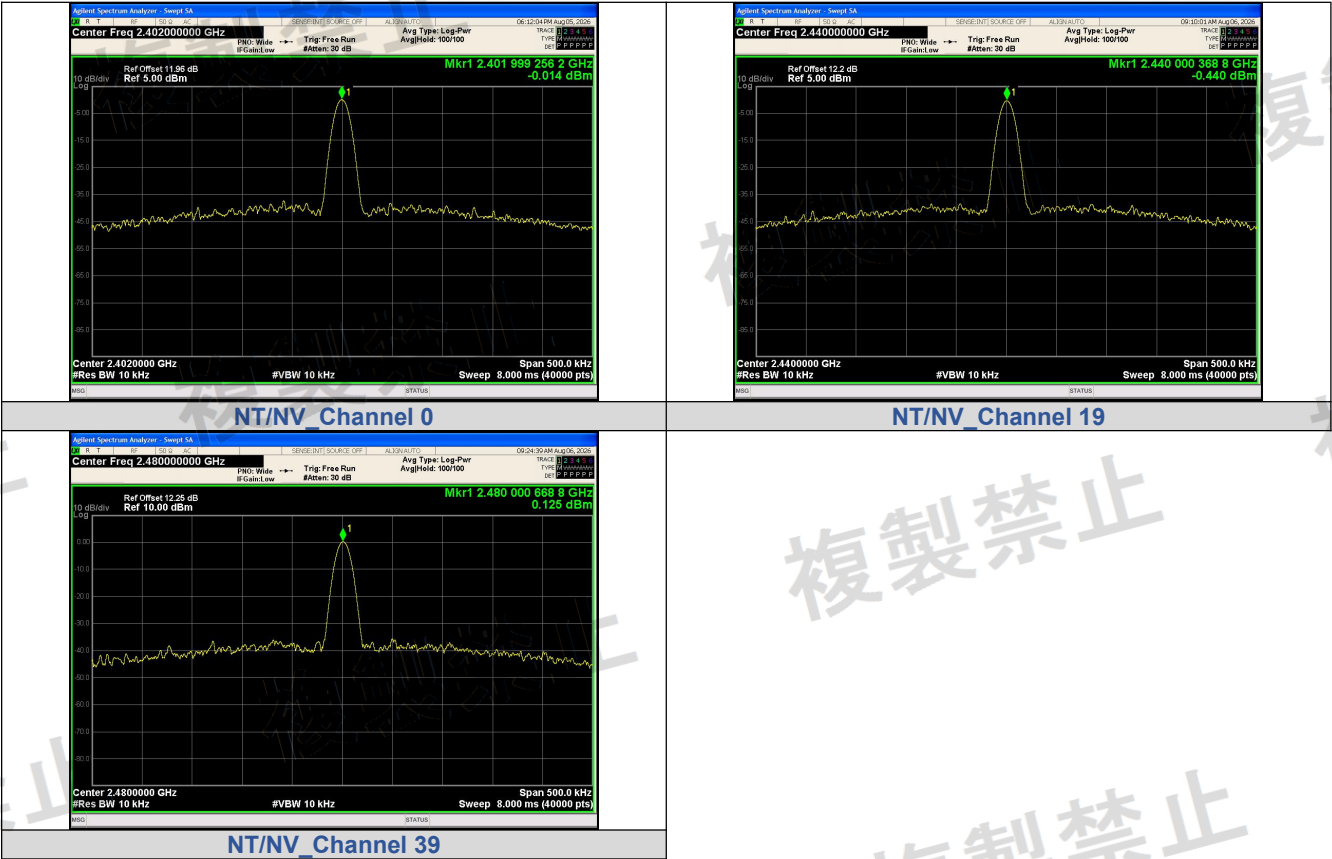
APPENDIX II. Frequency Tolerance

Test Result

Condition	Mode	Ch.	Center Frequency (MHz)	Measured Value (MHz)	Deviation (ppm)	Limit (ppm)	Result
NT/NV	BLE 1M(CW)	0	2402	2401.9992562	-0.31	± 50	PASS
		19	2440	2440.0003688	0.15		PASS
		39	2480	2480.0006688	0.27		PASS

