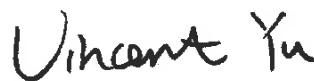




RF MEASUREMENT REPORT

Applicant: Plantronics, Inc.
Address: 345 Encinal Street, Santa Cruz, CA 95060 USA
Product: Bluetooth Stereo Headset
Model No.: VS80T
Brand Name: plantronics
Standard: Article 49.20 and the relevant articles of the Ordinance
Regulating Radio Equipment
Test Procedure: MIC Notice No.88 Annex 43
Product Category: Article 2, Paragraph 1, Item 19
Result: Complies
Test Date: 2022-11-07 ~ 2022-11-08

Reviewed By:



Vincent Yu

Approved By:



Robin Wu

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2211RSU003-J1	Rev. 01	Initial Report	2022-12-13	Valid

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1. General Information

1.1. Applicant

Plantronics, Inc.

345 Encinal Street, Santa Cruz, CA 95060 USA

1.2. Manufacturer

Plantronics, Inc.

345 Encinal Street, Santa Cruz, CA 95060 USA

1.3. Testing Facility

☒	Test Site – MRT Suzhou Laboratory Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China Laboratory Location (Suzhou - SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China Laboratory Accreditations A2LA: 3628.01 CNAS: L10551 FCC: CN1166 ISED: CN0001 VCCI: ☐ R-20025 ☐ G-20034 ☐ C-20020 ☐ T-20020 ☐ R-20141 ☐ G-20134 ☐ C-20103 ☐ T-20104
☐	Test Site – MRT Shenzhen Laboratory Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China Laboratory Accreditations A2LA: 3628.02 CNAS: L10551 FCC: CN1284 ISED: CN0105
☐	Test Site – MRT Taiwan Laboratory Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) Laboratory Accreditations TAF: L3261-190725 FCC: 291082, TW3261 ISED: TW3261

1.4. Product Information

Product Name	Bluetooth Stereo Headset
Model No.	VS80T
Serial No.	2LE2K3
Bluetooth Specification	Bluetooth BDR/EDR and Bluetooth LE (1M/2M)
Operating Temperature	0 ~ 45°C
Note: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Radio Specification under Test

Bluetooth Specification	Bluetooth BDR/EDR
Frequency Range	2402 ~ 2480MHz
Type of Modulation	GFSK, $\pi/4$ DQPSK, 8DPSK
Data Rate	1Mbps, 2Mbps, 3Mbps
Declared Output Power	For 1Mbps (GFSK): 0.5mW/MHz For 2Mbps ($\pi/4$ DQPSK): 0.1mW/MHz For 3Mbps (8DPSK): 0.1mW/MHz
Antenna Type	Inverted-F
Antenna Gain	-0.81 dBi

1.6. Working Frequencies

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2403 MHz	02	2404 MHz
03	2405 MHz	04	2406 MHz	05	2407 MHz
06	2408 MHz	07	2409 MHz	08	2410 MHz
09	2411 MHz	10	2412 MHz	11	2413 MHz
12	2414 MHz	13	2415 MHz	14	2416 MHz
15	2417 MHz	16	2418 MHz	17	2419 MHz
18	2420 MHz	19	2421 MHz	20	2422 MHz
21	2423 MHz	22	2424 MHz	23	2425 MHz
24	2426 MHz	25	2427 MHz	26	2428 MHz
27	2429 MHz	28	2430 MHz	29	2431 MHz
30	2432 MHz	31	2433 MHz	32	2434 MHz
33	2435 MHz	34	2436 MHz	35	2437 MHz
36	2438 MHz	37	2439 MHz	38	2440 MHz
39	2441 MHz	40	2442 MHz	41	2443 MHz
42	2444 MHz	43	2445 MHz	44	2446 MHz
45	2447 MHz	46	2448 MHz	47	2449 MHz
48	2450 MHz	49	2451 MHz	50	2452 MHz
51	2453 MHz	52	2454 MHz	53	2455 MHz
54	2456 MHz	55	2457 MHz	56	2458 MHz
57	2459 MHz	58	2460 MHz	59	2461 MHz
60	2462 MHz	61	2463 MHz	62	2464 MHz
63	2465 MHz	64	2466 MHz	65	2467 MHz
66	2468 MHz	67	2469 MHz	68	2470 MHz
69	2471 MHz	70	2472 MHz	71	2473 MHz
72	2474 MHz	73	2475 MHz	74	2476 MHz
75	2477 MHz	76	2478 MHz	77	2479 MHz
78	2480 MHz	--	--	--	--

2. Test Configuration

2.1. Test Mode

Mode 1: Transmitter - 1Mbps (GFSK)
Mode 2: Transmitter - 2Mbps ($\pi/4$ -DQPSK)
Mode 3: Transmitter - 3Mbps (8DPSK)
Mode 4: Receiver - 1Mbps (GFSK)
Mode 5: Receiver - 2Mbps ($\pi/4$ -DQPSK)
Mode 6: Receiver - 3Mbps (8DPSK)

2.2. Test Software

The test utility software used during testing was “BlueTest3.exe”, and the version was 3.3.15.

The EUT could enter Engineer Mode and transmit or receive.

2.3. Test Condition

The change of the measured voltage at the radio part of the EUT is below $\pm 1\%$, when input voltage from external power supply to the equipment under test is varied by $\pm 10\%$, thus the RF test is tested at rated voltage only.

2.4. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- MIC Notice No.88 Annex 43
- Article 49-20 and the relevant articles of the Ordinance Regulating Radio Equipment
- ARIB STD-T66 v3.7

3. Measuring Instrument

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site	Cali. Body	Cali. Method
USB Power Sensor	Keysight	U2021XA	MRTSUE06596	1 year	2023-08-23	SIP-TR2	Ceprei	c
Signal Analyzer	Keysight	N9030B	MRTSUE06395	1 year	2023-07-08	SIP-TR2	Ceprei	c
Thermohygrometer	testo	608-H1	MRTSUE11109	1 year	2023-03-21	SIP-TR2	testo	c

Note: All the above test equipment was used and kept valid calibration period during the testing.

Calibration Method:

- Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18 paragraph.
- Correction conducted pursuant to the previous of Article 135 or Article 144 of the measurement Law (Law No. 51 of 1992), Japan calibration Service System
- 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.

4. Decision Rules and Measurement Uncertainty

4.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2.
(Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

4.2. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.78dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 1.13dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 1.15dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.28%

5. Test Result

5.1. Summary

Test Description	Test Limit	Test Condition	Verdict
Output Power	$\leq 3\text{mW/MHz}$	Conducted	Pass
Output Power Tolerance	+20% to -80%		Pass
EIRP	$\leq 6.91\text{dBm/MHz}$		Pass
Spread Bandwidth and Spread Factor	Spread Bandwidth $\geq 500\text{kHz}$ Spread Factor ≥ 5		Pass
Occupied Bandwidth	$\leq 83.5\text{MHz}$ for FHSS		Pass
Frequency Tolerance	-50 ~ +50ppm		Pass
Dwell Time	$\leq 400\text{ms}$		Pass
Transmitter Spurious Emissions	$\leq 2.5\text{uW/MHz}$ for 30 ~ 2387MHz $\leq 25\text{uW/MHz}$ for 2387 ~ 2400MHz $\leq 25\text{uW/MHz}$ for 2483.5 ~ 2496.5MHz $\leq 2.5\text{uW/MHz}$ for 2496.5 ~ 12500MHz		Pass
Receiver Spurious Emissions	$\leq 4\text{nW}$ for 30 ~ 1000MHz $\leq 20\text{nW}$ for 1000 ~ 12500MHz		Pass
Carrier Sensing	Stop transmission while Carrier detecting		N/A
Interference Prevention Function	Automatic Transmission or Receiving function of Identification Sign	Radiated	Pass

Note:

- The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- "N/A" means that this item is not applicable, and the detail information refers to relevant section.

5.2. Output Power, Output Power Tolerance and EIRP Measurement

5.2.1. Test Limit

Output Power $\leq 3\text{mW/MHz}$

Output Power Tolerance: +20% to -80%

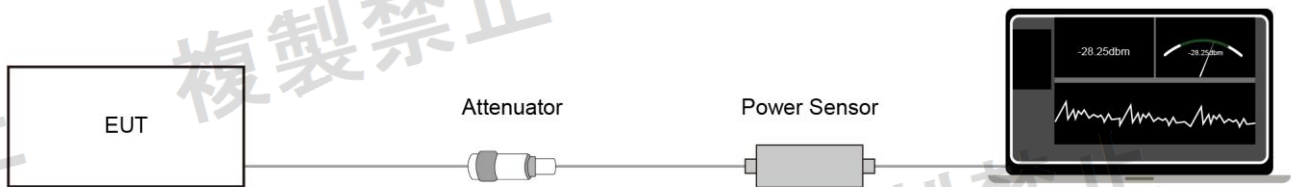
EIRP $\leq 6.91\text{dBm/MHz}$

5.2.2. Test Procedure

Measure the total power by Power Meter in a state of hopping mode (with Average Sensor).

If it's the burst wave, please measure the burst ratio. Then calculate the real total power by burst ratio.

5.2.3. Test Setup



5.2.4. Test Result

Test Site	SIP-TR1	Test Engineer	Alisa Deng
Temperature	24.8°C	Humidity	56.1%
Test Date	2022-11-07	Test Item	Output Power

Test Mode	Frequency (MHz)	Reading Value (dBm)	Reading Value (mW)	Output Power Density (mW/MHz)	Limit (mW/MHz)	Result
GFSK_DH5	2402~2480	12.75	18.84	0.35	3	Pass
$\pi/4$ -DQPSK_DH5	2402~2480	6.22	4.19	0.08	3	Pass
8DPSK_DH5	2402~2480	6.27	4.24	0.08	3	Pass

Note:

1. Reading Value (mW) = $10^{[\text{Reading Value (dBm)}]/10}$.
2. Output Power Density (mW/MHz) = Reading Value (mW) / Burst Ratio / Spread Bandwidth.

Test Site	SIP-TR1	Test Engineer	Alisa Deng
Temperature	24.8°C	Humidity	56.1%
Test Date	2022-11-07	Test Item	Output Power Tolerance

Test Mode	Frequency (MHz)	Output Power Density (mW/MHz)	Declared Output Power (mW/MHz)	Tolerance (%)	Limit	Result
GFSK_DH5	2402~2480	0.35	0.5	-30.00	+20%~-80%	Pass
$\pi/4$ -DQPSK_DH5	2402~2480	0.08	0.1	-20.00	+20%~-80%	Pass
8DPSK_DH5	2402~2480	0.08	0.1	-20.00	+20%~-80%	Pass

Note: Tolerance (%) = (Output Power - Declared Output Power) / Declared Output Power * 100%

Test Site	SIP-TR1	Test Engineer	Alisa Deng
Temperature	24.8°C	Humidity	56.1%
Test Date	2022-11-07	Test Item	EIRP

Test Mode	Frequency (MHz)	Output Power Density (mW/MHz)	EIRP (dBm/MHz)	Limit (dBm/MHz)	Result
GFSK_DH5	2402~2480	0.35	-5.37	≤ 6.91	Pass
π/4-DQPSK_DH5	2402~2480	0.08	-11.78	≤ 6.91	Pass
8DPSK_DH5	2402~2480	0.08	-11.78	≤ 6.91	Pass

Note: EIRP (dBm/MHz) = 10*log [Output Power Density (mW/MHz)] + Ant Gain (dBi).

