

JAPAN RADIO TEST REPORT

Report Reference No.: 25EJSS11053 11681

Date Sample(s) Received: 2025-11-18

Date Tested: From 2025-11-20 to 2025-11-27

Date of issue.....: 2025-12-02

Testing Laboratory.....: DongGuan ShuoXin Electronic Technology Co., Ltd.

Address: Zone A, 1F, No. 6, XinGang Road YuanGang Street, XinAn
District, ChangAn Town, DongGuan City, GuangDong, China

Applicant's name: Panasonic Corporation

Address: 1006 Kadoma, Kadoma City, Osaka, 571-8501, Japan

Test specification:

Test item description: Bluetooth Module

Trade Mark: Panasonic

Model/Type reference: BT3086P

Ratings: I/P: DC 5V

Responsible Engineer :

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Leo Chen

Authorized Signatory:

Smile Wang
Smile Wang

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TEST REPORT DECLARE

Applicant	:	Panasonic Corporation
Address	:	1006 Kadoma, Kadoma City, Osaka, 571-8501, Japan
Equipment under Test	:	Bluetooth Module
Model No	:	BT3086P
Trade Mark	:	Panasonic
Manufacturer	:	Panasonic Corporation
Address	:	1006 Kadoma, Kadoma City, Osaka, 571-8501, Japan
Test Standard Used	:	Article 49-20 and the relevant articles of the Ordinance Regulating Radio Equipment
Test method	:	MIC notice No.88 Appendix No.43

We Declare:

The equipment described above is tested by DongGuan ShuoXin Electronic Technology Co., Ltd. and in the configuration tested the equipment complied with the standard specified above. The test results are contained in this test report and DongGuan ShuoXin Electronic Technology Co.,Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

1. Summary of test results

CLAUSE	TEST PARAMETER	RESULTS
Transmitter Parameters		
3.2 (2)	Antenna Power	PASS
3.2 (3)	Tolerances for Antenna Power	PASS
3.2 (4)	Frequency Tolerance	PASS
3.2 (6)	Spurious Emissions	PASS
3.2 (7)	Occupied Frequency Bandwidth	PASS
3.2 (8)	Spread Bandwidth	PASS
3.2 (11)	Dwell Time	PASS
3.2 (12)	Interference prevention function	PASS
3.2 (13)	Transmission antenna gain	PASS
3.2 (14)	Transmission radiation angle width	N/A
Receiver Parameters		
3.3 (1)	Secondary Radiated Emissions	PASS
N/A is an abbreviation for Not Applicable.		

2. General test information

2.1. Description of EUT

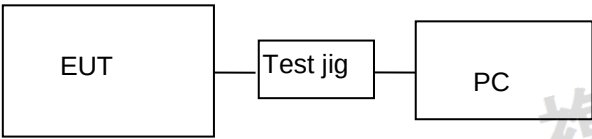
EUT* Name	:	Bluetooth Module
Model Number	:	BT3086P
Trade Mark	:	Panasonic
EUT function description	:	Please reference user manual of this device
Power supply	:	DC 5V
Adapter	:	N/A
Radio Specification	:	Bluetooth V5.3(EDR)
Operation frequency	:	2402MHz -2480MHz
Modulation	:	GFSK, $\pi/4$ QPSK, 8-DPSK
Data rate	:	1Mbps, 2Mbps, 3Mbps
Antenna Type	:	PCB Antenna Total maximum PK gain: 1dBi
Date of Receipt	:	2025/11/18
Sample Type	:	Series production
Software version	:	0.1.7
Hardware version	:	MU3

Note: EUT is the ab. of equipment under test.

2.2. Assistant equipment used for test

Description of Assistant equipment	Manufacturer	Model number or Type	Other
Notebook	Lenovo	Thinkbook 15	/

2.3. Block diagram of EUT configuration for test



EUT's Bluetooth module was connected to a special test jig provided by manufacturer which has a standard SPI connector to connect to control PC, and the control PC will run a special test software "Blue Test3.exe" provided by manufacturer to control EUT work in test mode as blow table.

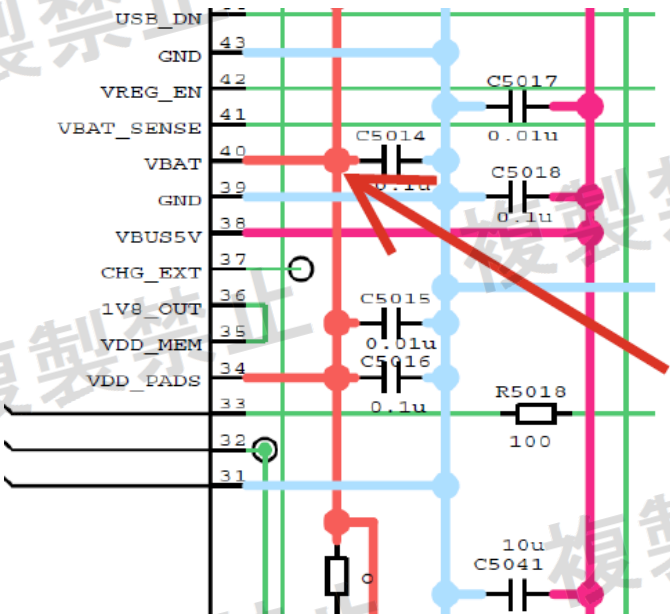
Channel List							
CH	Frequency	CH	Frequency	CH	Frequency	CH	Frequency
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
Carrier Tx Mode	CH0	2402
	CH39	2441
	CH78	2480
GFSK hopping on Tx Mode	CH0 to CH78	2402 to 2480
$\pi/4$ -QPSK hopping on Tx Mode	CH0 to CH78	2402 to 2480
8-DPSK hopping on Tx Mode	CH0 to CH78	2402 to 2480
GFSK hopping off Tx Mode	CH0	2402
	CH39	2441
	CH78	2480
$\pi/4$ -QPSK hopping off Tx Mode	CH0	2402
	CH39	2441
	CH78	2480
8-DPSK hopping off Tx Mode	CH0	2402
	CH39	2441
	CH78	2480
GFSK Rx Mode	CH0	2402
	CH39	2441
	CH78	2480
$\pi/4$ -QPSK Rx Mode	CH0	2402
	CH39	2441
	CH78	2480
8-DPSK Rx Mode	CH0	2402
	CH39	2441
	CH78	2480

2.4. EUT Test Voltage

EUT and Module input voltage test			
	Low(-10%)	Normal	Hight(+10%)
EUT Setup Value (Vdc)	4.50	5.00	5.50
Module Vdd Power Measurement Value (Vdc)	3.275	3.275	3.275
Voltage error (%)	0	/	0
Limit (%)	1	/	1
Judgment	PASS	/	PASS
The normal voltage settings are respectively adopted during the test. Because the voltage error are less than 1%.			

Measuring point



2.5. Test environment conditions

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

	Normal Conditions
Temperature range	21-25°C
Humidity range	50-65%
Pressure range	86-106kPa
Power supply	DC 5V

2.6. Measurement uncertainty

Test Item	Uncertainty
RF Output power, conducted	±0.5B
Occupied Channel Bandwidth	±1%
Uncertainty for radio frequency	1×10 ⁻⁹
Power Spectral Density, Conducted	±1.3B
Unwanted Emissions, Conducted	±0.6dB
Temperature	±0.2°C
Humidity	±1%
DC and Low frequency voltage	±0.4
Time	±1%
Duty Cycle	±1%

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



3. Antenna Power

3.1. Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated until	Calibration body	classification
Spectrum analyzer	Agilent	N9010A	MY55150427	2025/05/16	2026/05/15	Jingheng	(c)
Multimeter	FLUKE	15B+	42320912WS	2025/11/13	2026/11/12	Jingheng	(c)
Attenuator	Mini-Circuits	BW-S10W2	101109	N/A	N/A	N/A	N/A
RF Cable	Micable	C10-01-01-1	100309	N/A	N/A	N/A	N/A

Remark:

(a)Calibration conducted by the National Institute of Information and Communications Technology(NITC) in Japan (hereinafter referred to as “NITC”) or a designated calibration agency under Article 102-18 paragraph(1) in JRL

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

(c)Calibration conducted in countries except Japan, which shall be equivalent to the calibration Conducted by the NITC or a designation agency under Article 102-18 paragraph(1)

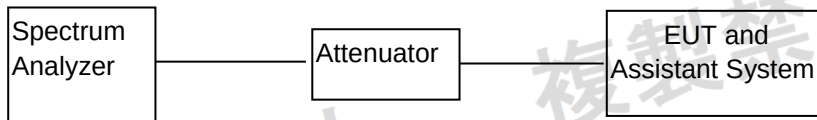
(d)Calibration, etc. conducted by using measuring instruments and other equipment listed in the night column of appended table No.3,whice shall have been given any type of calibration, etc. listed above from(a) to (c).

From JRL Article 24-2,paragraph 4,item2

3.2. Limit

Limit	3mW/MHz
Tolerance	+20%

3.3. Block diagram of test setup



3.4. Test Procedure

- (1) Configure EUT and assistant system according clause 2.3 and 3.3
- (2) Set EUT work in test mode as described in clause 2.3
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

In Search

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

Resolution BW: 1MHz

Video BW: RBW*3

Span: 160MHz

Detector: Peak

Trace Mode: Max Hold

Sweep Time: Auto

Meas.

Resolution BW: over OBW

Video BW: about same as RBW

Span: 0Hz

Detector: RMS

Trace Mode: Max Hold

Sweep Time: Auto

- (4) When the trace is complete, find the peak value of the power envelope and record.

Note: The cable loss and attenuator loss have been put into spectrum analyzer as amplitude offset.

3.5. Test result

Mode	CH	Voltage (V)	Measured		Spread Bandwidth	Result	Limit
			dBm	mW	MHz	mW/MHz	(mW/MHz)
GFSK Tx Mode	Hopping	Normal	8.349	6.838	71.317	0.096	3
$\pi/4$ -QPSK Tx Mode	Hopping		8.223	6.642	71.485	0.093	3
8-DPSK Tx Mode	Hopping		8.600	7.244	71.267	0.102	3

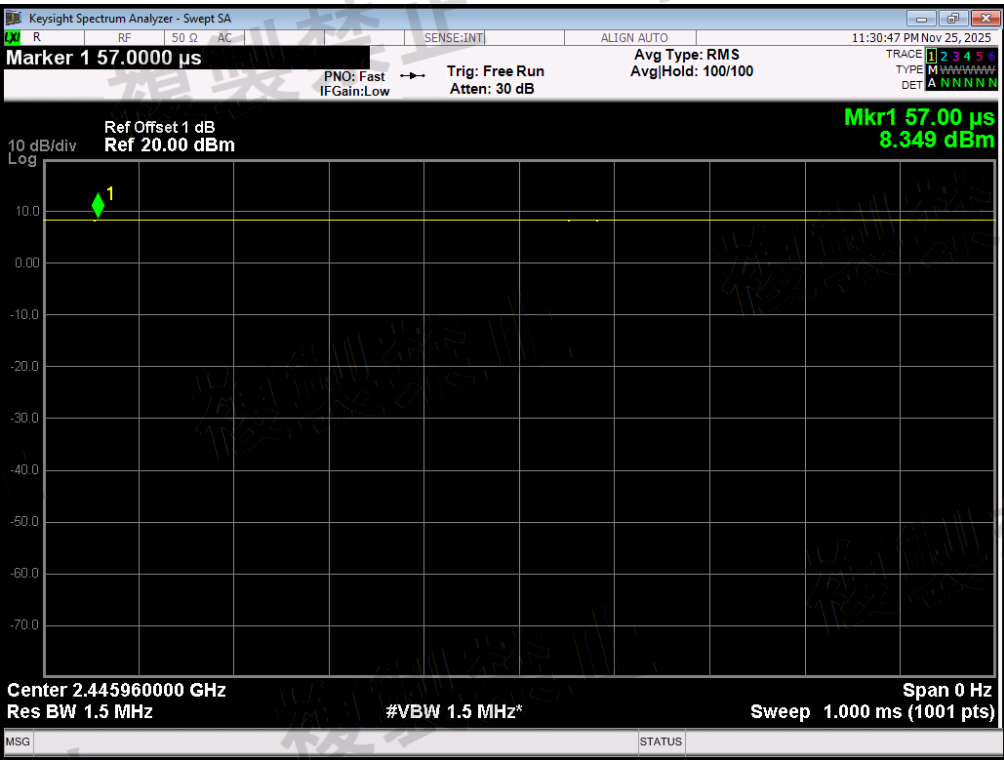
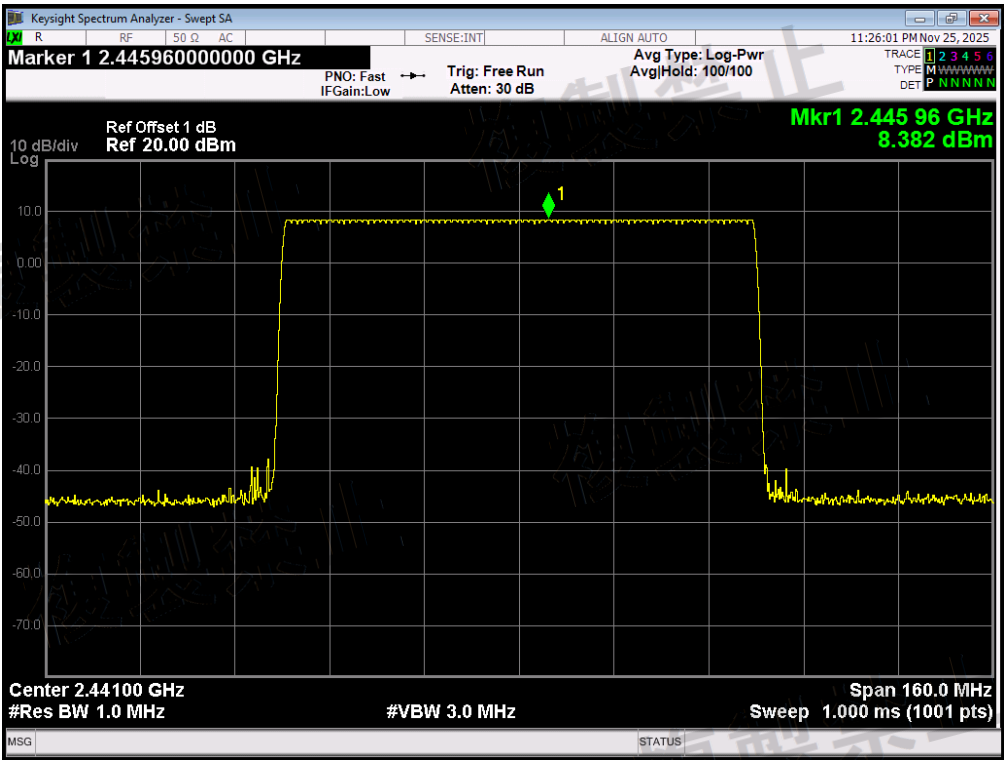
Conclusion : PASS

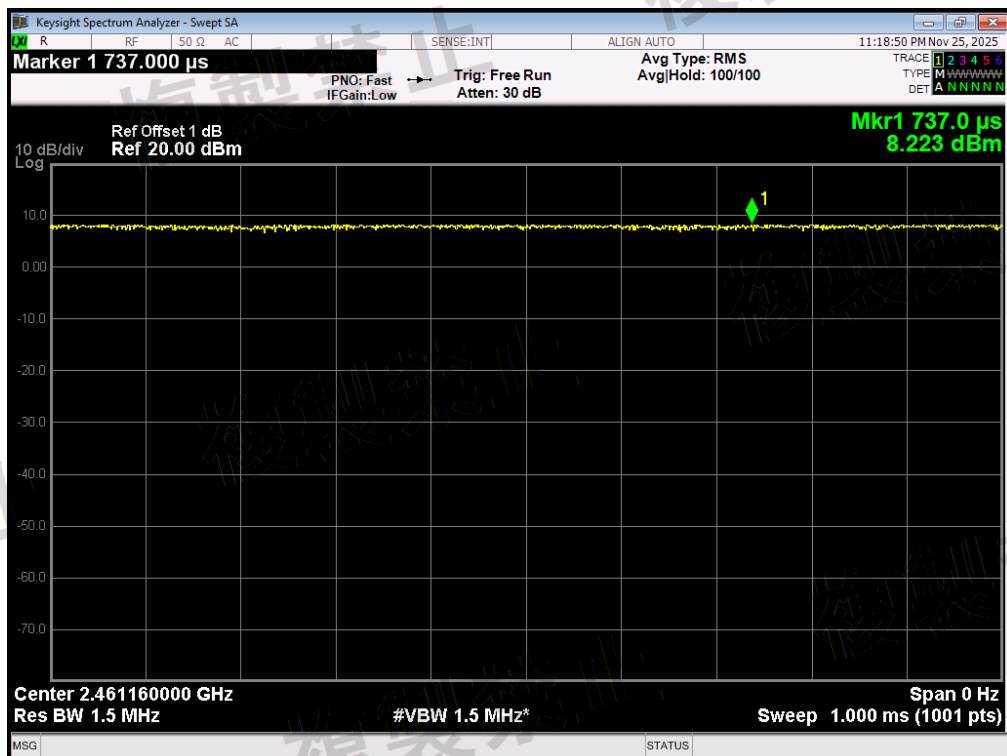
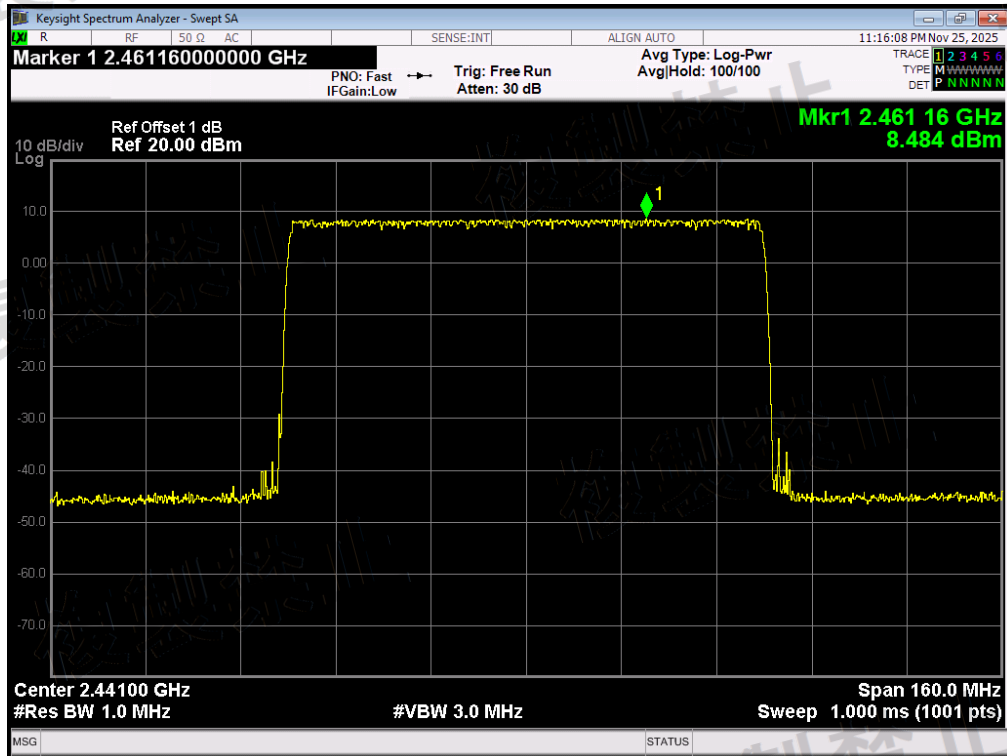
Mode	CH	Voltage (V)	Stated power	Result	Tolerance	Limit
			(mW/MHz)	(mW/MHz)	%	%
GFSK Tx Mode	Hopping	Normal	0.11	0.096	-12.73	+20
$\pi/4$ -QPSK Tx Mode	Hopping		0.11	0.093	-15.45	+20
8-DPSK Tx Mode	Hopping		0.11	0.102	-7.27	+20

Conclusion : PASS

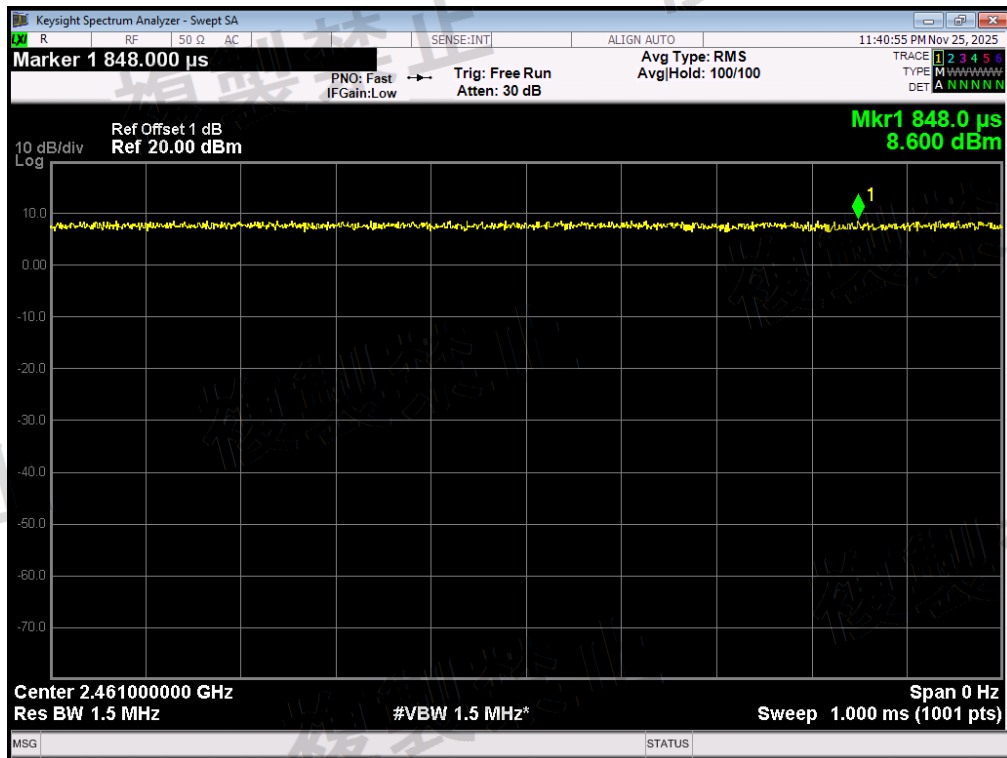
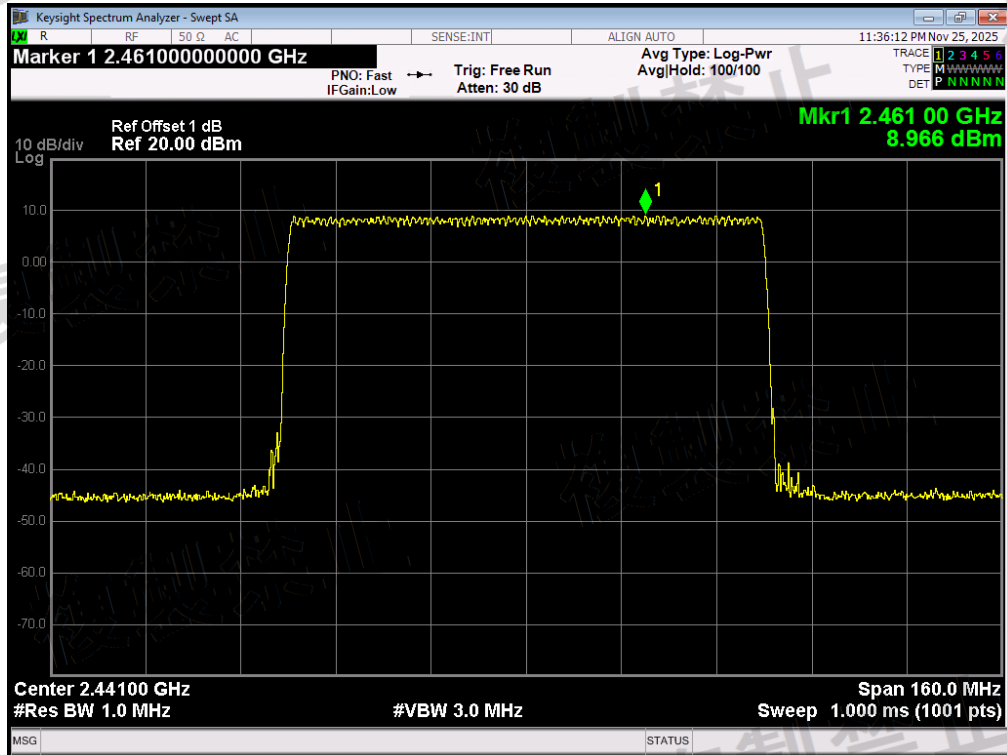
3.6. Original Test Data

GFSK Hopping on



$\pi/4$ -QPSK Hopping on

8-DPSK Hopping on



4. Frequency Tolerance

4.1. Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated until	Calibration body	classification
Spectrum analyzer	Agilent	N9010A	MY55150427	2025/05/16	2026/05/15	Jingheng	(c)
Multimeter	FLUKE	15B+	42320912WS	2025/11/13	2026/11/12	Jingheng	(c)
Attenuator	Mini-Circuits	BW-S10W2	101109	N/A	N/A	N/A	N/A
RF Cable	Micable	C10-01-01-1	100309	N/A	N/A	N/A	N/A

Remark:

(a) Calibration conducted by the National Institute of Information and Communications Technology(NITC) in Japan (hereinafter referred to as “NITC”) or a designated calibration agency under Article 102-18 paragraph(1) in JRL

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

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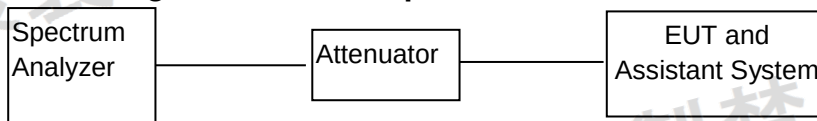
(d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the night column of appended table No.3,whice shall have been given any type of calibration, etc. listed above from(a) to (c).

From JRL Article 24-2,paragraph 4,item2

4.2. Limit

+/- 50x 10⁻⁶ or less (50ppm)

4.3. Block diagram of test setup



4.4. Test Procedure

- (1) Configure EUT and assistant system according clause 2.3 and 4.3
- (2) Set EUT work in carrier Tx mode as described in clause 2.3
- (3) 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: 1KHz.

Video BW: 3 KHz.

Span: 100 KHz.

Detector: Peak.

Trace Mode: Max Hold.

- (4) When the trace is complete, find the peak value of the power envelope and record the frequency.

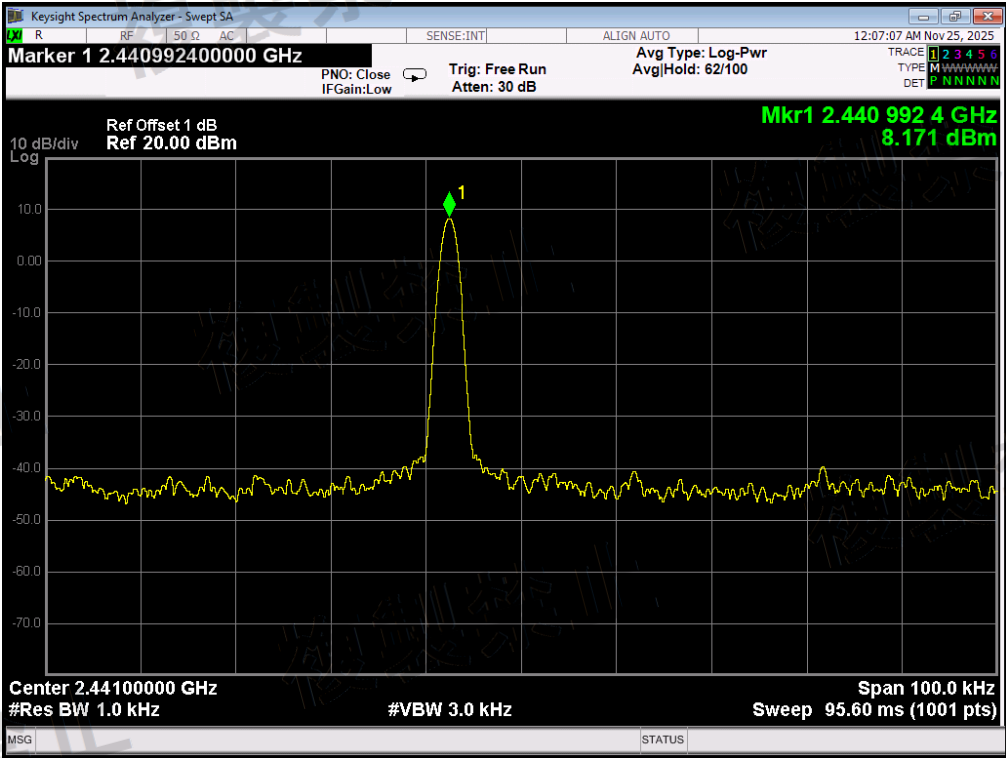
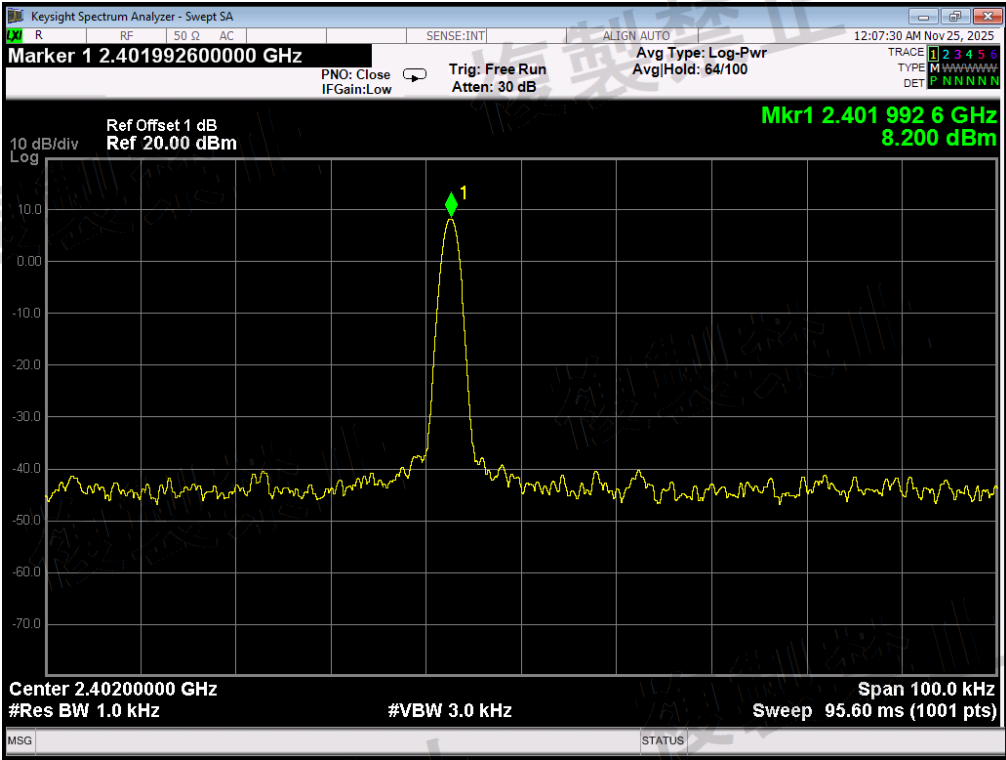


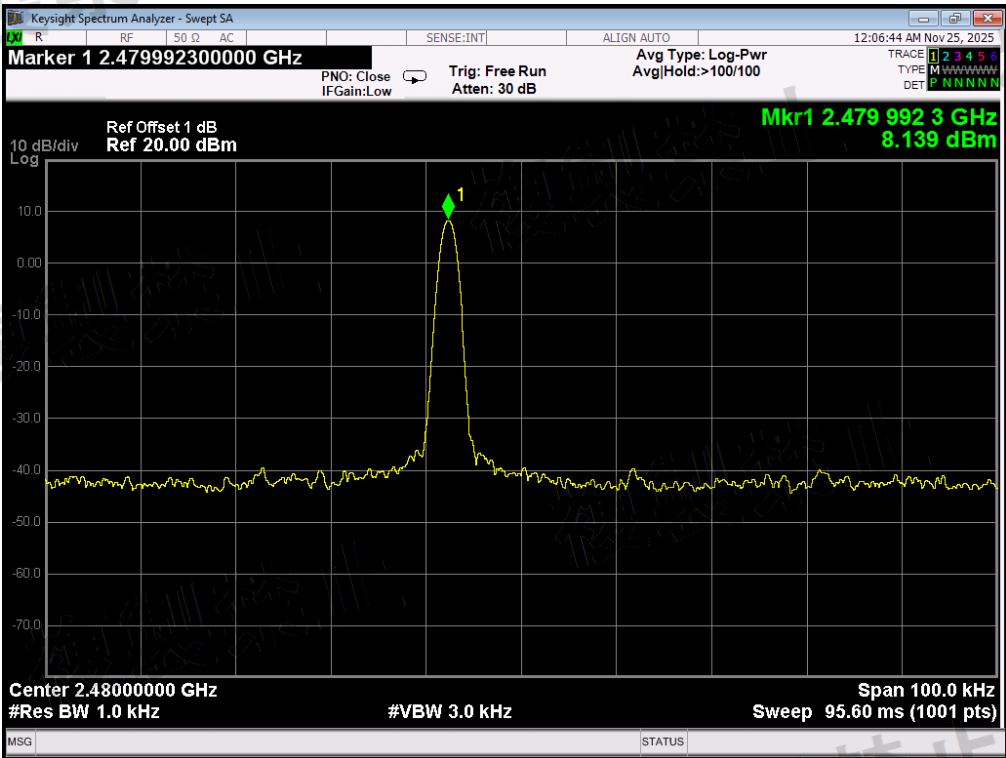
4.5. Test result

Mode	CH	Voltage (V)	Result			Limit
			Measured (MHz)	Tolerance (kHz)	Tolerance (ppm)	ppm
Carrier Tx Mode	CH0:2402MHz	Normal	2401.9926	7.4	-3.081	±50
	CH39:2441MHz		2440.9924	7.6	-3.113	±50
	CH78:2480MHz		2479.9923	7.7	-3.105	±50
Conclusion : PASS						

4.6. Original test data

Normal Voltage





5. Occupied Frequency Bandwidth

5.1. Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated until	Calibration body	classification
Spectrum analyzer	Agilent	N9010A	MY55150427	2025/05/16	2026/05/15	Jingheng	(c)
Multimeter	FLUKE	15B+	42320912WS	2025/11/13	2026/11/12	Jingheng	(c)
Attenuator	Mini-Circuits	BW-S10W2	101109	N/A	N/A	N/A	N/A
RF Cable	Micable	C10-01-01-1	100309	N/A	N/A	N/A	N/A

Remark:

(a)Calibration conducted by the National Institute of Information and Communications Technology(NITC) in Japan (hereinafter referred to as “NITC”) or a designated calibration agency under Article 102-18 paragraph(1) in JRL

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

(c)Calibration conducted in countries except Japan, which shall be equivalent to the calibration Conducted by the NITC or a designation agency under Article 102-18 paragraph(1)

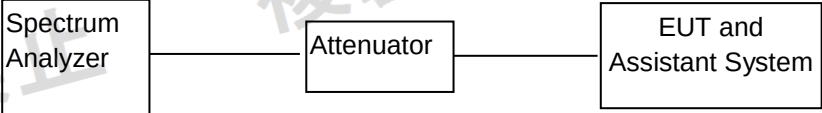
(d)Calibration, etc. conducted by using measuring instruments and other equipment listed in the night column of appended table No.3,whice shall have been given any type of calibration, etc. listed above from(a) to (c).

From JRL Article 24-2,paragraph 4,item2

5.2. Limit

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.

5.3. Block diagram of test setup



5.4. Test Procedure

- (1) Configure EUT and assistant system according clause 2.3 and 5.3
- (2) Set EUT work in test mode as described in clause 2.3
- (3) 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: 30 KHz
 - Video BW: 100 KHz
 - Span: Wide enough to cover the complete power envelope of the signal of the EUT.
 - Detector: Peak.
 - Trace Mode: Max Hold.
- (4) When the trace is complete, measure the occupied bandwidth (99% bandwidth) with spectrum analyzer's bandwidth measure function.