Test Graphs

NT/NV



APPENDIX III. Antenna Power**Test Result**

Condition	Modulation	Frequency (MHz)	Antenna power (dBm)	Antenna power density (mW)	Limit (mW)	Result
NT/NV	BLE 1M	2402	0.223	1.053	10	PASS
	BLE 1M	2440	-0.212	0.952	10	PASS
	BLE 1M	2480	0.237	1.056	10	PASS

Condition	Modulation	Frequency (MHz)	Tolerance (%)	Tolerance Limit (%)	Rated power (mW)	Result
NT/NV	BLE 1M	2402	-29.8	+20	1.5	PASS
	BLE 1M	2440	-36.5333	+20		PASS
	BLE 1M	2480	-29.6	+20		PASS

EIRP

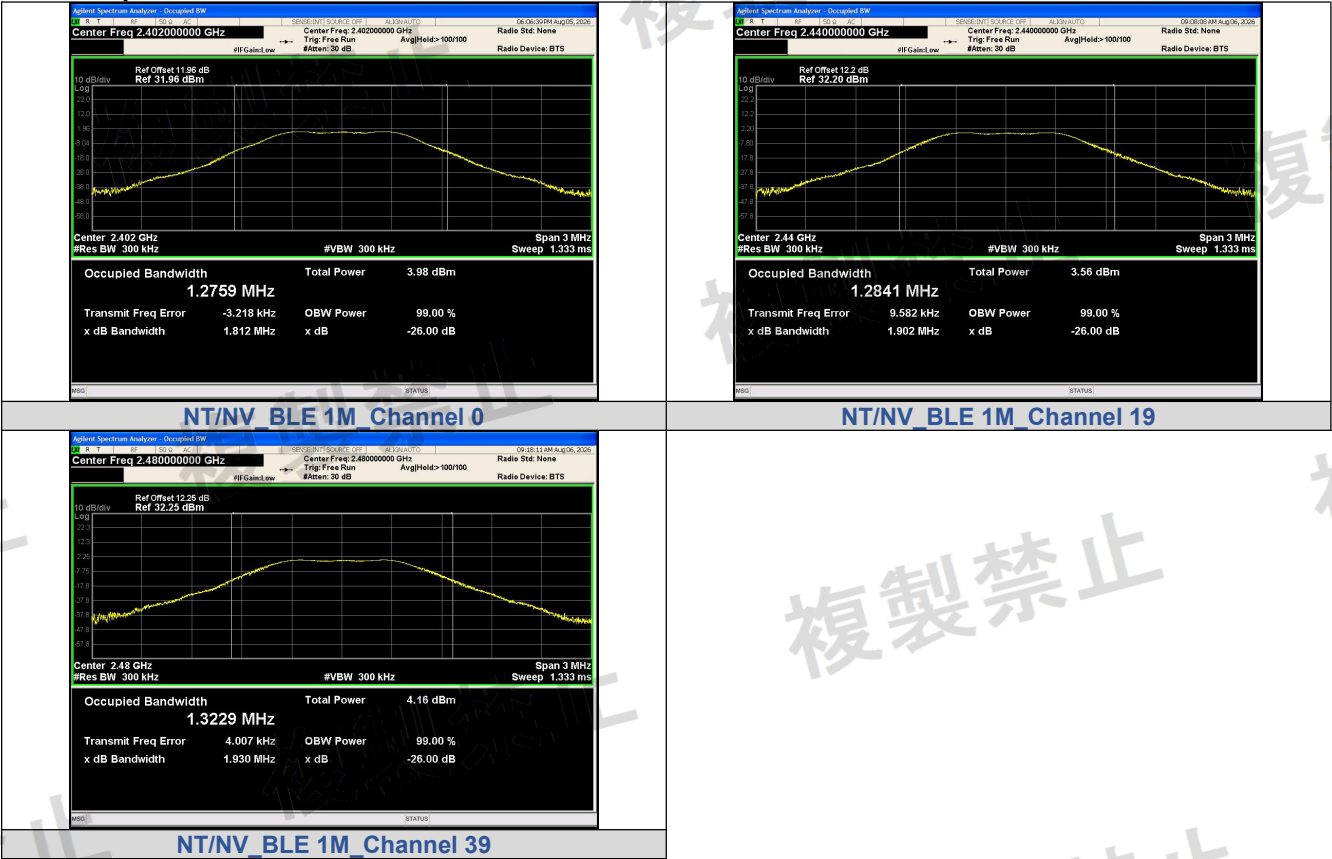
Condition	Mode	Frequency (MHz)	EIRP(dBm)	Gain(dBi)	Limit (dBm)	Result
NT/NV	BLE 1M	2402	-0.457	-0.68	12.14	PASS
		2440	-0.892	-0.68	12.14	PASS
		2480	-0.443	-0.68	12.14	PASS