Output Power	
GFSK_DH5	$\pi/4$ -DQPSK_DH5
Instrument : U2021XA (MY59330014) Measurement : 1 Channel A Avg 2440MHz OFS Min : 12.70 Max : 13.04 12.75 dBm	Instrument : U2021XA (MY59330014) Measurement : 1 Channel A Avg 2440MHz OFS Min : 4.79 Max : 6.24 6.22 dBm
8DPSK_DH5	
Instrument : U2021XA (MY59330014) Measurement : 1 Channel A Avg 2440MHz OFS Min : 6.18 Max : 6.28 6.27 dBm	

5.3. Spread Bandwidth and Spread Factor Measurement

5.3.1. Test Limit

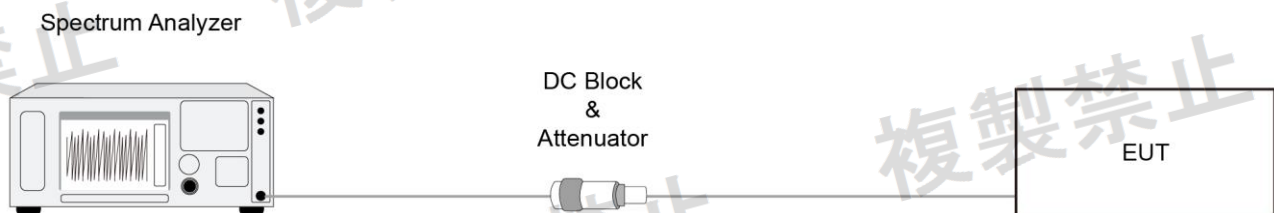
Spread Bandwidth ≥ 500 kHz

Spread Factor ≥ 5 for 2400 ~ 2483.5 MHz

5.3.2. Test Procedure

1. A spectrum analyzer or similar device shall be used to observe a sample of the modulated transmitter's radio frequency power output.
2. A positive peak detector function must be used.
3. A measurement instrument with an integrated 90% power bandwidth function may be used to automate the test process.
4. The measurement instrument bandwidth and span must be set sufficiently with, and, the scan time set sufficiently slowly, to ensure all major modulation products are captured. Note that the measurement bandwidth should also be set sufficiently narrow to avoid adding significant error to the test result.
5. 'Maximum Hold' mode may be used to accumulate the measurement result over several scans provided the emission is repetitive in nature.

5.3.3. Test Setup



5.3.4. Test Result

Test Site	SIP-TR1	Test Engineer	Alisa Deng
Temperature	24.8°C	Humidity	56.1%
Test Date	2022-11-07		

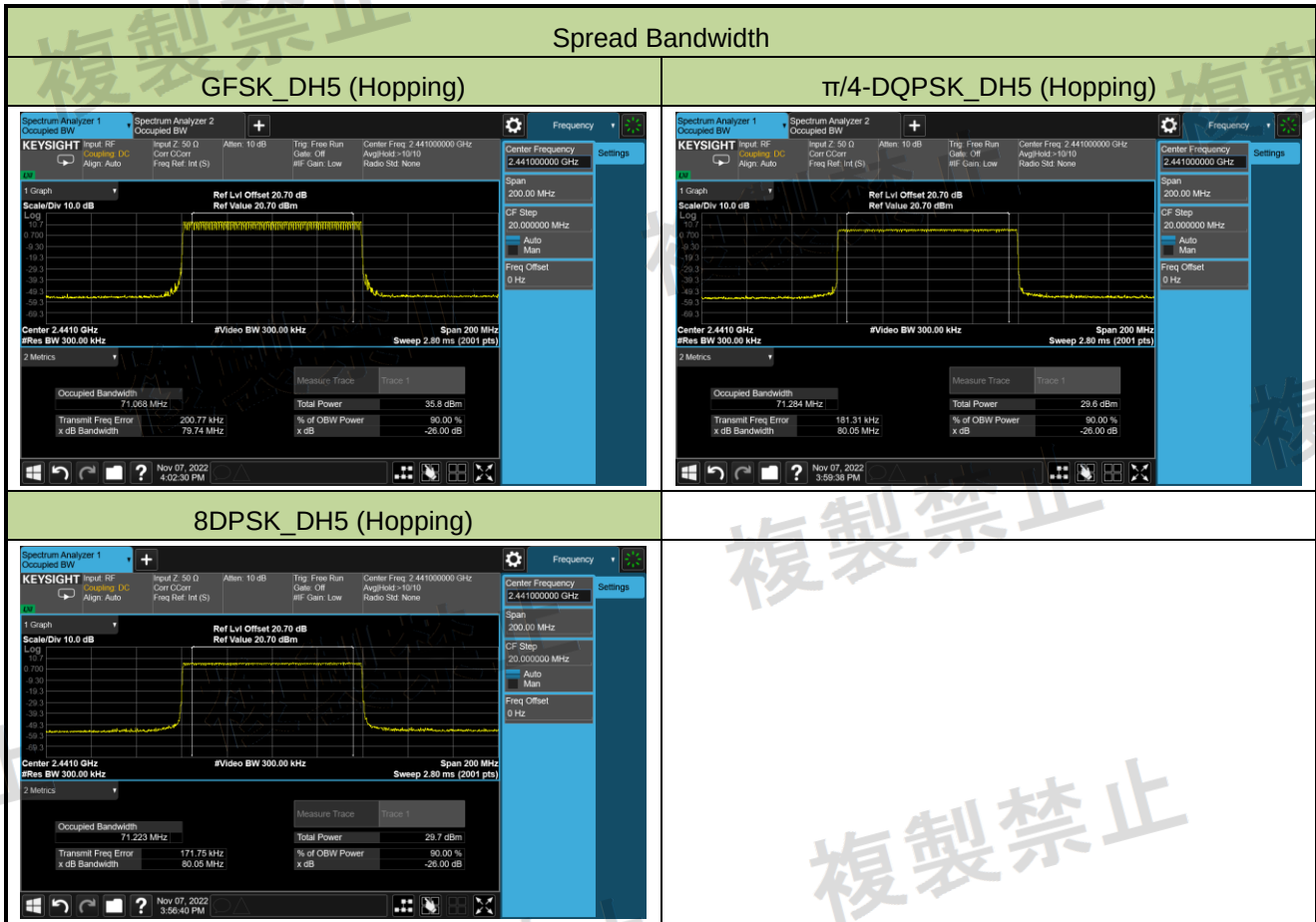
Spread Bandwidth

Test Mode	Frequency (MHz)	Spread Bandwidth (MHz)	Limit (kHz)	Result
GFSK_DH5	2402 ~ 2480	71.068	≥ 500	Pass
$\pi/4$ -DQPSK_DH5	2402 ~ 2480	71.284	≥ 500	Pass
8DPSK_DH5	2402 ~ 2480	71.223	≥ 500	Pass

Spread Factor

Test Mode	Frequency (MHz)	Spread Factor	Limit	Result
GFSK_DH5	2402 ~ 2480	71.068	≥ 5	Pass
$\pi/4$ -DQPSK_DH5	2402 ~ 2480	71.284	≥ 5	Pass
8DPSK_DH5	2402 ~ 2480	71.223	≥ 5	Pass

Note: Spread Factor = Spread Bandwidth / Symbol Rate, Symbol Rate = 1Ms/s



5.4. Occupied Bandwidth Measurement

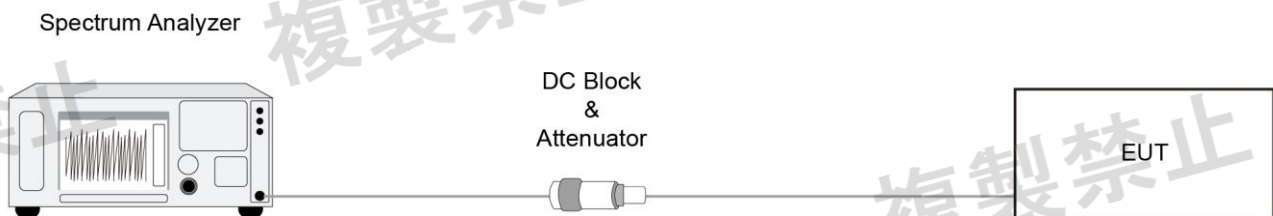
5.4.1. Test Limit

≤ 83.5 MHz for FHSS

5.4.2. Test Procedure

1. A spectrum analyzer or similar device shall be used to observe a sample of the modulated transmitter's radio frequency power output.
2. A positive peak detector function must be used.
3. A measurement instrument with an integrated 99% power bandwidth function may be used to automate the test process.
4. The measurement instrument bandwidth and span must be set sufficiently with, and, the scan time set sufficiently slowly, to ensure all major modulation products are captured. Note that the measurement bandwidth should also be set sufficiently narrow to avoid adding significant error to the test result.
5. 'Maximum Hold' mode may be used to accumulate the measurement result over several scans provided the emission is repetitive in nature.

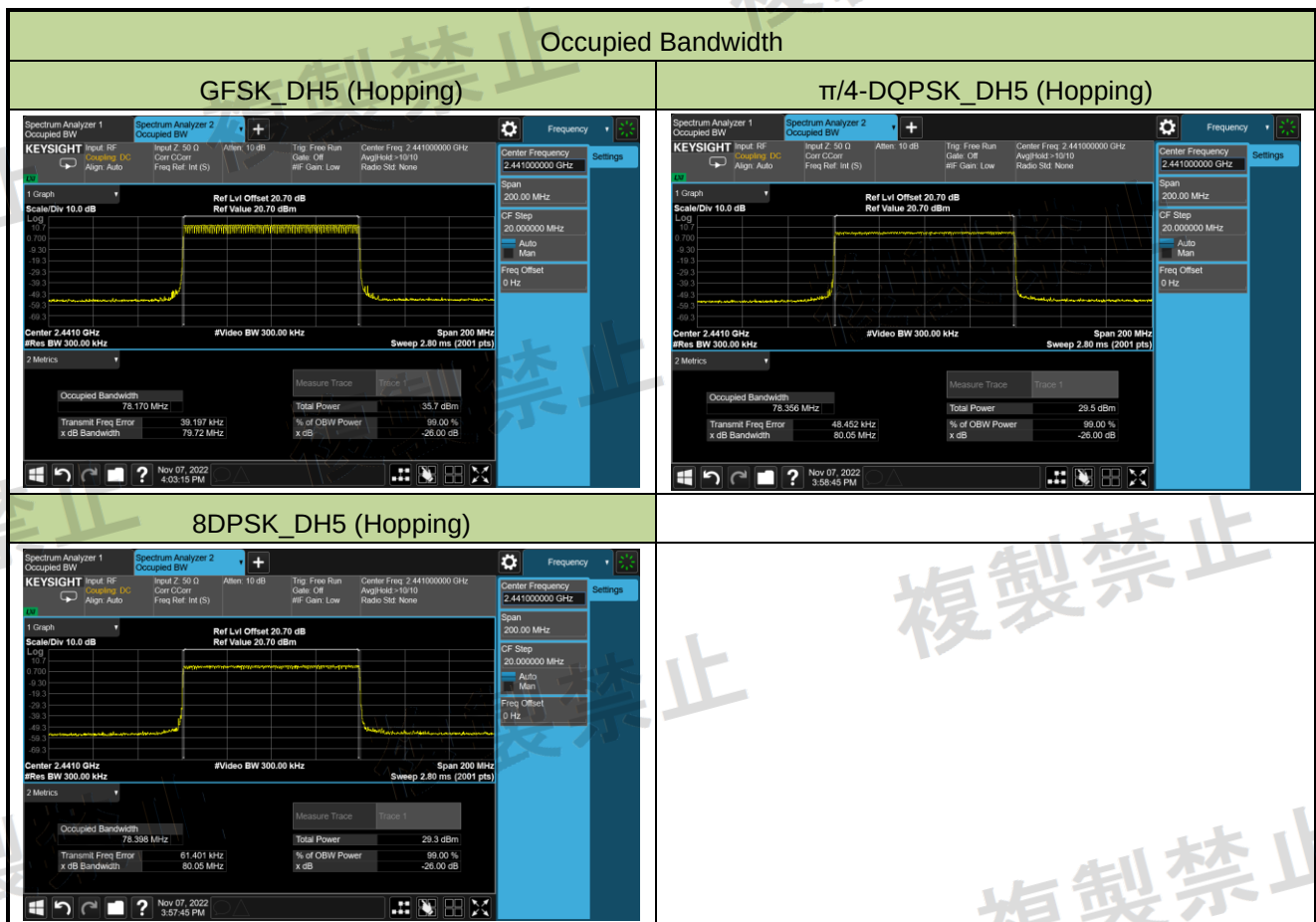
5.4.3. Test Setup



5.4.4. Test Result

Test Site	SIP-TR1	Test Engineer	Alisa Deng
Temperature	24.8°C	Humidity	56.1%
Test Date	2022-11-07		

Test Mode	Frequency (MHz)	Occupied Bandwidth (MHz)	Limit (MHz)	Result
GFSK_DH5	2402 ~ 2480	78.170	≤ 83.5	Pass
$\pi/4$ -DQPSK_DH5	2402 ~ 2480	78.356	≤ 83.5	Pass
8DPSK_DH5	2402 ~ 2480	78.398	≤ 83.5	Pass



5.5. Frequency Tolerance Measurement

5.5.1. Test Limit

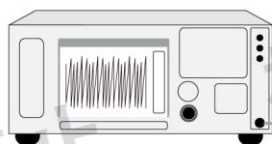
≤ 50 ppm

5.5.2. Test Procedure

1. A spectrum analyzer or similar device shall be used to observe a sample of the modulated transmitter's radio frequency power output.
2. A positive peak detector function must be used.
3. The measurement instrument bandwidth and span must be set sufficiently with, and, the scan time set sufficiently slowly, to ensure all major modulation products are captured. Note that the measurement bandwidth should also be set sufficiently narrow to avoid adding significant error to the test result.
4. 'Maximum Hold' mode may be used to accumulate the measurement result over several scans provided the emission is repetitive in nature.