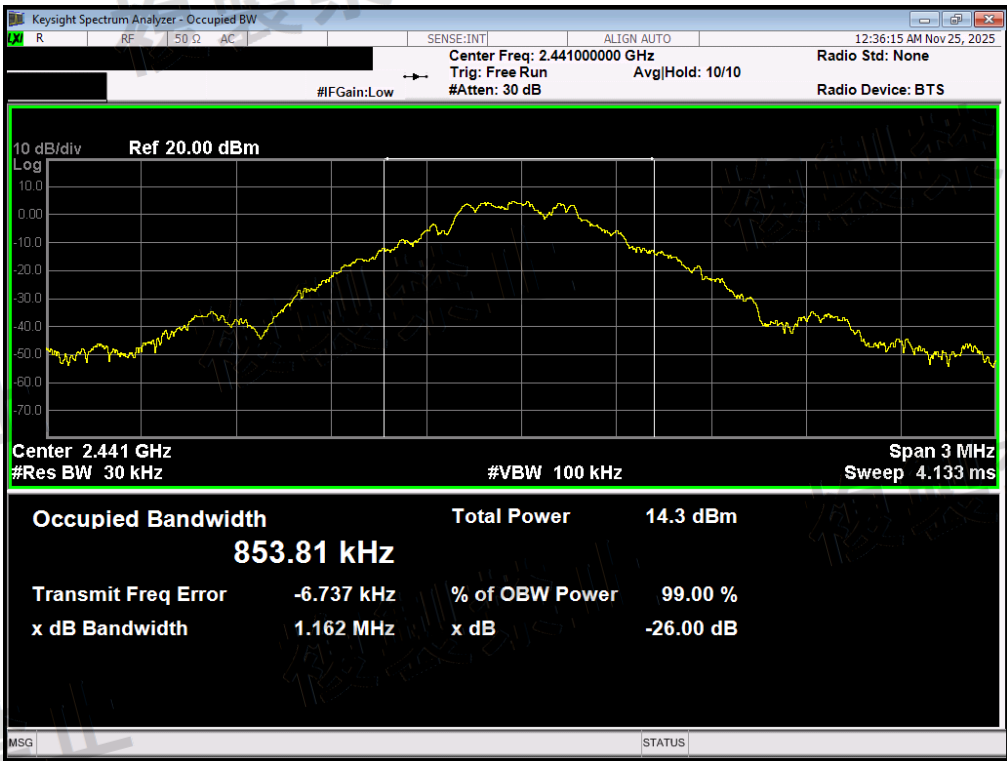
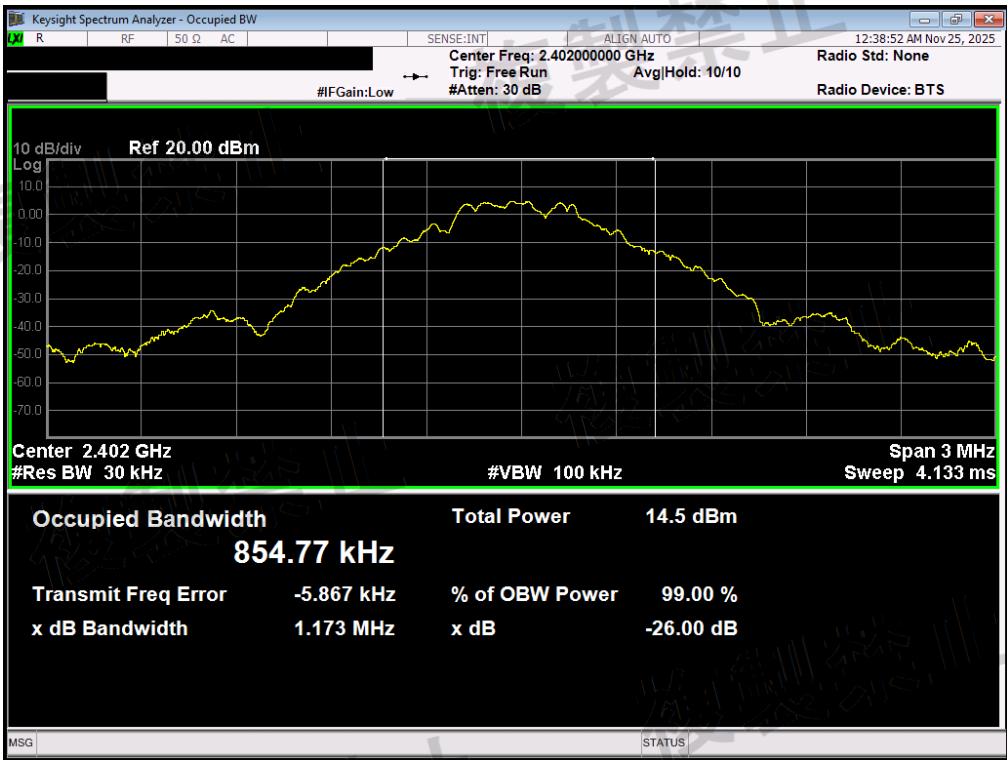
5.5. Test result

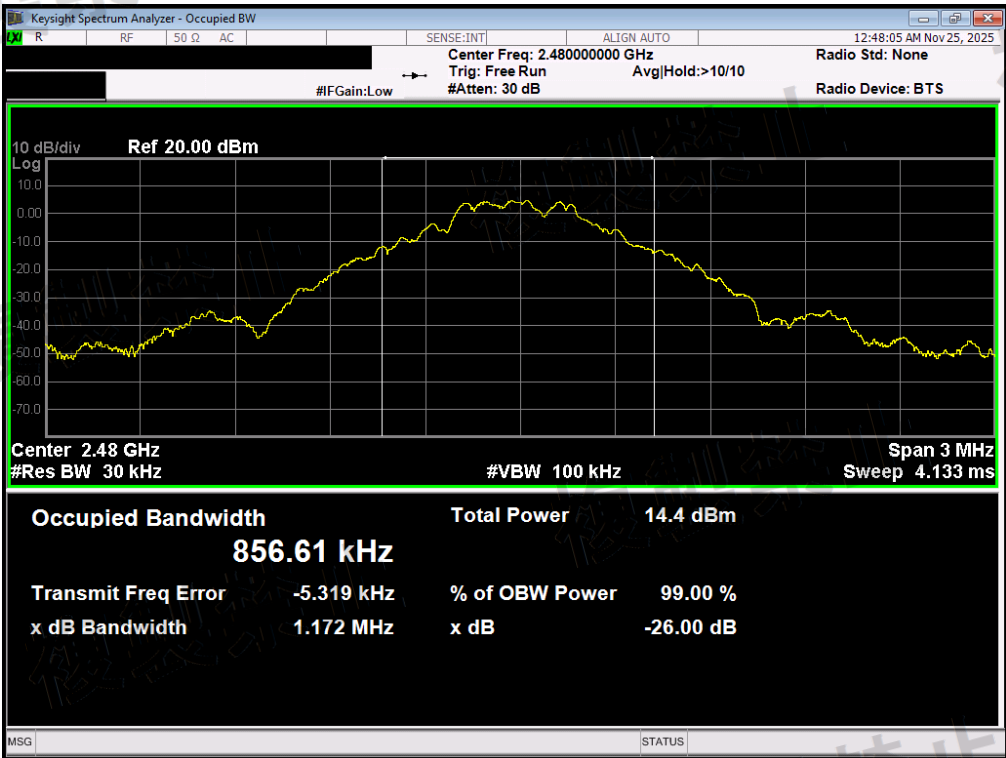
Mode	CH	Voltage (V)	Result	Limit
			MHz	MHz
GFSK Tx Mode Hopping off	CH0	Normal	0.8547	83.5
	CH39		0.8538	83.5
	CH78		0.8566	83.5
$\pi/4$ -QPSK Tx Mode Hopping off	CH0		1.1802	83.5
	CH39		1.1803	83.5
	CH78		1.1824	83.5
8-DPSK Tx Mode Hopping off	CH0		1.1683	83.5
	CH39		1.1706	83.5
	CH78		1.1699	83.5
Conclusion : PASS				

Mode	CH	Voltage (V)	Result MHz	Limit MHz
GFSK Tx Mode Hopping on	CH0-CH78	Normal	78.177	83.5
$\pi/4$ -QPSK Tx Mode Hopping on	CH0-CH78		78.384	83.5
8-DPSK Tx Mode Hopping on	CH0-CH78		78.386	83.5
Conclusion : PASS				

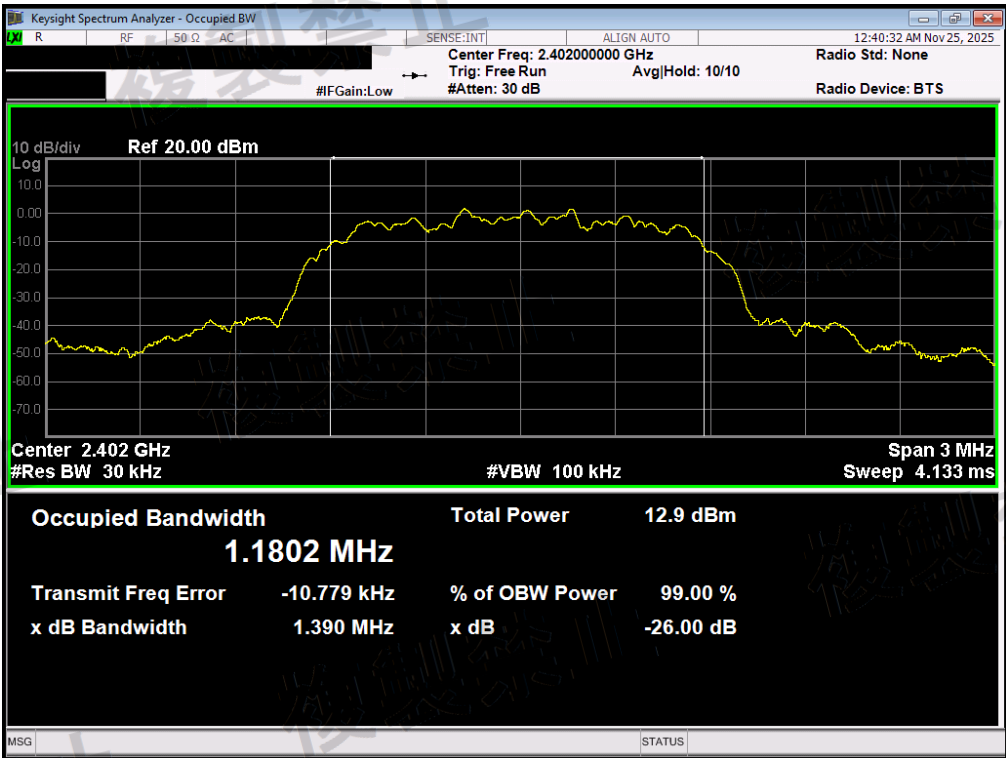
5.6. Original test data

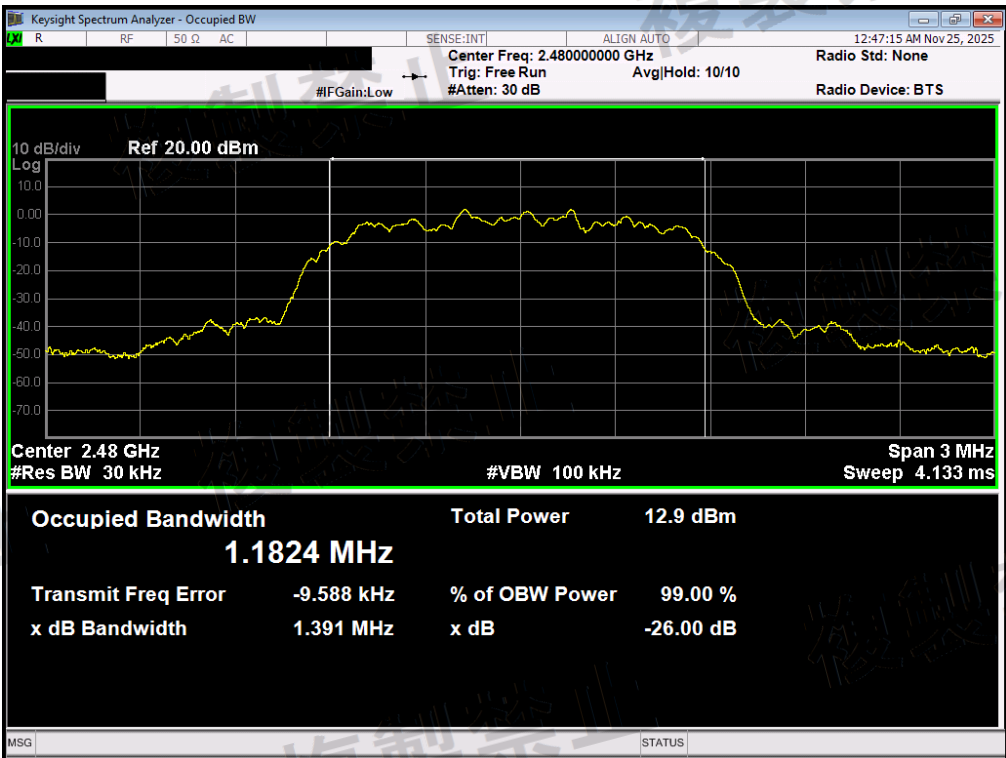
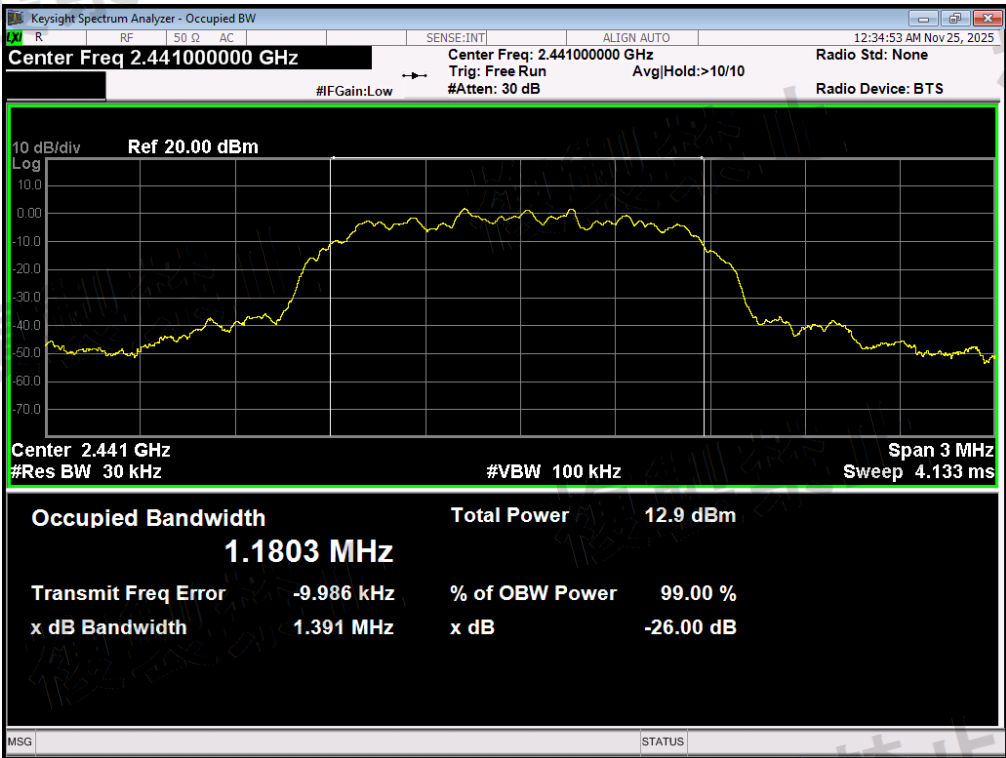
GFSK Tx Mode Hopping off



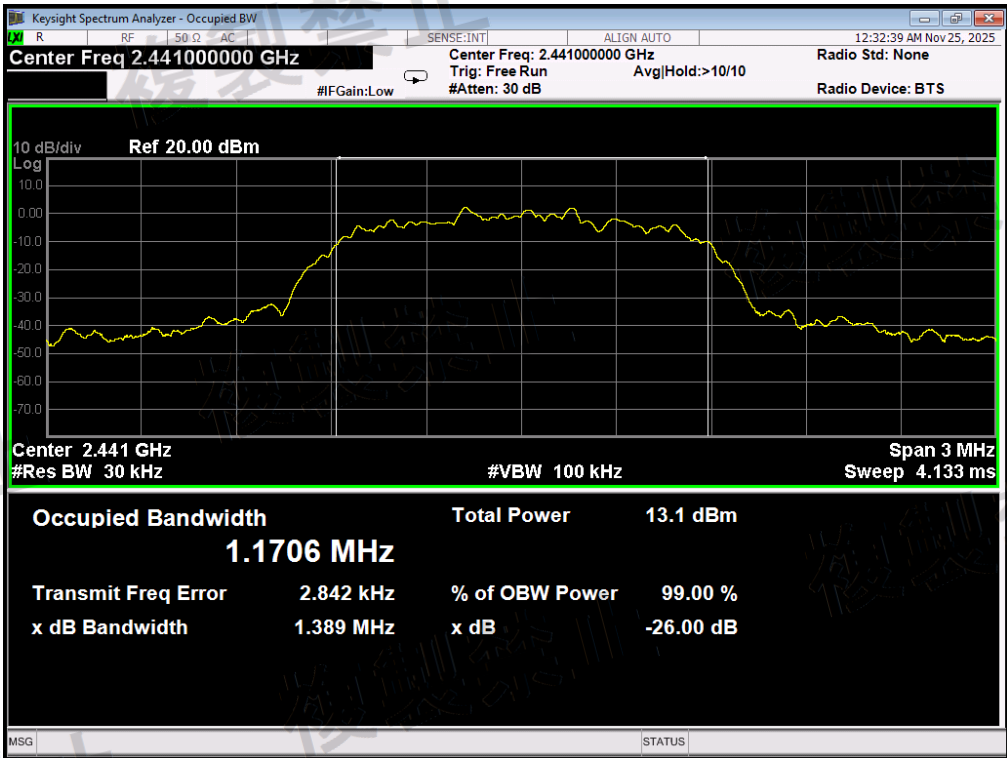
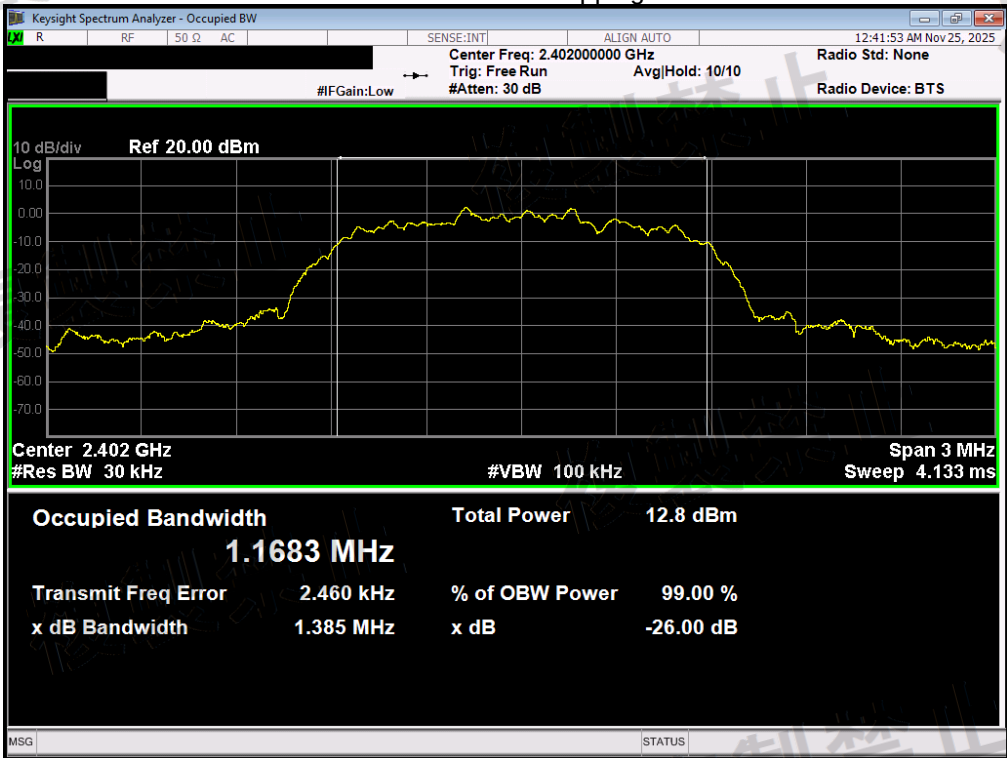


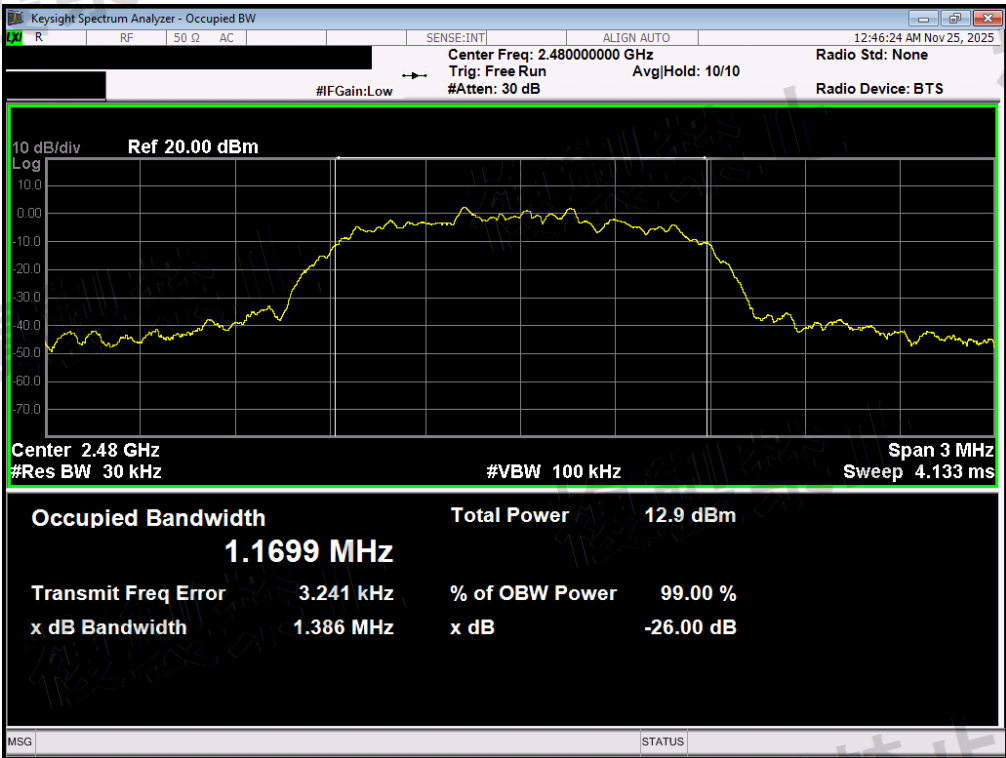
$\pi/4$ -QPSK Tx Mode Hopping off



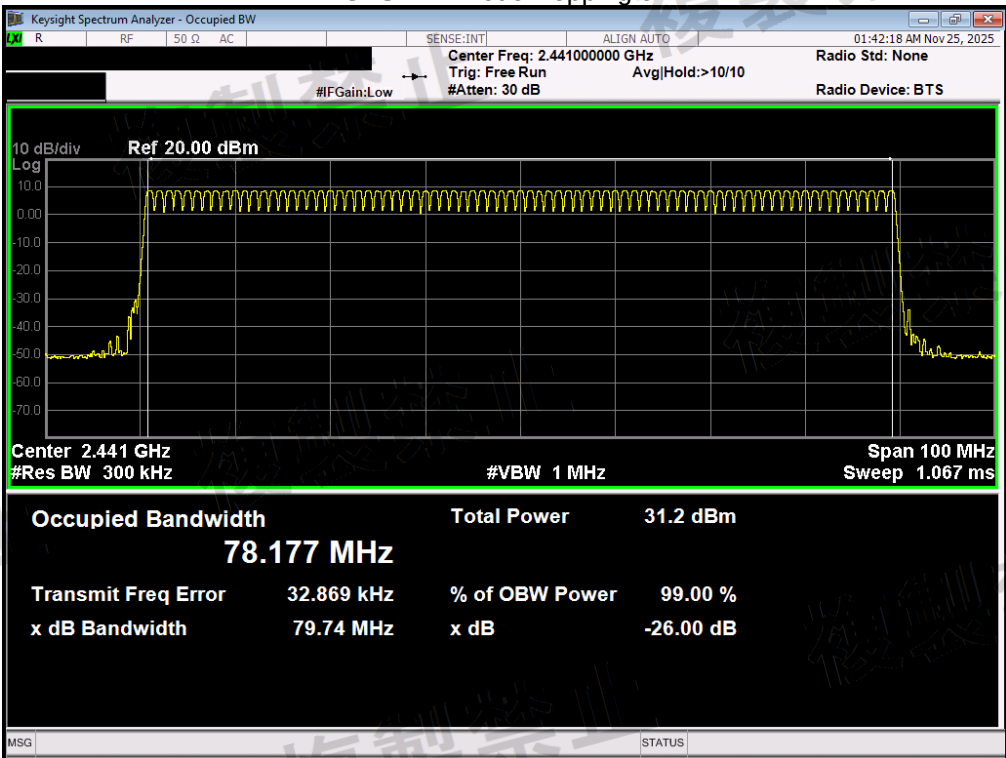


8-DPSK Tx Mode Hopping off

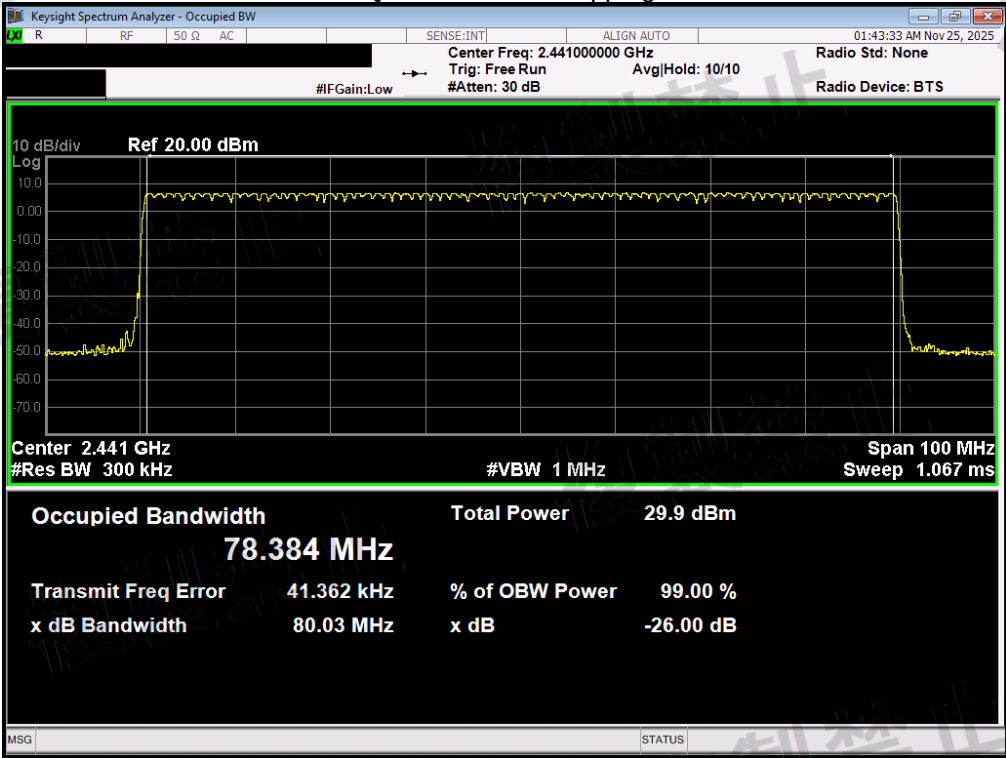




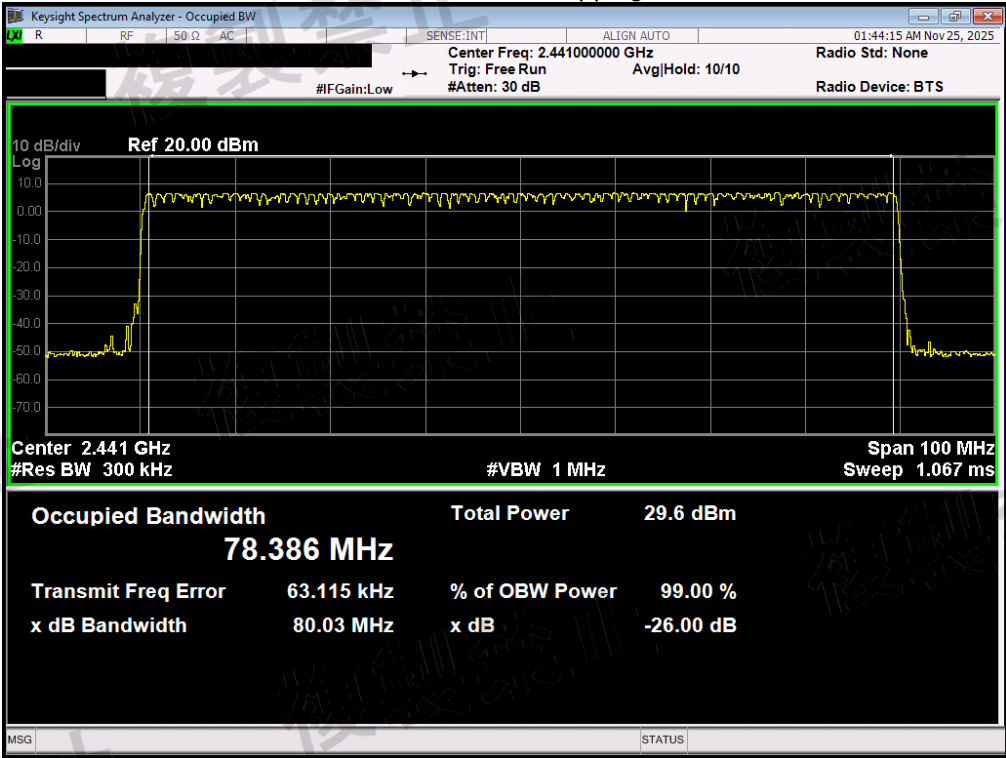
GFSK Tx Mode Hopping on



$\pi/4$ -QPSK Tx Mode Hopping on



8-DPSK Tx Mode Hopping on



6. Spread Bandwidth

6.1. Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated until	Calibration body	classification
Spectrum analyzer	Agilent	N9010A	MY55150427	2025/05/16	2026/05/15	Jingheng	(c)
Multimeter	FLUKE	15B+	42320912WS	2025/11/13	2026/11/12	Jingheng	(c)
Attenuator	Mini-Circuits	BW-S10W2	101109	N/A	N/A	N/A	N/A
RF Cable	Micable	C10-01-01-1	100309	N/A	N/A	N/A	N/A

Remark:

(a)Calibration conducted by the National Institute of Information and Communications Technology(NITC) in Japan (hereinafter referred to as “NITC”) or a designated calibration agency under Article 102-18 paragraph(1) in JRL

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

(c)Calibration conducted in countries except Japan, which shall be equivalent to the calibration Conducted by the NITC or a designation agency under Article 102-18 paragraph(1)

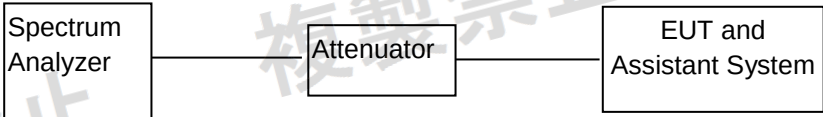
(d)Calibration, etc. conducted by using measuring instruments and other equipment listed in the night column of appended table No.3,whice shall have been given any type of calibration, etc. listed above from(a) to (c).

From JRL Article 24-2,paragraph 4,item2

6.2. Limit

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

6.3. Block diagram of test setup



6.4. Test Procedure

- (1) Configure EUT and assistant system according clause 2.4 and 6.3
- (2) Set EUT work in test mode as described in clause 2.4
- (3) 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: 300 KHz.
Video BW: 1 MHz.
Span: Wide enough to cover the complete power envelope of the signal of the EUT.
Detector: Peak.
Trace Mode: Max Hold.
- (4) When the trace is complete, measure the spread bandwidth (90% bandwidth) with spectrum analyzer's bandwidth measure function.

6.5. Test result

Mode	CH	Voltage (V)	Result	Limit
			MHz	KHz
GFSK Tx Mode Hopping on	CH0-CH78	Normal	71.317	>500
$\pi/4$ -QPSK Tx Mode Hopping on	CH0-CH78		71.485	>500
8-DPSK Tx Mode Hopping on	CH0-CH78		71.267	>500
Conclusion : PASS				

Note:

GFSK mode Spreading factor= Spread Bandwidth/ Symbol rate =71.317MHz

$\pi/4$ -QPSK mode Spreading factor = Spread Bandwidth/ Symbol rate =71.485MHz

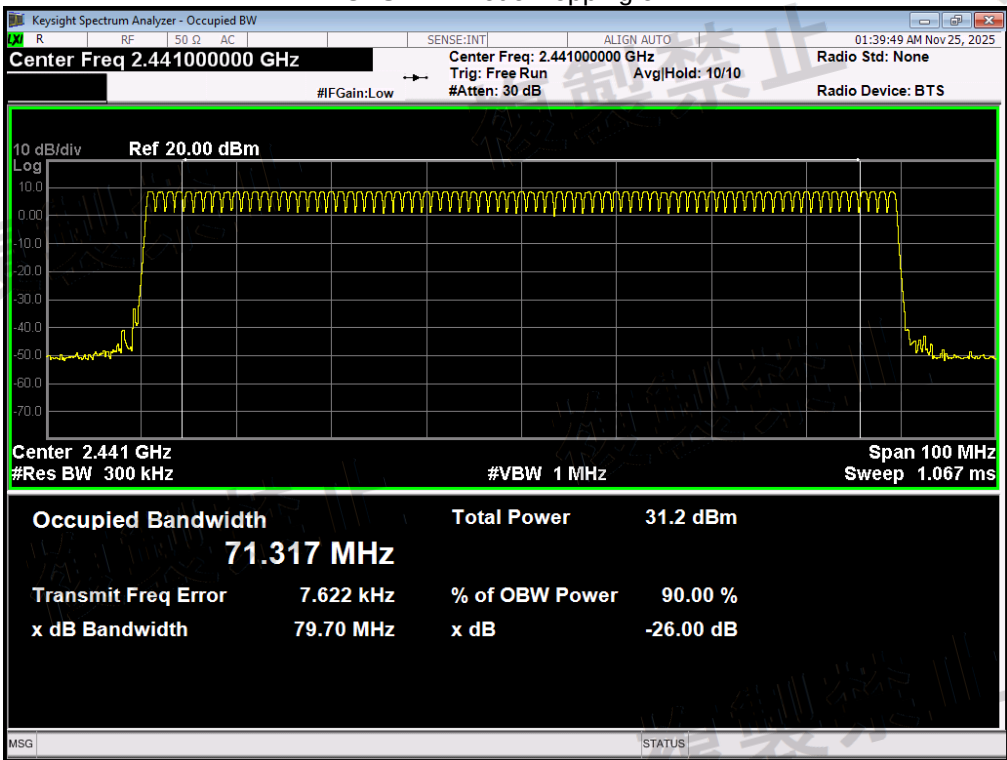
8-DPSK mode Spreading factor = Spread Bandwidth/ Symbol rate =71.267MHz

Symbol rate=1MHz

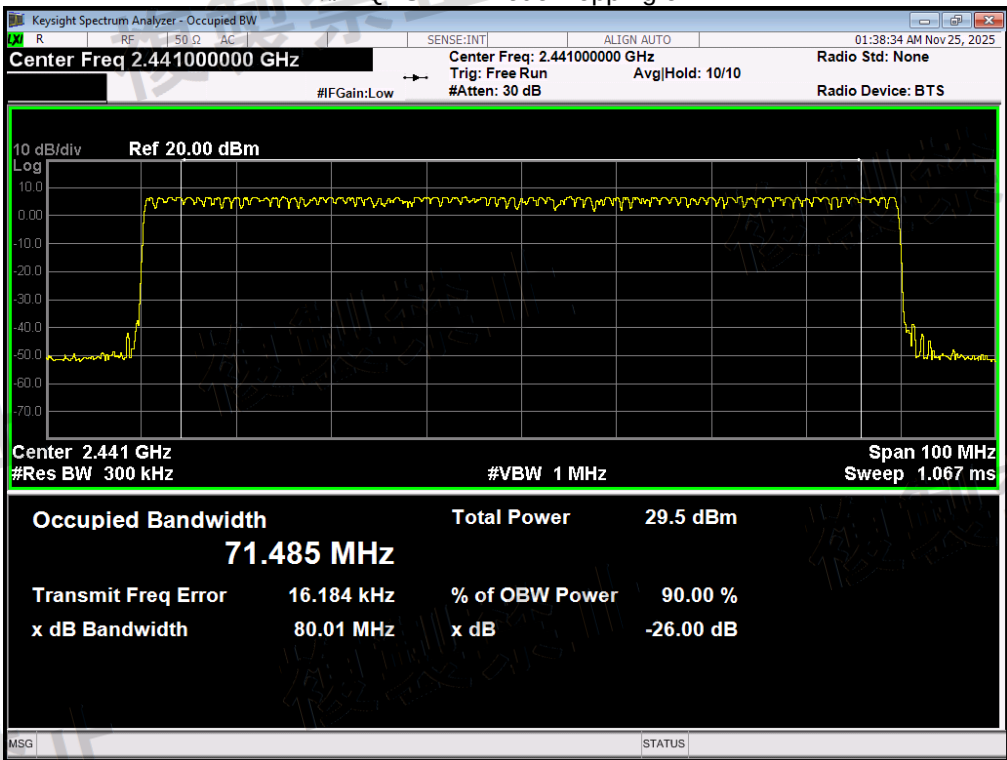
Spreading factor $\geq$ 5

6.6. Original test data

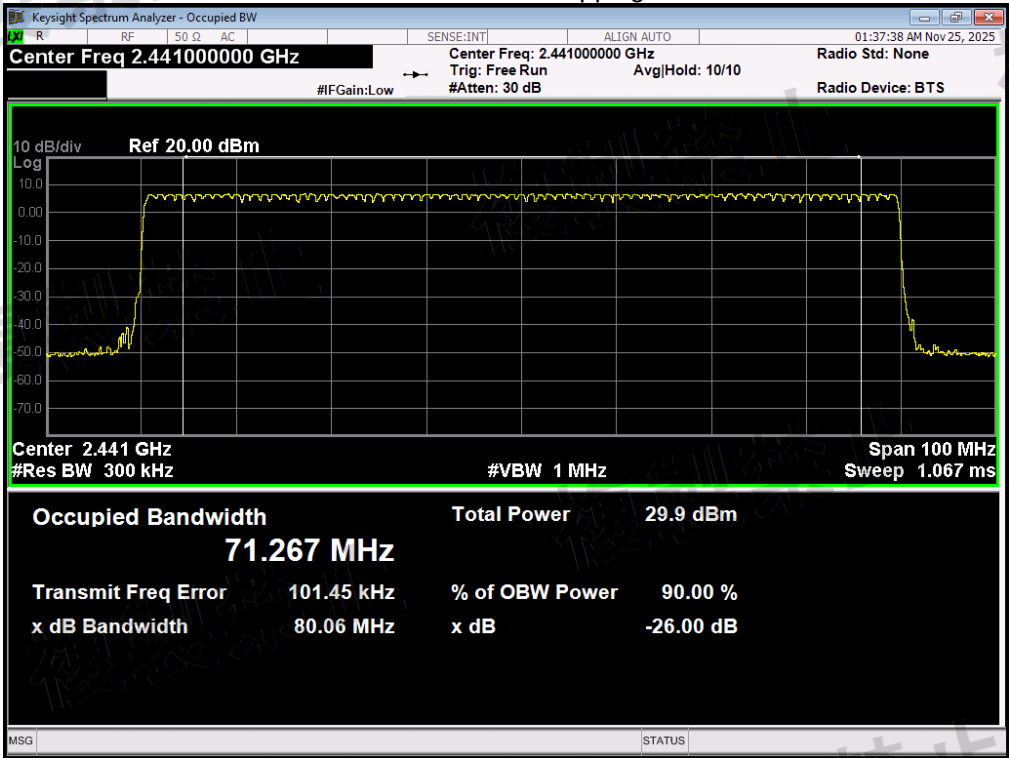
GFSK Tx Mode Hopping on



$\pi/4$ -QPSK Tx Mode Hopping on



8-DPSK Tx Mode Hopping on



7. Dwell time

7.1. Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated until	Calibration body	classification
Spectrum analyzer	Agilent	N9010A	MY55150427	2025/05/16	2026/05/15	Jingheng	(c)
Multimeter	FLUKE	15B+	42320912WS	2025/11/13	2026/11/12	Jingheng	(c)
Attenuator	Mini-Circuits	BW-S10W2	101109	N/A	N/A	N/A	N/A
RF Cable	Micable	C10-01-01-1	100309	N/A	N/A	N/A	N/A

Remark:

(a)Calibration conducted by the National Institute of Information and Communications Technology(NITC) in Japan (hereinafter referred to as “NITC”) or a designated calibration agency under Article 102-18 paragraph(1) in JRL

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

(c)Calibration conducted in countries except Japan, which shall be equivalent to the calibration Conducted by the NITC or a designation agency under Article 102-18 paragraph(1)

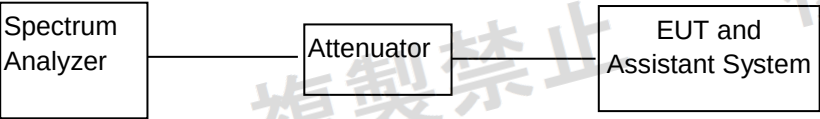
(d)Calibration, etc. conducted by using measuring instruments and other equipment listed in the night column of appended table No.3,whice shall have been given any type of calibration, etc. listed above from(a) to (c).

From JRL Article 24-2,paragraph 4,item2

7.2. Limit

Frequency dwell time (time during which radio waves continue to be emitted at a specified frequency) of a transmitting equipment using the FH system shall be 0.4 seconds or less.

7.3. Block diagram of test setup



7.4. Test Procedure

- (1) Configure EUT and assistant system according clause 2.3 and 7.3
- (2) Set EUT work in test mode as described in clause 2.3
- (3) 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 middle hopping channel.