APPENDIX IV. Occupied Bandwidth (99% BW)

Test Result

Condition	Mode	Channel	Frequency (MHz)	99% BW (MHz)	Limit (MHz)	Result
NT/NV	BLE 1M	0	2402	1.2759	26	PASS
		19	2440	1.2841		PASS
		39	2480	1.3229		PASS

Test Graphs

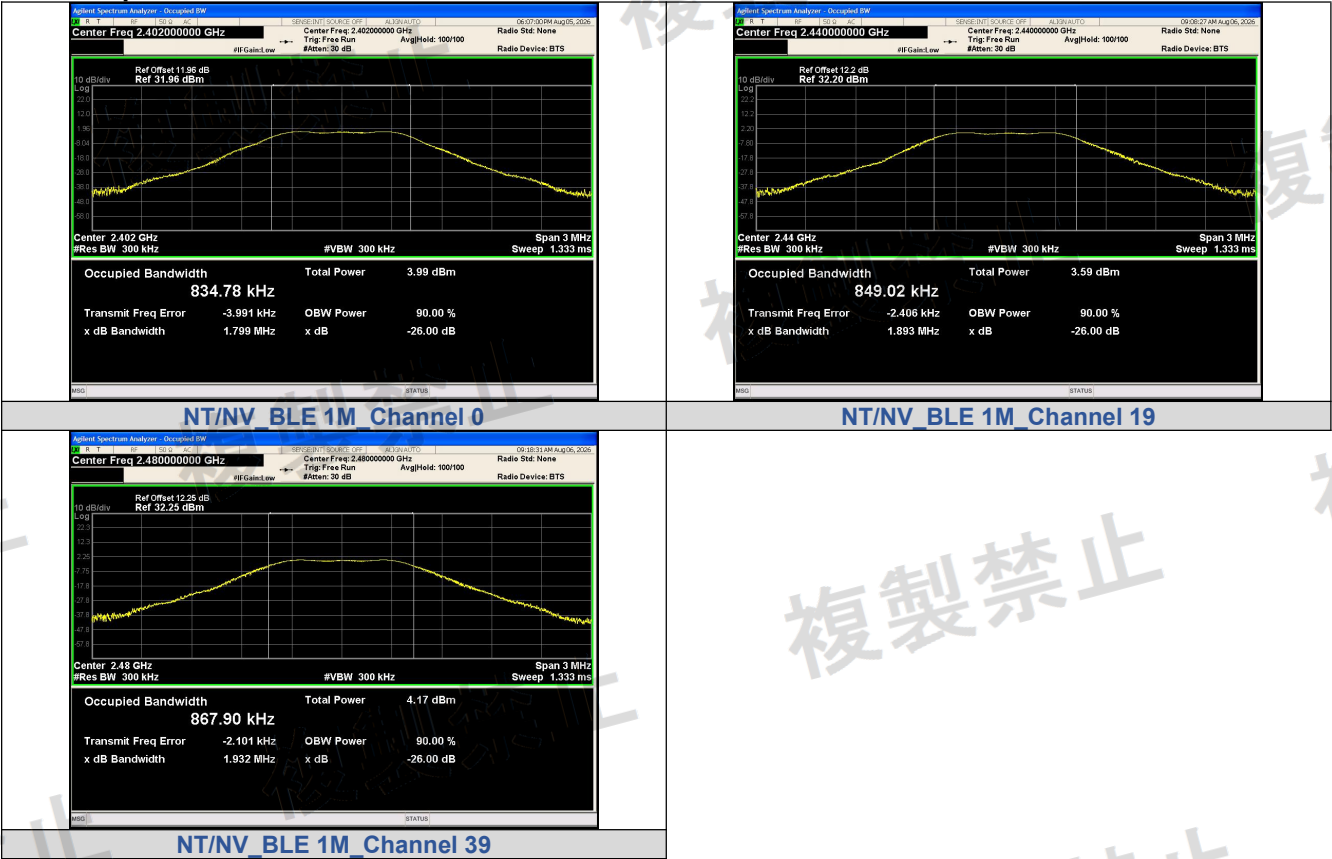


APPENDIX V. Spreading Bandwidth (90% BW)

Test Result

Condition	Mode	Channel	Frequency (MHz)	90% SBW (MHz)	Result
NT/NV	BLE 1M	0	2402	0.83478	PASS
		19	2440	0.84902	PASS
		39	2480	0.86790	PASS