5.5.3. Test Setup

Spectrum Analyzer



DC Block
&
Attenuator



EUT

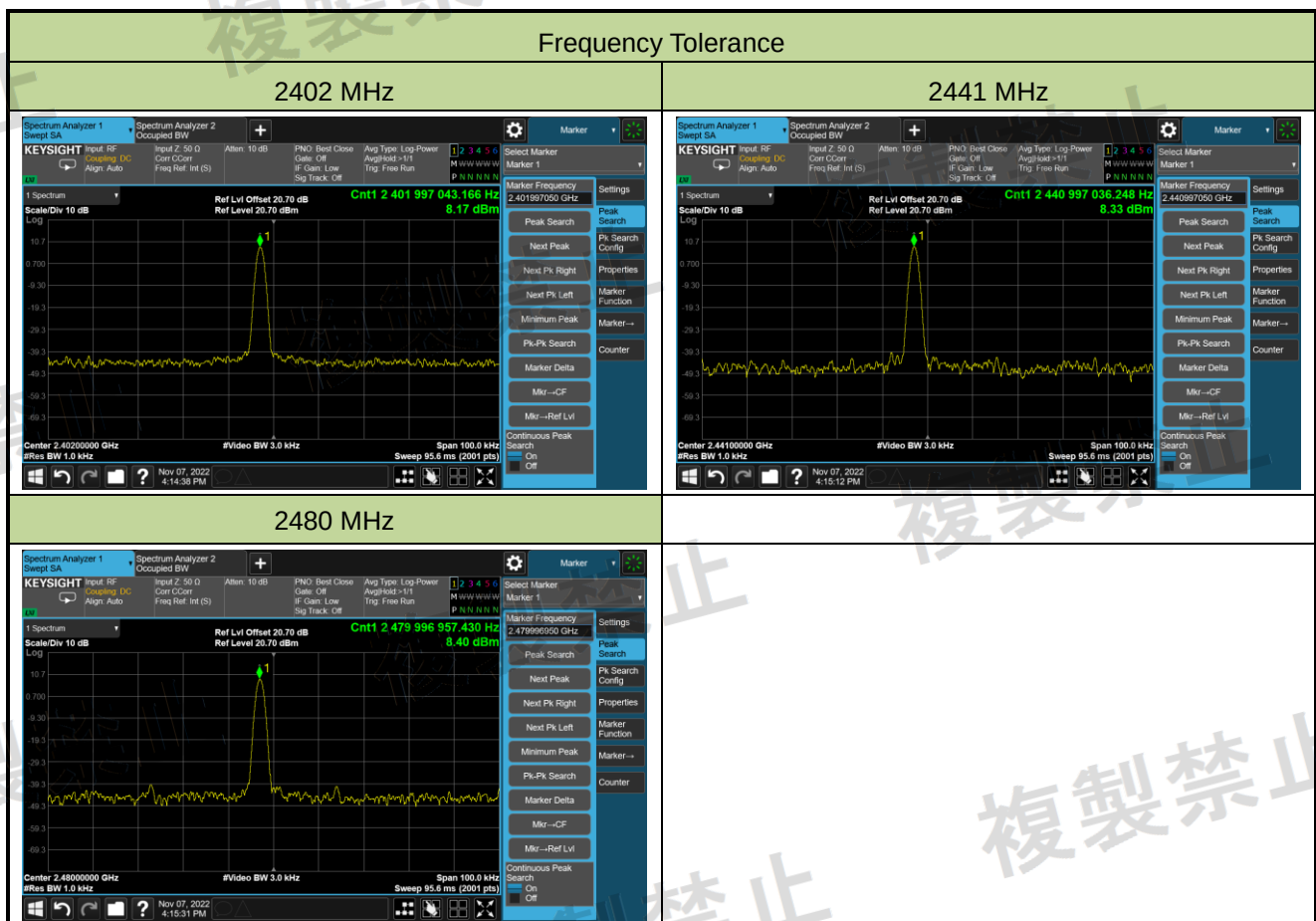


5.5.4. Test Result

Test Site	SIP-TR1	Test Engineer	Alisa Deng
Temperature	24.8°C	Humidity	56.1%
Test Date	2022-11-07		

Test Mode	Center Frequency (MHz)	Measurement Frequency (MHz)	Frequency Tolerance (ppm)	Limit (ppm)	Result
Carrier Wave	2402	2401.997043	-1.23	-50 ~ +50	Pass
	2441	2440.997036	-1.21	-50 ~ +50	Pass
	2480	2479.996957	-1.23	-50 ~ +50	Pass

Note: Frequency Tolerance (ppm) = (Measurement Frequency - Center Frequency) / Center Frequency * 10⁶



5.6. Dwell Time Measurement

5.6.1. Test Limit

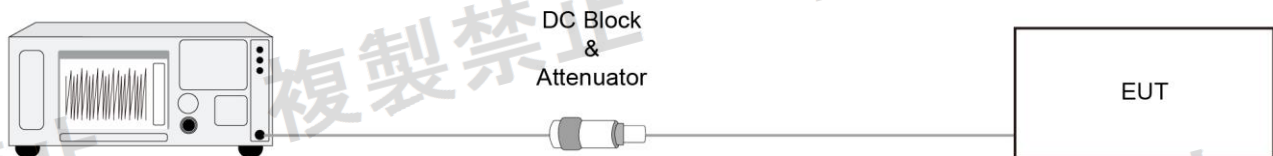
$\leq 0.4s$

5.6.2. Test Procedure

1. A spectrum analyzer or similar device shall be used to observe a sample of the modulated transmitter's radio frequency power output.
2. A positive peak detector function must be used.
3. The center frequency is set to the test frequency and the span is switched to zero.
4. The measurement instrument bandwidth and span must be set sufficiently with, and, the scan time set sufficiently slowly, to ensure all major modulation products are captured. Note that the measurement bandwidth should also be set sufficiently narrow to avoid adding significant error to the test result.
5. 'Single sweep' mode may be used to capture a packet over a single scan.

5.6.3. Test Setup

Spectrum Analyzer



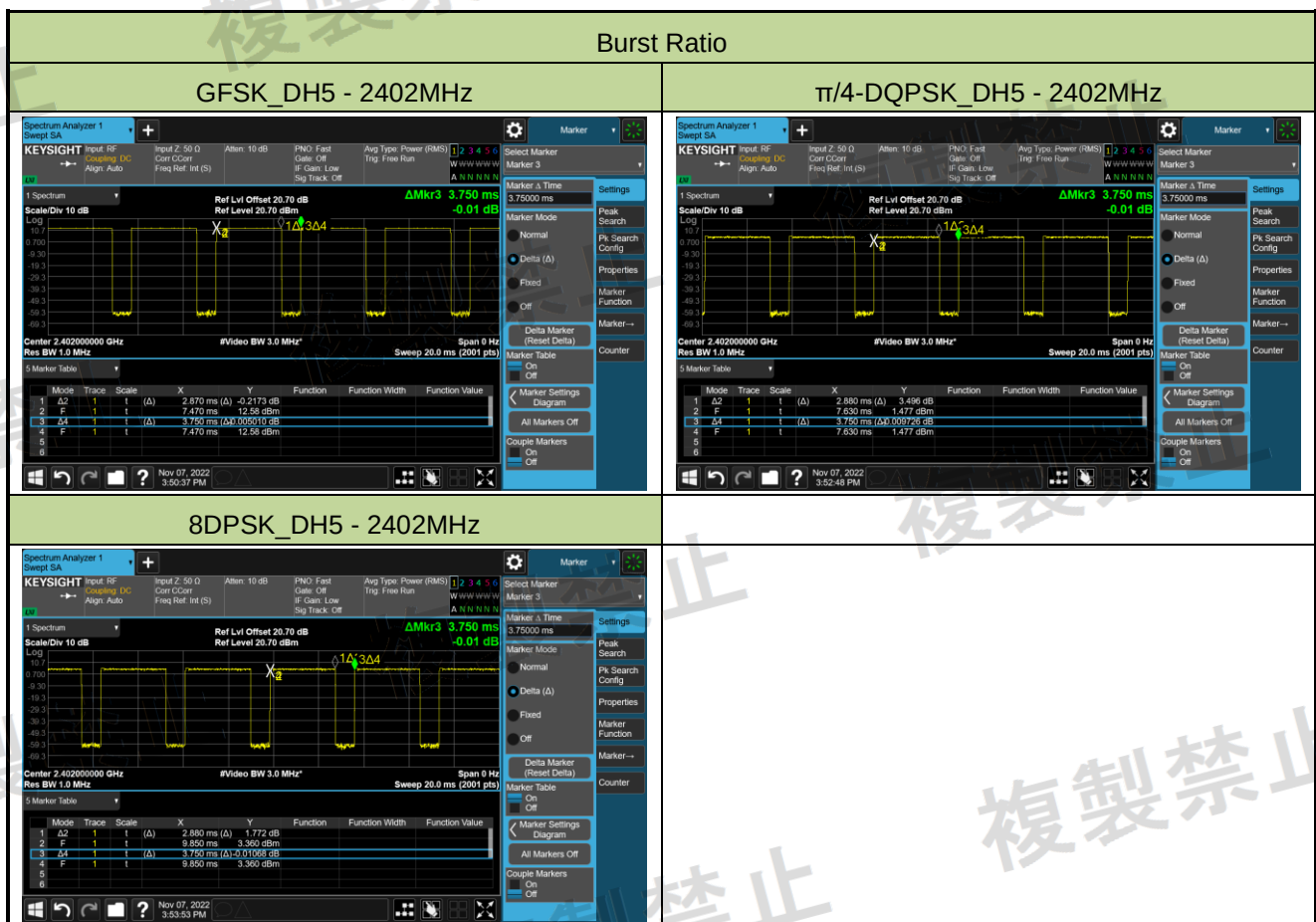
5.6.4. Test Result

Test Site	SIP-TR1	Test Engineer	Alisa Deng
Temperature	24.8°C	Humidity	56.1%
Test Date	2022-11-07		

Test Mode	Test Frequency (MHz)	Burst Ratio	Dwell Time (s)	Limit (s)	Result
GFSK_DH5	2402	0.7653	0.2754	≤ 0.4	Pass
$\pi/4$ -DQPSK_DH5	2402	0.7680	0.2772	≤ 0.4	Pass
8DPSK_DH5	2402	0.7680	0.2770	≤ 0.4	Pass

Note 1: Burst Ratio = ON Time / (ON Time + OFF Time).