Resolution BW: 1 MHz.

Video BW: 1 MHz.

Span: Zero span.

Detector: Peak

Trace Mode: Max Hold.

Sweep: Video Trigger

- (4) When the trace is complete, measure the sending time of 1 burst and the duty cycle of 1 burst cycle.
- (5) Calculate dwell time follow below formula:

Dwell time = $(0.4(s) \times \text{spreading rate} \times \text{sending time of 1 burst}(s)) / (\text{burst cycle}(s) \times \text{No. of hopping channel})$

Spreading rate = Spread bandwidth (actual measurement value) / Transmission rate.

7.5. Test result

Mode	Packet type	CH	Voltage (V)	Duty Cycle (%)	Dwell Time Result (s)	Limit (s)
GFSK Tx Mode Hopping on	DH 1	CH 0	Normal	33.17%	0.12	0.4
		CH 39		32.94%	0.12	
		CH 78		32.53%	0.12	
	DH 3	CH 0		67.46%	0.24	
		CH 39		66.59%	0.24	
		CH 78		67.07%	0.24	
	DH 5	CH 0		78.28%	0.28	
		CH 39		78.61%	0.28	
		CH 78		78.46%	0.28	
$\pi/4$ -QPSK Tx Mode Hopping on	DH 1	CH 0	Normal	32.78%	0.12	0.4
		CH 39		32.93%	0.12	
		CH 78		33.17%	0.12	
	DH 3	CH 0		67.55%	0.24	
		CH 39		67.23%	0.24	
		CH 78		67.07%	0.24	
	DH 5	CH 0		78.34%	0.28	
		CH 39		78.40%	0.28	
		CH 78		77.93%	0.28	
8-DPSK Tx Mode Hopping on	DH 1	CH 0	Normal	32.85%	0.12	0.4
		CH 39		32.93%	0.12	
		CH 78		33.01%	0.12	
	DH 3	CH 0		66.83%	0.24	
		CH 39		66.99%	0.24	
		CH 78		67.07%	0.24	
	DH 5	CH 0		78.07%	0.28	
		CH 39		77.98%	0.28	
		CH 78		78.13%	0.28	

GFSK mode Spreading rate= Spread bandwidth (actual measurement value)/ amount of channels
=71.317MHz/79=0.90

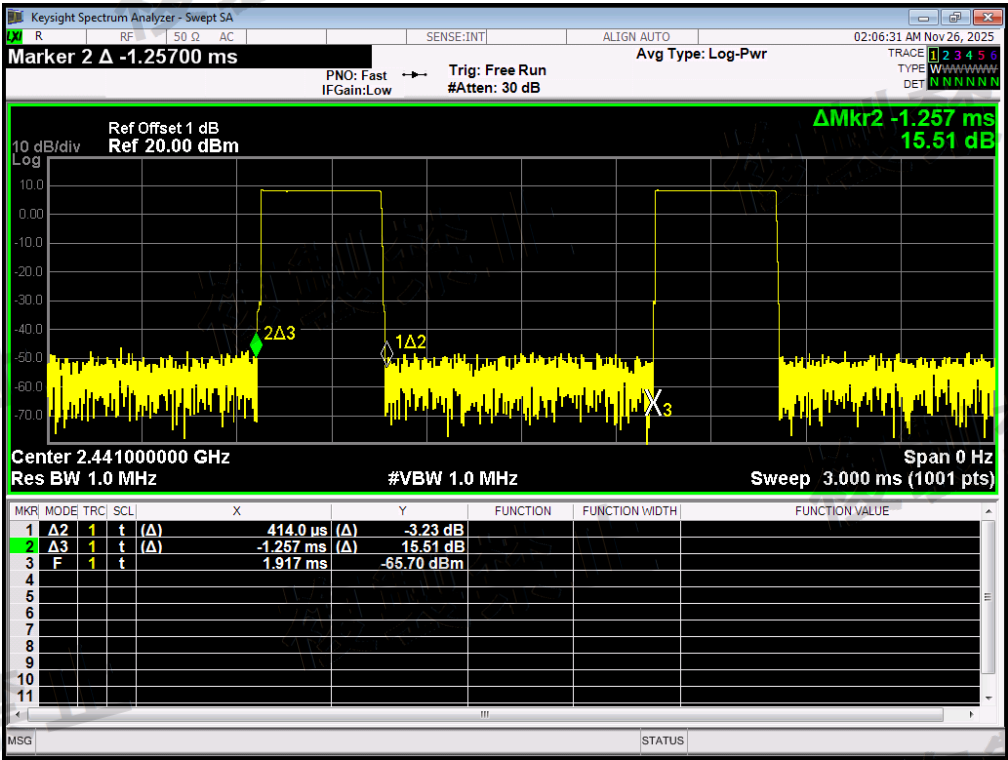
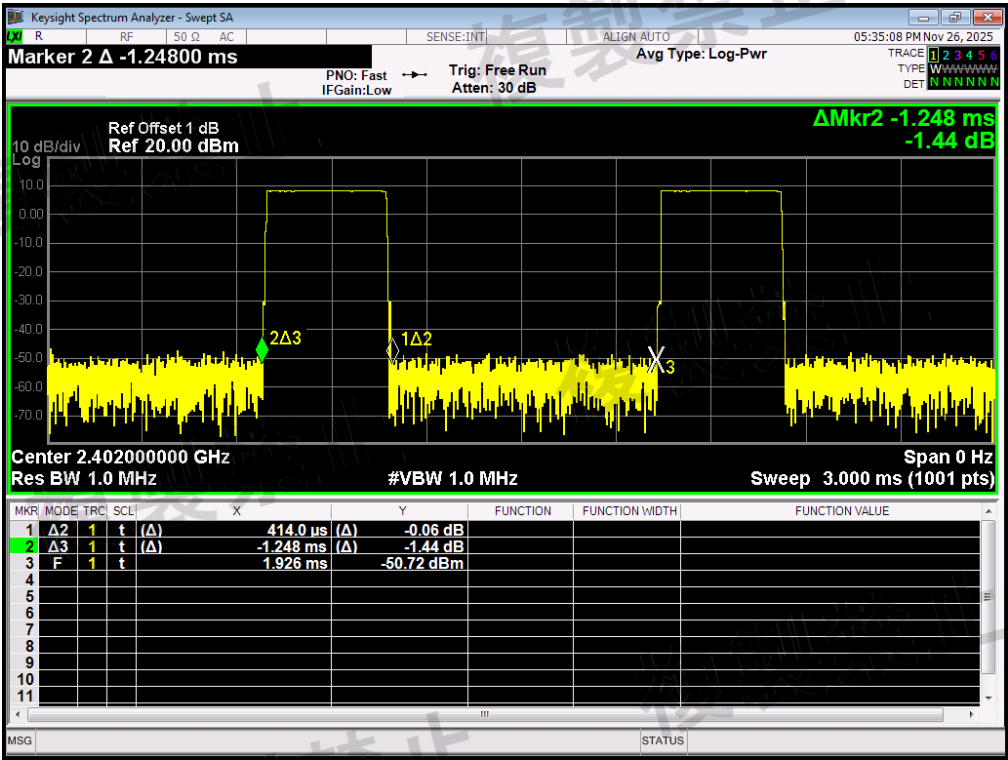
$\pi/4$ -QPSK mode Spreading rate= Spread bandwidth (actual measurement Value)/ amount of channels
=71.485MHz/79=0.90

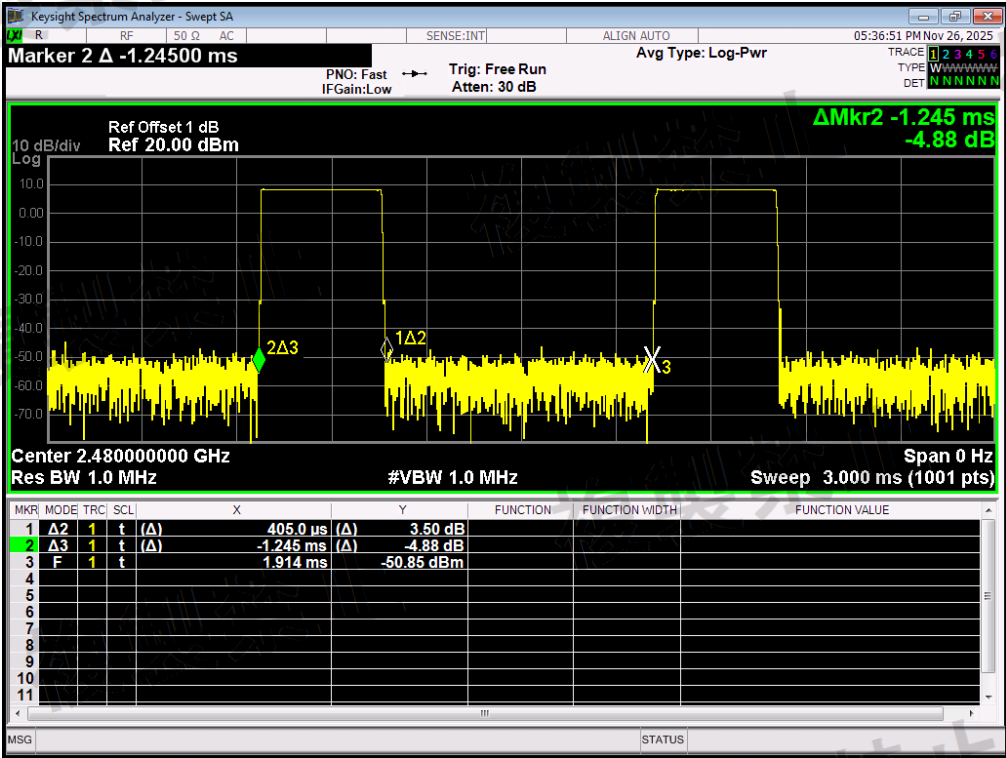
8-DPSK mode Spreading rate= Spread bandwidth (actual measurement value)/ amount of channels
=71.267 MHz/79=0.90

Conclusion : PASS

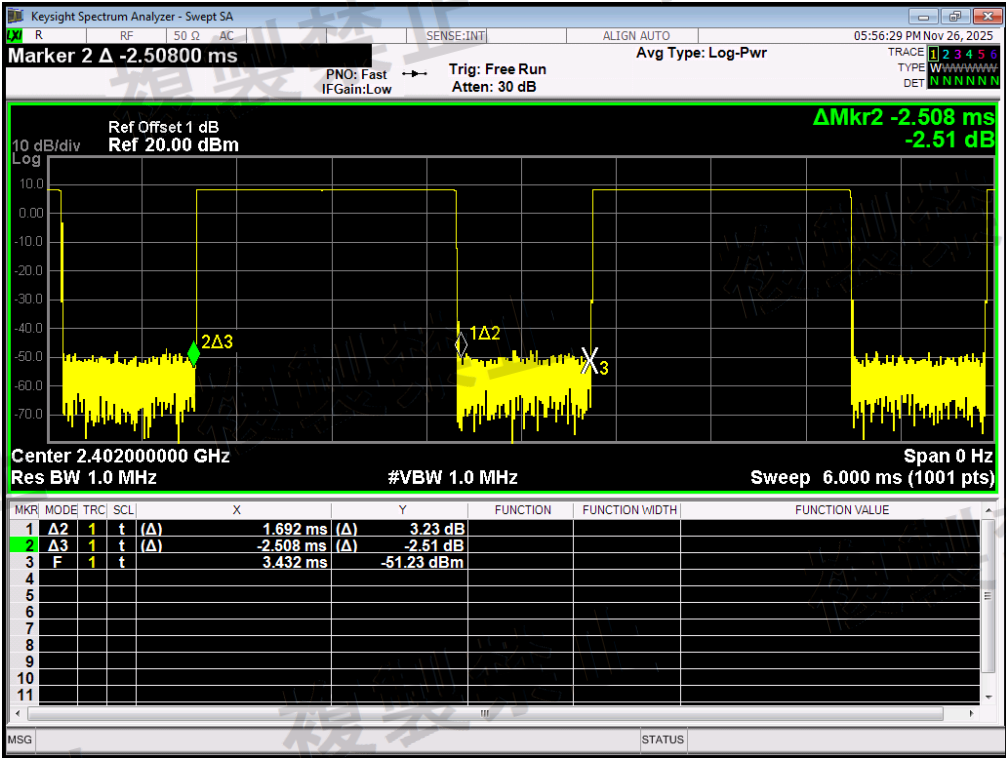
7.6. Original test data

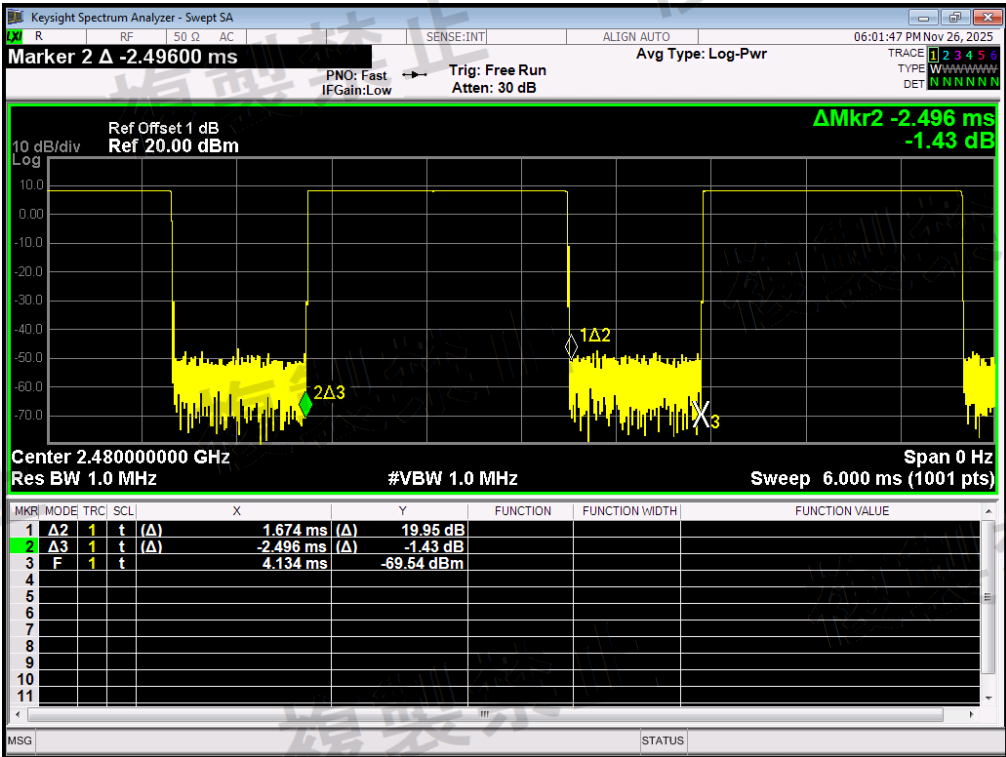
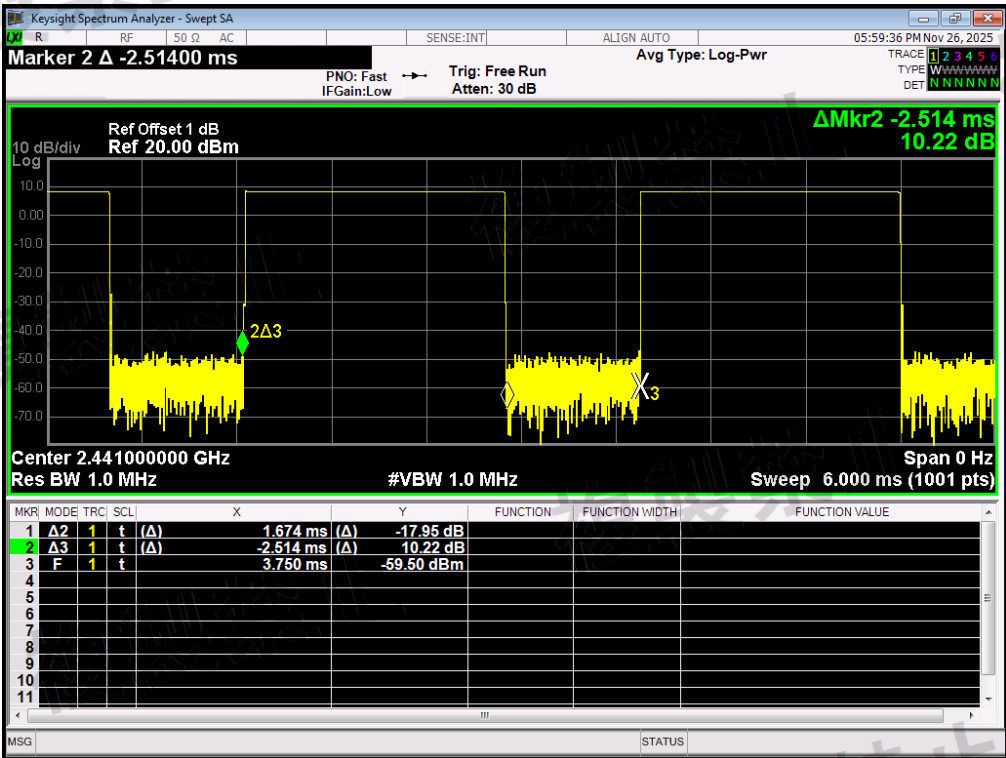
Normal Voltage
GFSK DH1



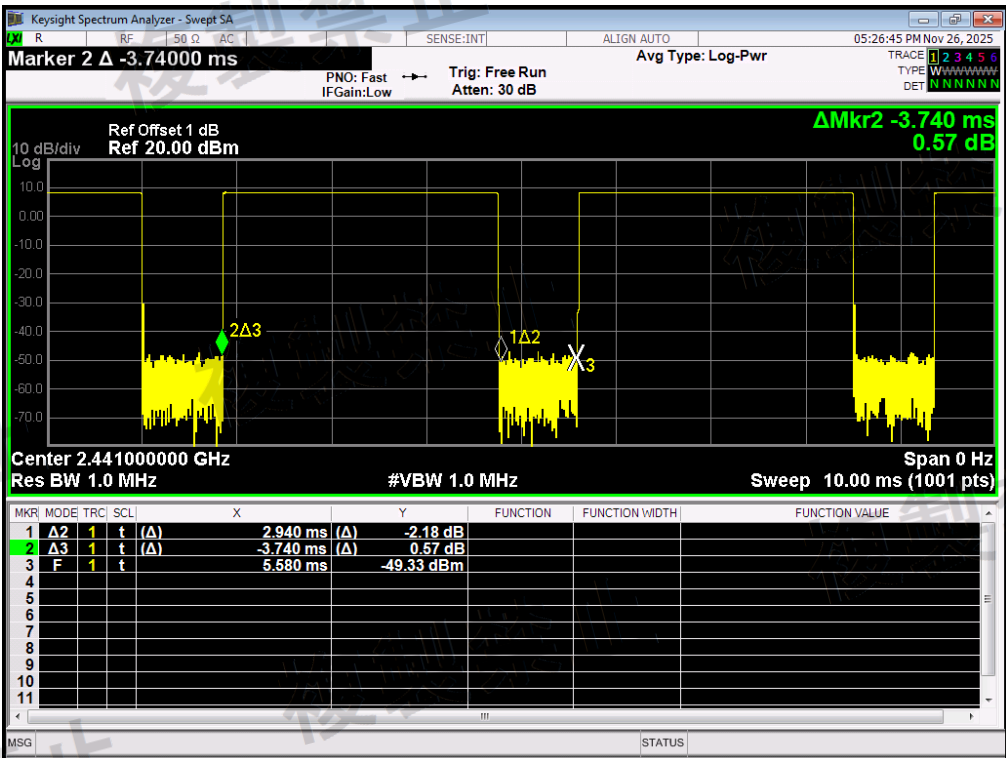
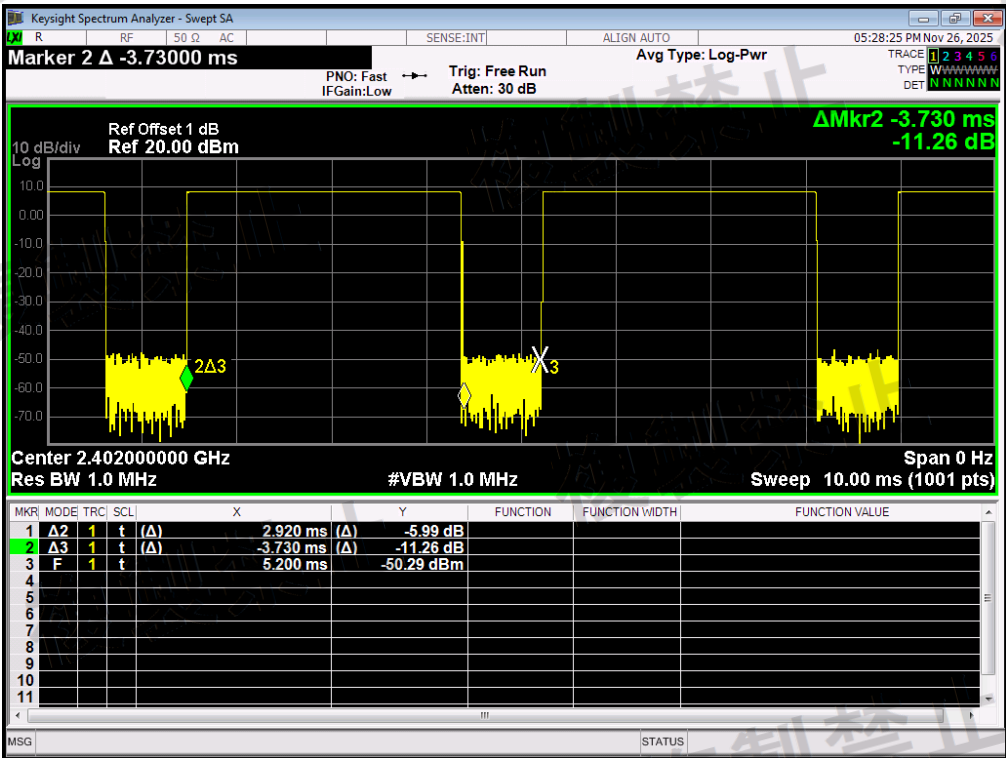


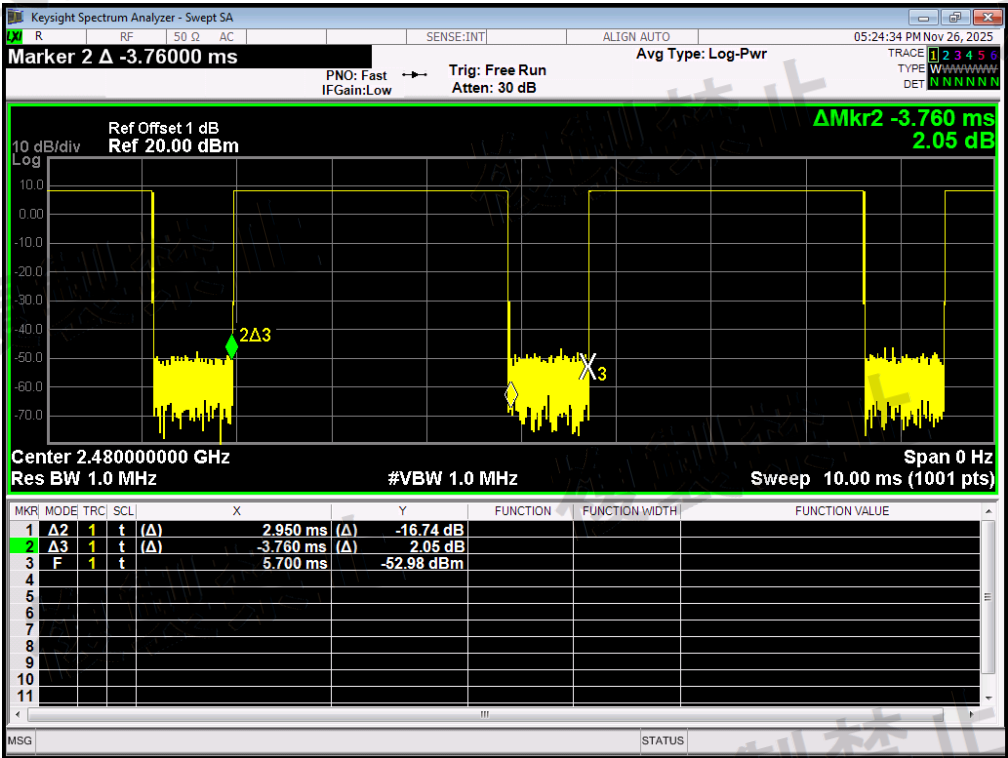
GFSK DH3





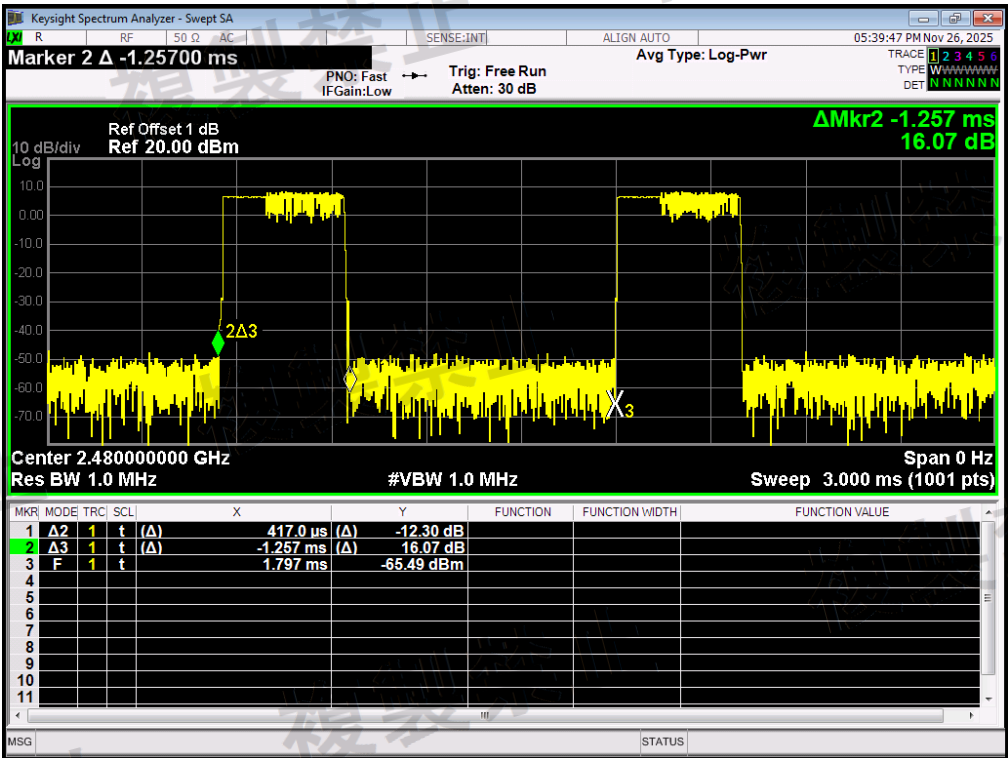
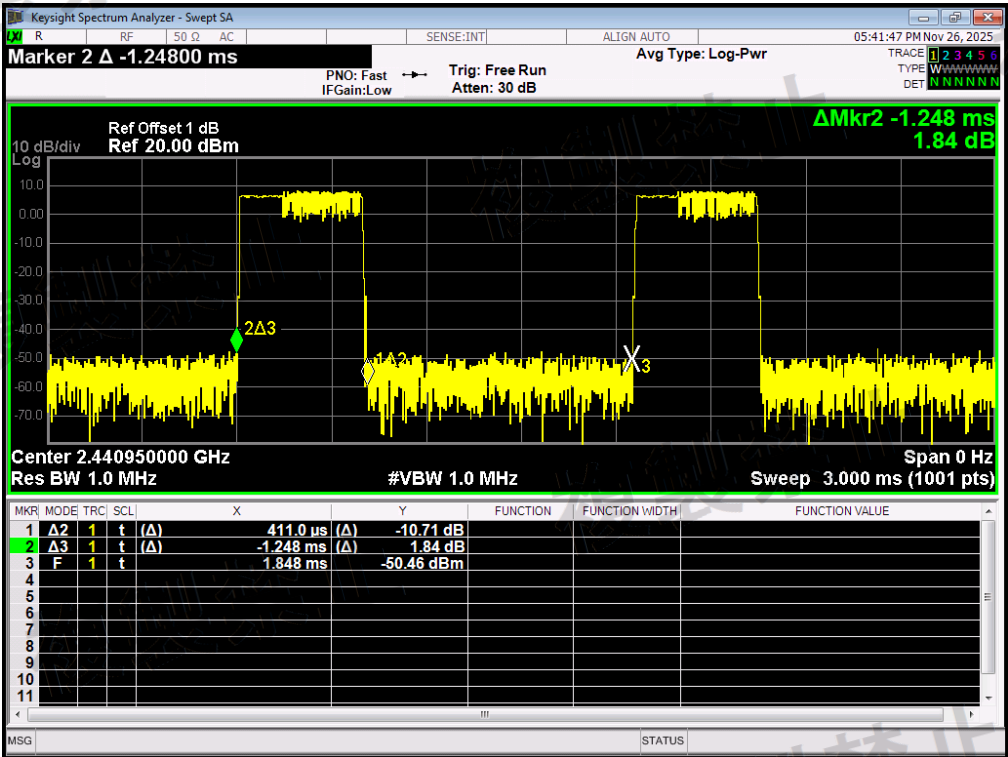
GFSK DH5



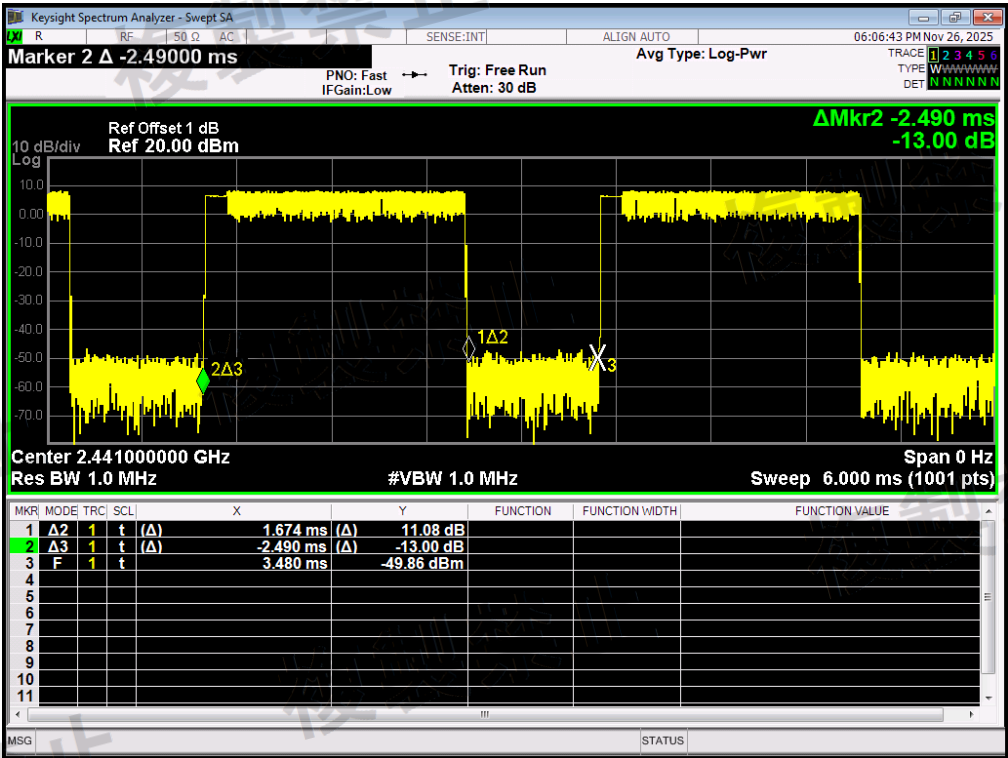
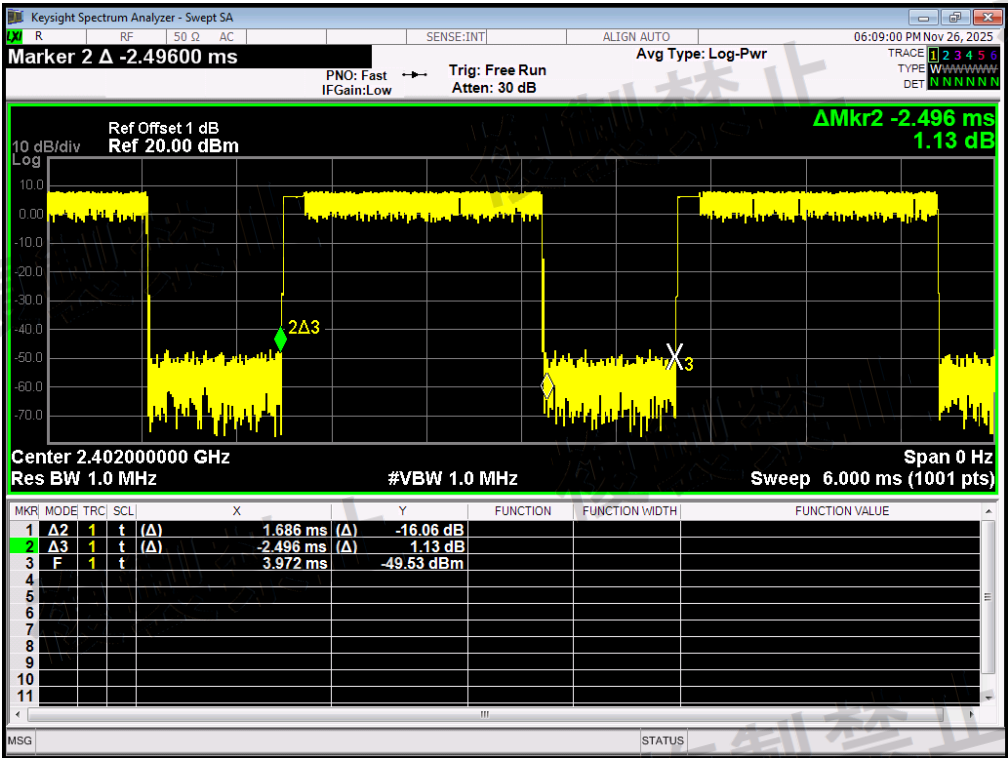


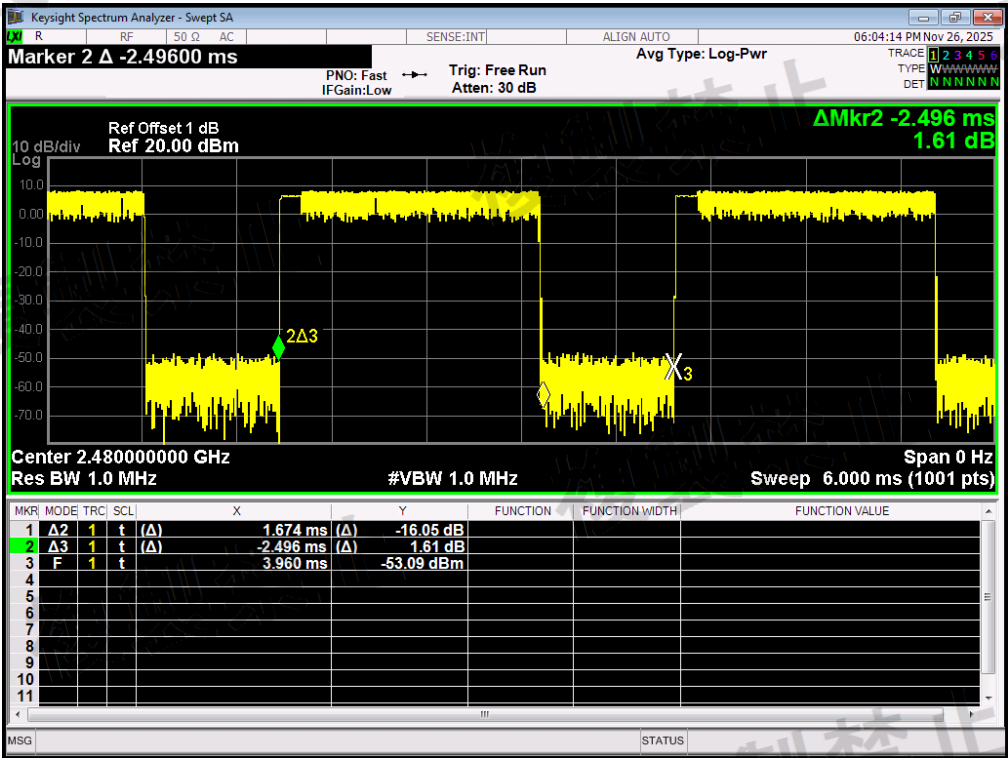
$\pi/4$ -QPSK DH1



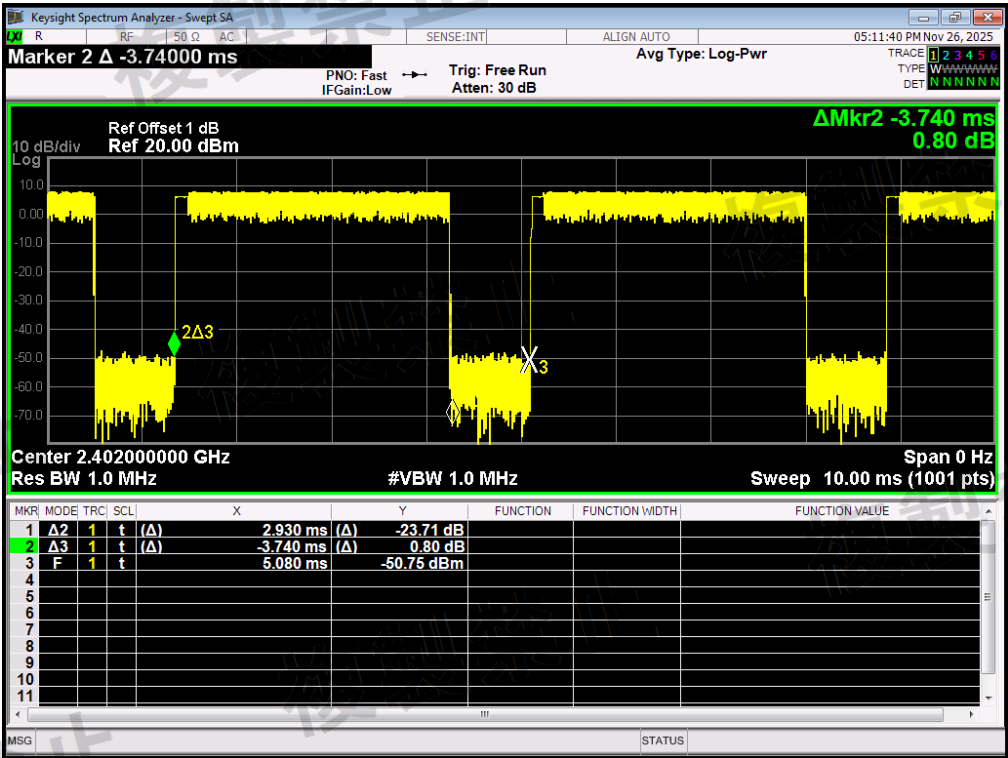


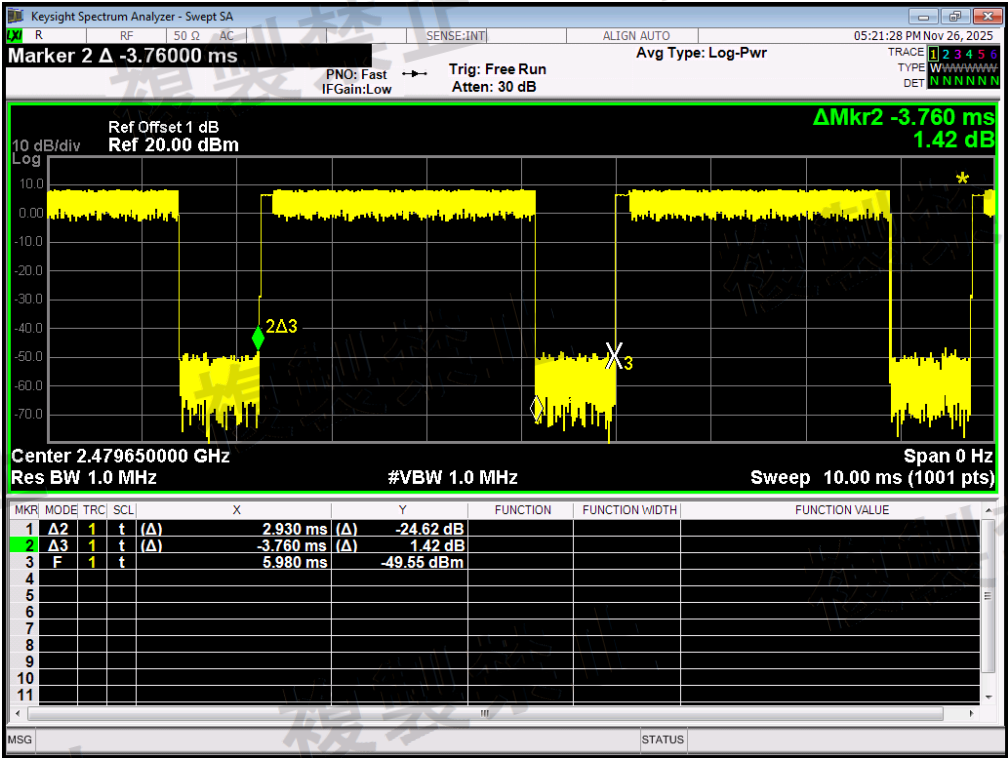
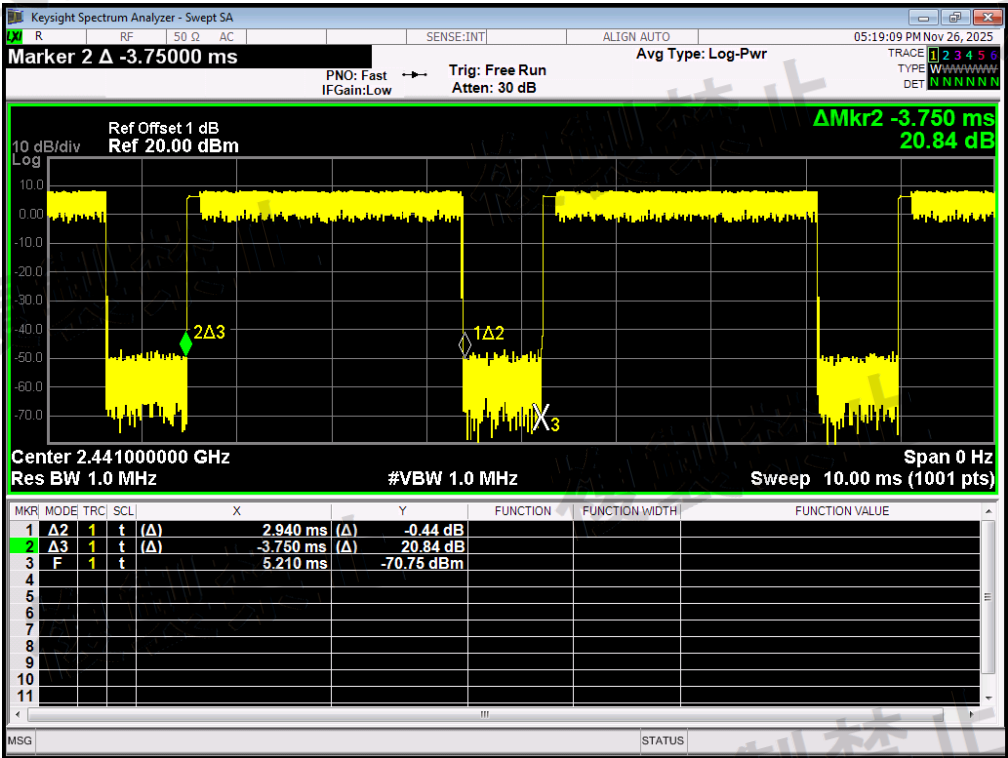
$\pi/4$ -QPSK DH3