Test Graphs



APPENDIX VI. Spurious Emissions

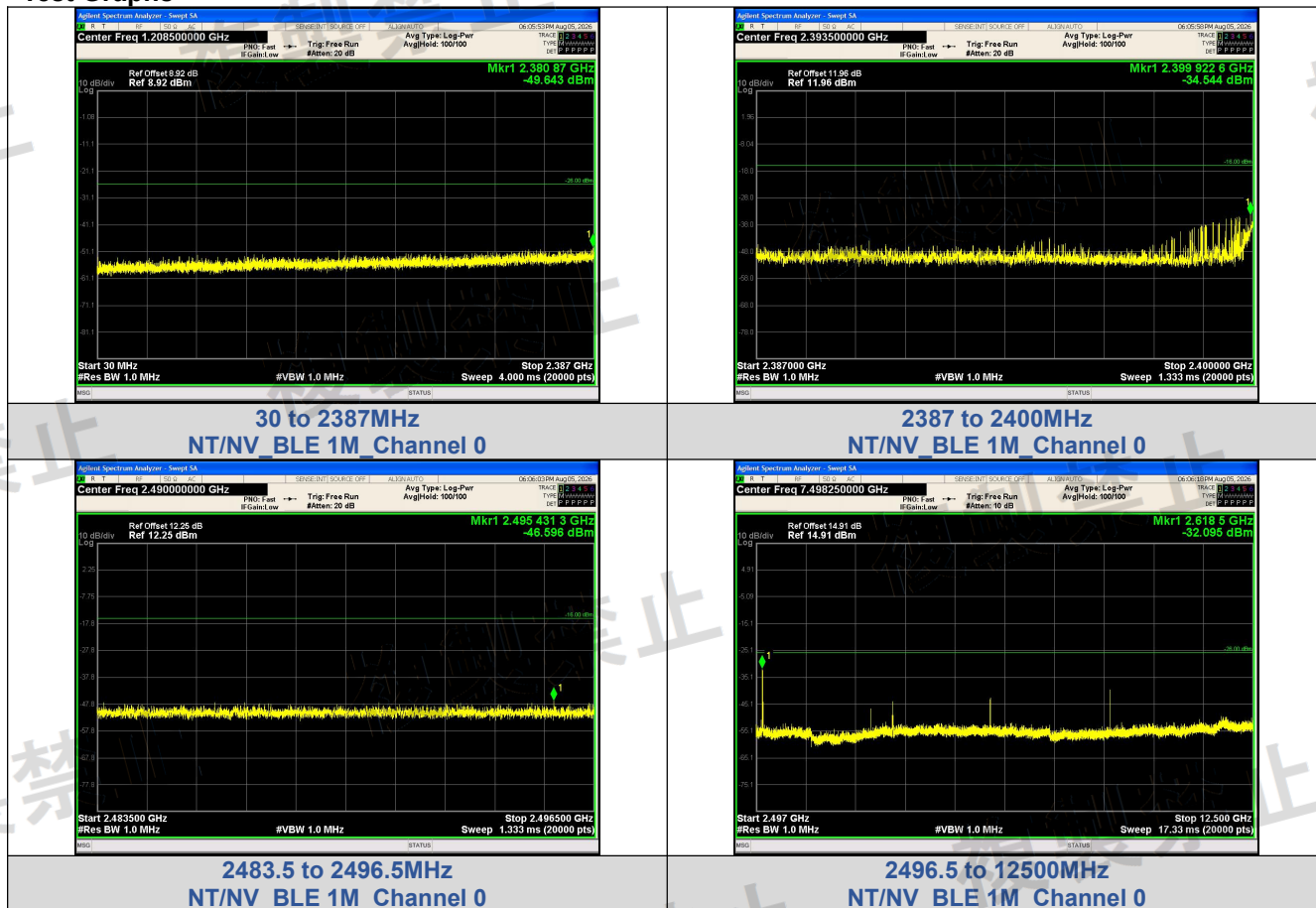
Test Result

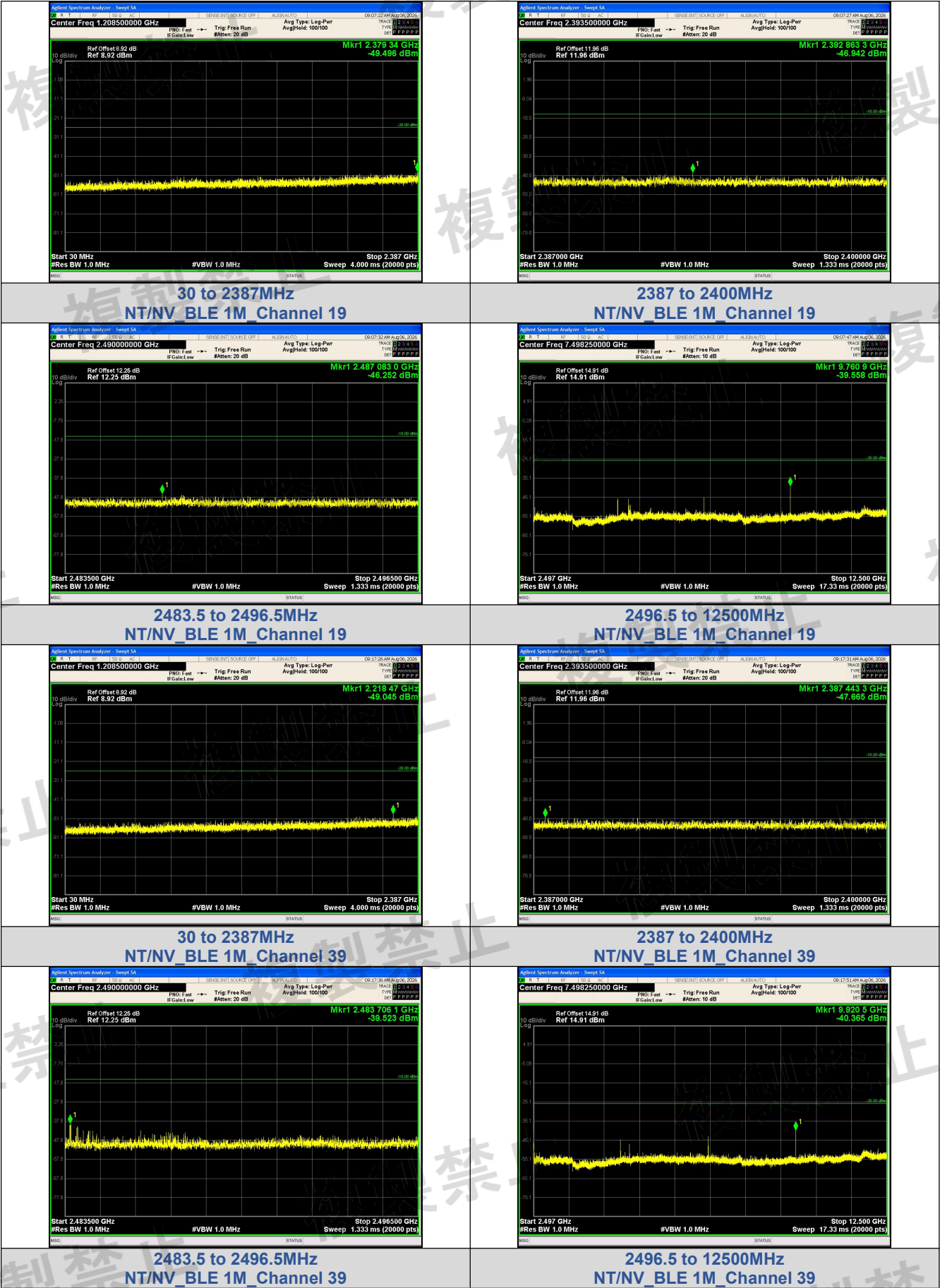
BLE 1M

Condition	Frequency Range	Lowest Channel			Middle Channel			Highest Channel			Limit ($\mu\text{W/M Hz}$)
		Peak (Mhz)	Measured Value (dbm)	Measured Value ($\mu\text{W/M Hz}$)	Peak (Mhz)	Measured Value (dbm)	Measured Value ($\mu\text{W/M Hz}$)	Peak (Mhz)	Measured Value (dbm)	Measured Value ($\mu\text{W/M Hz}$)	
NT/NV	30 to 2387	2380.871	-49.643	0.011	2379.339	-49.496	0.011	2218.466	-49.045	0.012	2.5
NT/NV	2387 to 2400	2399.923	-34.544	0.351	2392.863	-46.942	0.02	2387.443	-47.665	0.017	25
NT/NV	2483.5 to 2496.5	2495.431	-46.596	0.022	2487.083	-46.252	0.024	2483.706	-39.523	0.112	25
NT/NV	2496.5 to 12500	2618.549	-32.095	0.617	9760.905	-39.558	0.111	9920.469	-40.365	0.092	2.5
NT/NV											None