Note 2: Dwell Time = (Spreading Factor * 0.4) * (Burst Ratio / 79).



5.7. Transmitter Spurious Emissions Measurement

5.7.1. Test Limit

$\leq 2.5\mu\text{W}$ for 30 ~ 2387MHz

$\leq 25\mu\text{W}$ for 2387 ~ 2400MHz

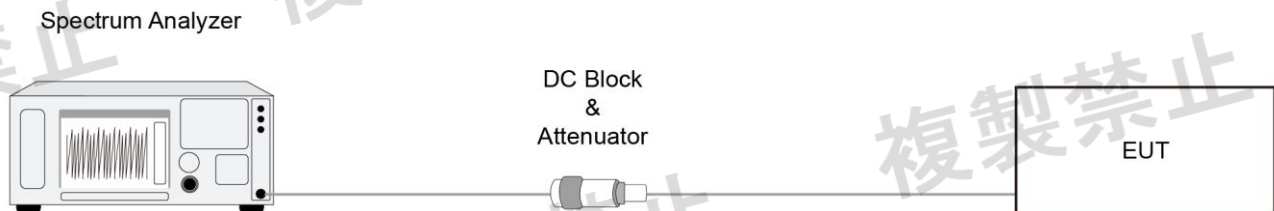
$\leq 25\mu\text{W}$ for 2483.5 ~ 2496.5MHz

$\leq 2.5\mu\text{W}$ for 2496.5 ~ 12500MHz

5.7.2. Test Procedure

1. A spectrum analyzer or similar device shall be used to observe a sample of the modulated transmitter's radio frequency power output.
2. A positive peak detector function must be used.
3. The measurement instrument bandwidth and span must be set sufficiently with, and, the scan time set sufficiently slowly, to ensure all major modulation products are captured. Note that the measurement bandwidth should also be set sufficiently narrow to avoid adding significant error to the test result.
4. 'Maximum Hold' mode may be used to accumulate the measurement result over several scans provided the emission is repetitive in nature.

5.7.3. Test Setup



5.7.4. Test Result

Test Site	SIP-TR1	Test Engineer	Alisa Deng
Temperature	24.8°C	Humidity	56.1%
Test Date	2022-11-07		

Test Mode	Test Frequency (MHz)	Frequency Range (MHz)	Max. Reading Level (dBm)	Limit (dBm)	Result
GFSK_DH5	2402	30 ~ 1000	-50.43	-26 (2.5uW)	Pass
		1000 ~ 2387	-48.29	-26 (2.5uW)	Pass
		2387 ~ 2400	-19.85	-16 (25uW)	Pass
		2483.5 ~ 2496.5	-48.21	-16 (25uW)	Pass
		2496.5 ~ 8000	-44.78	-26 (2.5uW)	Pass
		8000 ~ 12500	-44.94	-26 (2.5uW)	Pass
	2441	30 ~ 1000	-50.56	-26 (2.5uW)	Pass
		1000 ~ 2387	-46.52	-26 (2.5uW)	Pass
		2387 ~ 2400	-48.63	-16 (25uW)	Pass
		2483.5 ~ 2496.5	-48.16	-16 (25uW)	Pass
		2496.5 ~ 8000	-45.39	-26 (2.5uW)	Pass
		8000 ~ 12500	-46.37	-26 (2.5uW)	Pass
	2480	30 ~ 1000	-50.31	-26 (2.5uW)	Pass
		1000 ~ 2387	-48.36	-26 (2.5uW)	Pass
		2387 ~ 2400	-48.39	-16 (25uW)	Pass
		2483.5 ~ 2496.5	-29.93	-16 (25uW)	Pass
		2496.5 ~ 8000	-44.92	-26 (2.5uW)	Pass
		8000 ~ 12500	-45.67	-26 (2.5uW)	Pass

Test Site	SIP-TR1	Test Engineer	Alisa Deng
Temperature	24.1°C	Humidity	53.9%
Test Date	2022-11-08		

Test Mode	Test Frequency (MHz)	Frequency Range (MHz)	Max. Reading Level (dBm)	Limit (dBm)	Result
$\pi/4$ -DQPSK_DH5	2402	30 ~ 1000	-49.80	-26 (2.5uW)	Pass
		1000 ~ 2387	-47.47	-26 (2.5uW)	Pass
		2387 ~ 2400	-26.57	-16 (25uW)	Pass
		2483.5 ~ 2496.5	-47.50	-16 (25uW)	Pass
		2496.5 ~ 8000	-45.05	-26 (2.5uW)	Pass
		8000 ~ 12500	-45.79	-26 (2.5uW)	Pass
	2441	30 ~ 1000	-50.40	-26 (2.5uW)	Pass
		1000 ~ 2387	-47.87	-26 (2.5uW)	Pass
		2387 ~ 2400	-48.81	-16 (25uW)	Pass
		2483.5 ~ 2496.5	-48.53	-16 (25uW)	Pass
		2496.5 ~ 8000	-45.18	-26 (2.5uW)	Pass
		8000 ~ 12500	-46.77	-26 (2.5uW)	Pass
	2480	30 ~ 1000	-49.66	-26 (2.5uW)	Pass
		1000 ~ 2387	-48.32	-26 (2.5uW)	Pass
		2387 ~ 2400	-49.41	-16 (25uW)	Pass
		2483.5 ~ 2496.5	-35.48	-16 (25uW)	Pass
		2496.5 ~ 8000	-45.71	-26 (2.5uW)	Pass
		8000 ~ 12500	-46.21	-26 (2.5uW)	Pass

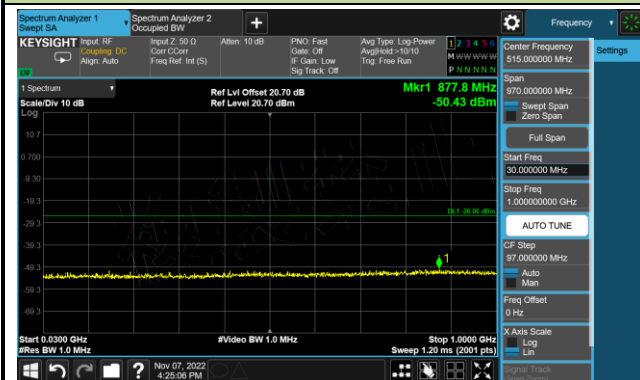
Test Site	SIP-TR1	Test Engineer	Alisa Deng
Temperature	24.1°C	Humidity	53.9%
Test Date	2022-11-08		

Test Mode	Test Frequency (MHz)	Frequency Range (MHz)	Max. Reading Level (dBm)	Limit (dBm)	Result
8DPSK_DH5	2402	30 ~ 1000	-50.21	-26 (2.5uW)	Pass
		1000 ~ 2387	-48.01	-26 (2.5uW)	Pass
		2387 ~ 2400	-24.48	-16 (25uW)	Pass
		2483.5 ~ 2496.5	-48.72	-16 (25uW)	Pass
		2496.5 ~ 8000	-44.87	-26 (2.5uW)	Pass
		8000 ~ 12500	-46.41	-26 (2.5uW)	Pass
	2441	30 ~ 1000	-50.05	-26 (2.5uW)	Pass
		1000 ~ 2387	-47.89	-26 (2.5uW)	Pass
		2387 ~ 2400	-48.35	-16 (25uW)	Pass
		2483.5 ~ 2496.5	-47.60	-16 (25uW)	Pass
		2496.5 ~ 8000	-46.09	-26 (2.5uW)	Pass
		8000 ~ 12500	-46.61	-26 (2.5uW)	Pass
	2480	30 ~ 1000	-50.35	-26 (2.5uW)	Pass
		1000 ~ 2387	-48.05	-26 (2.5uW)	Pass
		2387 ~ 2400	-48.38	-16 (25uW)	Pass
		2483.5 ~ 2496.5	-35.68	-16 (25uW)	Pass
		2496.5 ~ 8000	-44.74	-26 (2.5uW)	Pass
		8000 ~ 12500	-46.51	-26 (2.5uW)	Pass