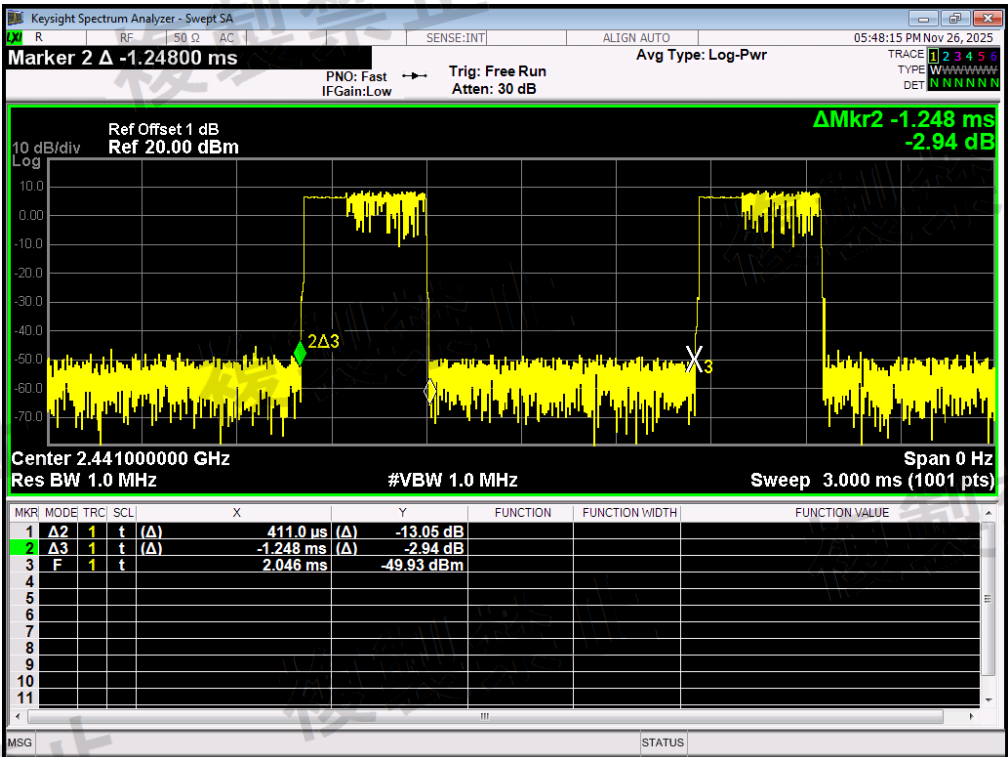
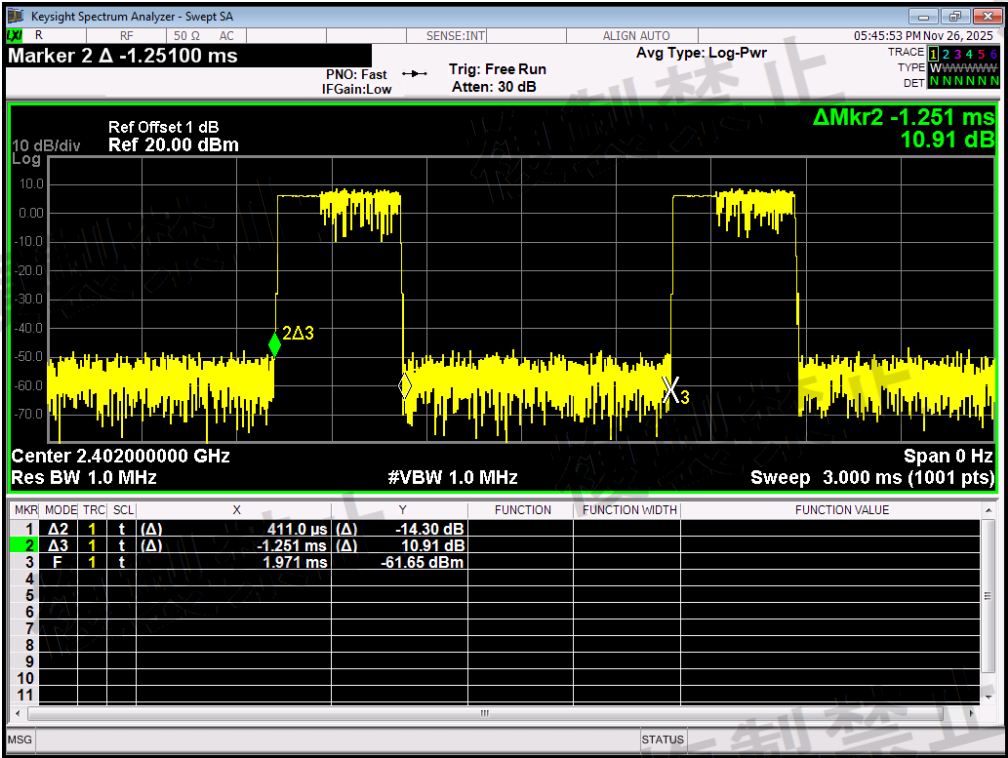


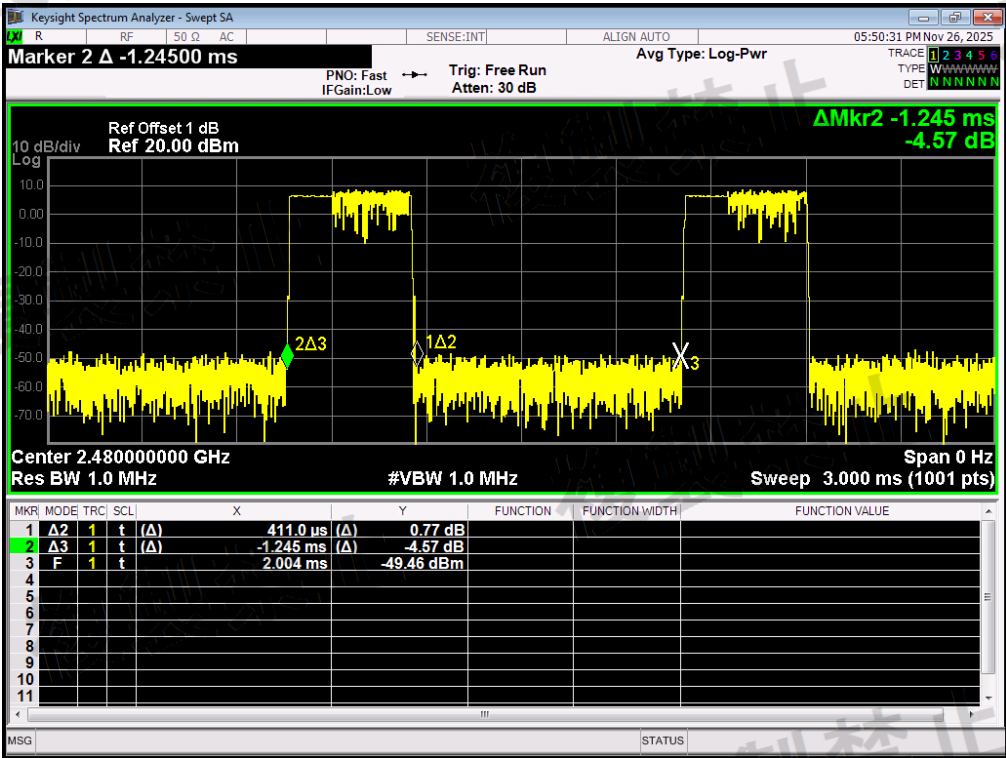
$\pi/4$ -QPSK DH5



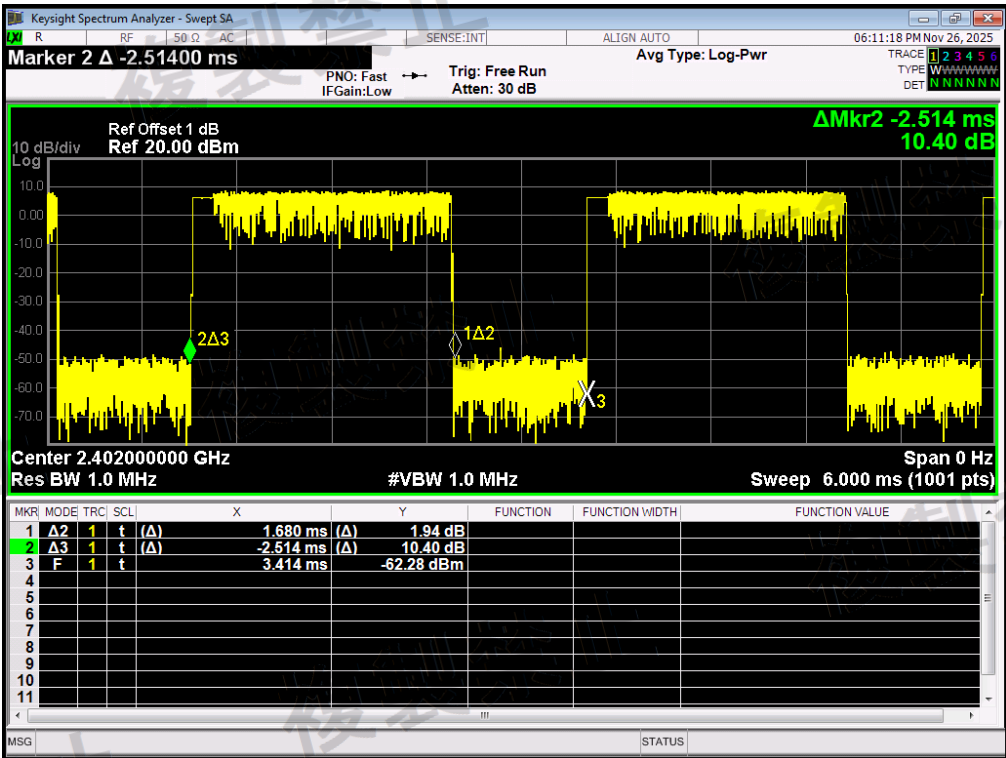


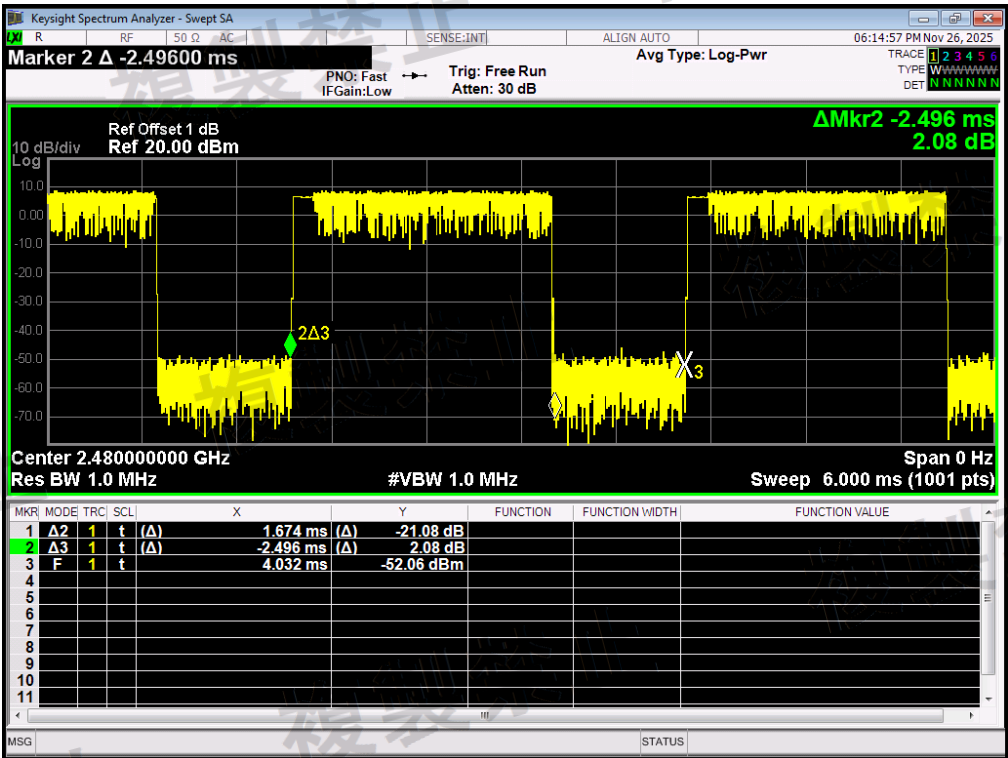
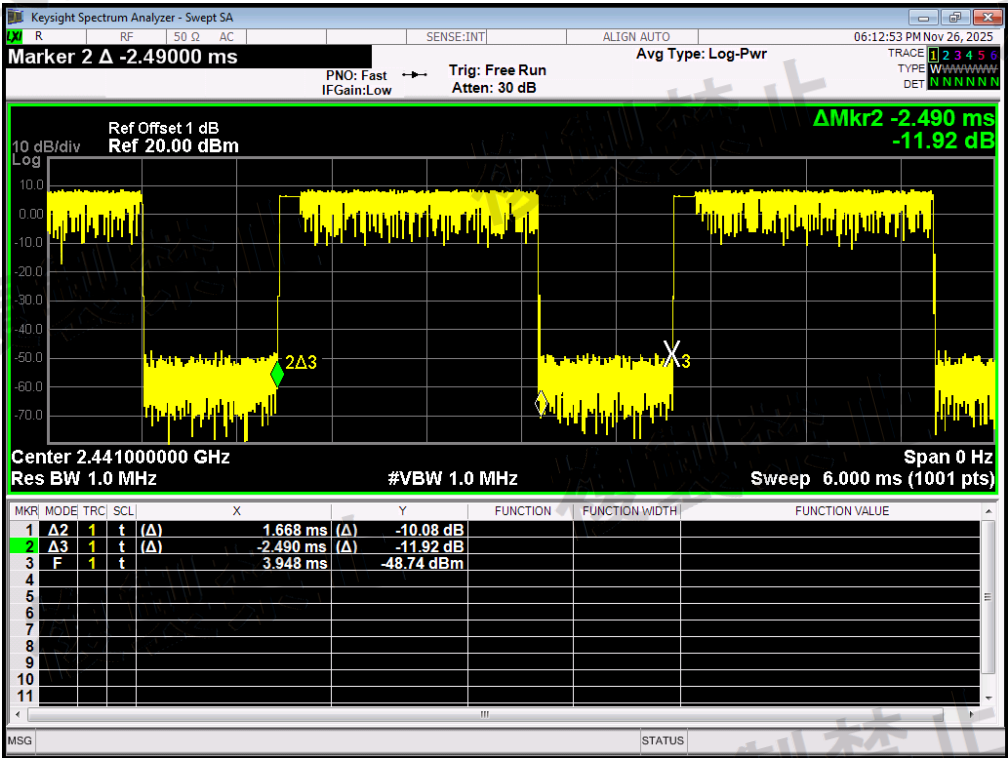
8-DPSK DH1



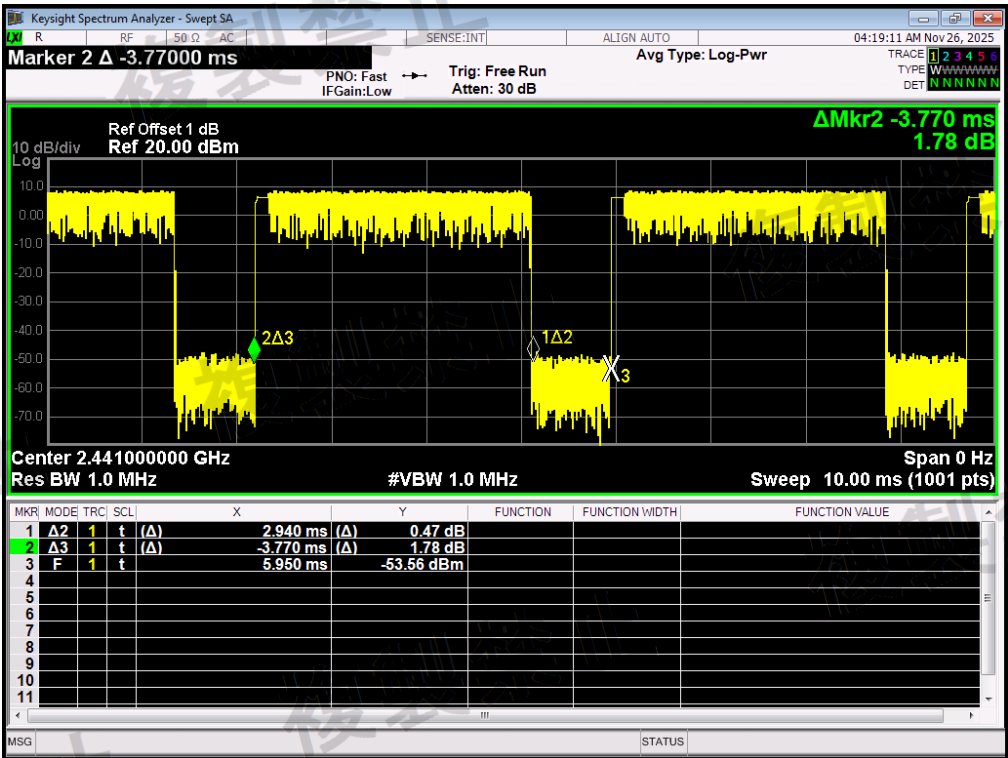


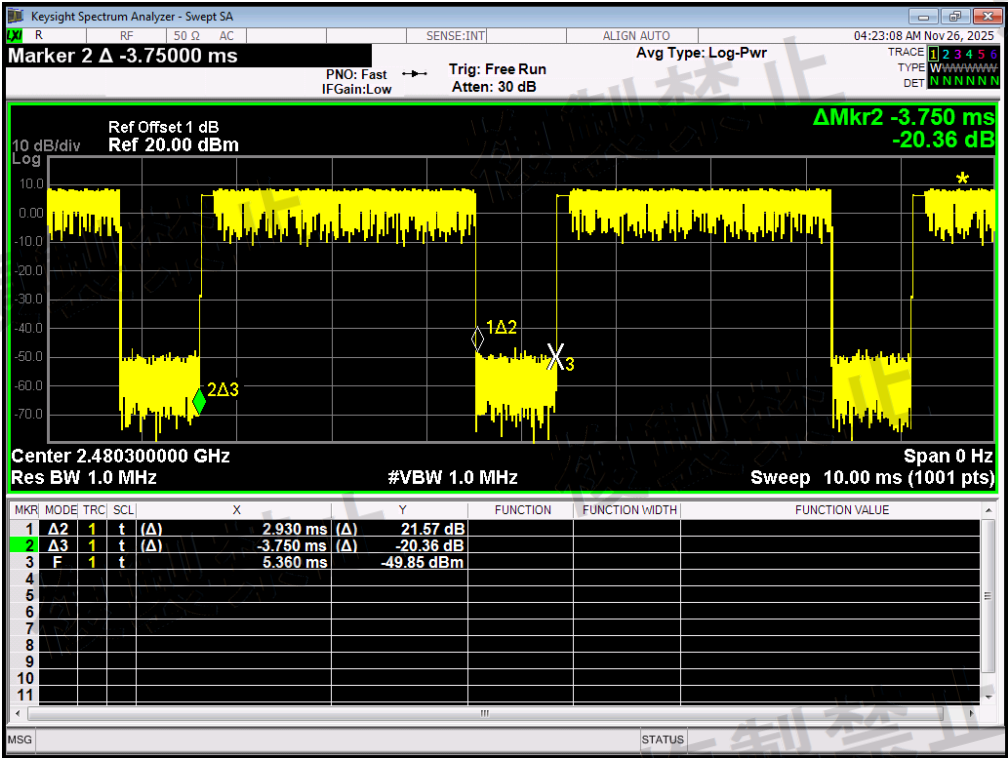
8-DPSK DH3





8-DPSK DH5





8. Transmitter Spurious Emissions (conducted)

8.1. Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated until	Calibration body	classification
Spectrum analyzer	Agilent	N9010A	MY55150427	2025/05/16	2026/05/15	Jingheng	(c)
Multimeter	FLUKE	15B+	42320912WS	2025/11/13	2026/11/12	Jingheng	(c)
Attenuator	Mini-Circuits	BW-S10W2	101109	N/A	N/A	N/A	N/A
RF Cable	Micable	C10-01-01-1	100309	N/A	N/A	N/A	N/A

Remark:

- (a) Calibration conducted by the National Institute of Information and Communications Technology (NITC) in Japan (hereinafter referred to as "NITC") or a designated calibration agency under Article 102-18 paragraph(1) in JRL
- (b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No.51 of 1992)
- (c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration Conducted by the NITC or a designation 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).

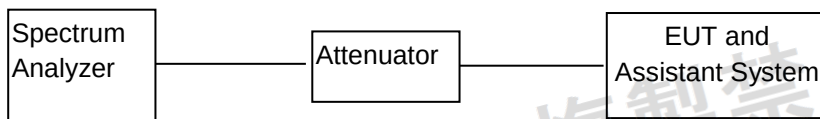
From JRL Article 24-2, paragraph 4, item 2

8.2. Limit

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

- a. $2,387\text{MHz} \leq f \leq 2,400\text{MHz}$ and $2,483.5\text{MHz} < f \leq 2,496.5\text{MHz}$ 25 μW or less
- b. $2,387\text{MHz} > f$ and $2,496.5\text{MHz} < f$ 2.5 μW or less

8.3. Block diagram of test setup



8.4. Test Procedure

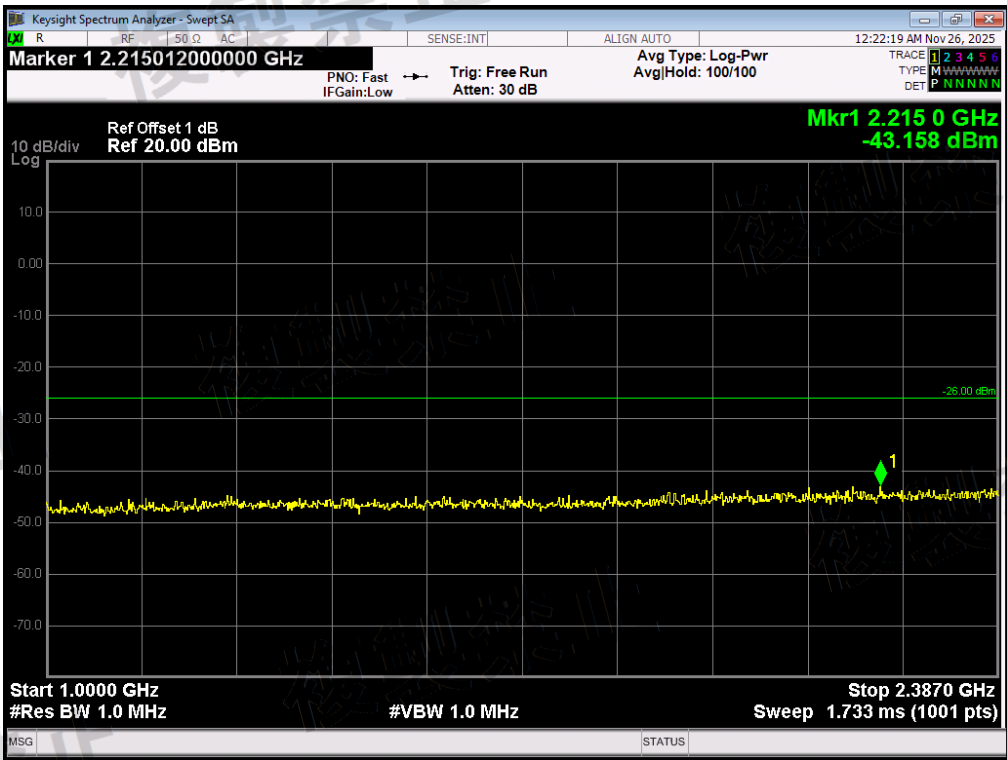
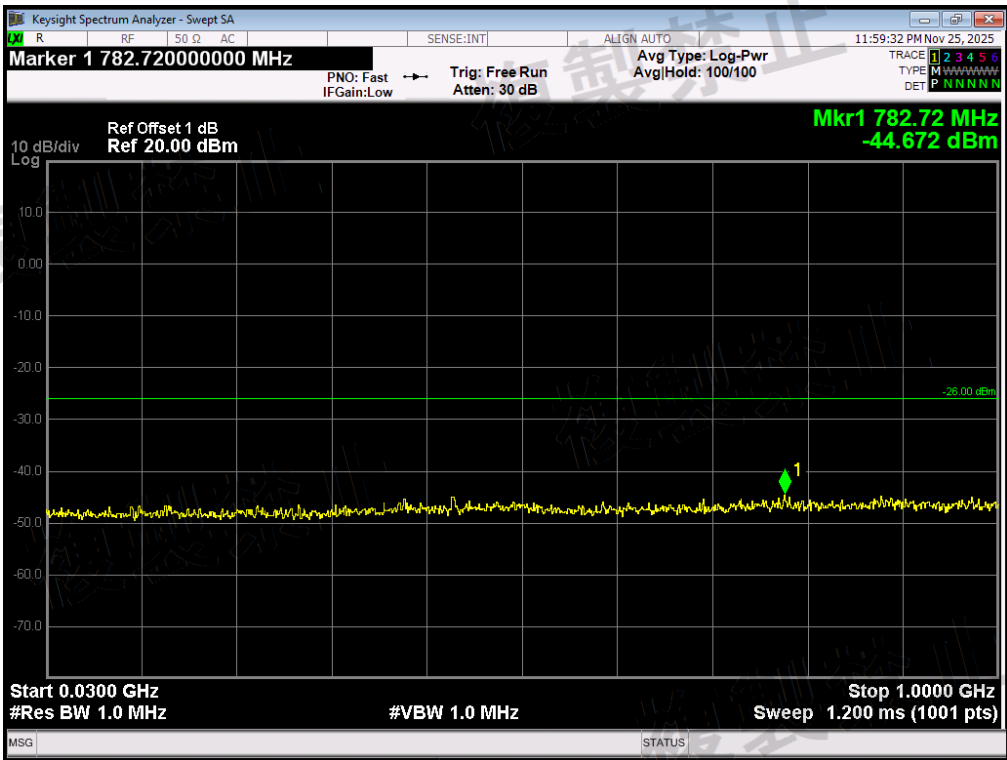
- (1) Configure EUT and assistant system according clause 2.4 and 8.3
- (2) Set EUT work in test mode as described in clause 2.4
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
 - Resolution BW: 1MHz. Video BW: 1MHz.
 - Detector: Peak. Trace Mode: Max Hold.
- (4) Sufficient number of measurements and samples are taken when measuring at average.
- (5) All the emissions from 30MHz to 13GHz were measured and record.

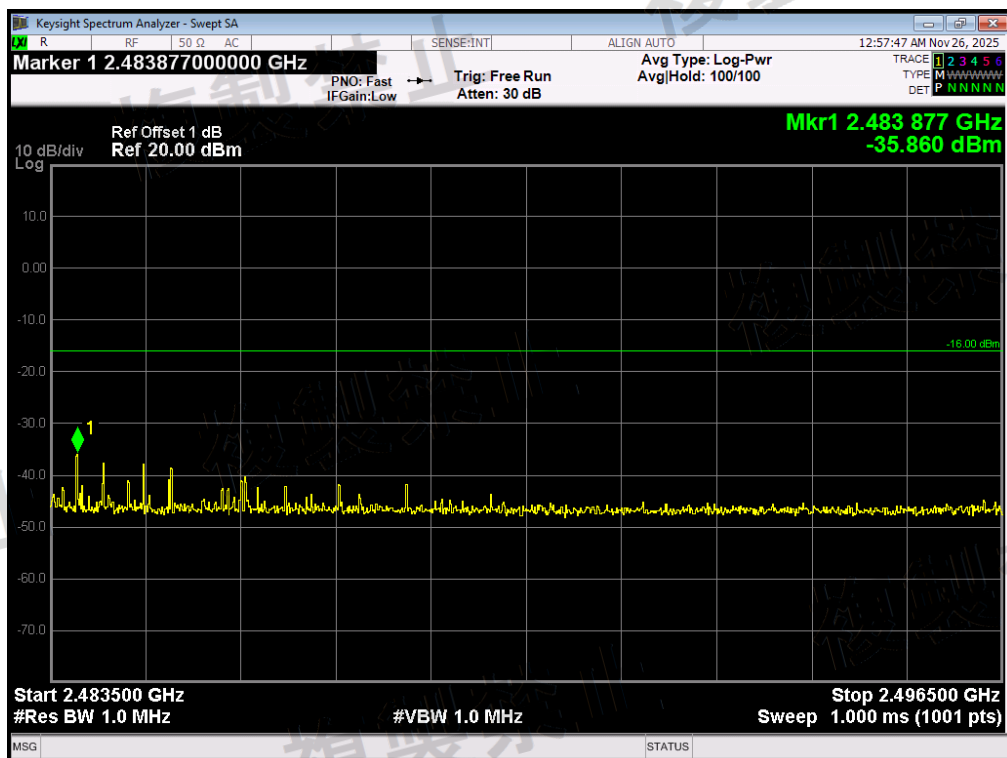
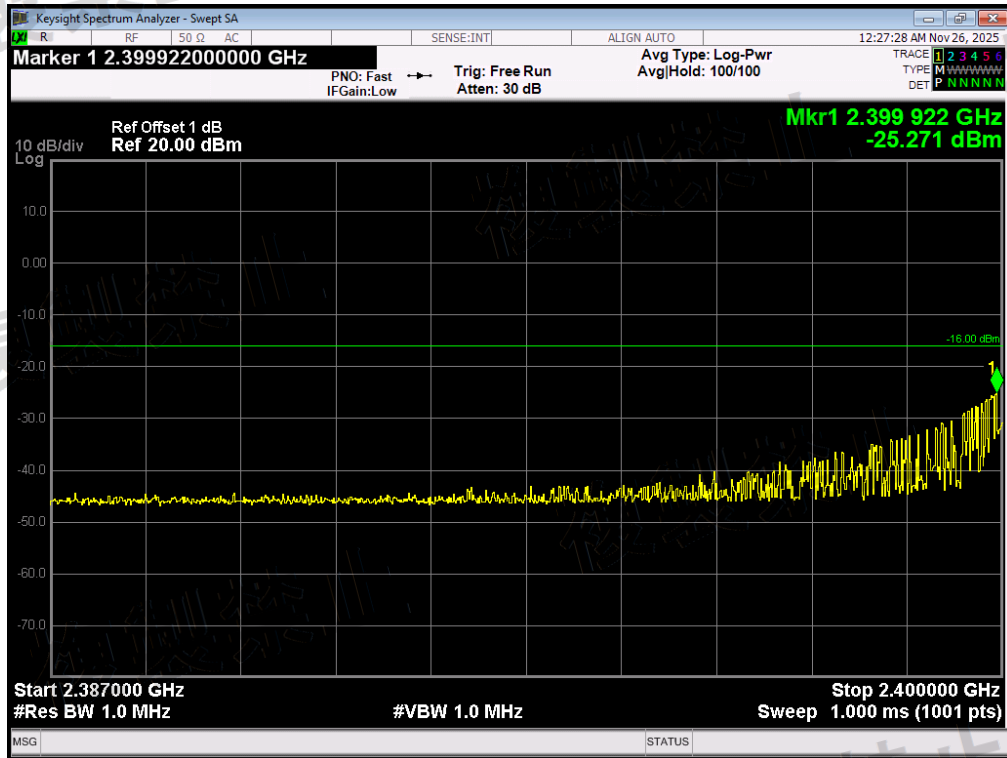
8.5. Test result

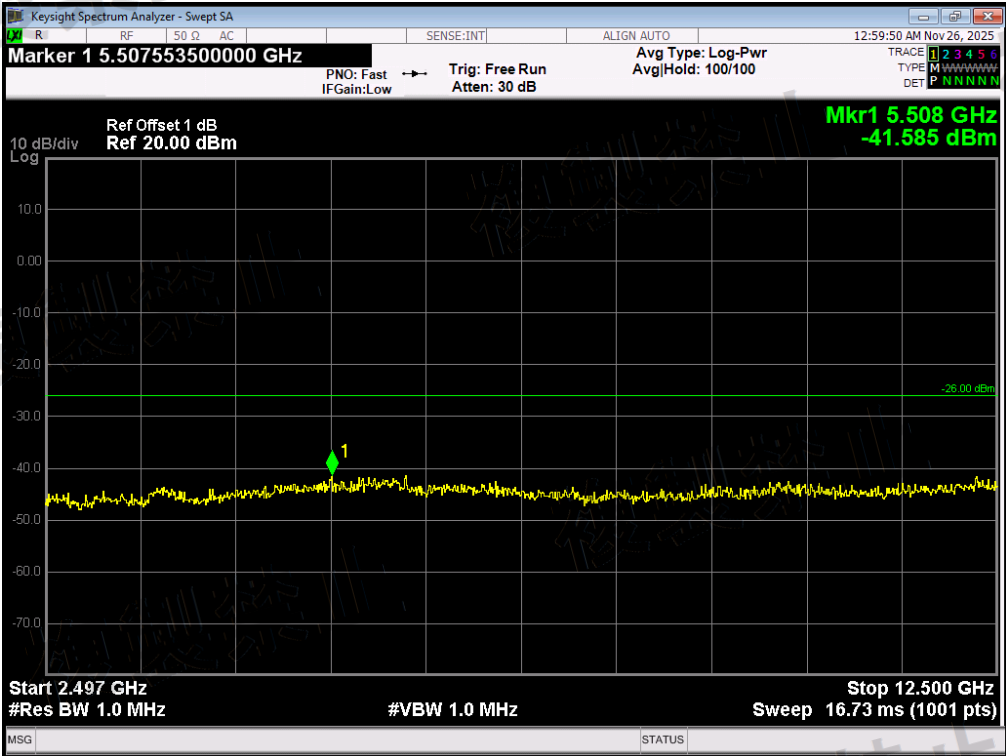
Voltage (V)	Mode	CH	Frequency (MHz)	Reading (dBm)	Limit (dBm)	Result
Normal	GFSK Tx Mode	CH 0	30-1000	-44.672	-26	PASS
			1000-2387	-43.158	-26	PASS
			2387-2400	-25.271	-16	PASS
			2483.5-2496.5	-35.860	-16	PASS
			2496.5-12500	-41.585	-26	PASS
		CH 39	30-1000	-44.928	-26	PASS
			1000-2387	-43.344	-26	PASS
			2387-2400	-44.306	-16	PASS
			2483.5-2496.5	-37.271	-16	PASS
			2496.5-12500	-41.541	-26	PASS
		CH 78	30-1000	-44.341	-26	PASS
			1000-2387	-42.931	-26	PASS
			2387-2400	-45.765	-16	PASS
			2483.5-2496.5	-37.625	-16	PASS
			2496.5-12500	-41.105	-26	PASS
	$\pi/4$ -QPSK Tx Mode	CH 0	30-1000	-45.107	-26	PASS
			1000-2387	-42.797	-26	PASS
			2387-2400	-26.537	-16	PASS
			2483.5-2496.5	-37.878	-16	PASS
			2496.5-12500	-41.260	-26	PASS
		CH 39	30-1000	-44.905	-26	PASS
			1000-2387	-42.976	-26	PASS
			2387-2400	-45.477	-16	PASS
			2483.5-2496.5	-38.551	-16	PASS
			2496.5-12500	-41.629	-26	PASS
		CH 78	30-1000	-44.958	-26	PASS
			1000-2387	-42.300	-26	PASS
			2387-2400	-45.299	-16	PASS
			2483.5-2496.5	-37.041	-16	PASS
			2496.5-12500	-41.374	-26	PASS
	8-DPSK Tx Mode	CH 0	30-1000	-45.061	-26	PASS
			1000-2387	-43.085	-26	PASS
			2387-2400	-26.496	-16	PASS
			2483.5-2496.5	-36.288	-16	PASS
			2496.5-12500	-41.866	-26	PASS
		CH 39	30-1000	-44.668	-26	PASS
			1000-2387	-42.677	-26	PASS
			2387-2400	-45.400	-16	PASS
			2483.5-2496.5	-39.213	-16	PASS
			2496.5-12500	-41.912	-26	PASS
		CH 78	30-1000	-44.671	-26	PASS
			1000-2387	-43.631	-26	PASS
			2387-2400	-45.801	-16	PASS
			2483.5-2496.5	-36.815	-16	PASS
			2496.5-12500	-41.494	-26	PASS