Result: PASS

Test Graphs



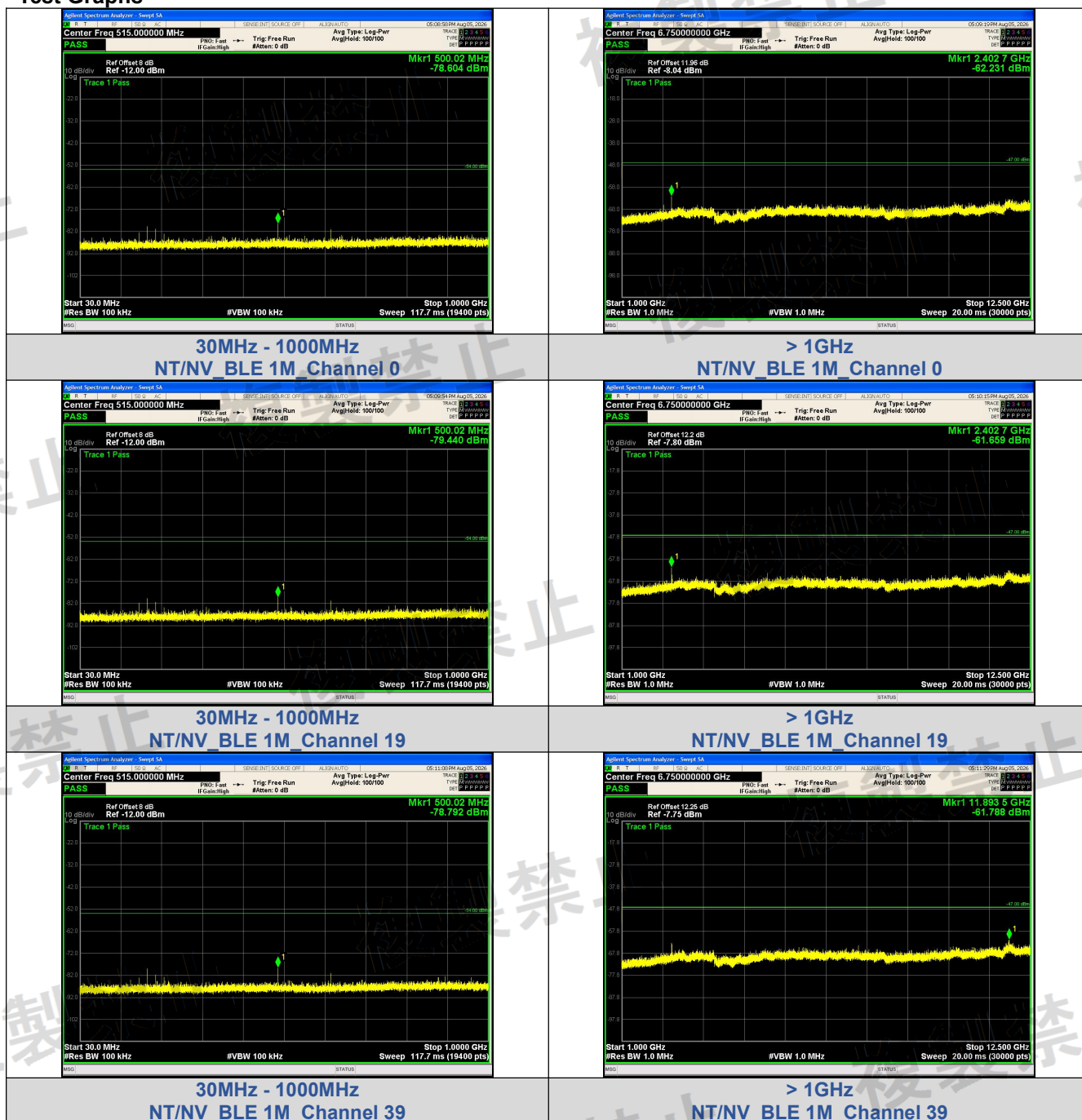


APPENDIX VII. Spurious Emissions of Receiver

Test Result BLE 1M

Condition	Channel	Frequency Range (MHz)	Peak (MHz)	Measured Value (dBm)	Limit		Result
					dBm	nW	
NT/NV	0	30 to 1000	500.024	-78.604	-54	≤4	PASS
		1000 to 12500	2402.663	-62.231	-47	≤20	PASS
	19	30 to 1000	500.024	-79.440	-54	≤4	PASS
		1000 to 12500	2402.663	-61.659	-47	≤20	PASS
	39	30 to 1000	500.024	-78.792	-54	≤4	PASS
		1000 to 12500	11893.546	-61.788	-47	≤20	PASS

Test Graphs



***** End of Report *****