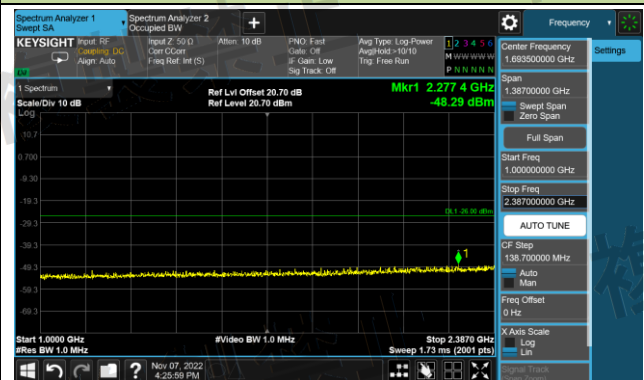
GFSK_DH5 Transmitter Spurious Emissions

2402MHz

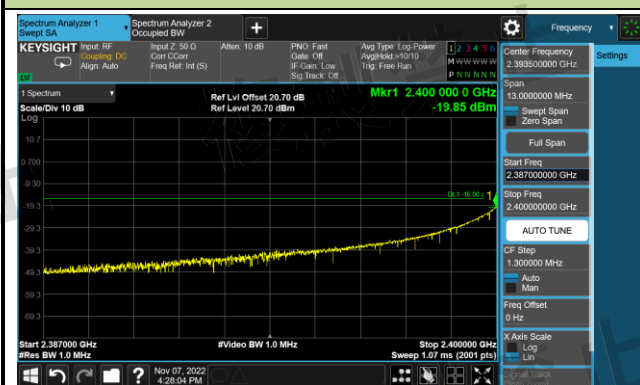
30 ~ 1000MHz



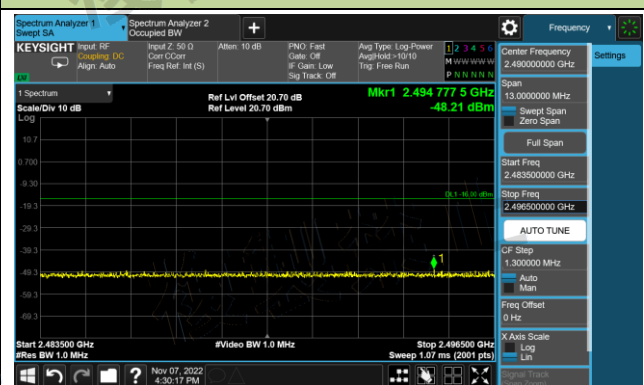
1000 ~ 2387MHz



2387 ~ 2400MHz



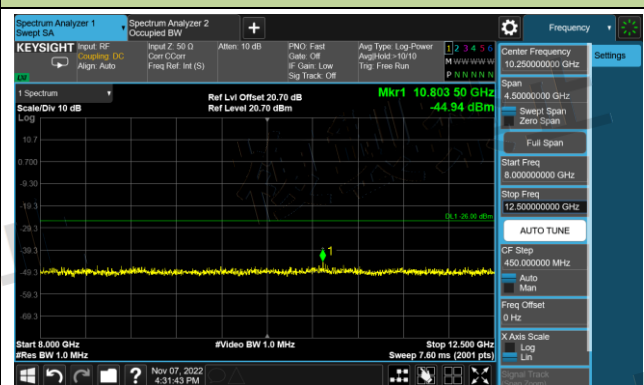
2483.5 ~ 2496.5MHz



2496.5 ~ 8000MHz



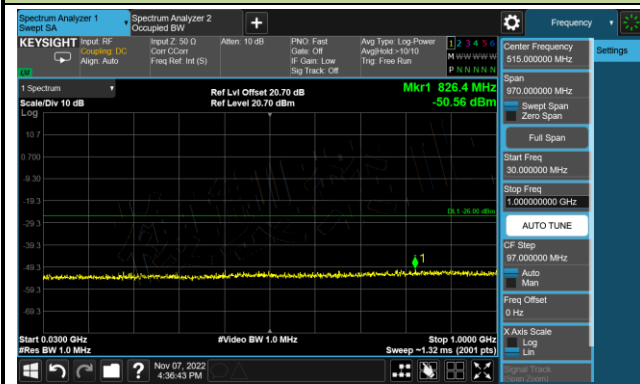
8000 ~ 12500MHz



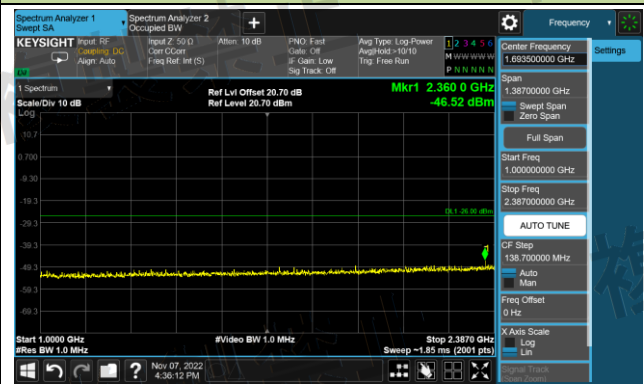
GFSK_DH5 Transmitter Spurious Emissions

2441MHz

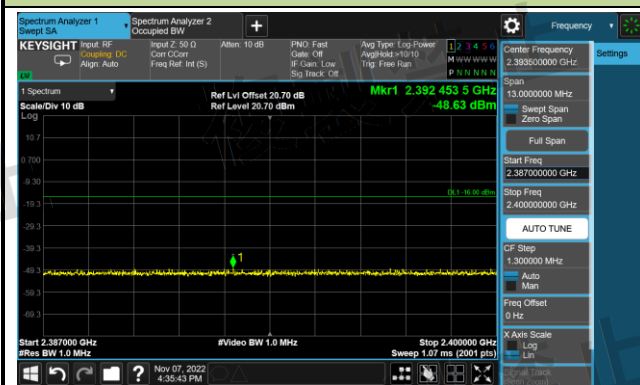
30 ~ 1000MHz



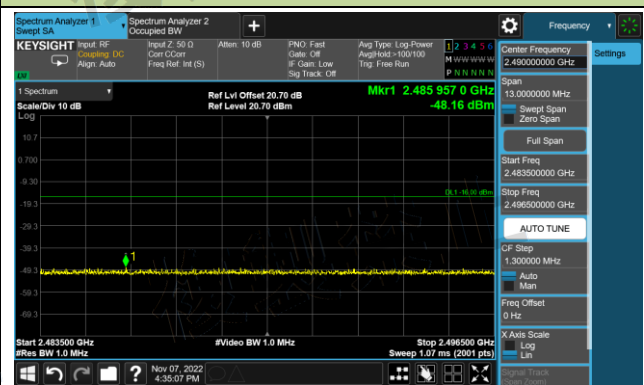
1000 ~ 2387MHz



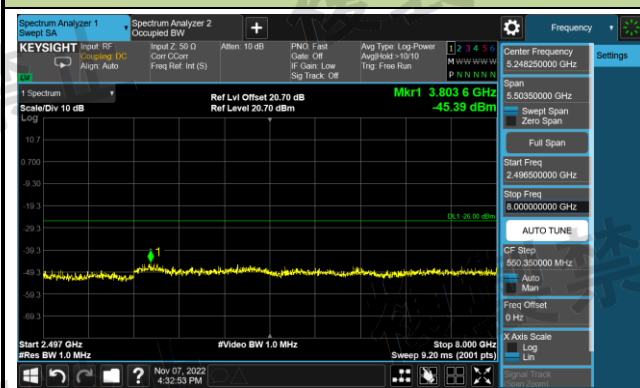
2387 ~ 2400MHz



2483.5 ~ 2496.5MHz



2496.5 ~ 8000MHz



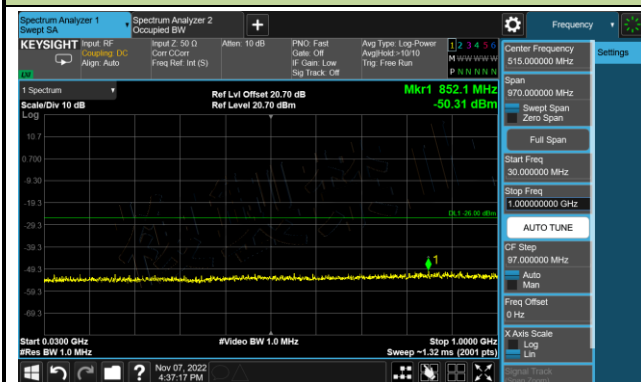
8000 ~ 12500MHz



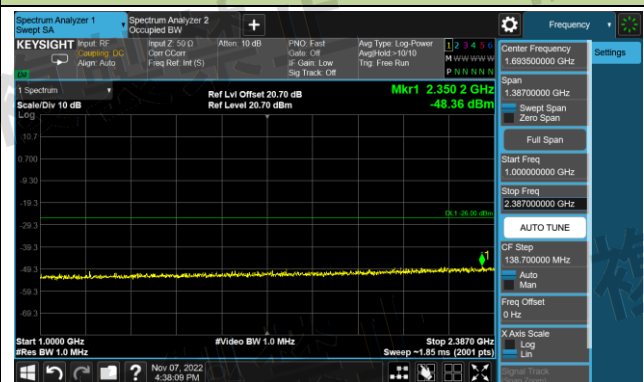
GFSK_DH5 Transmitter Spurious Emissions

2480MHz

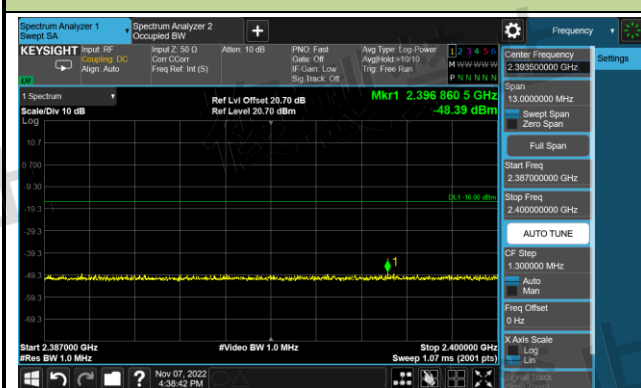
30 ~ 1000MHz



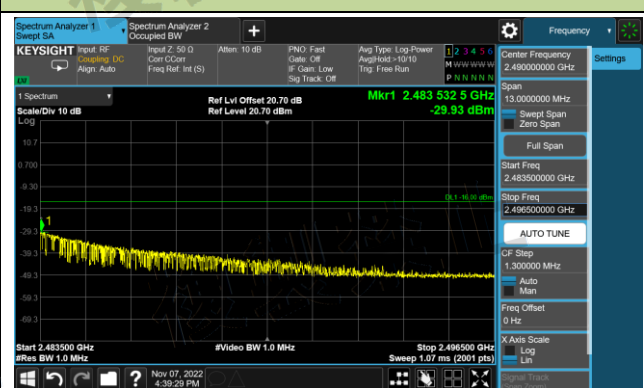
1000 ~ 2387MHz



2387 ~ 2400MHz



2483.5 ~ 2496.5MHz



2496.5 ~ 8000MHz



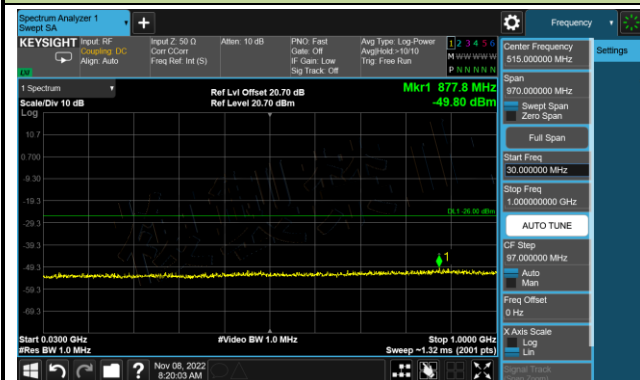
8000 ~ 12500MHz



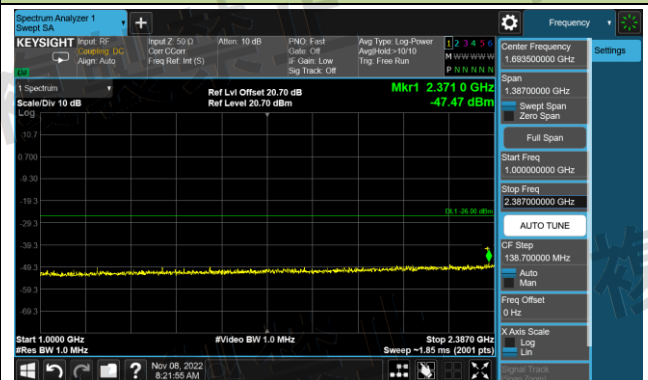
$\pi/4$ -DQPSK_DH5 Transmitter Spurious Emissions

2402MHz

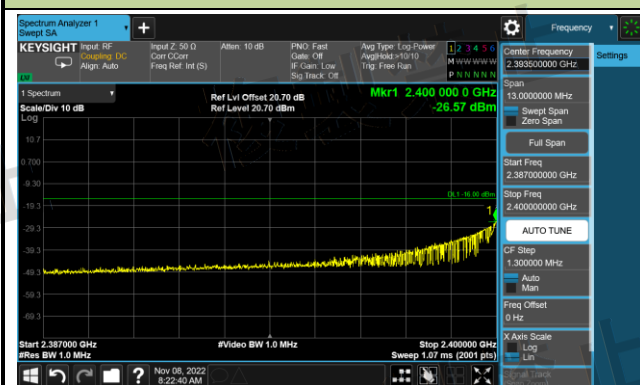
30 ~ 1000MHz



1000 ~ 2387MHz



2387 ~ 2400MHz



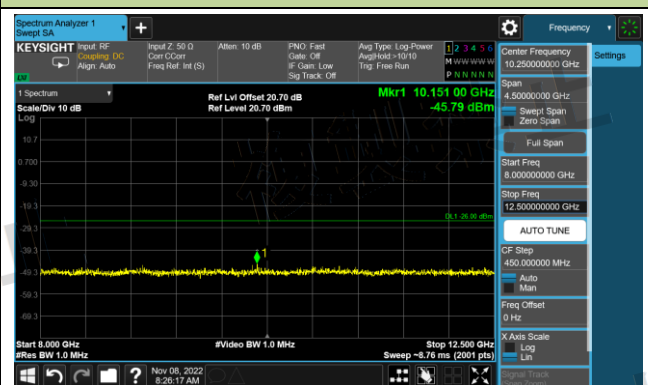
2483.5 ~ 2496.5MHz



2496.5 ~ 8000MHz



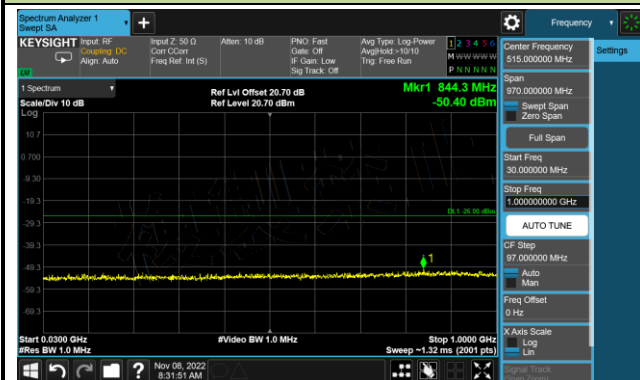
8000 ~ 12500MHz



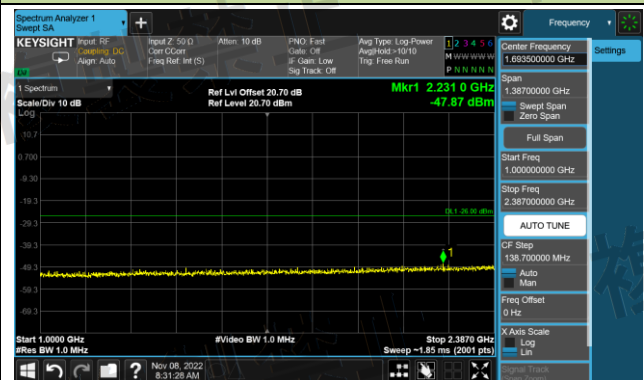
$\pi/4$ -DQPSK_DH5 Transmitter Spurious Emissions