8.6. Original test data

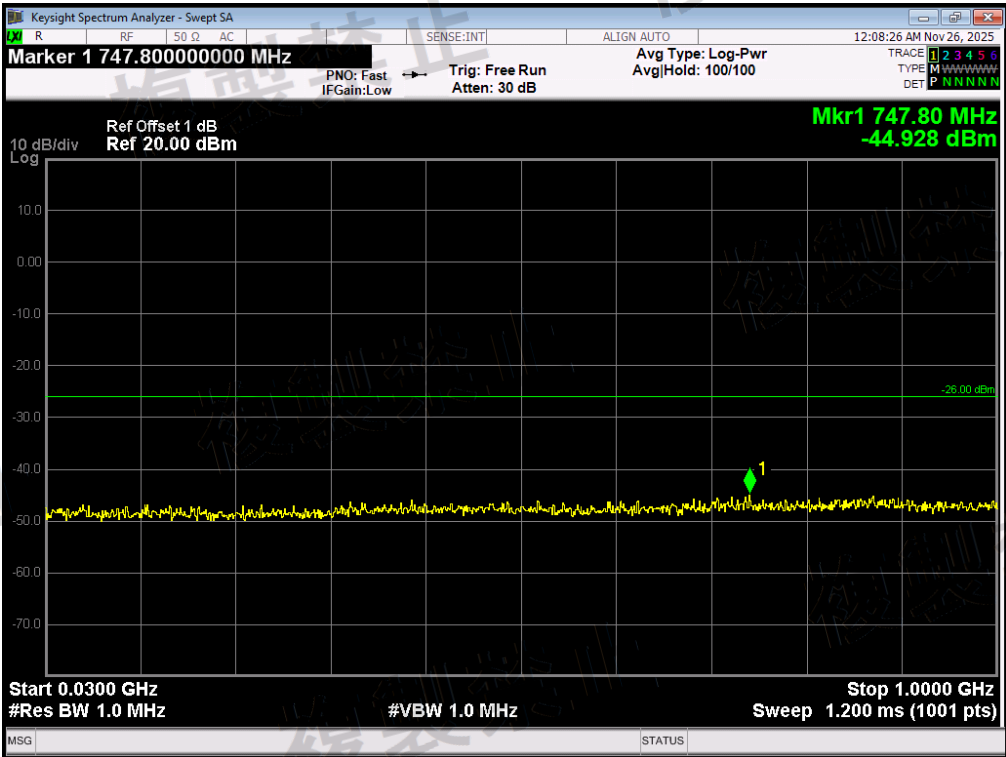
GFSK Tx Mode CH 0

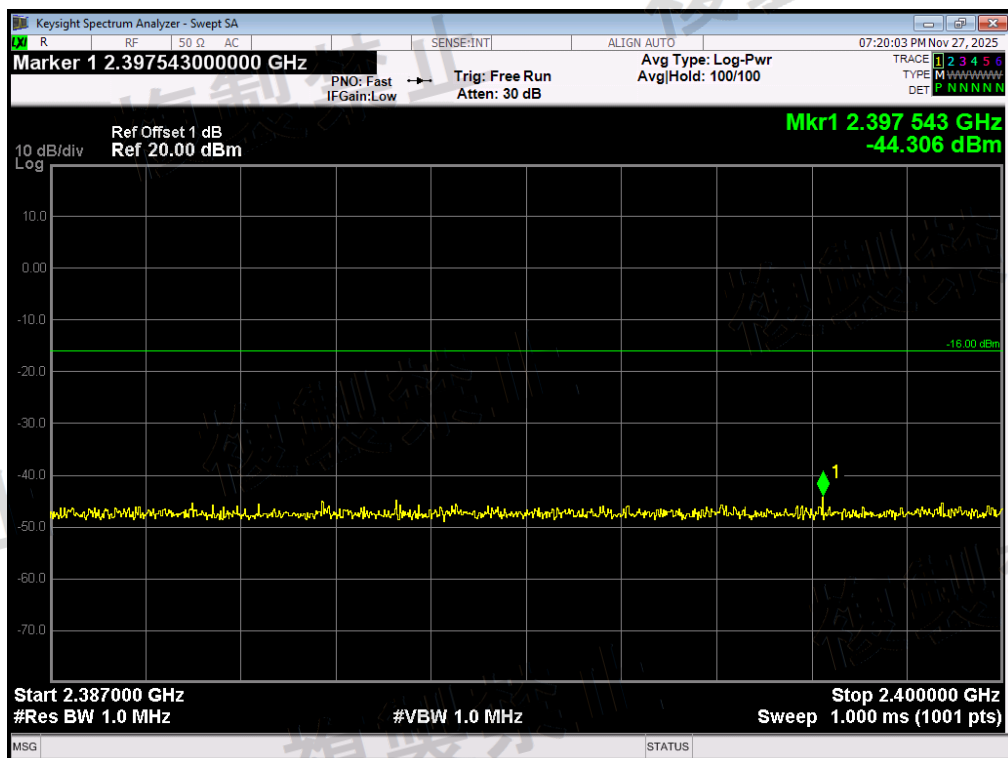
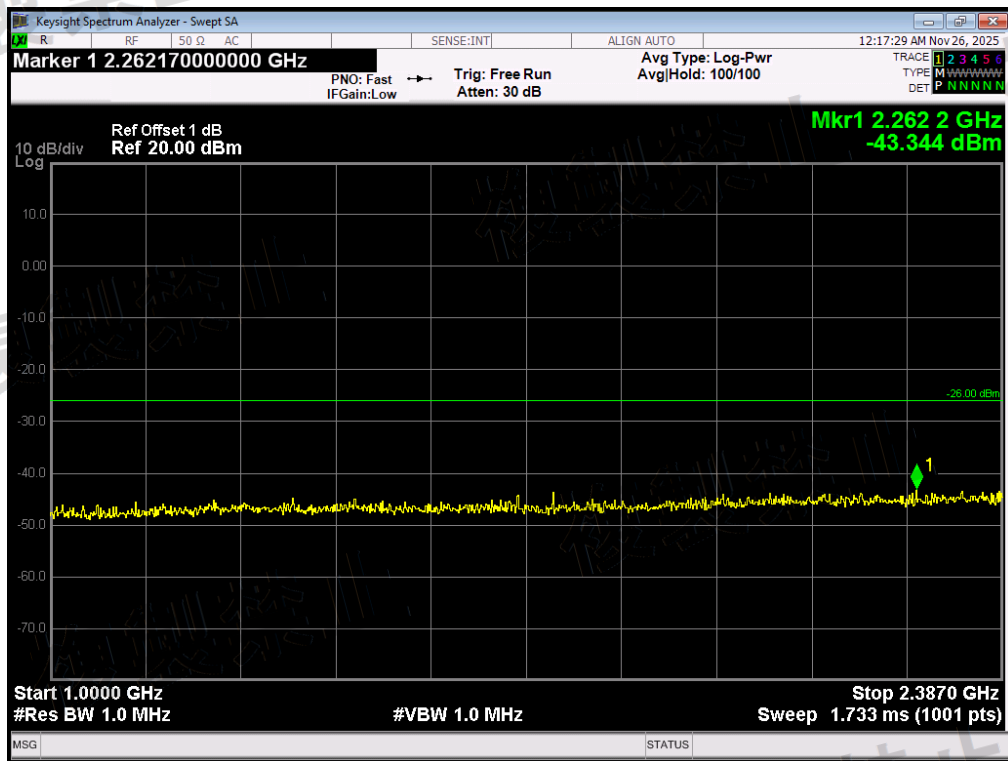


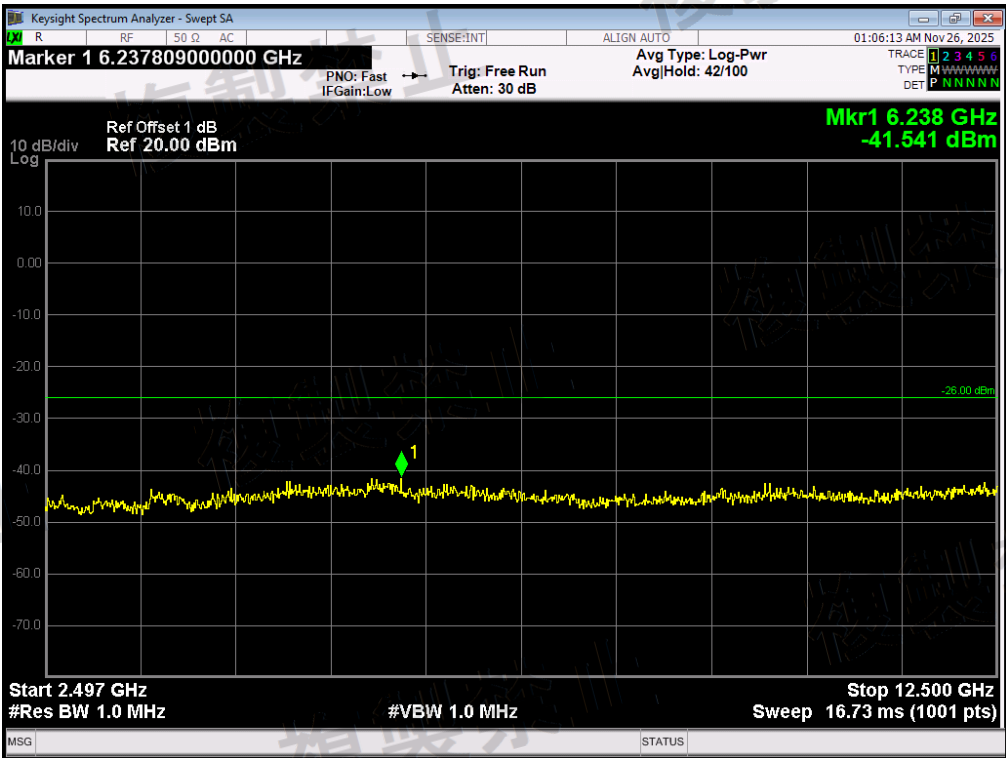
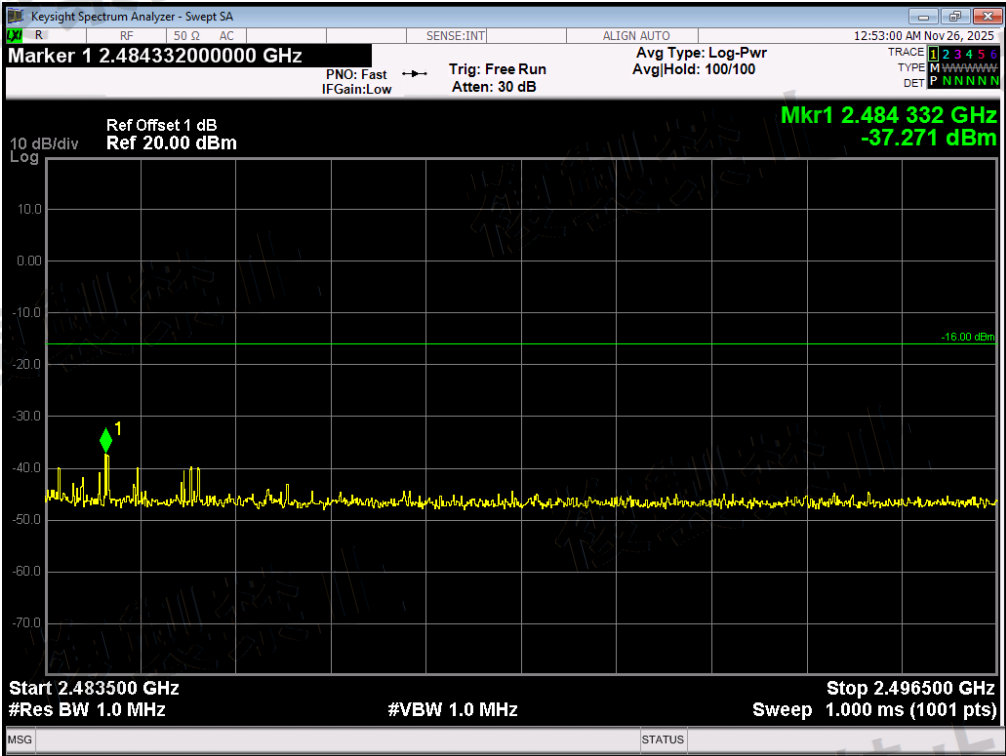




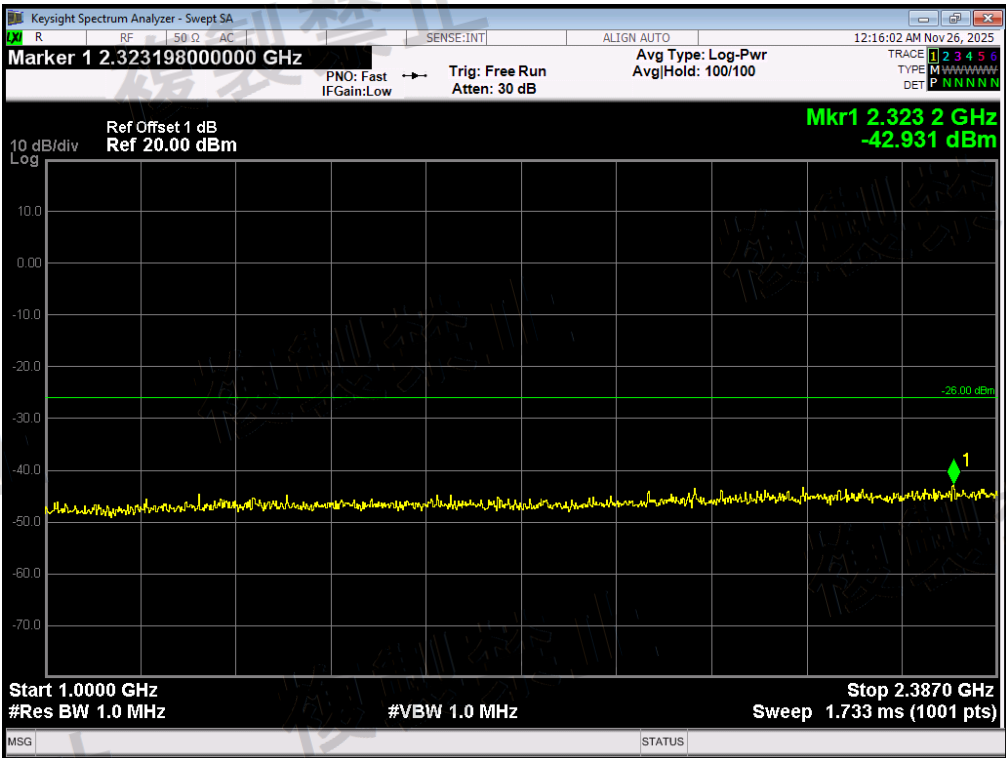
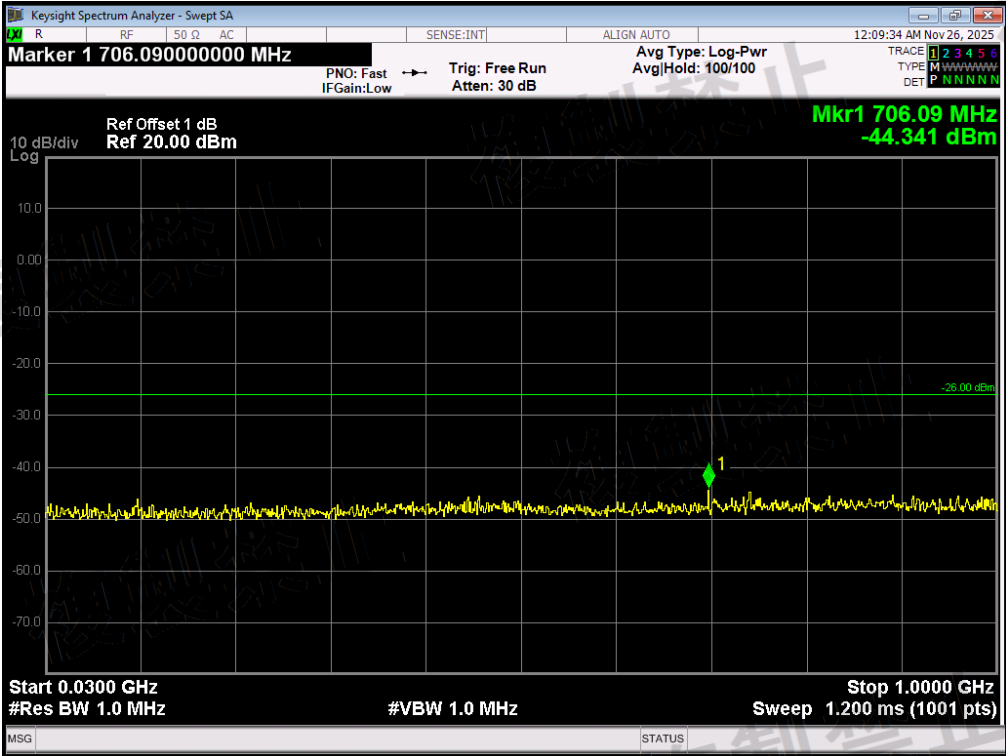
GFSK Tx Mode CH 39

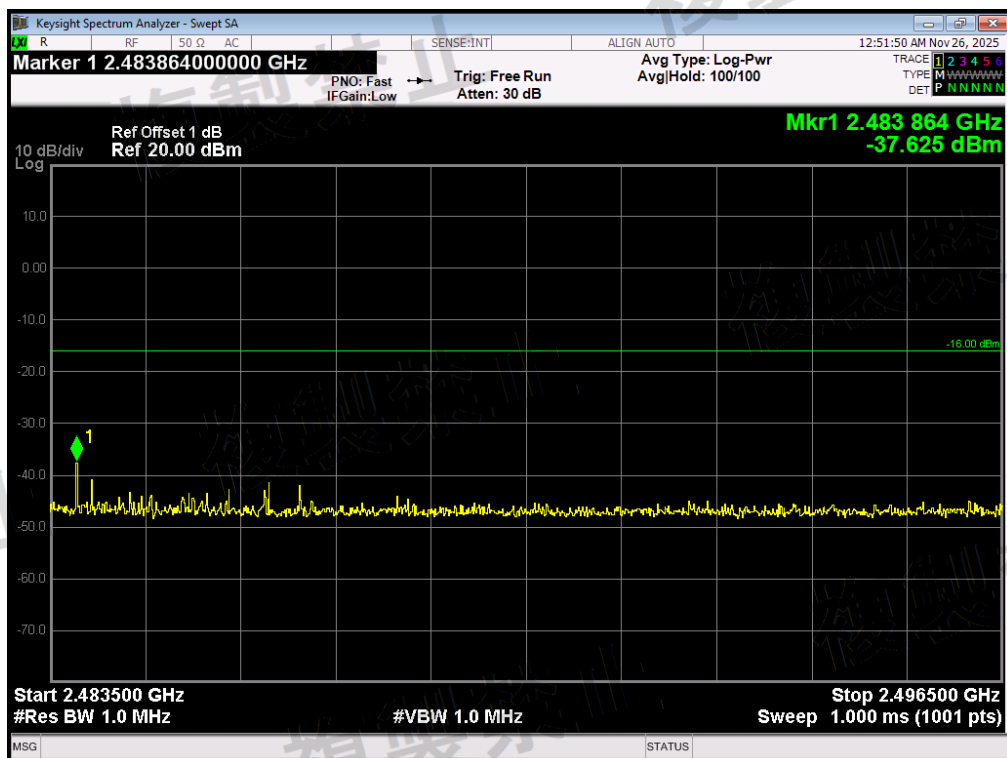
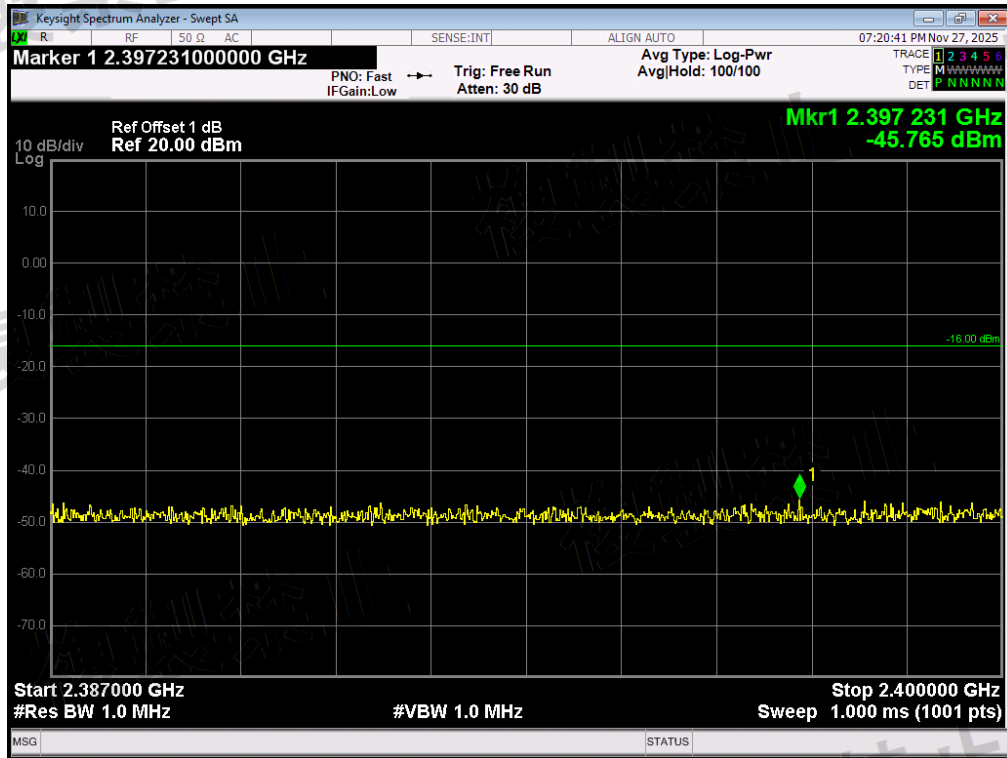


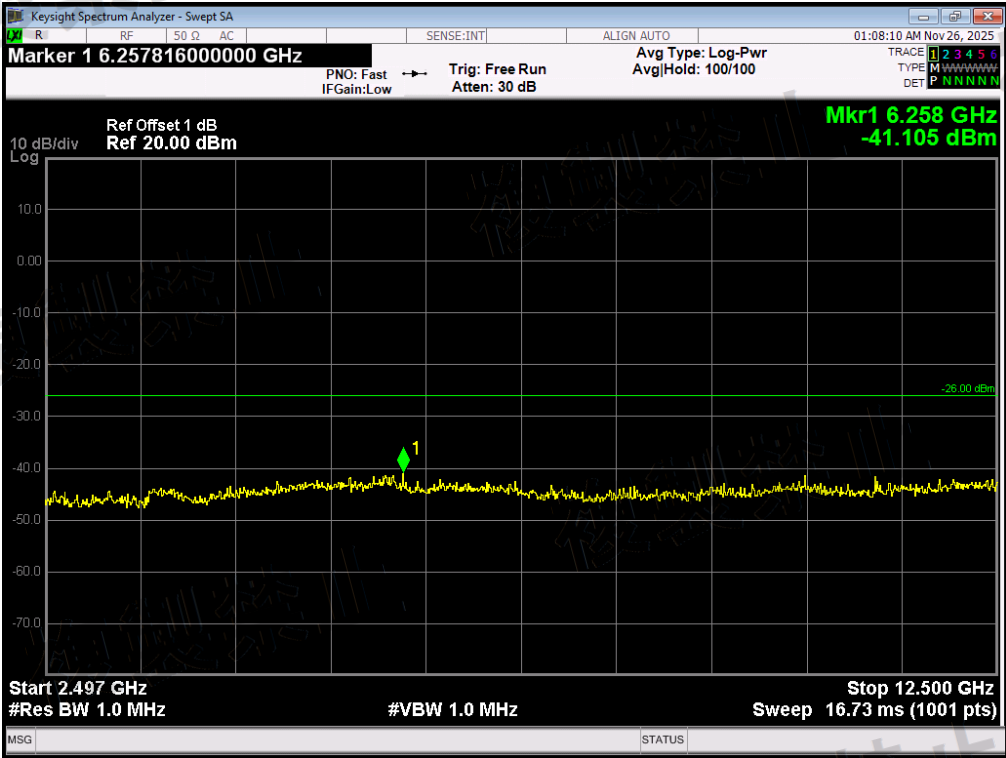




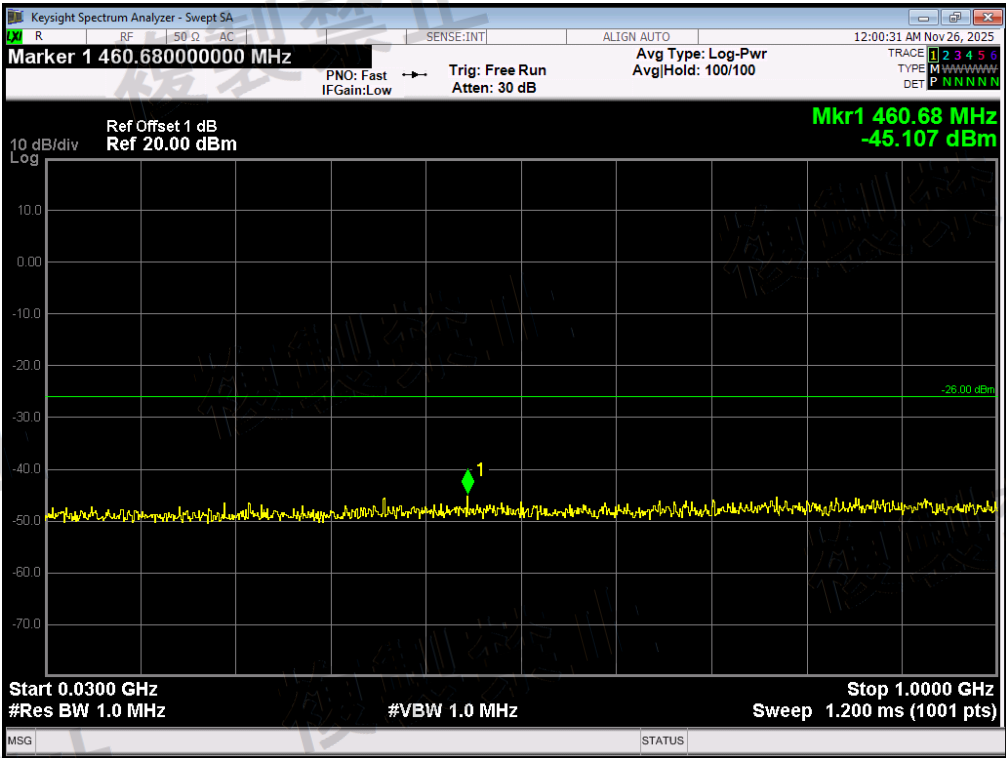
GFSK Tx Mode CH 78

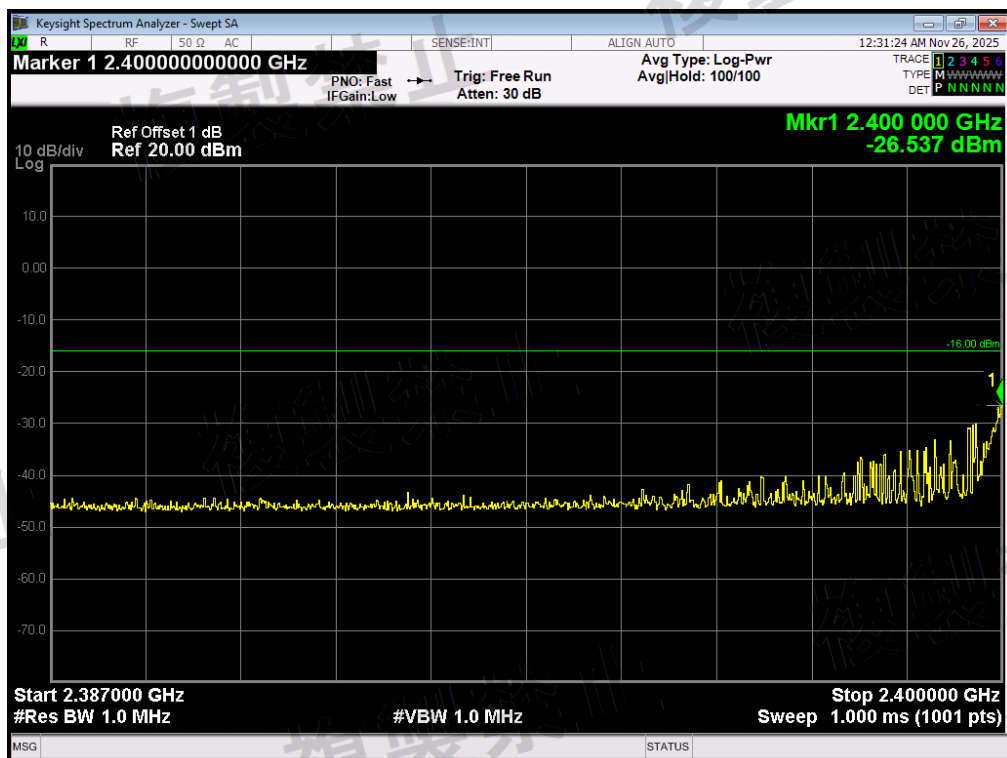
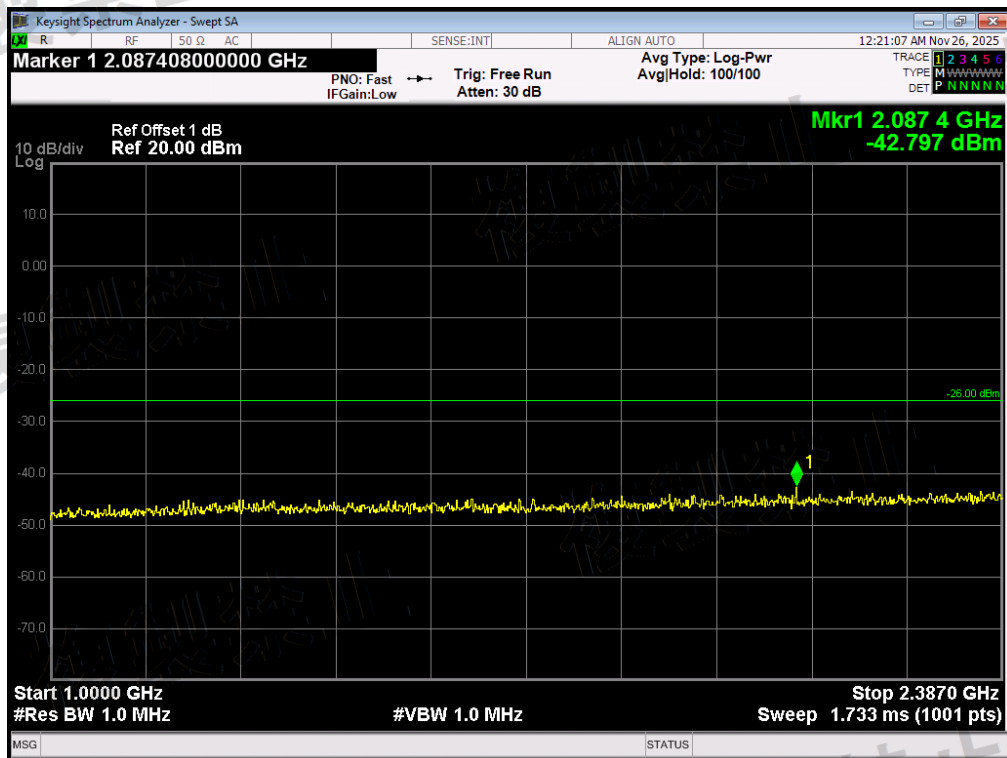


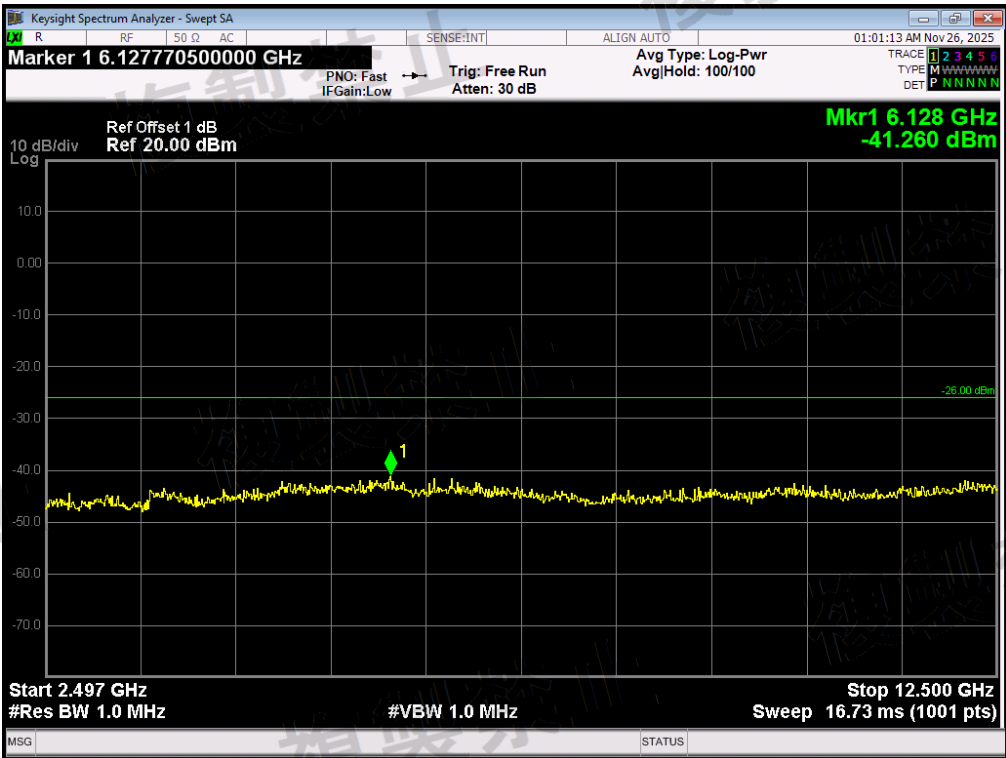
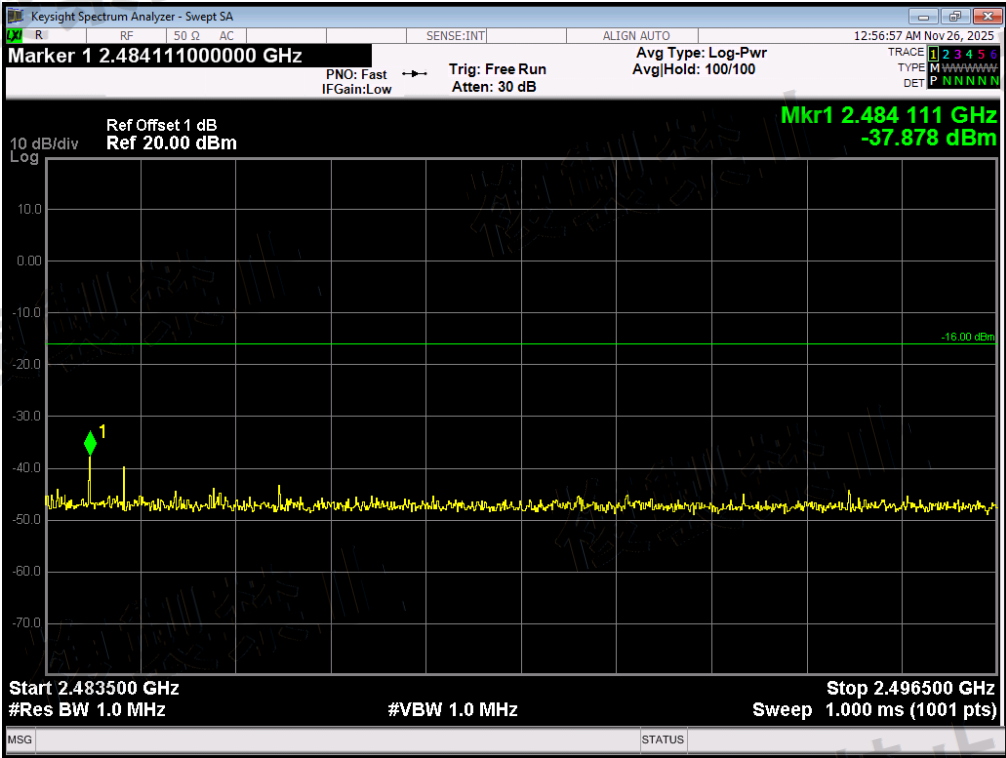