2441MHz

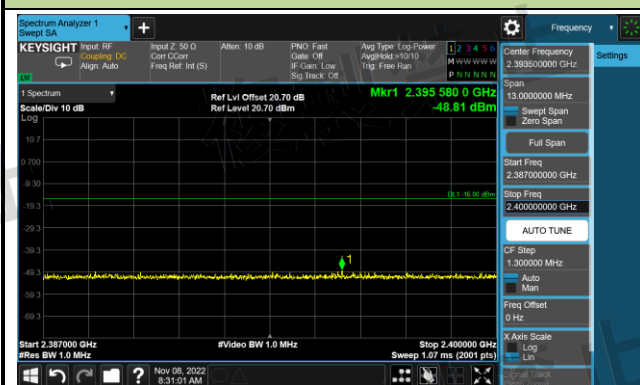
30 ~ 1000MHz



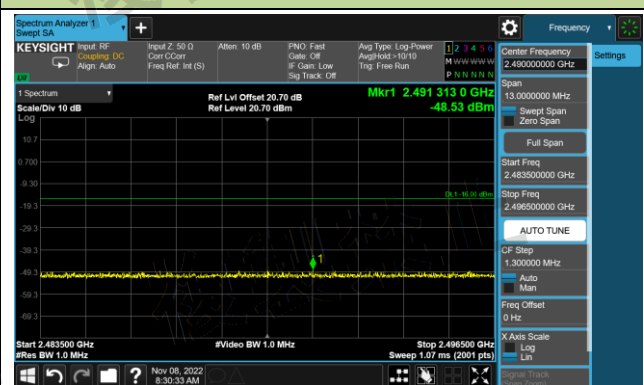
1000 ~ 2387MHz



2387 ~ 2400MHz



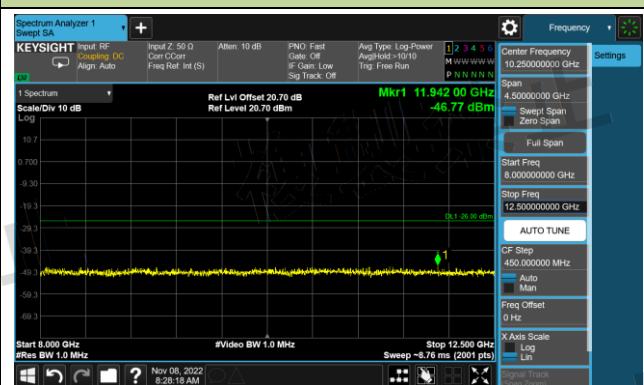
2483.5 ~ 2496.5MHz



2496.5 ~ 8000MHz



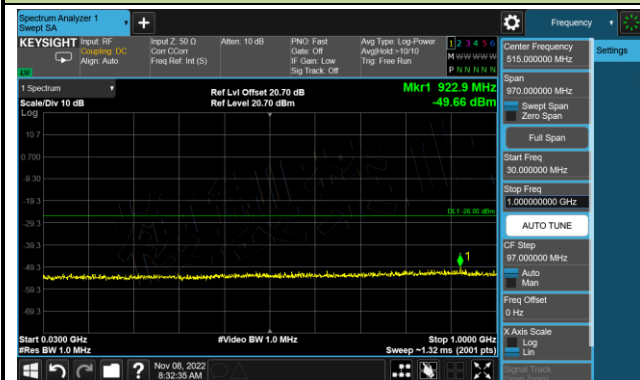
8000 ~ 12500MHz



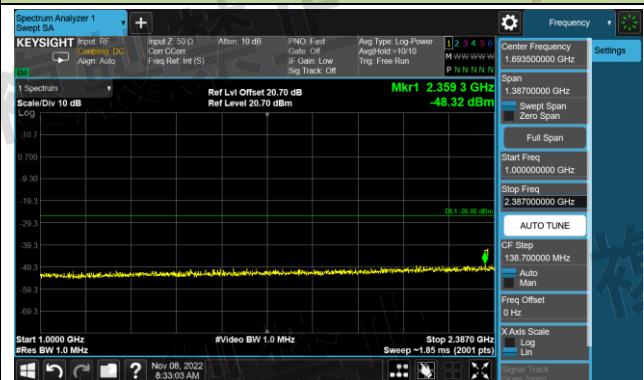
$\pi/4$ -DQPSK_DH5 Transmitter Spurious Emissions

2480MHz

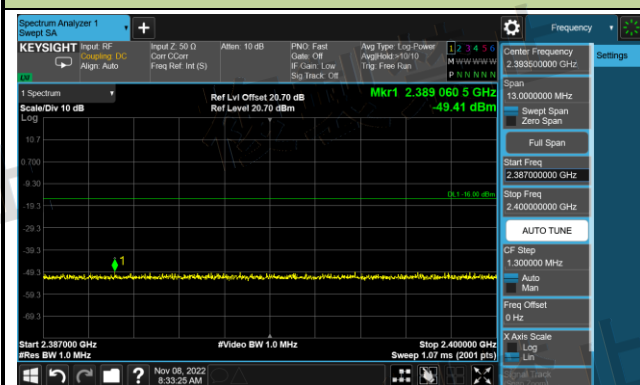
30 ~ 1000MHz



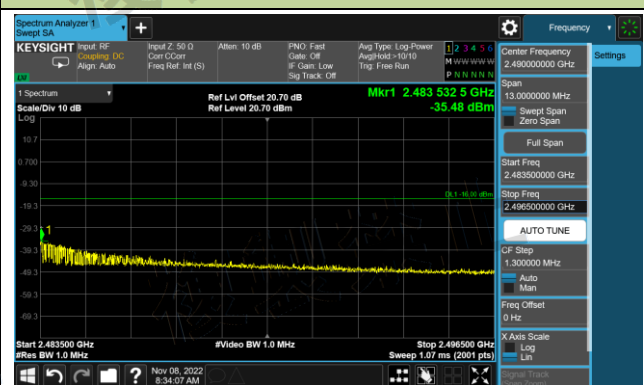
1000 ~ 2387MHz



2387 ~ 2400MHz



2483.5 ~ 2496.5MHz



2496.5 ~ 8000MHz



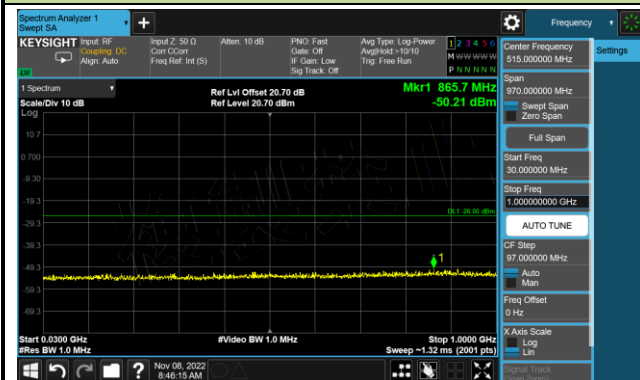
8000 ~ 12500MHz



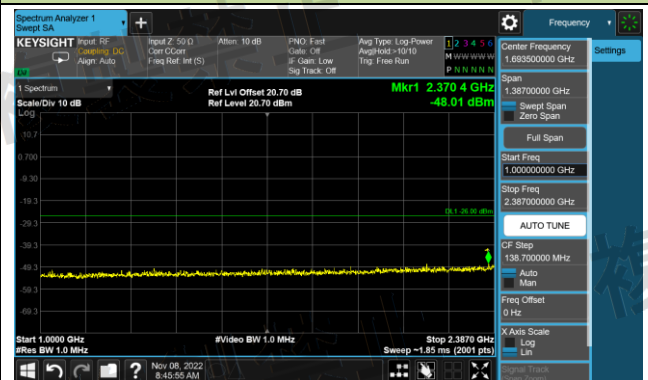
8DPSK_DH5 Transmitter Spurious Emissions

2402MHz

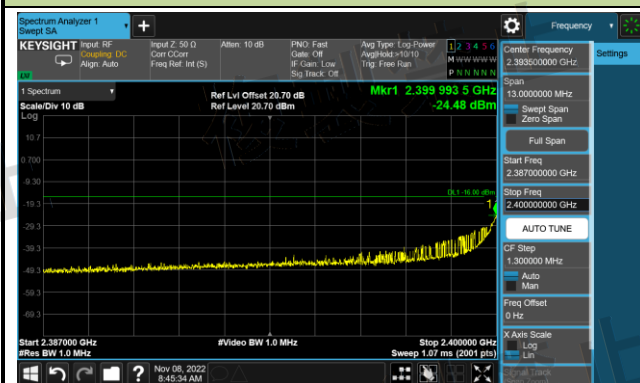
30 ~ 1000MHz



1000 ~ 2387MHz



2387 ~ 2400MHz



2483.5 ~ 2496.5MHz



2496.5 ~ 8000MHz



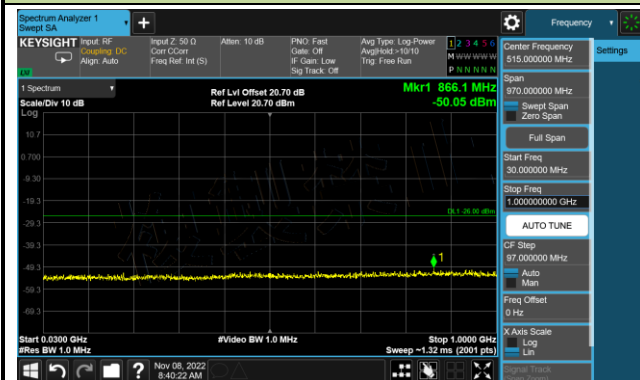
8000 ~ 12500MHz



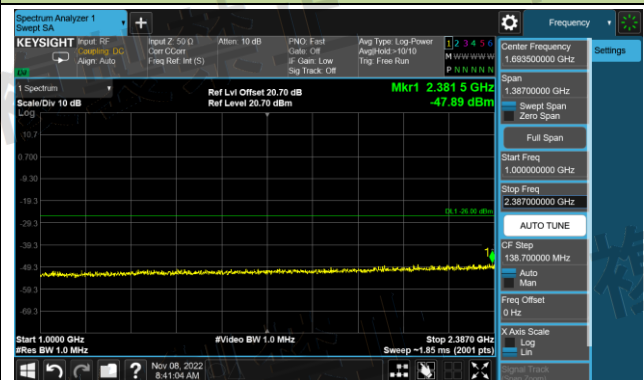
8DPSK_DH5 Transmitter Spurious Emissions

2441MHz

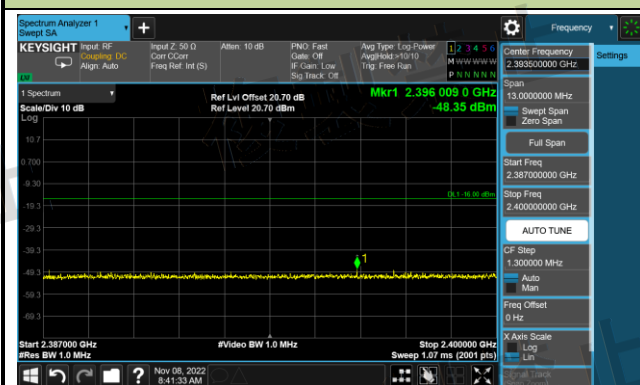
30 ~ 1000MHz



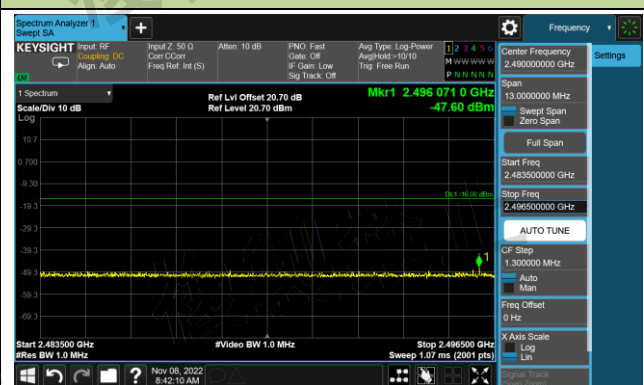
1000 ~ 2387MHz



2387 ~ 2400MHz



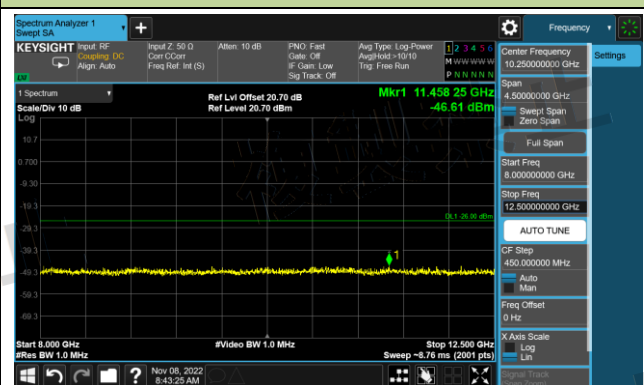
2483.5 ~ 2496.5MHz



2496.5 ~ 8000MHz



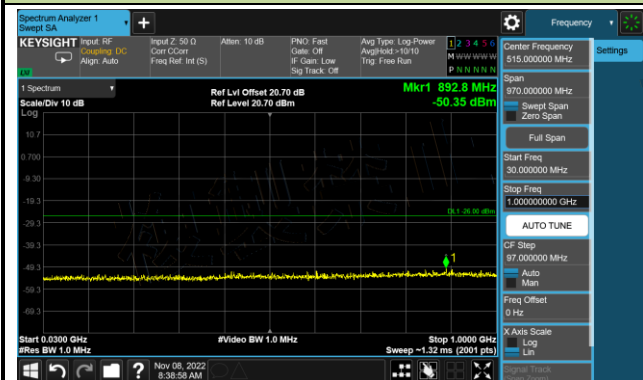
8000 ~ 12500MHz



8DPSK_DH5 Transmitter Spurious Emissions

2480MHz

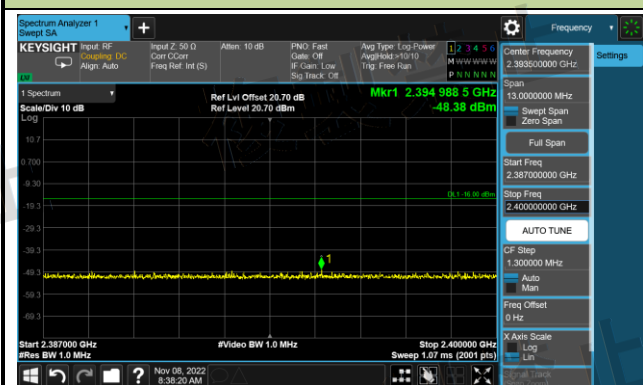
30 ~ 1000MHz



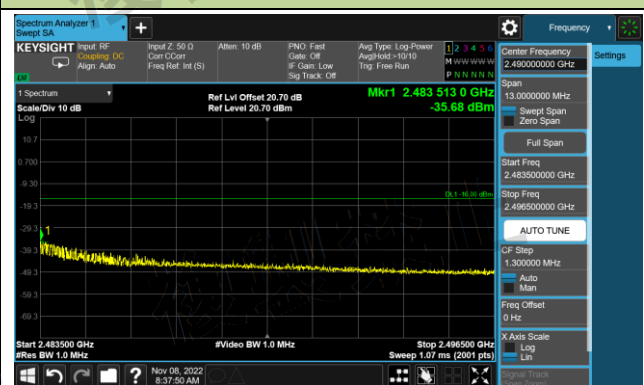
1000 ~ 2387MHz



2387 ~ 2400MHz



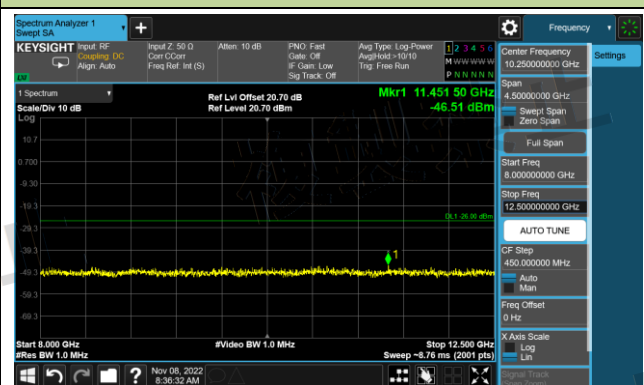
2483.5 ~ 2496.5MHz



2496.5 ~ 8000MHz



8000 ~ 12500MHz



5.8. Receiver Spurious Emissions Measurement

5.8.1. Test Limit

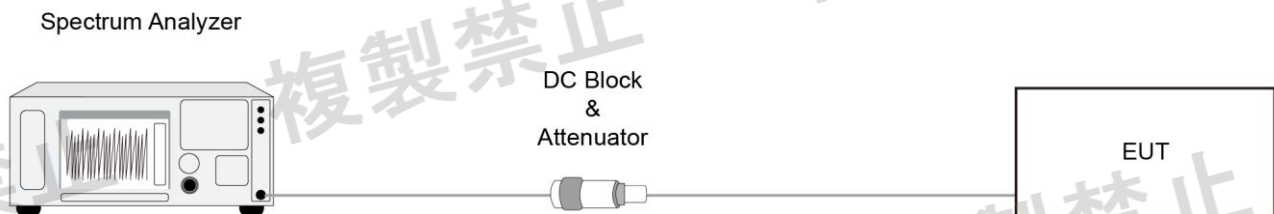
$\leq 4\text{nW}$ for 30 ~ 1000MHz

$\leq 20\text{nW}$ for 1000 ~ 12500MHz

5.8.2. Test Procedure

1. A spectrum analyzer or similar device shall be used to observe a sample of the modulated transmitter's radio frequency power output.
2. A positive peak detector function must be used.
3. The measurement instrument bandwidth and span must be set sufficiently with, and, the scan time set sufficiently slowly, to ensure all major modulation products are captured. Note that the measurement bandwidth should also be set sufficiently narrow to avoid adding significant error to the test result.
4. 'Maximum Hold' mode may be used to accumulate the measurement result over several scans provided the emission is repetitive in nature.

5.8.3. Test Setup



5.8.4. Test Result

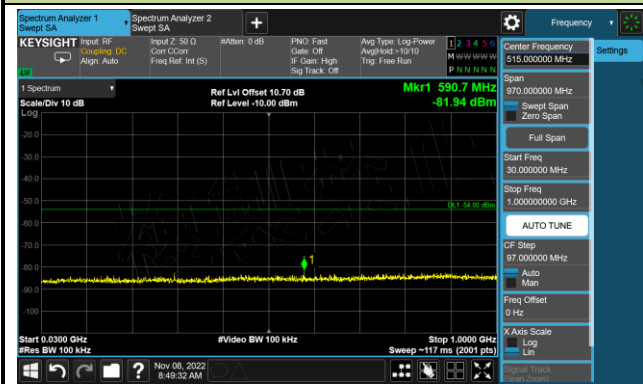
Test Site	SIP-TR1	Test Engineer	Alisa Deng
Temperature	24.1°C	Humidity	53.9%
Test Date	2022-11-08		

Test Mode	Test Frequency (MHz)	Frequency Range (MHz)	Max Reading Level (dBm)	Limit (dBm)	Result
GFSK_DH5	2402	30 ~ 1000	-81.94	-54 (4nW)	Pass
		1000 ~ 12500	-65.97	-47 (20nW)	Pass
	2441	30 ~ 1000	-82.63	-54 (4nW)	Pass
		1000 ~ 12500	-65.95	-47 (20nW)	Pass
	2480	30 ~ 1000	-82.87	-54 (4nW)	Pass
		1000 ~ 12500	-67.00	-47 (20nW)	Pass
$\pi/4$ -DQPSK_DH5	2402	30 ~ 1000	-82.71	-54 (4nW)	Pass
		1000 ~ 12500	-66.34	-47 (20nW)	Pass
	2441	30 ~ 1000	-81.81	-54 (4nW)	Pass
		1000 ~ 12500	-65.61	-47 (20nW)	Pass
	2480	30 ~ 1000	-83.04	-54 (4nW)	Pass
		1000 ~ 12500	-66.69	-47 (20nW)	Pass
8DPSK_DH5	2402	30 ~ 1000	-82.59	-54 (4nW)	Pass
		1000 ~ 12500	-66.01	-47 (20nW)	Pass
	2441	30 ~ 1000	-82.93	-54 (4nW)	Pass
		1000 ~ 12500	-66.25	-47 (20nW)	Pass
	2480	30 ~ 1000	-82.38	-54 (4nW)	Pass
		1000 ~ 12500	-66.12	-47 (20nW)	Pass