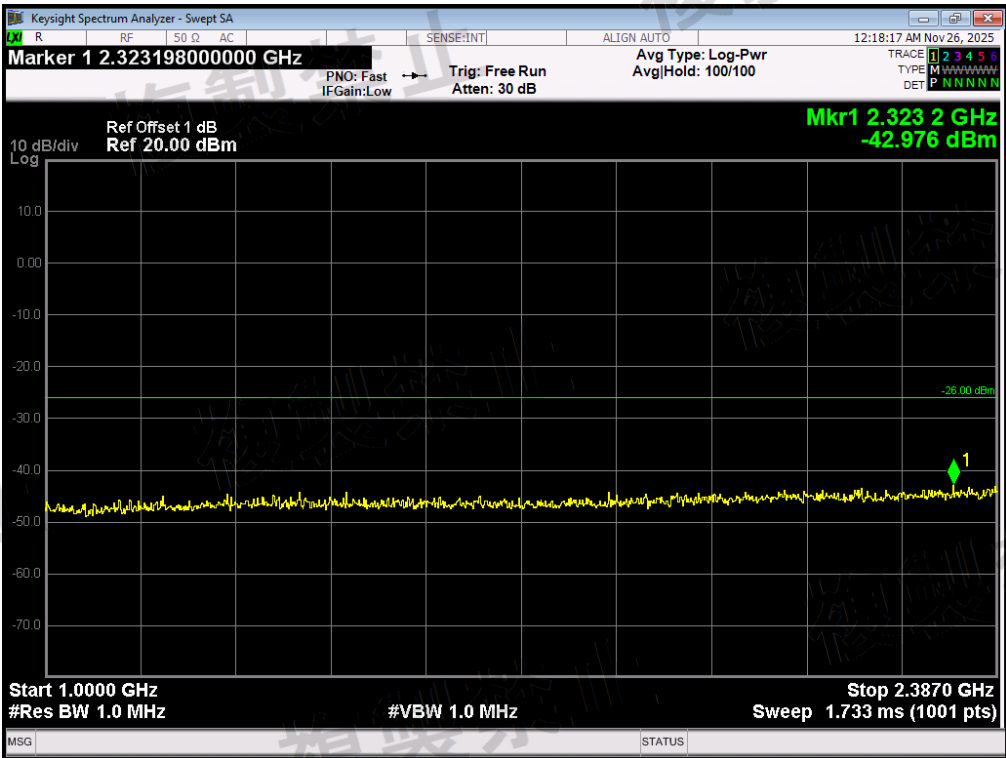
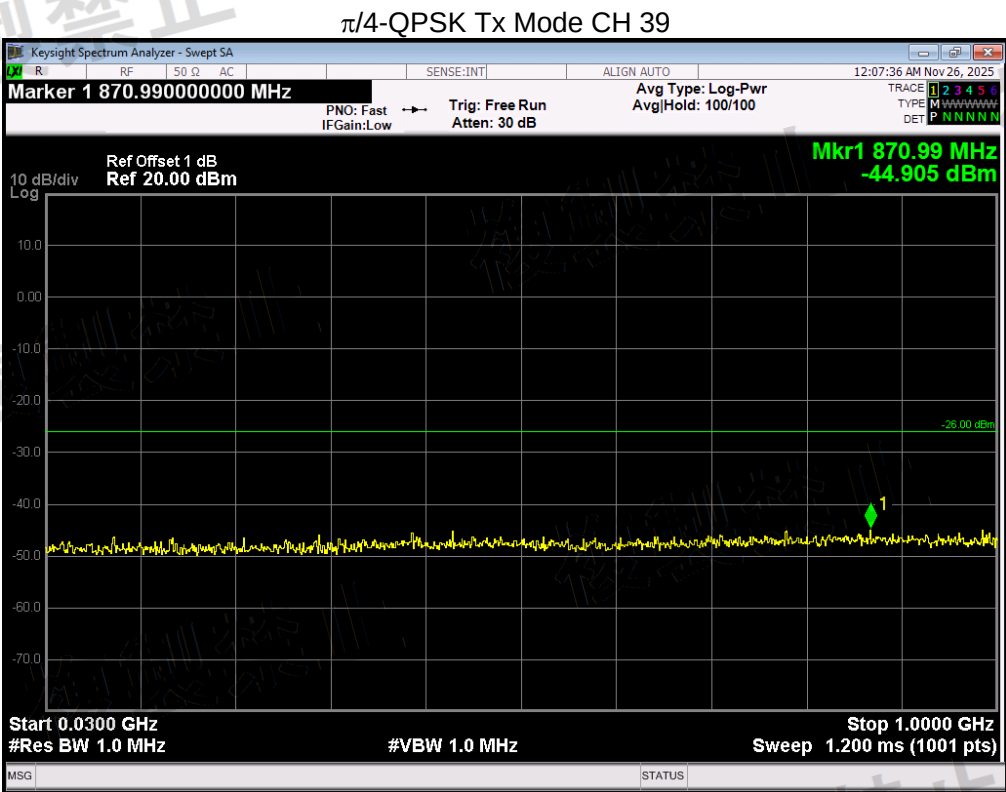


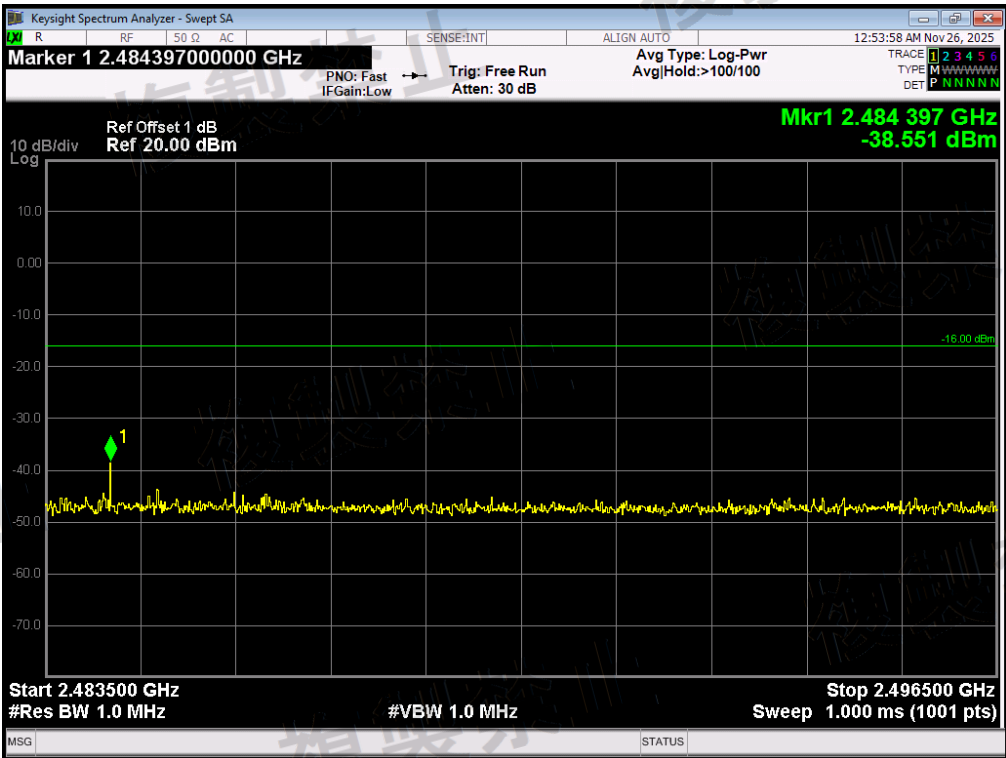
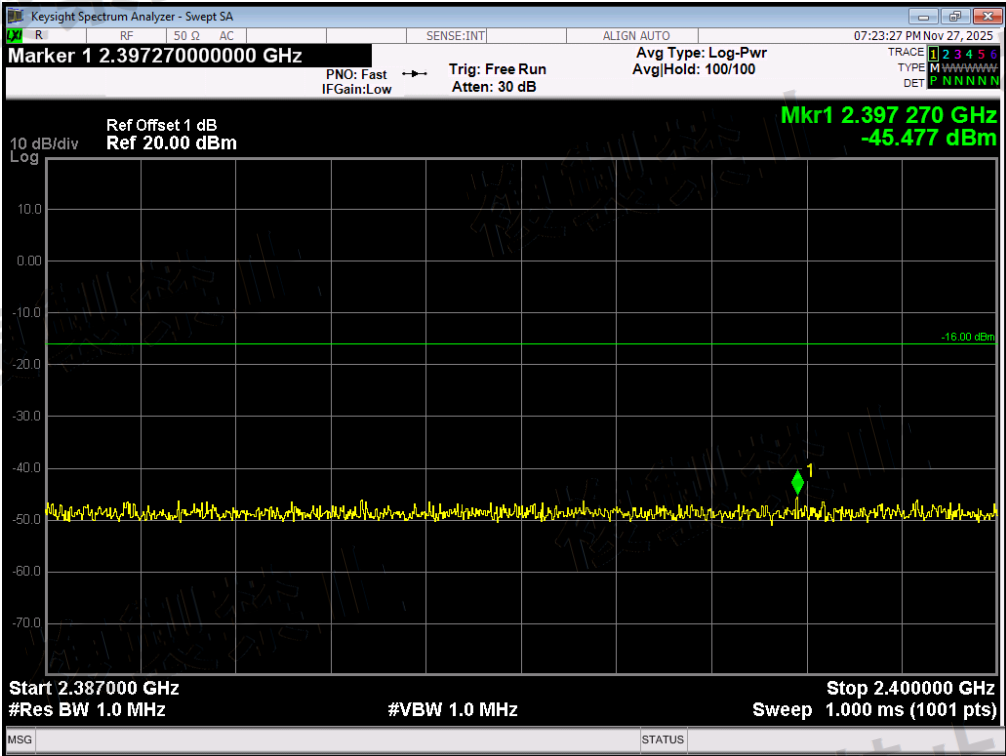
$\pi/4$ -QPSK Tx Mode CH 0

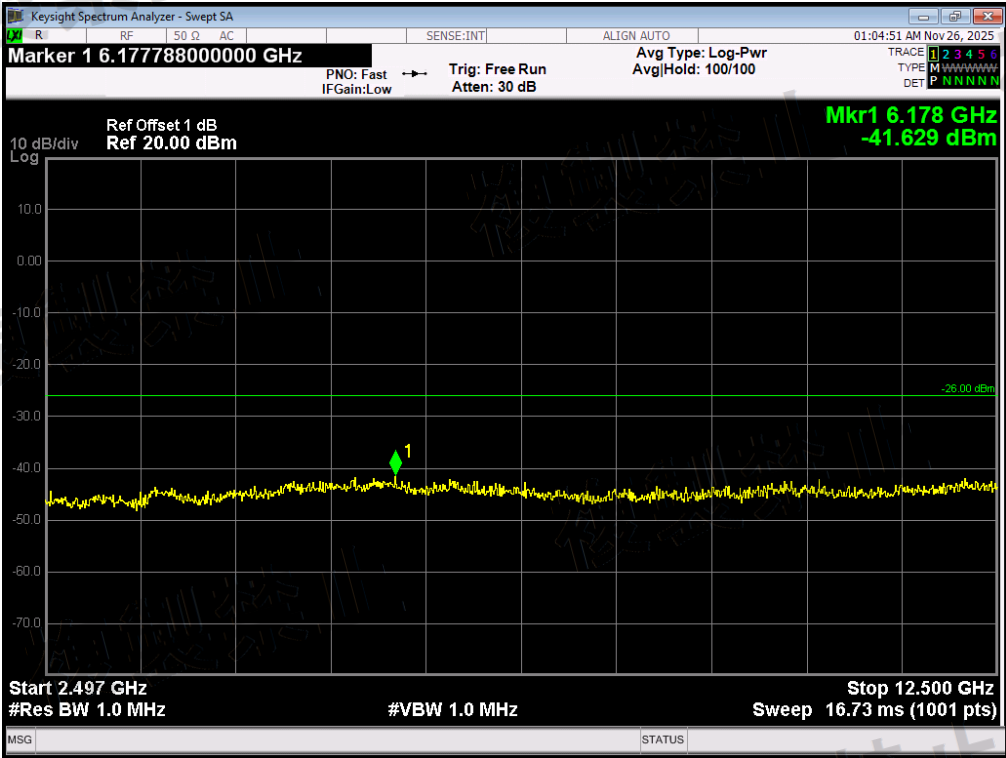




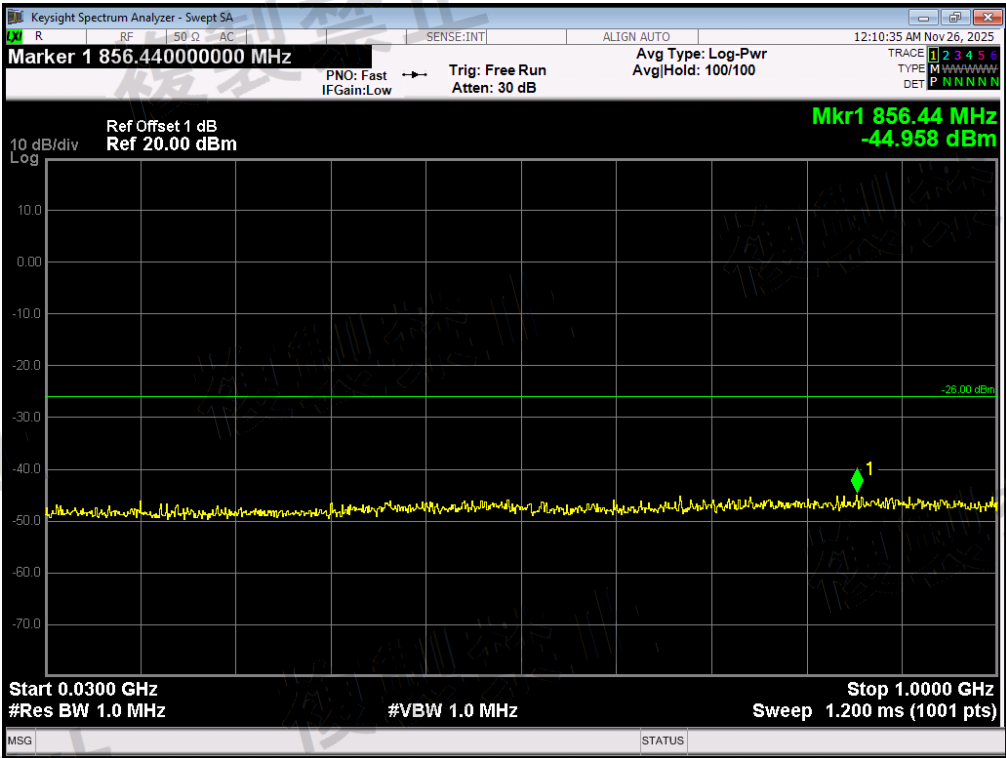


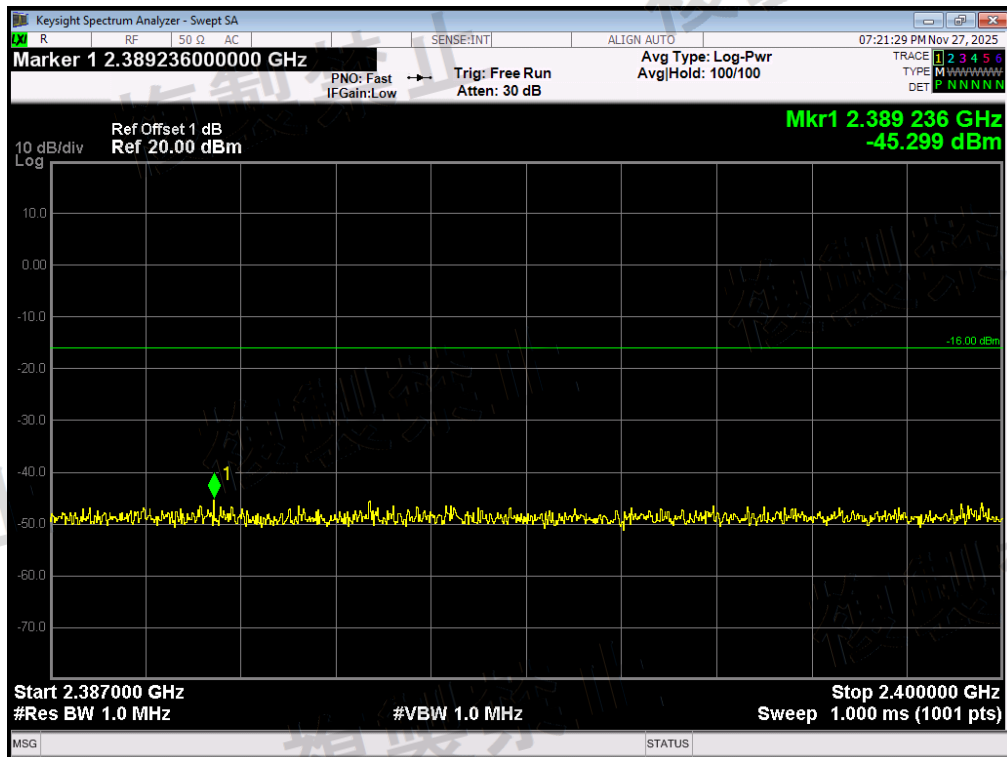
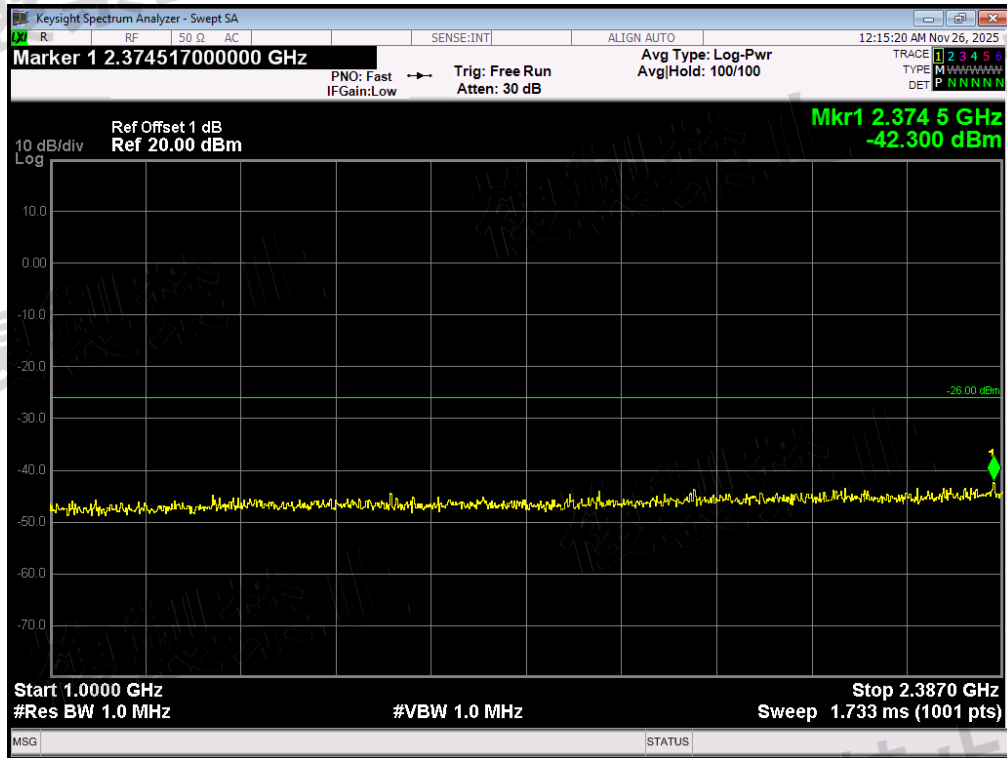


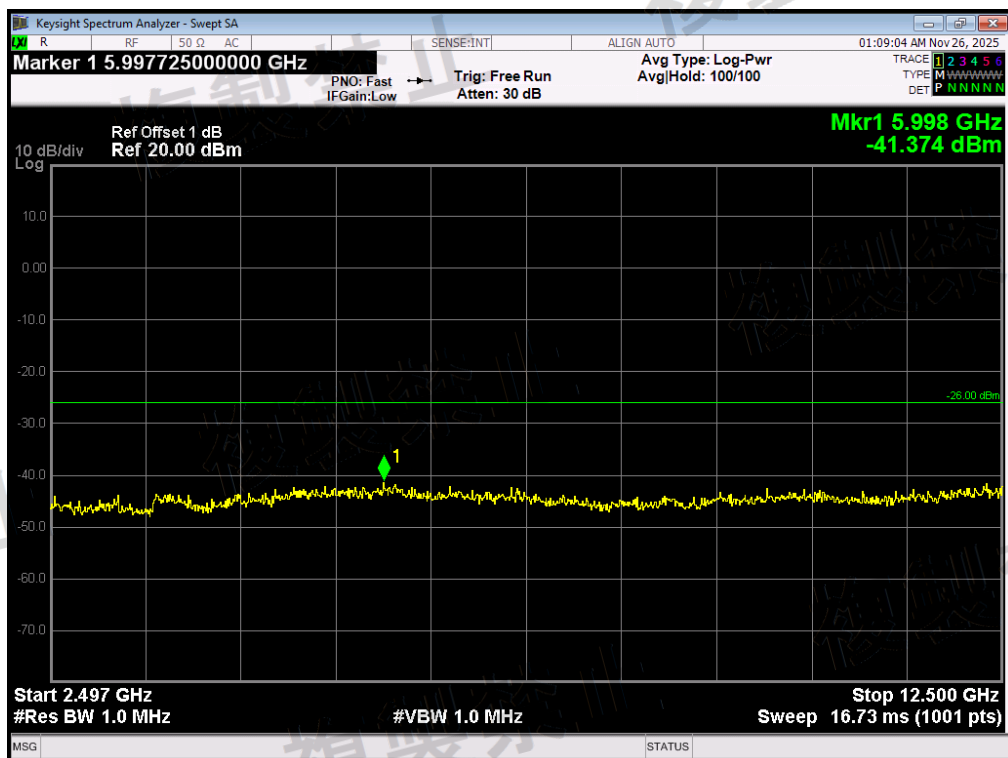
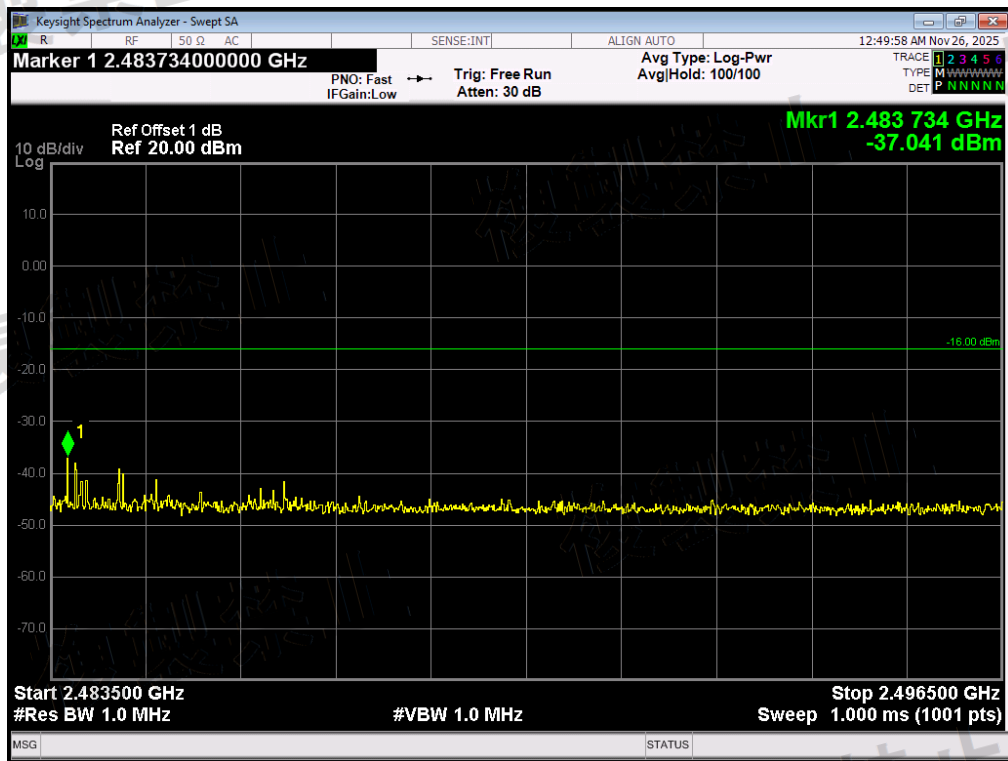




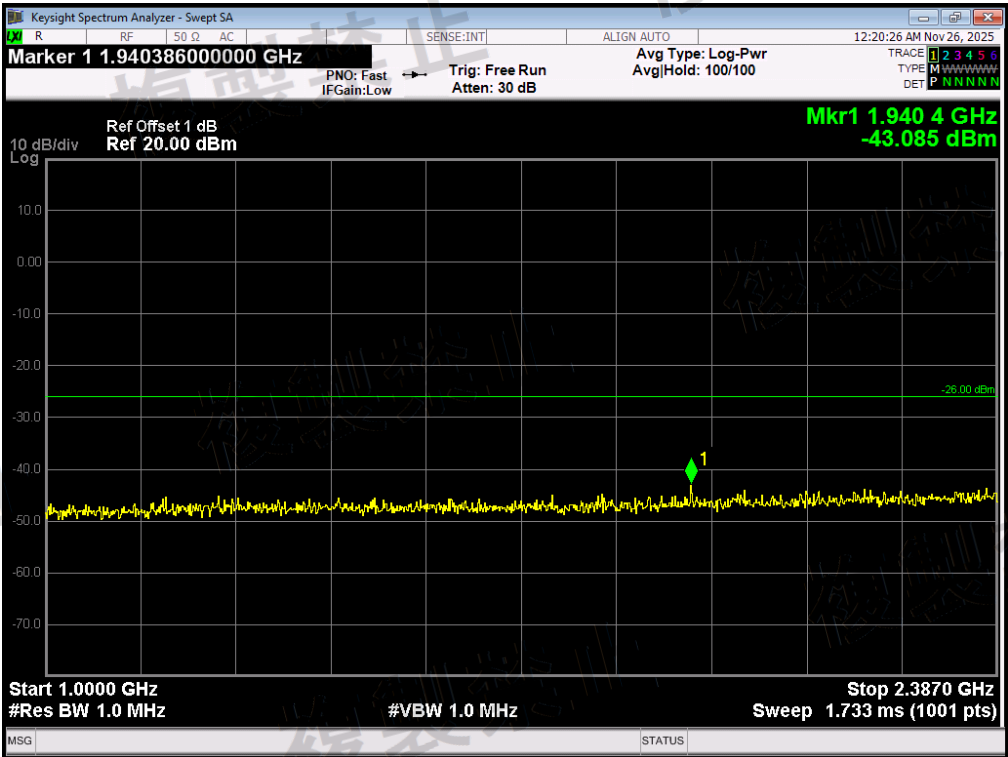
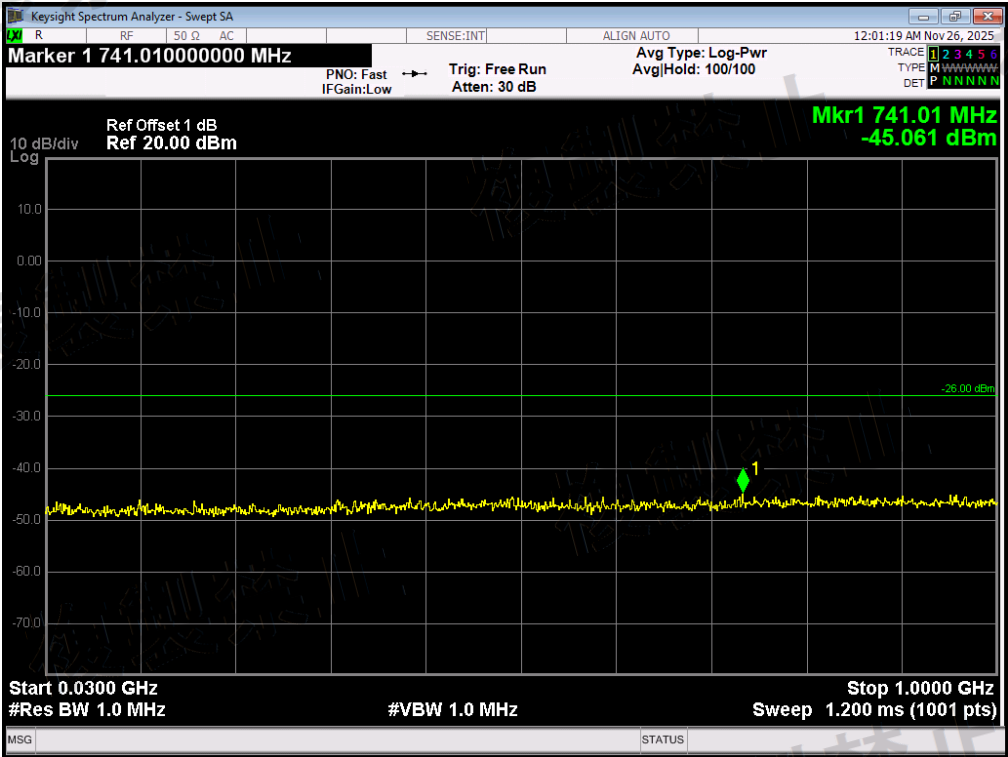
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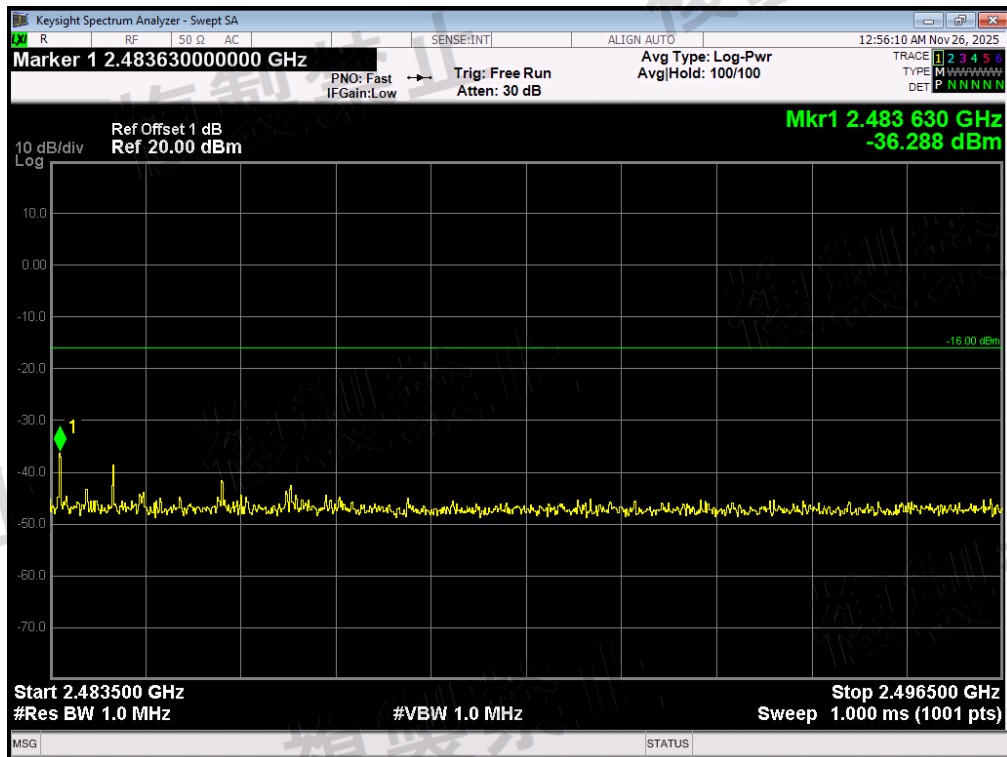
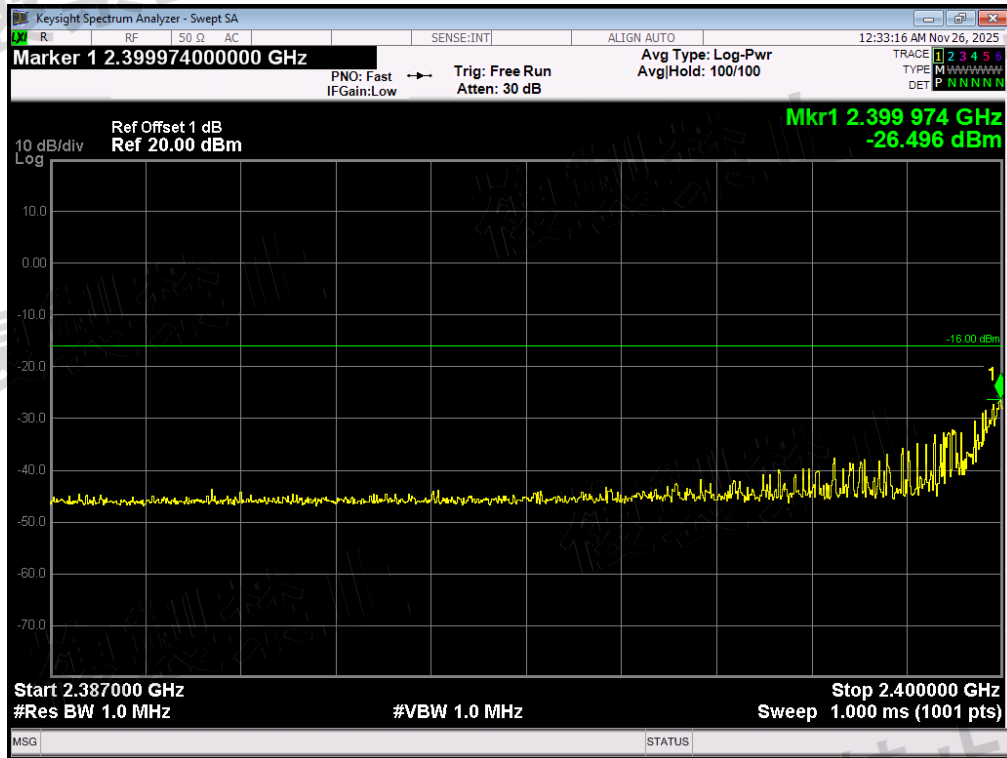


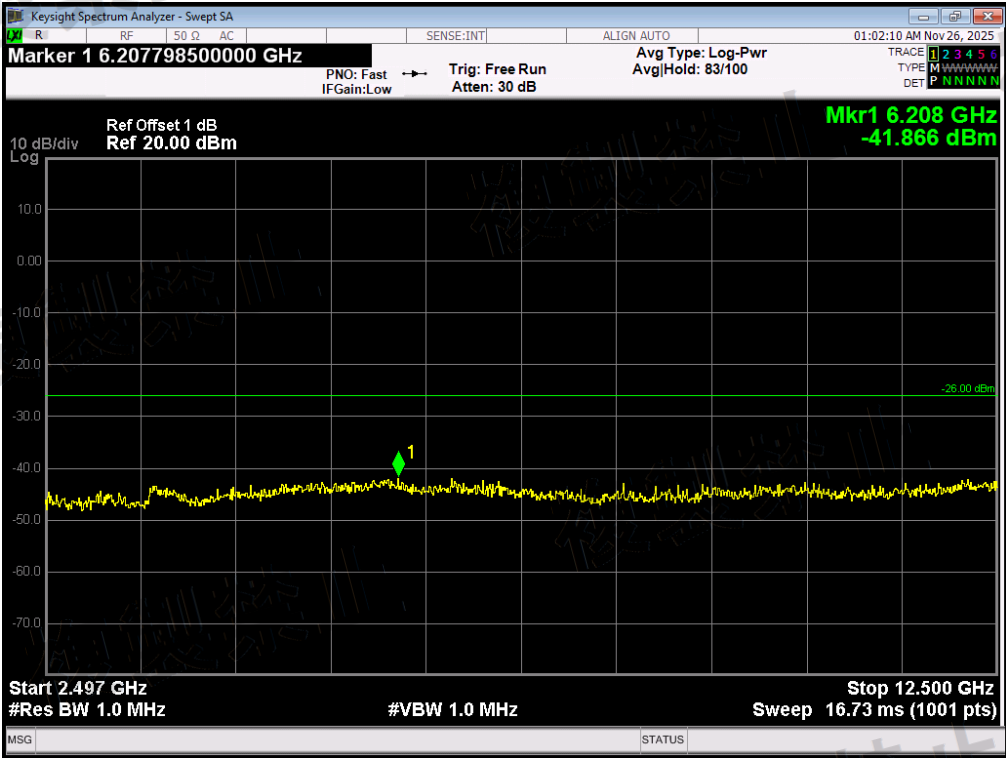




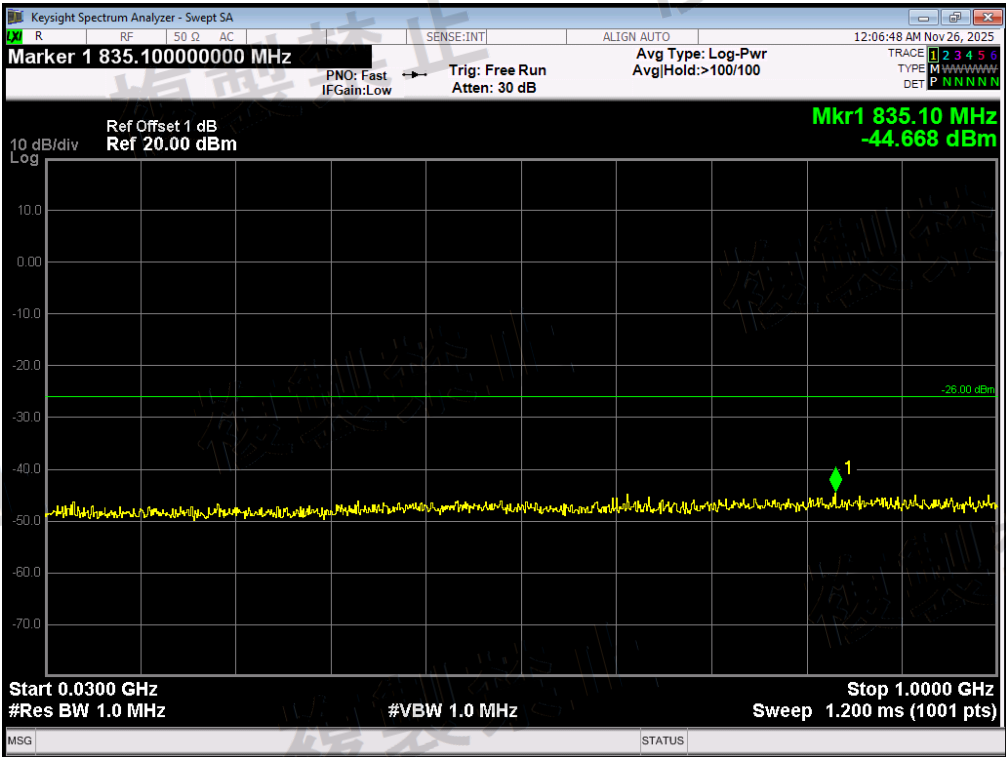
8-DPSK Tx Mode CH 0

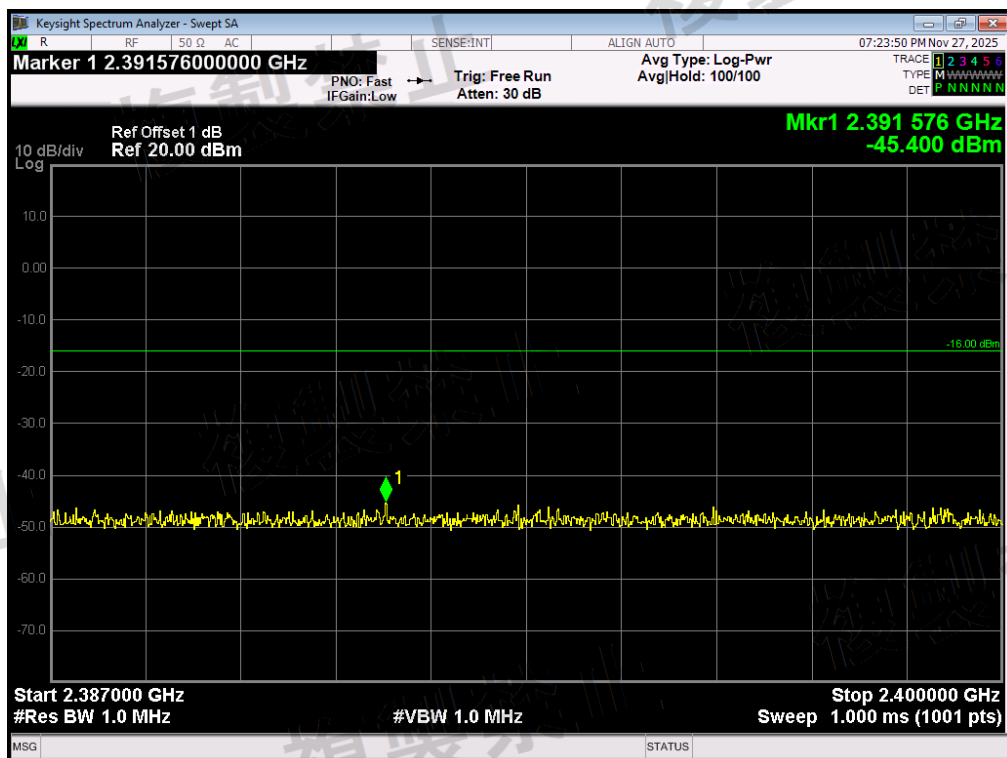
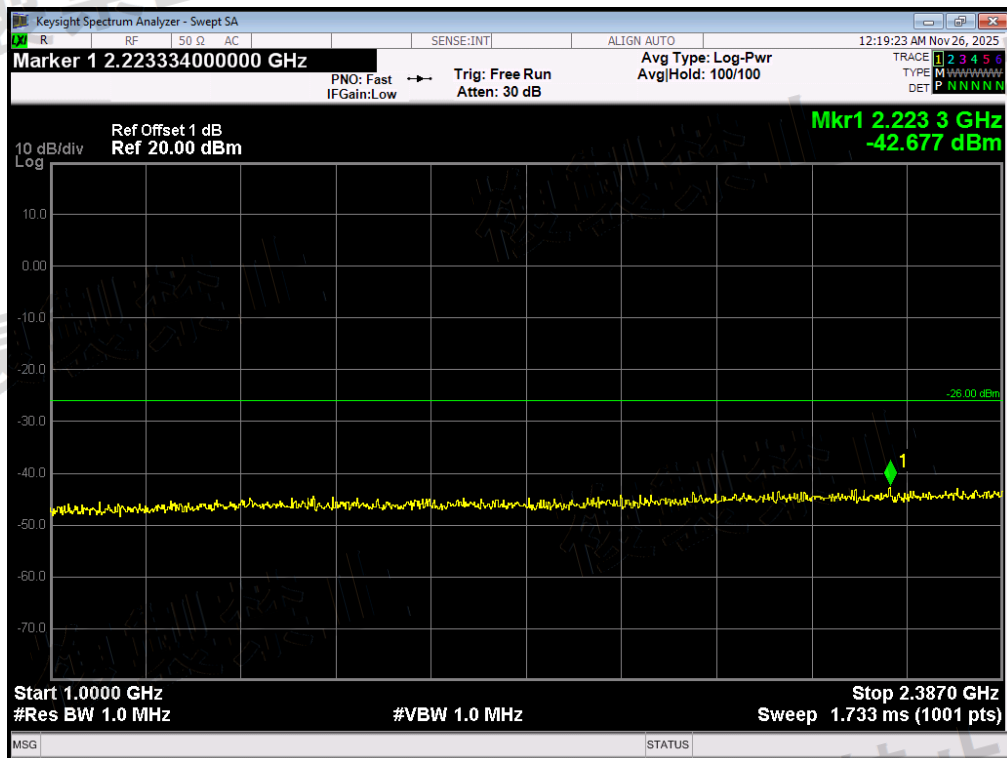


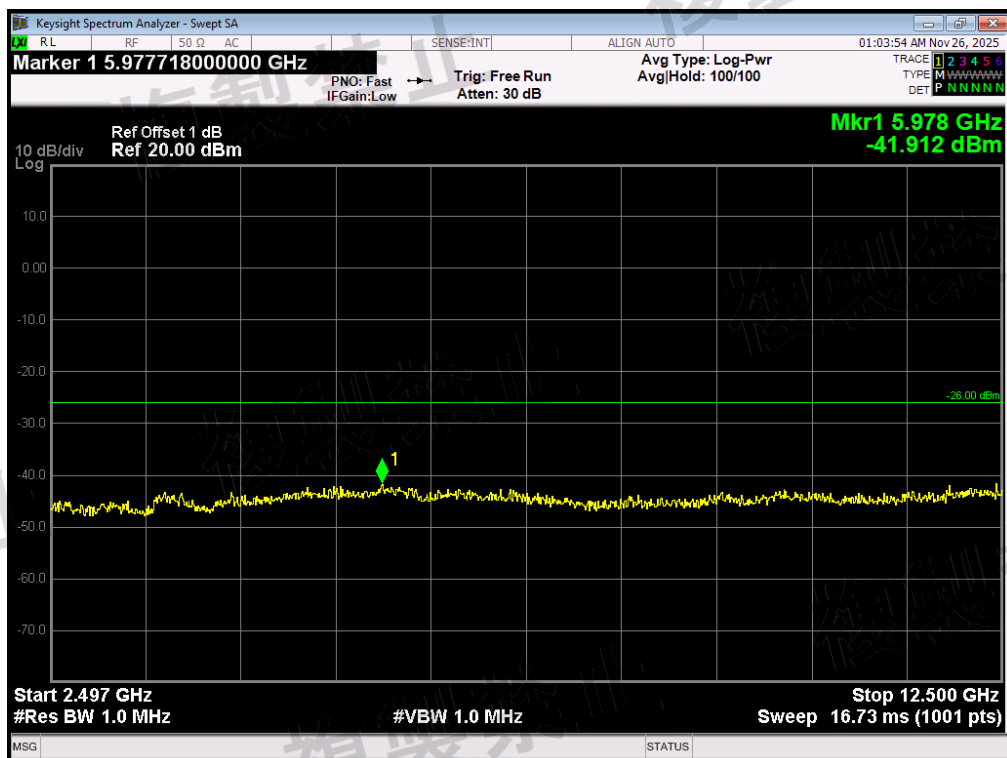
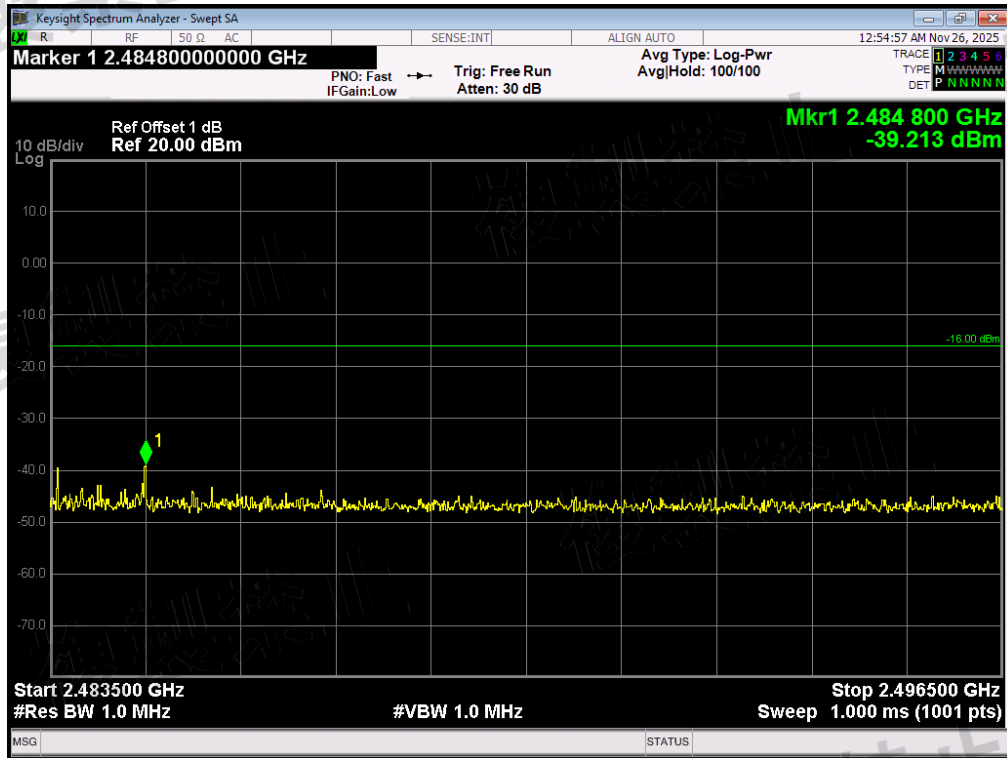




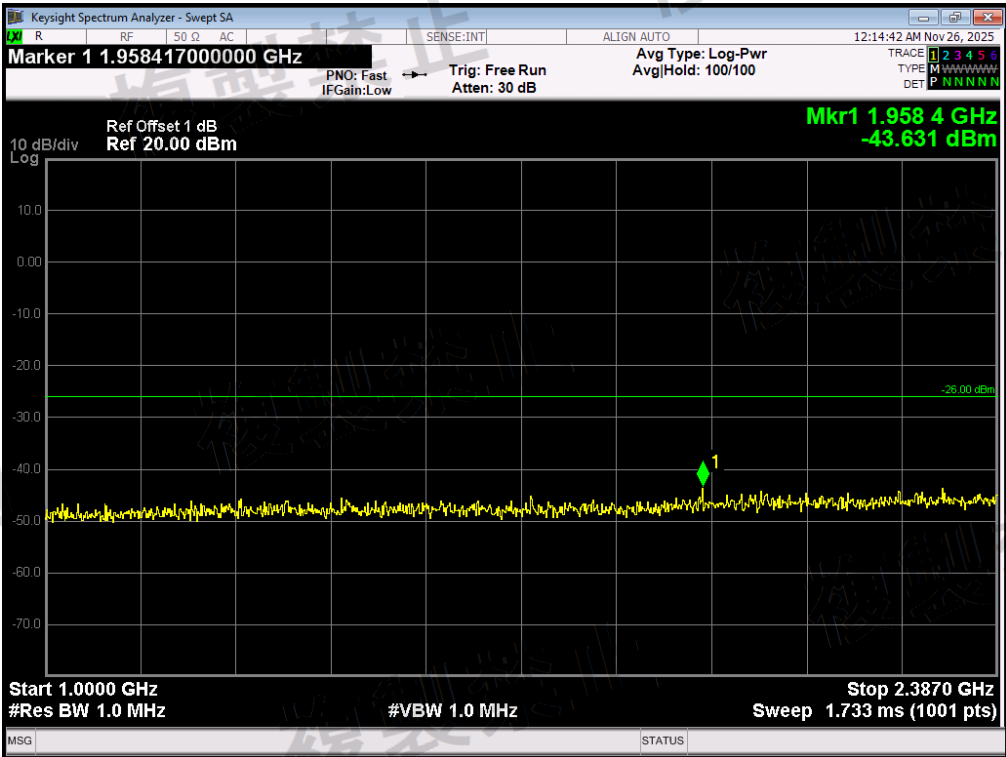
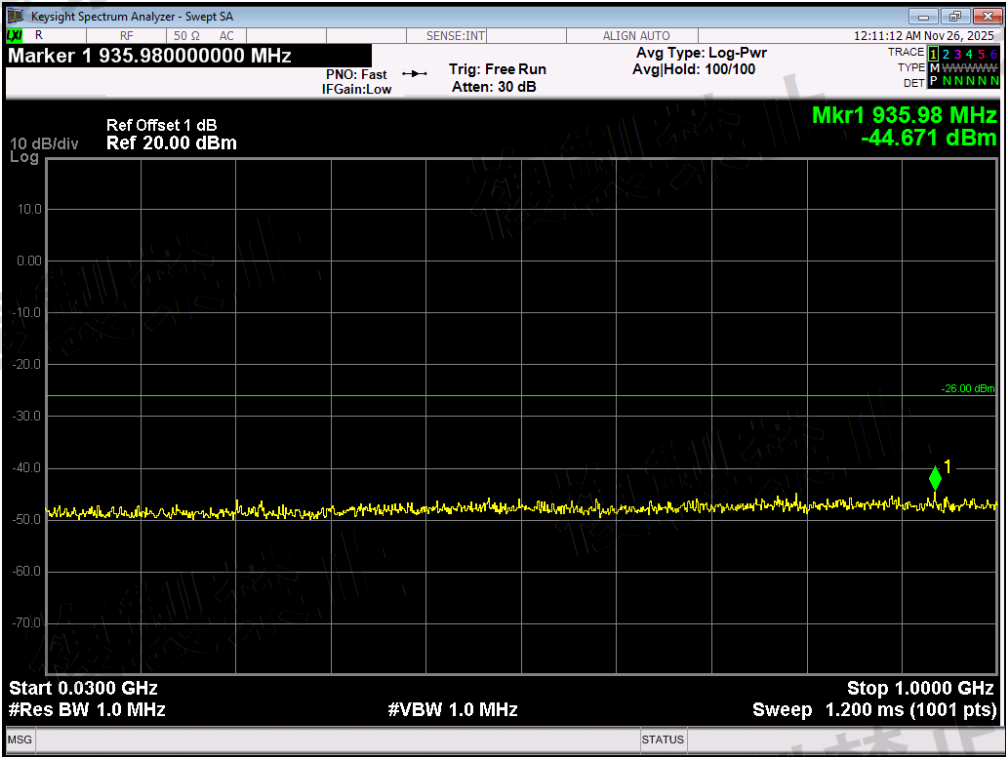
8-DPSK Tx Mode CH 39

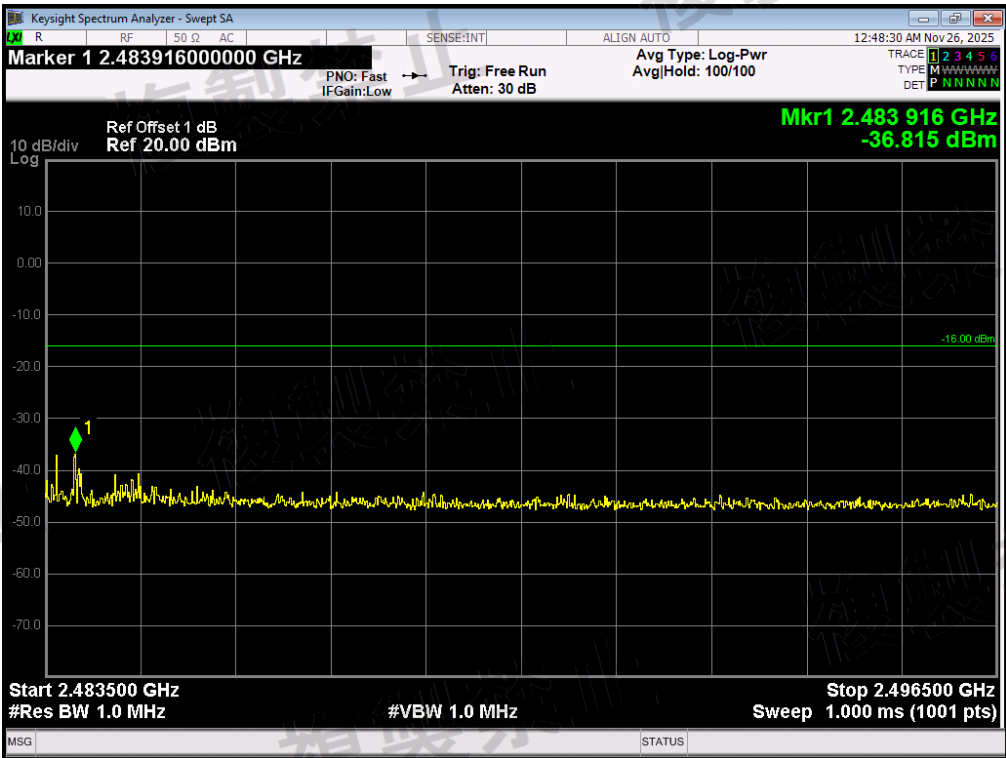
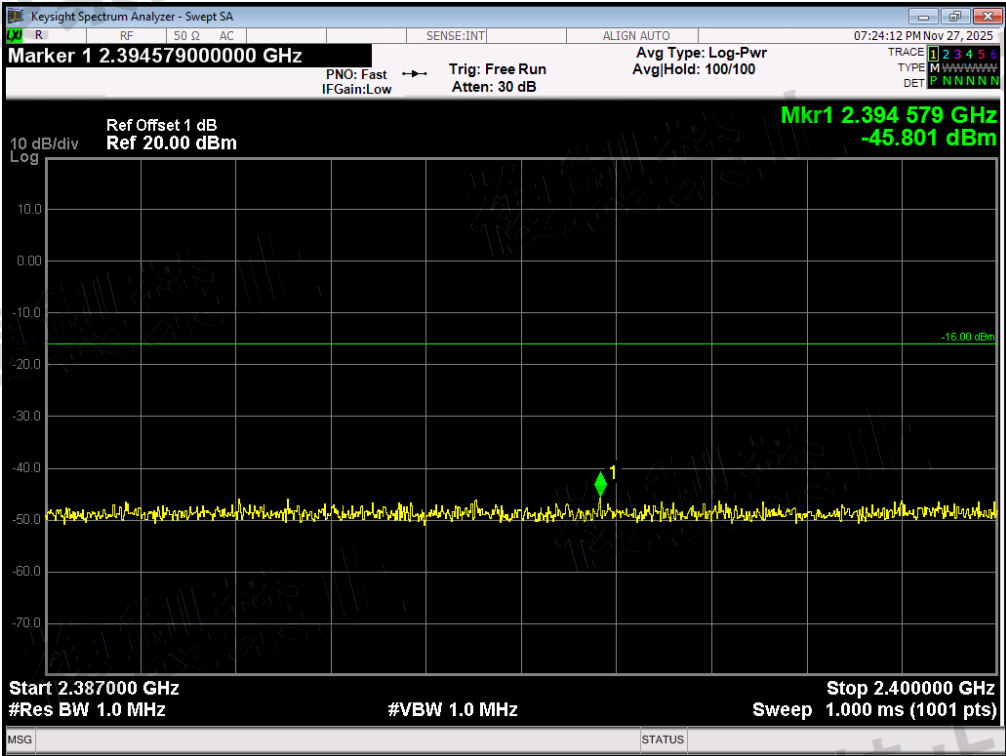


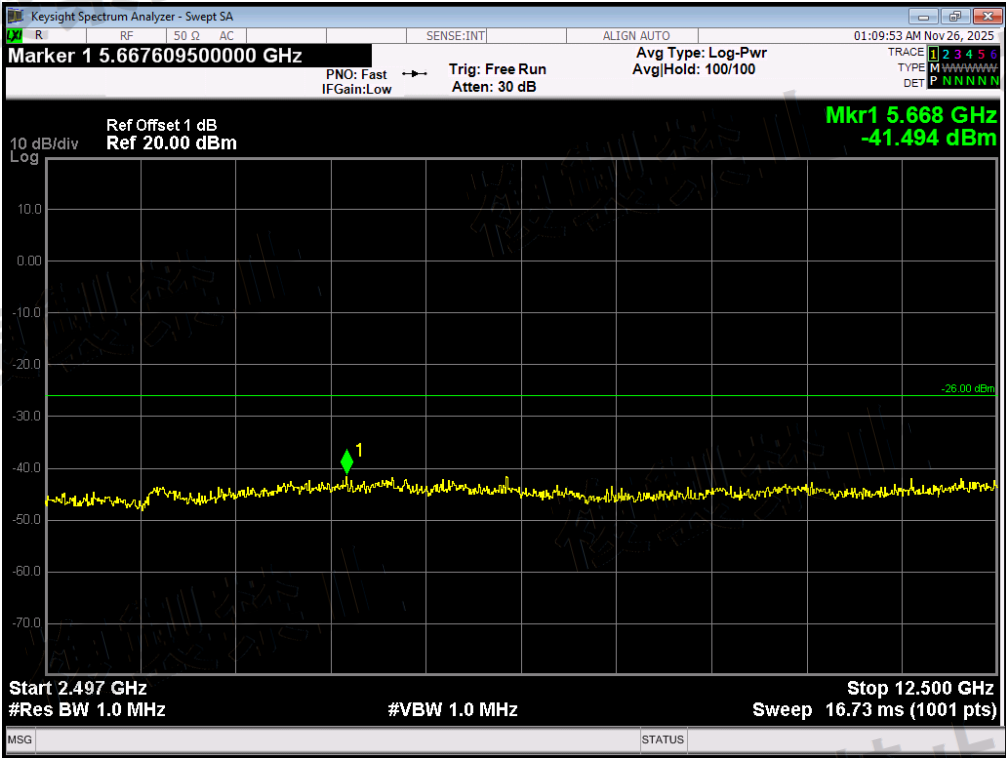




8-DPSK Tx Mode CH 78







9. Secondary Radiated Emissions

9.1. Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated until	Calibration body	classification
Spectrum analyzer	Agilent	N9010A	MY55150427	2025/05/16	2026/05/15	Jingheng	(c)
Multimeter	FLUKE	15B+	42320912WS	2025/11/13	2026/11/12	Jingheng	(c)
Attenuator	Mini-Circuits	BW-S10W2	101109	N/A	N/A	N/A	N/A
RF Cable	Micable	C10-01-01-1	100309	N/A	N/A	N/A	N/A

Remark:

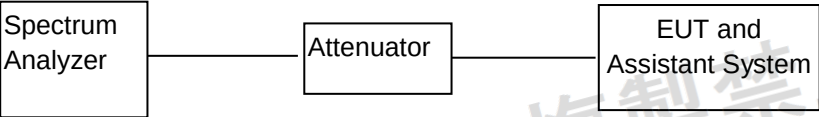
- (a) Calibration conducted by the National Institute of Information and Communications Technology(NITC) in Japan (hereinafter referred to as “NITC”) or a designated calibration agency under Article 102-18 paragraph(1) in JRL
- (b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act(Act No.51 of 1992)
- (c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration Conducted by the NITC or a designation agency under Article 102-18 paragraph(1)
- (d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the night column of appended table No.3,whice shall have been given any type of calibration, etc. listed above from(a) to (c).

From JRL Article 24-2,paragraph 4,item2

9.2. Limit

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

9.3. Block diagram of test setup



9.4. Test Procedure

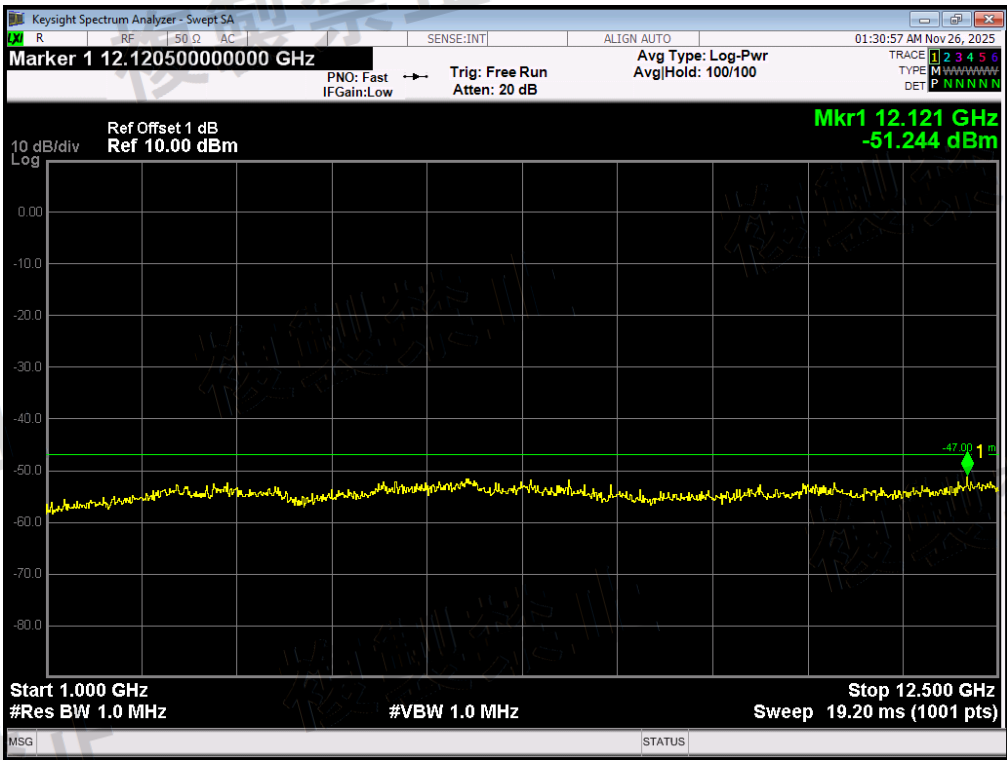
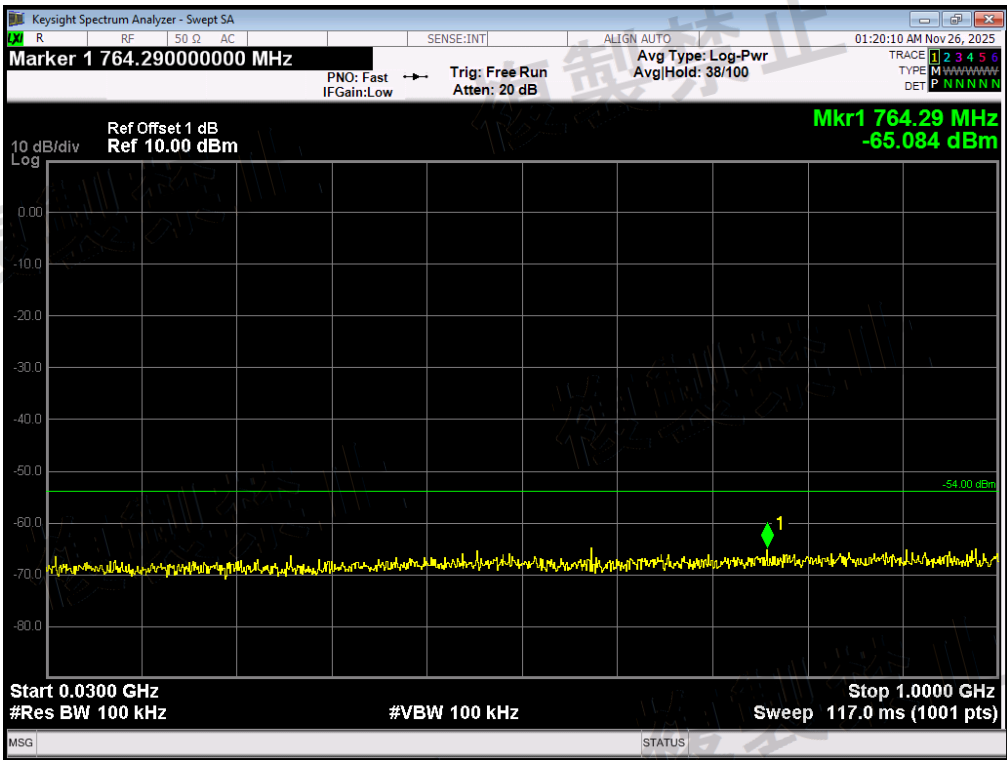
- (1) Configure EUT and assistant system according clause 2.3 and 9.3
- (2) Set EUT work in test mode as described in clause 2.3
- (3) Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:
Resolution BW: 100 KHz for frequency below 1GHz and 1MHz for frequency above 1GHz
Video BW: 100 KHz for frequency below 1GHz and 1MHz for frequency above 1GHz
Detector: Peak Trace Mode: Max Hold.
- (4)Sufficient number of measurements and samples are taken when measuring at average.
- (5) All the emissions from 30MHz to 13GHz were measured and record.

9.5. Test result

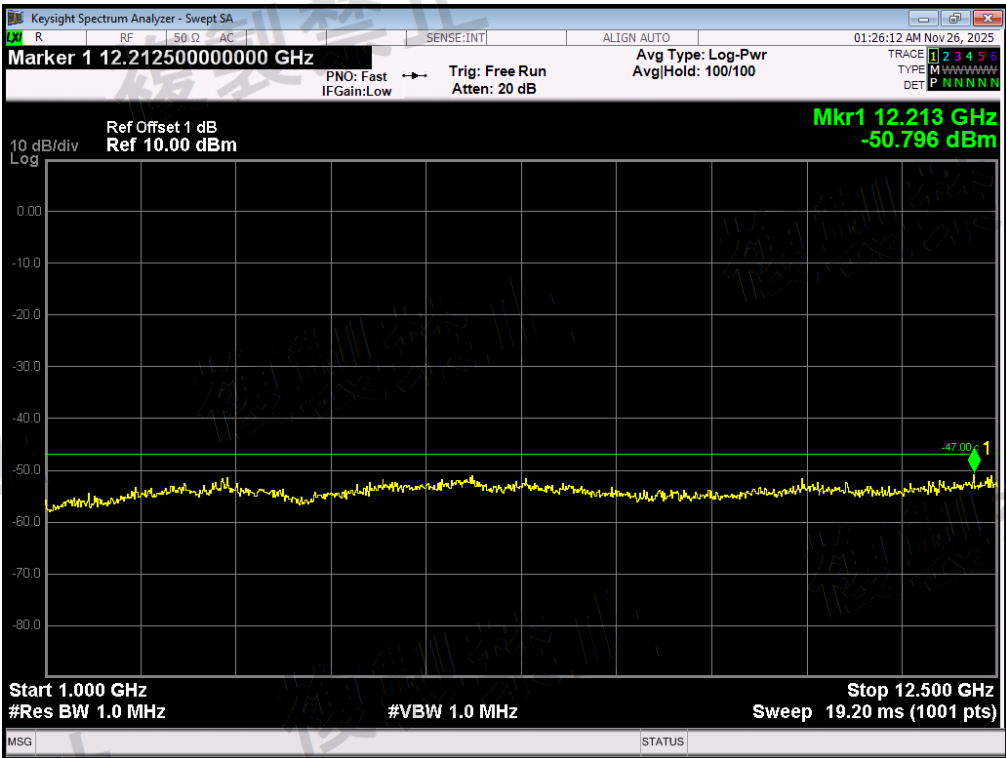
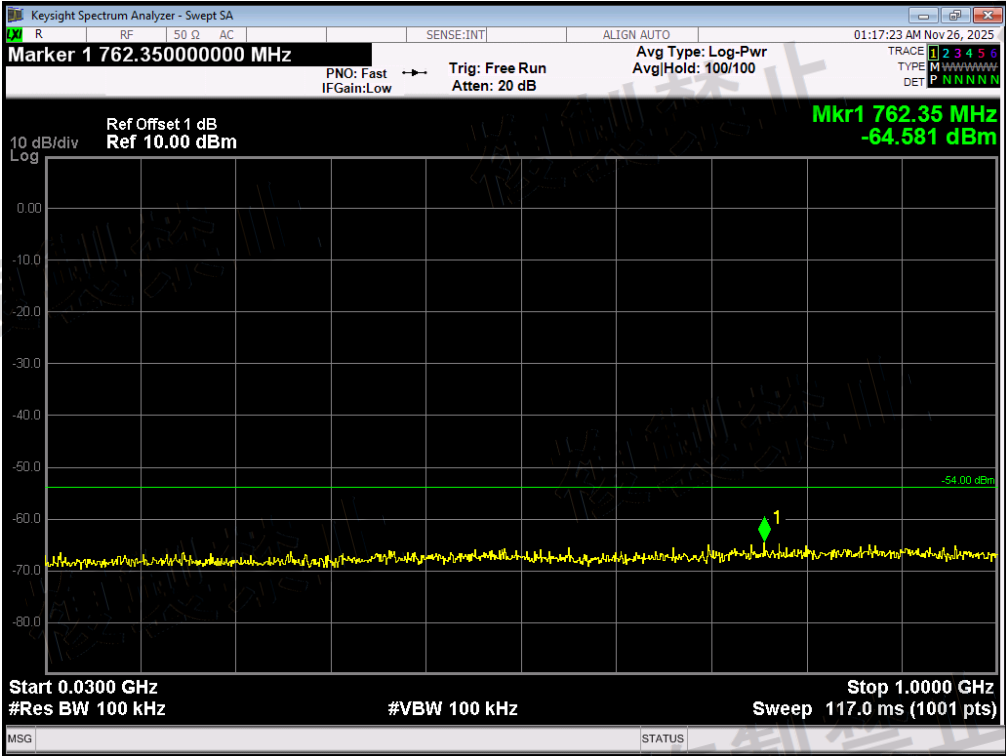
Voltage (V)	Mode	CH	Frequency (MHz)	Reading (dBm)	Limit (dBm)	Result
Normal	GFSK Rx Mode	CH 0	30-1000	-65.084	-54	PASS
			1000-12500	-51.244	-47	PASS
		CH 39	30-1000	-64.581	-54	PASS
			1000-12500	-50.796	-47	PASS
		CH 78	30-1000	-64.473	-54	PASS
			1000-12500	-51.285	-47	PASS
	$\pi/4$ -QPSK Rx Mode	CH 0	30-1000	-65.024	-54	PASS
			1000-12500	-51.079	-47	PASS
		CH 39	30-1000	-64.310	-54	PASS
			1000-12500	-51.234	-47	PASS
		CH 78	30-1000	-65.774	-54	PASS
			1000-12500	-52.319	-47	PASS
	8-DPSK Rx Mode	CH 0	30-1000	-64.599	-54	PASS
			1000-12500	-51.466	-47	PASS
		CH 39	30-1000	-64.732	-54	PASS
			1000-12500	-51.569	-47	PASS
		CH 78	30-1000	-65.437	-54	PASS
			1000-12500	-51.435	-47	PASS

9.6. Original test data

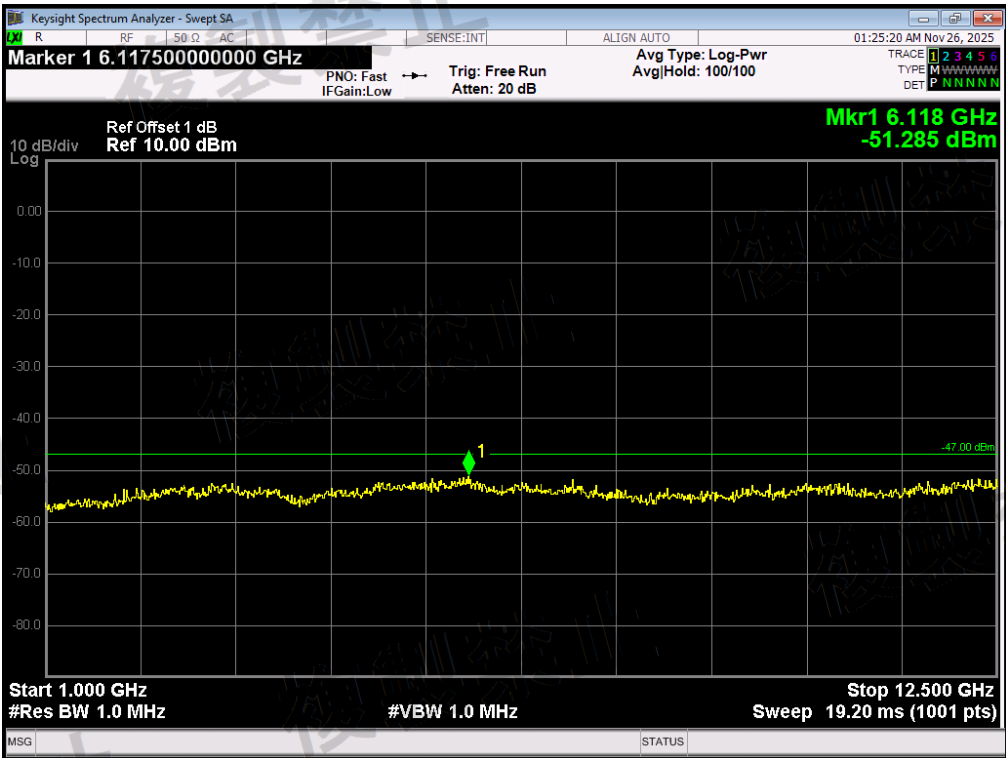
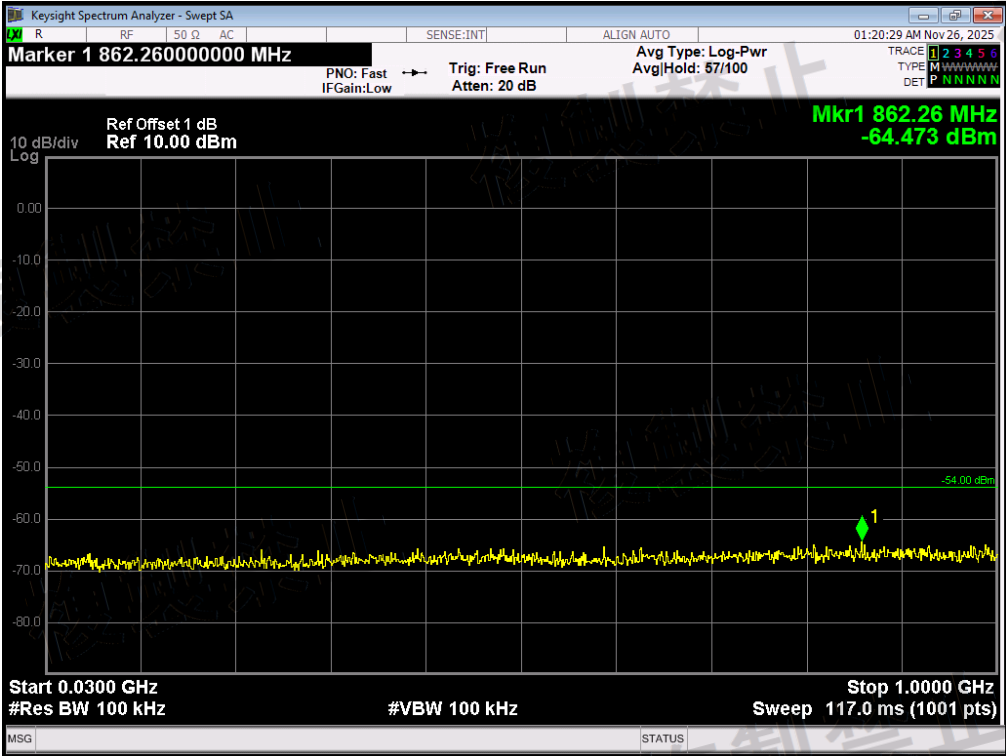
GFSK Rx Mode CH 0



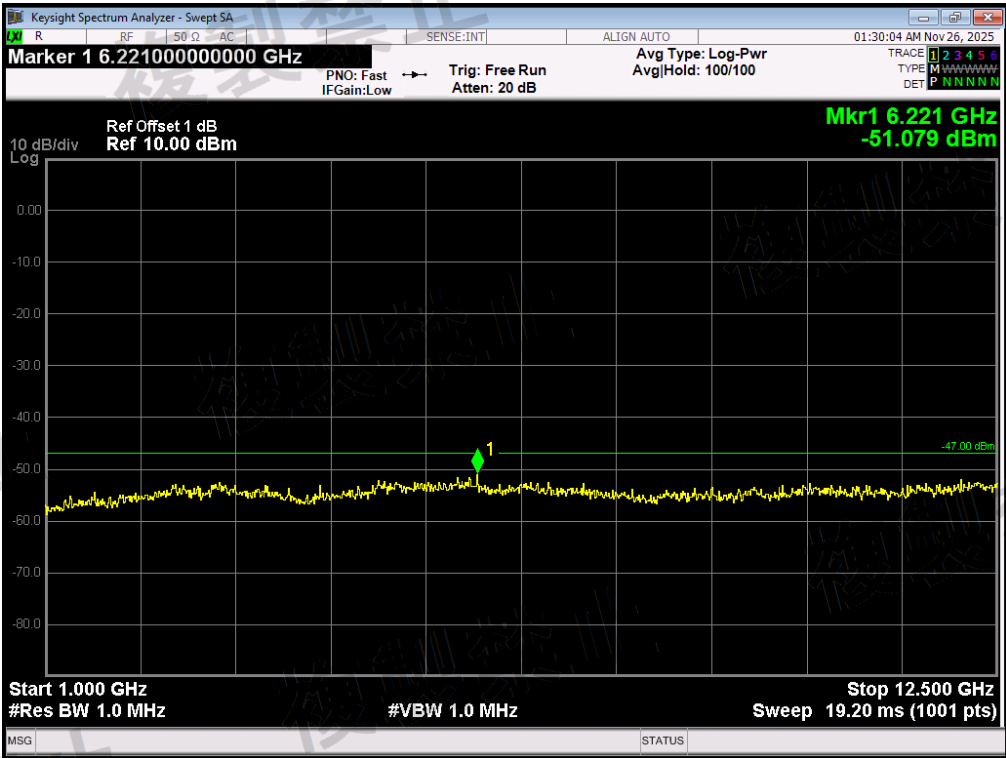
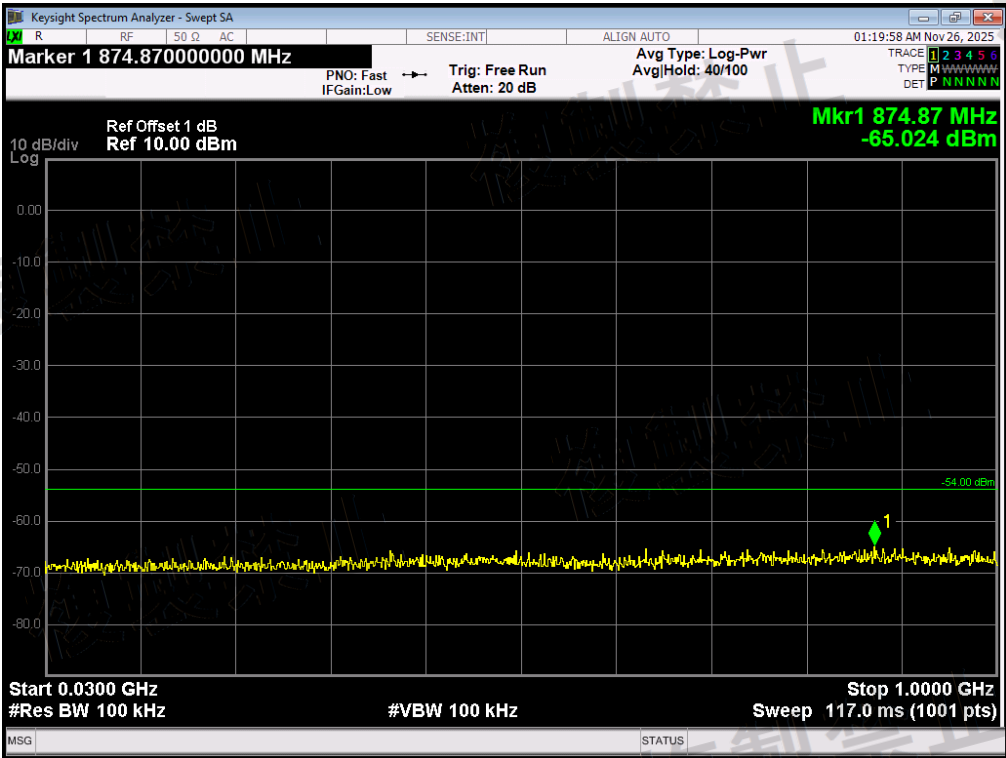
GFSK Rx Mode CH 39



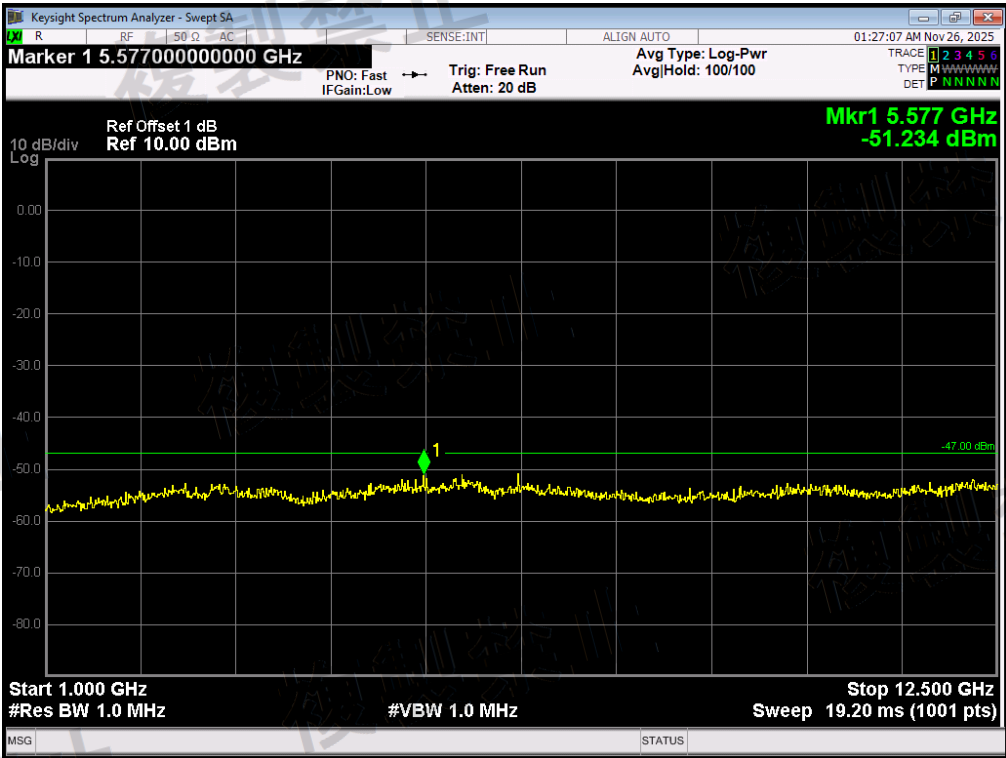
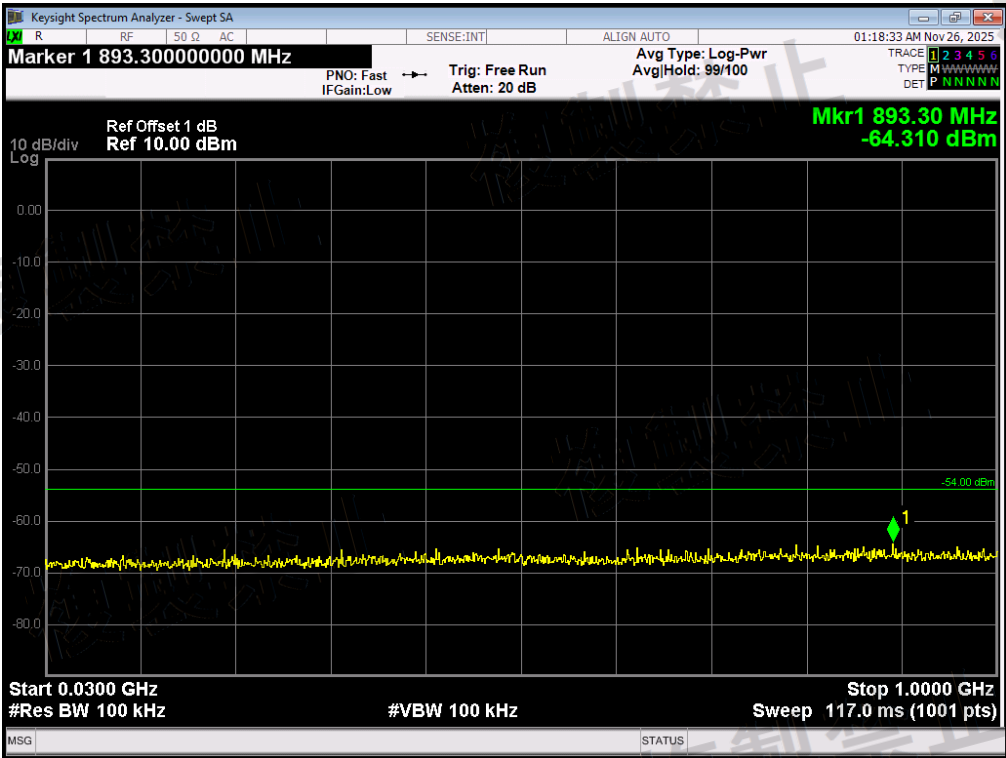
GFSK Rx Mode CH 78

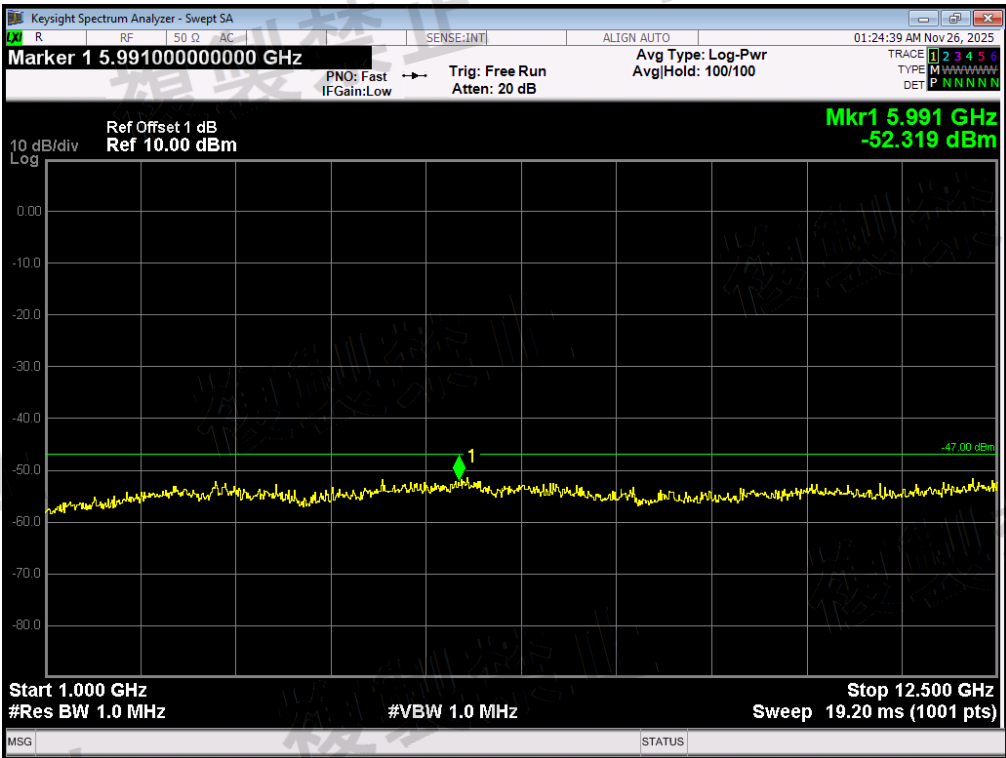
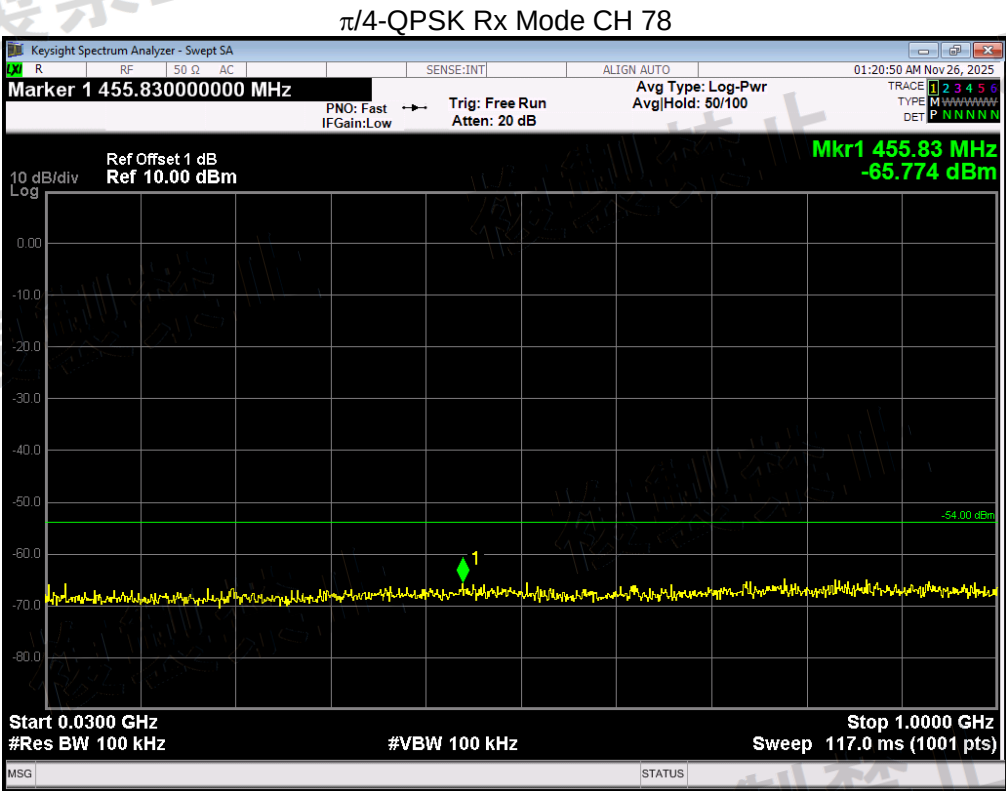


$\pi/4$ -QPSK Rx Mode CH 0

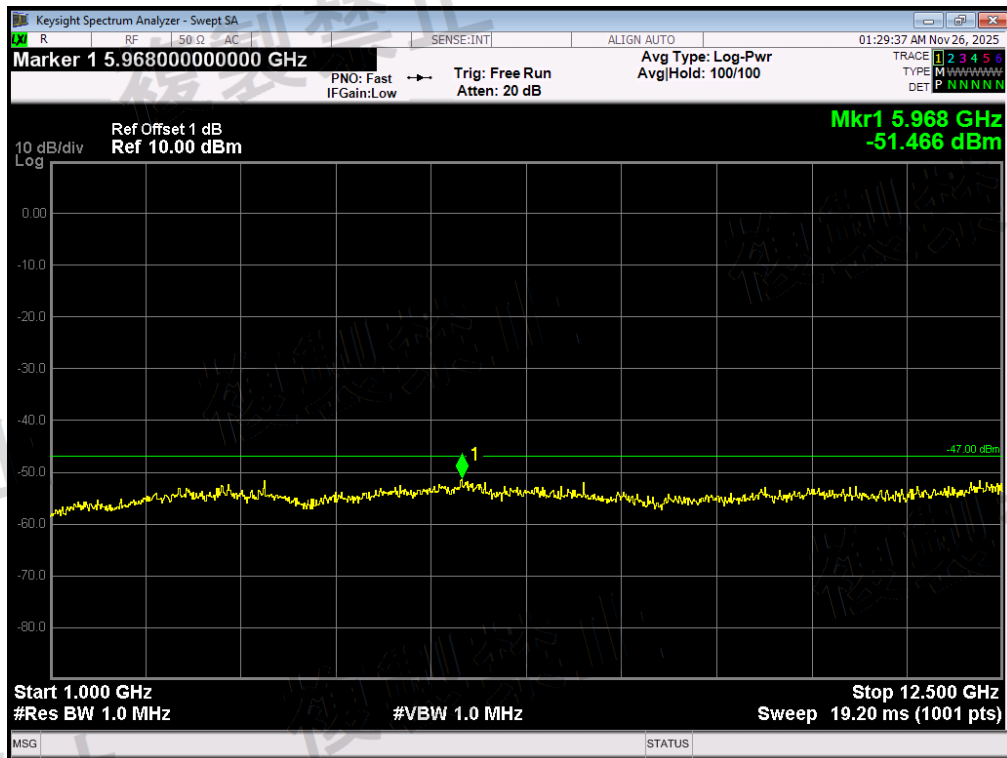
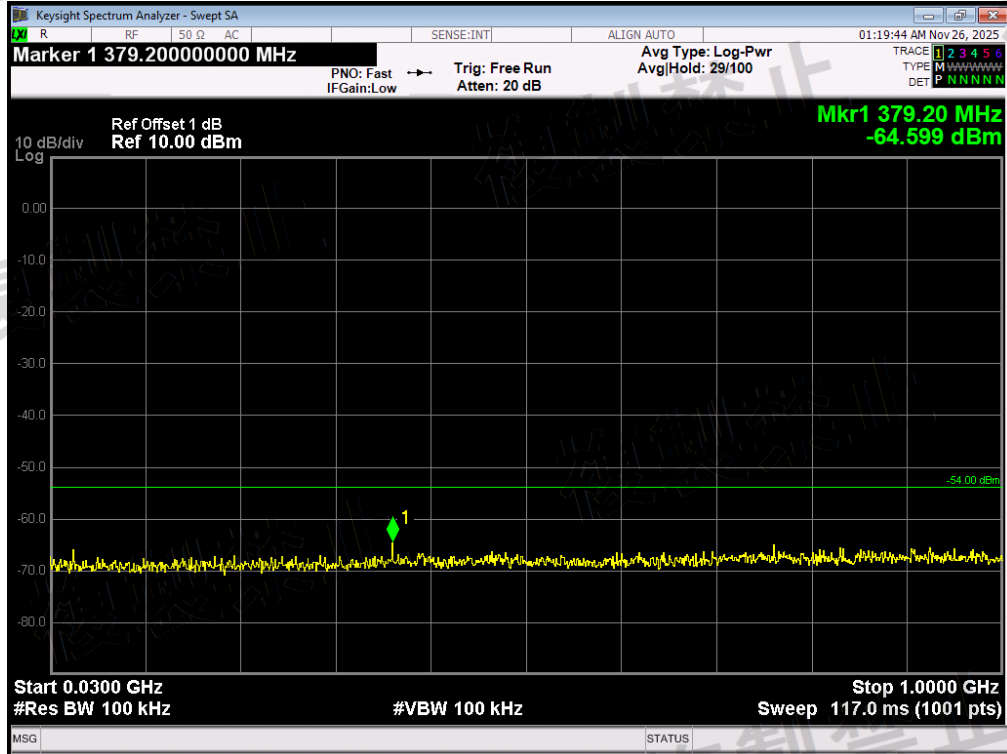


$\pi/4$ -QPSK Rx Mode CH 39

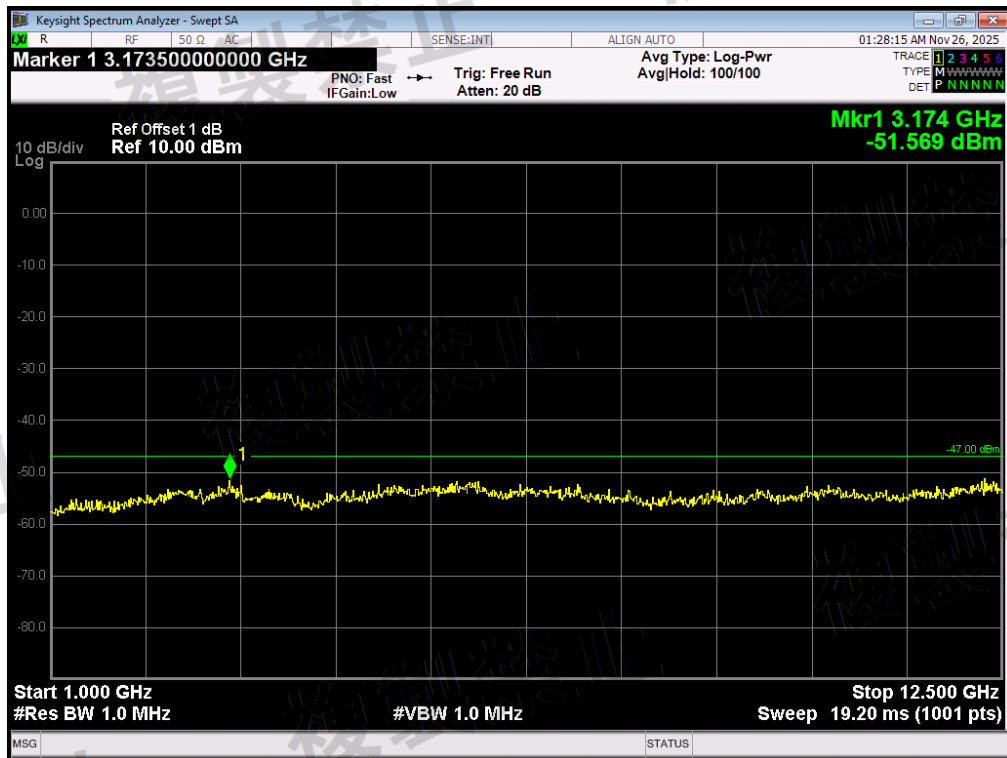
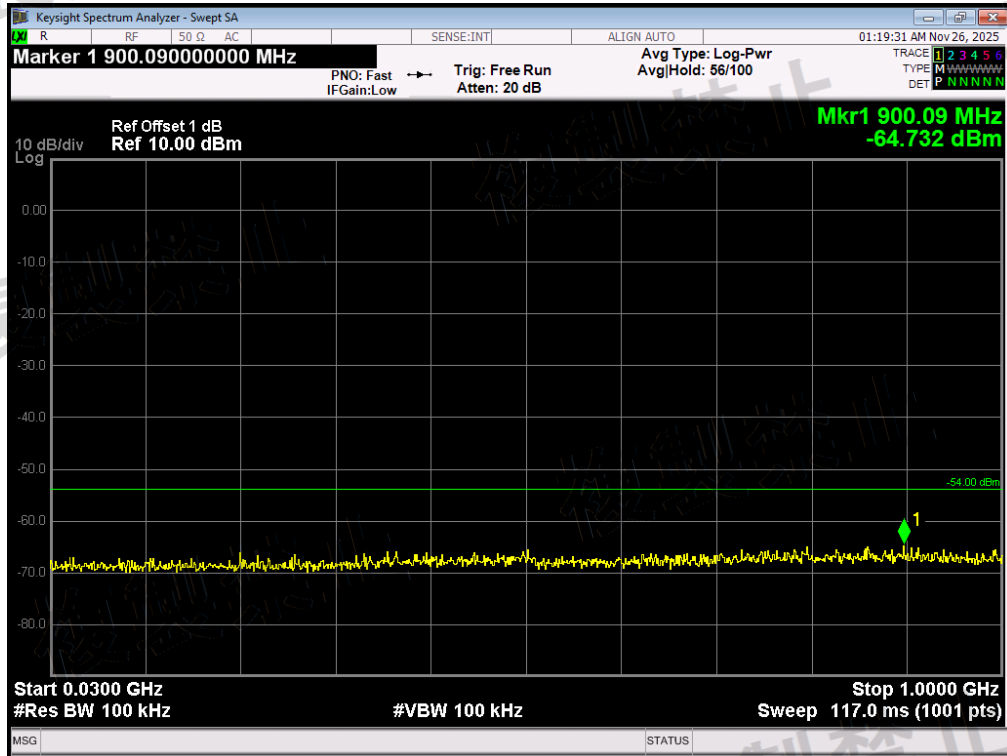




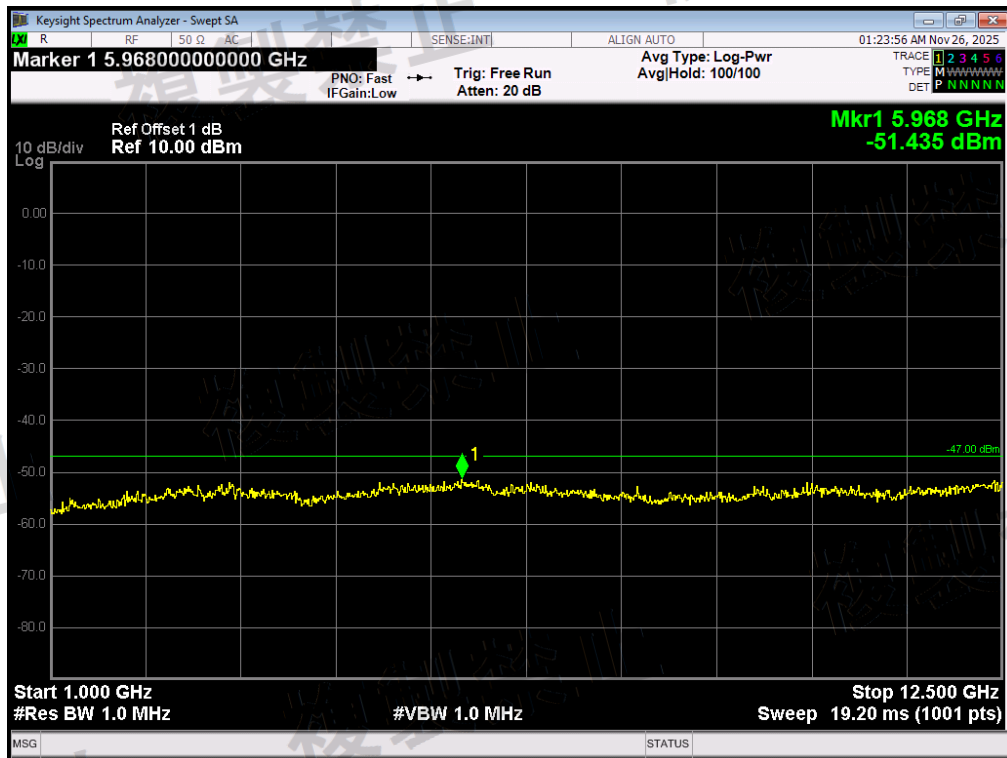
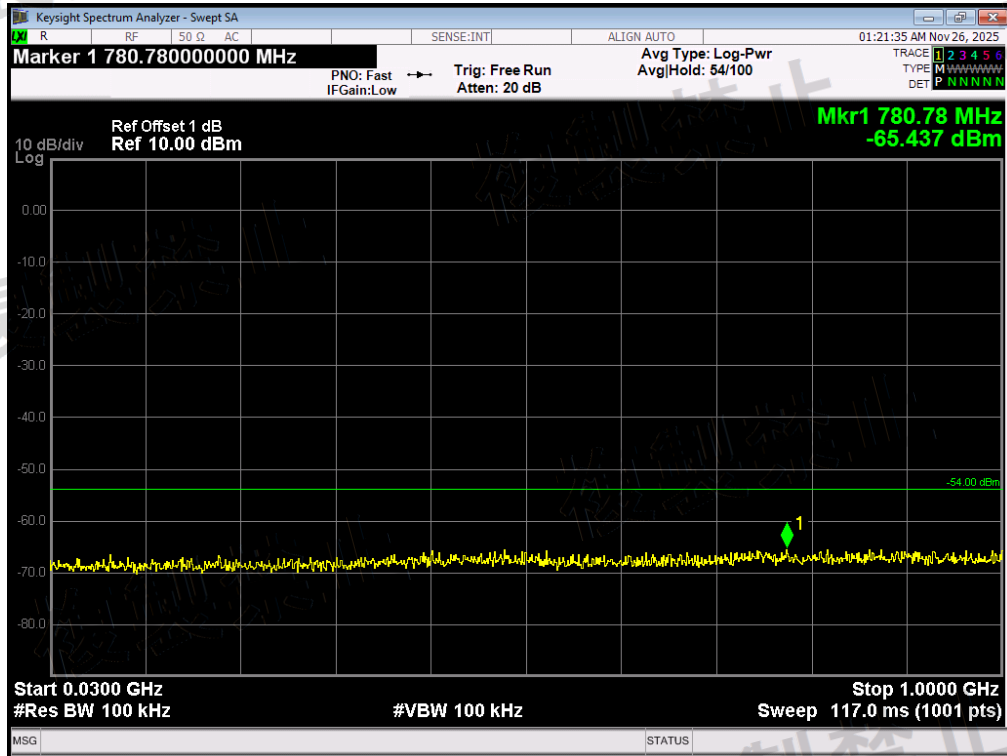
8-DPSK Rx Mode CH 0



8-DPSK Rx Mode CH 39

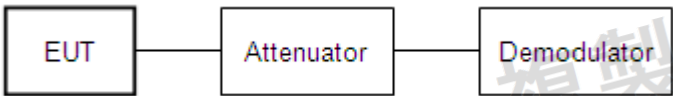


8-DPSK Rx Mode CH 78

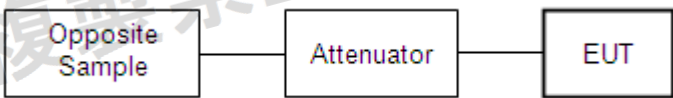


10. Interference prevention function

10.1. In case identification code is transmitted



10.2. In case identification code is received



10.3. Measuring Equipment Conditions

- a. The Demodulator shall demodulate the TX-signal transmitted by the EUT and be able to display the contents of the identification code.
- b. The opposite sample shall be able to transmit TX-signal equivalent to the TX-signal transmitted by the EUT.

10.4. Conditions of EUT

The EUT is set on the usual operating mode.

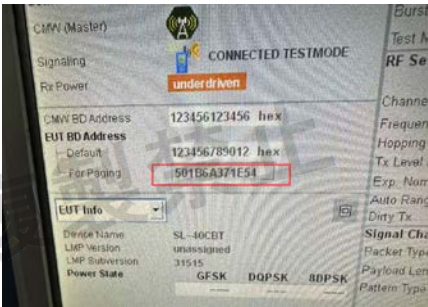
10.5. Measurement Procedure

- (1) In case the EUT possesses function to transmit identification code automatically
 - a. Predetermined identification code is transmitted by the EUT.
 - b. Verify the transmitted identification code.
- (2) In case the EUT possesses function to receive identification code automatically
 - a. Predetermined identification code is transmitted by the opposite sample.
 - b. Verify the working of the normal communication.
 - c. Other code than the predetermined identification code is transmitted by the opposite sample.
 - d. Verify the EUT to stop transmitting or to display that the ID code is different.

Radio interface prevention function

	Normal voltage	Low voltage	High voltage
Result	OK	/	/

Mac address: 50:1B:6A:37:1E:54



11. Transmission Antenna Gain (EIRP Antenna Power) Measurement

11.1. Limit

Item	Limits
EIRP Power Density	$\leq 16.91\text{dBm/MHz}$ (FH form 2427 - 2470.75 MHz) $\leq 22.14\text{dBm/MHz}$ (OFDM,DS from 2400~2483.5MHz) $\leq 22.14\text{dBm}$ (Other from 2400~2483.5MHz)
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	

11.2. Measuring Instruments And Setting

Please refer to section 5 in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB/VB	1 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

11.3. Test Procedures

1. Set EUT ad measuring antenna at the same height and roughly facing each other.
2. 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 the measuring antenna. The output level at the spectrum analyzer is read sa "E".
3. Remove the EUT from the turn table and put the replacing antenna facing to measuring antenna at same height. Set the standard signal generator (SSG) at same frequency and transmit on then receive the signal
4. Swing the replacing antenna give a maximum receiving level.
5. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of replacing antenna height and swing it to find the maximum receiving level.
6. Set SSG output power at Pt to give the equivalent output level of "E" or caluate Pt with SSG output which gives the nearest of "E" and difference ($\pm 1\text{dB}$). Record the Pt.

7. Calculate EIRP by the formula below $EIRP = G_t - L + P_t$.

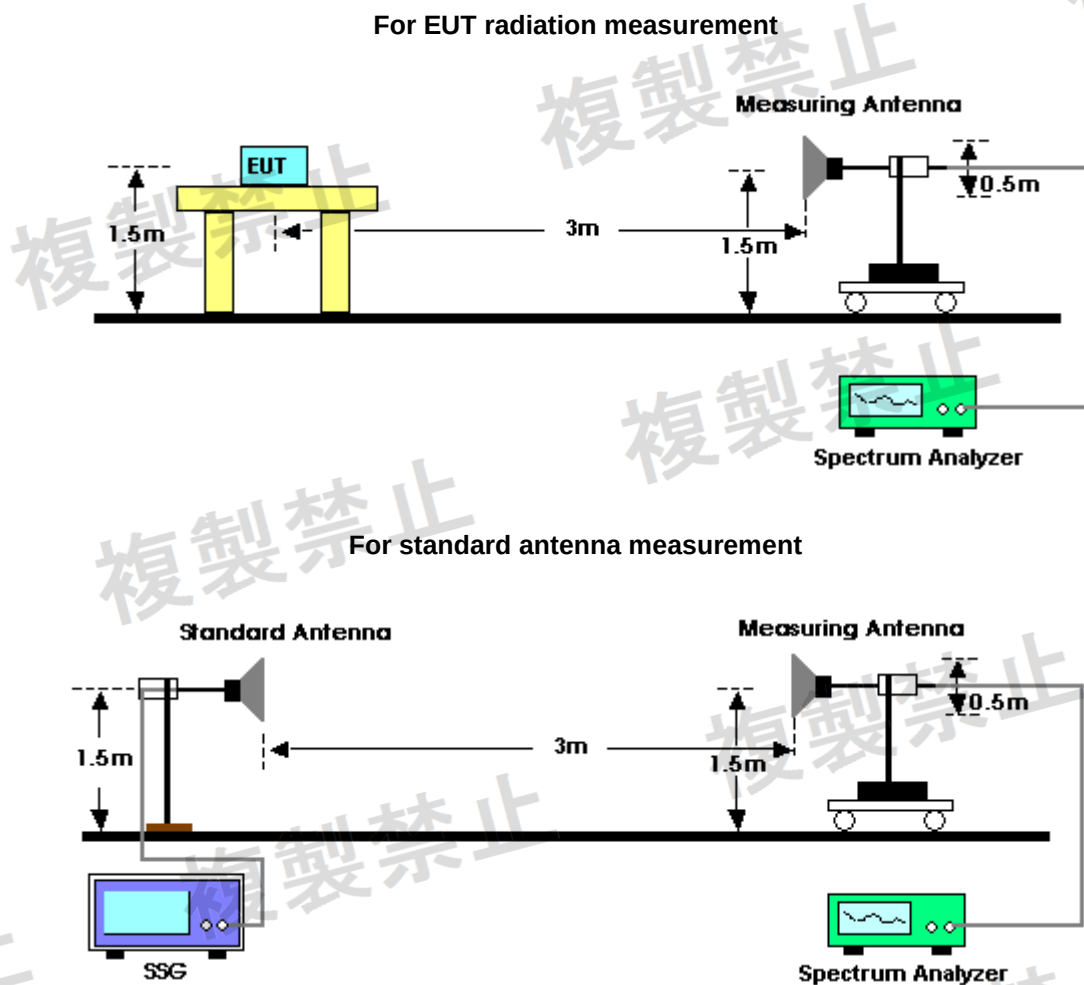
G_t: gain of replacing antenna (dBi)

L: feeder loss between SSG and replacing antenna

P_t: Output power of the SSG

8. If the antenna for the EUT has circular polarization, sum of V-field and H-field will be result if measuring antenna is linear polarization.

11.4. Test Setup Layout



11.5. Test Deviation

There is no deviation with the original standard.

11.6. EUT Operation During Test

The EUT was programmed to be in continuously transmitting mode.

11.7. Results Of Transmission Antenna Gain

Not Applicable

12. Transmission Radiation Angle Width (3dB Beamwidth) Measurement

12.1. Limit

Item	Limits
3dB antenna beam width	$360/A$ (If $A < 1$; then $A=1$) $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$ or $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$
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	

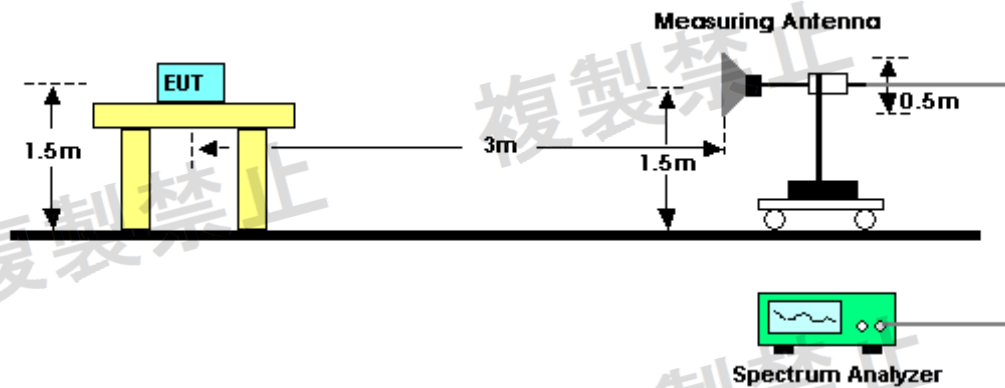
12.2. Measuring Instruments And Setting

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

12.3. Test Procedures

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. The output level at the spectrum analyzer is read as "E"
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 $A=1$).
 $A = \{\text{EIRP Power [mW]} / 16.36 \text{ for DS, OFDM}\}$ or
 $A = \{\text{EIRP Power [mW]} / 4.9 \text{ for FH}\}$

12.4. Test Setup Layout



12.5. Test Deviation

There is no deviation with the original standard.

12.6. EUT Operation During Test

The EUT was programmed to be in continuously transmitting mode.

12.7. Test Result Of Transmission Radiation Angle Width (3dB Beamwidth)

Not Applicable

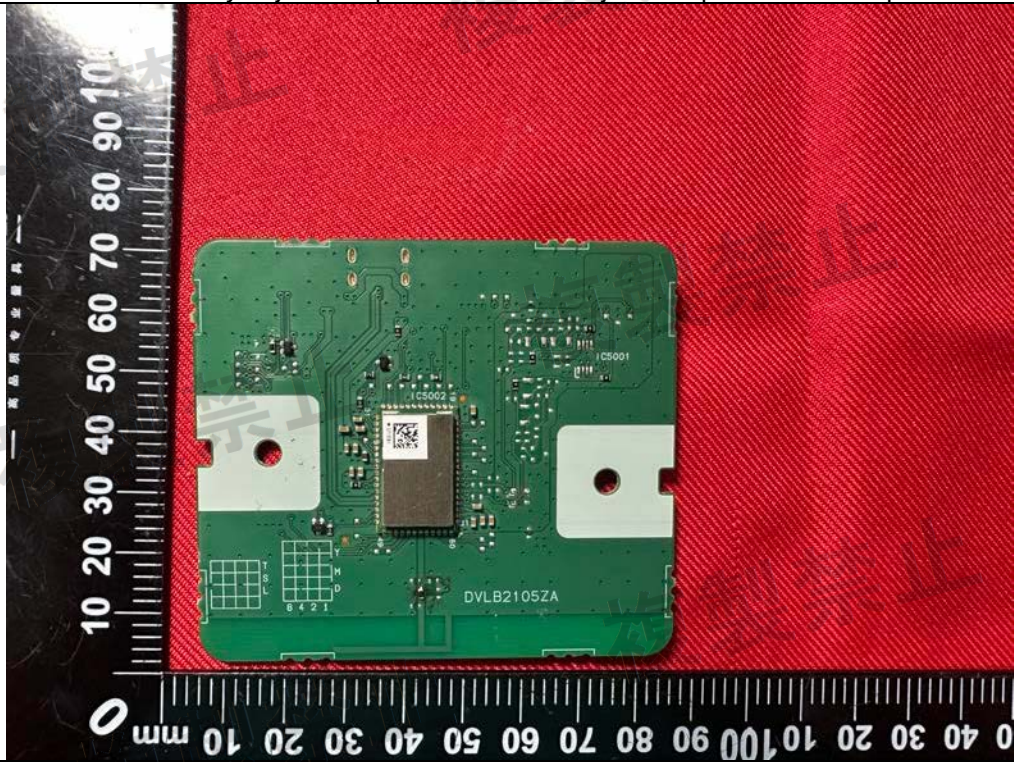
13. Construction Protection Confirmation Method

13.1. Limit

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

13.2. Result

Confirmation Method

Protected Method	Use surface mount technology
Description	RF and Modulation parts are mounted on PCB with surface mount technology, and there is no any adjustable parts on PCB or adjustable parts are not exposed
Photo	

END OF REPORT