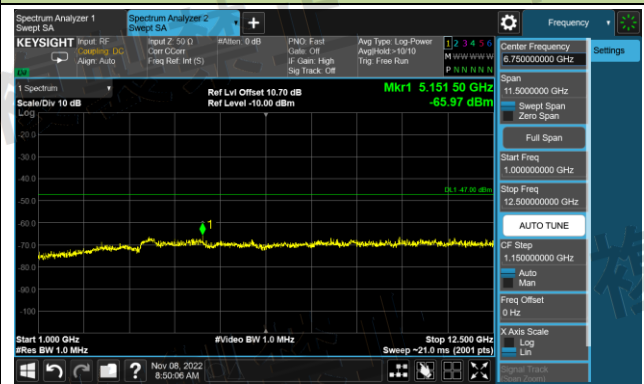
GFSK_DH5 Receiver Spurious Emissions

2402MHz

30 ~ 1000MHz

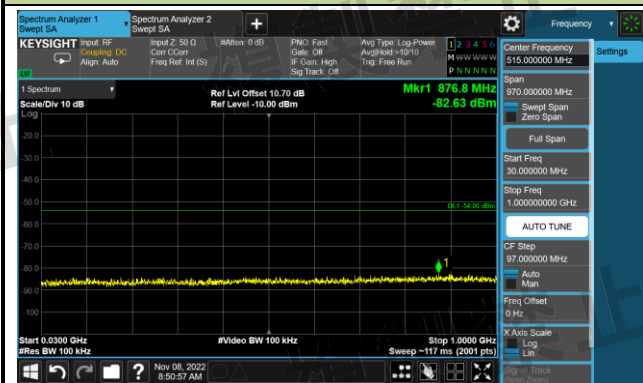


1000 ~ 12500MHz

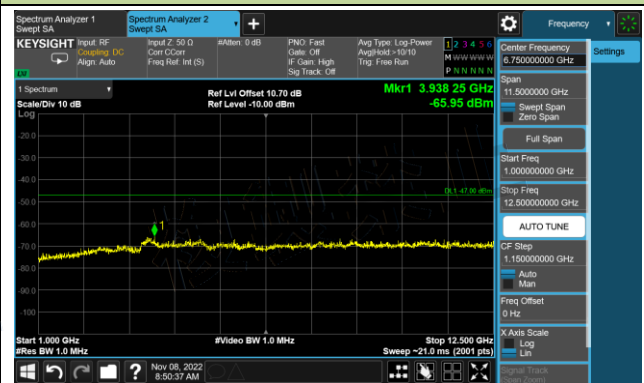


2441MHz

30 ~ 1000MHz

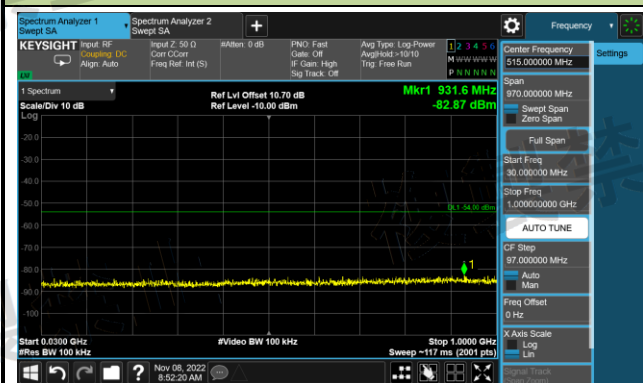


1000 ~ 12500MHz

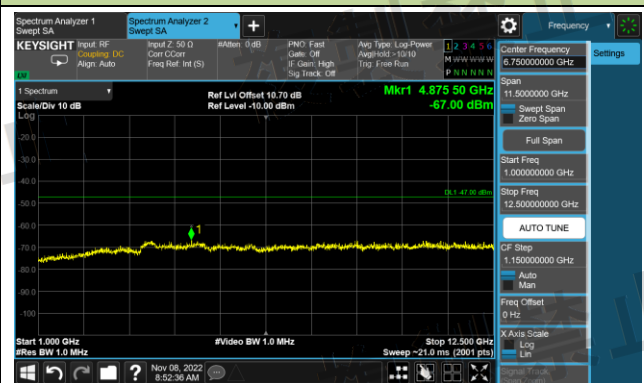


2480MHz

30 ~ 1000MHz



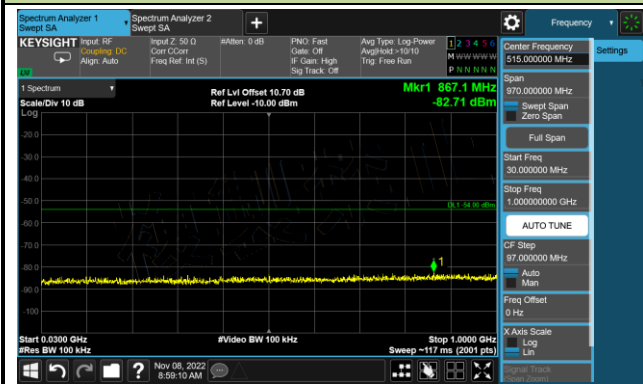
1000 ~ 12500MHz



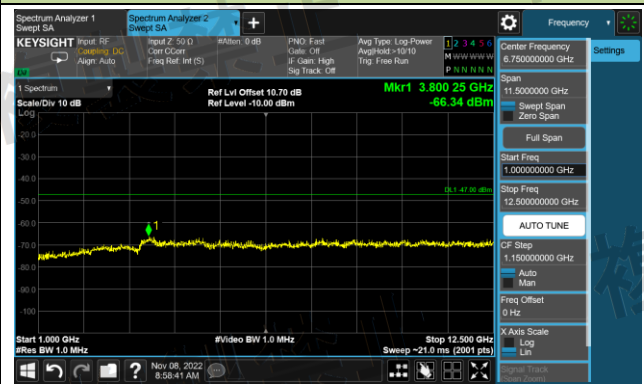
$\pi/4$ -DQPSK_DH5 Receiver Spurious Emissions

2402MHz

30 ~ 1000MHz



1000 ~ 12500MHz

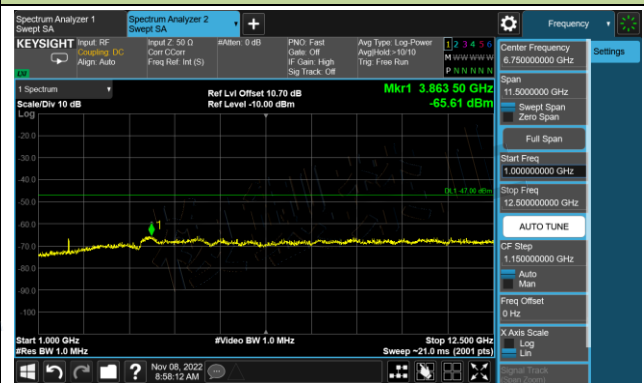


2441MHz

30 ~ 1000MHz

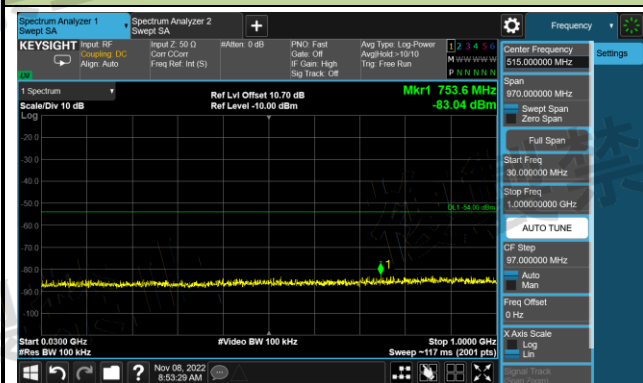


1000 ~ 12500MHz

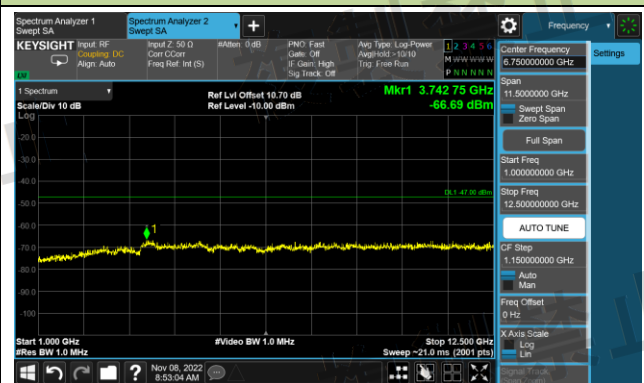


2480MHz

30 ~ 1000MHz



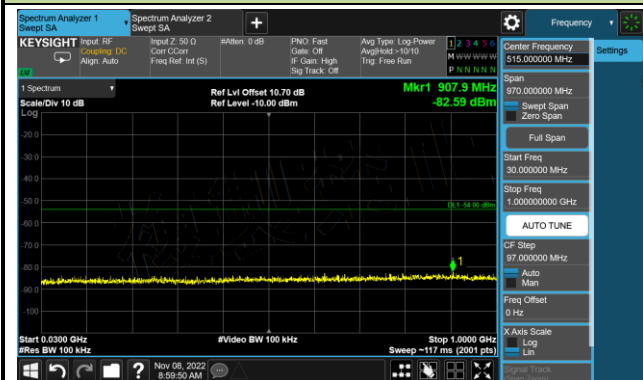
1000 ~ 12500MHz



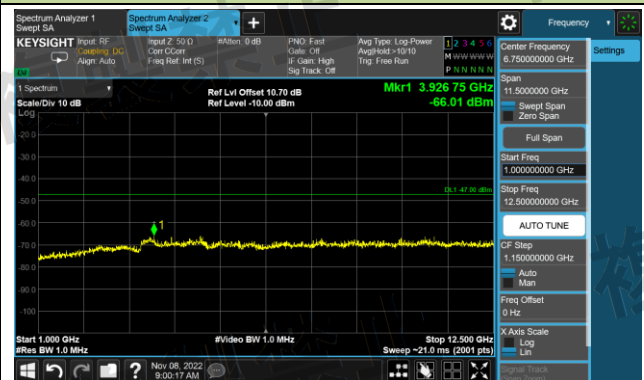
8DPSK_DH5 Receiver Spurious Emissions

2402MHz

30 ~ 1000MHz

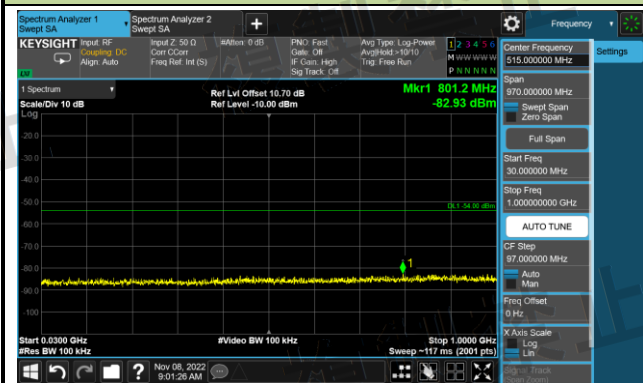


1000 ~ 12500MHz

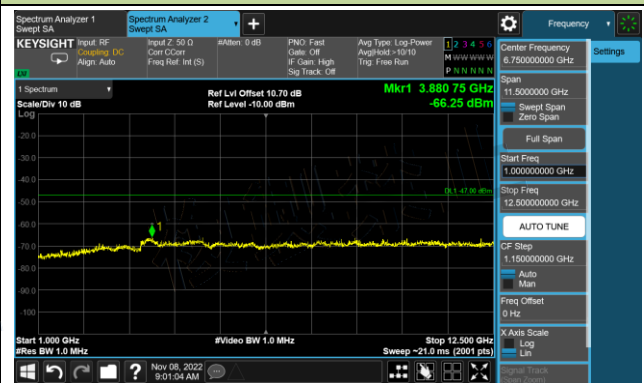


2441MHz

30 ~ 1000MHz

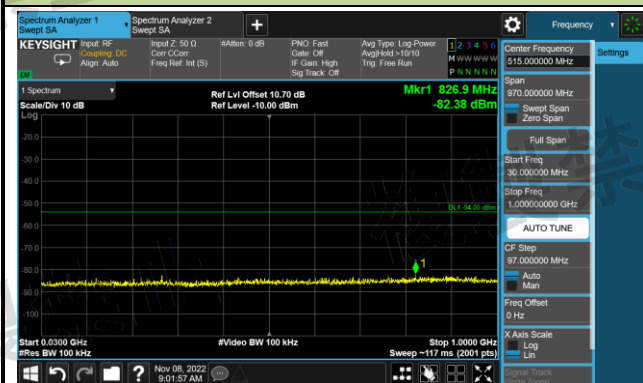


1000 ~ 12500MHz

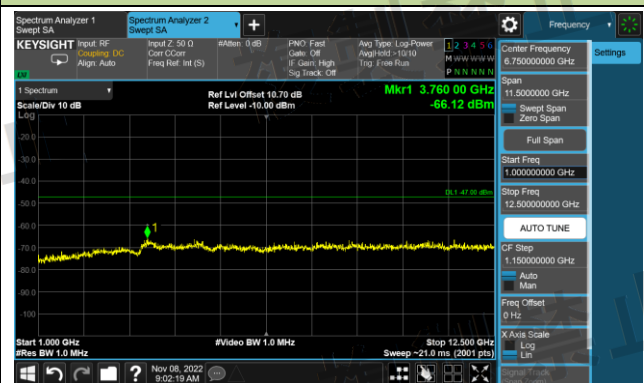


2480MHz

30 ~ 1000MHz



1000 ~ 12500MHz



5.9. Carrier Sensing Measurement

5.9.1. Test Limit

Stop transmission while carrier detecting.

Field intensity in the direction of the maximum gain of a receiving antenna: 100mV/m (It's a radiated testing detection threshold level).

The conducted detection threshold level shows as below:

(6)式の電界強度 E を既定値の 100mV/m (100dB μ V/m) とし、 λ (m)を F (MHz) に変換し、 P を dBm 単位で表すと (7) 式を得る。

$$P[\text{dBm}] = 22.79 + G - 20\log F \quad (7)$$

P : 受信機のアンテナ端子に入力される受信電力 [dBm]

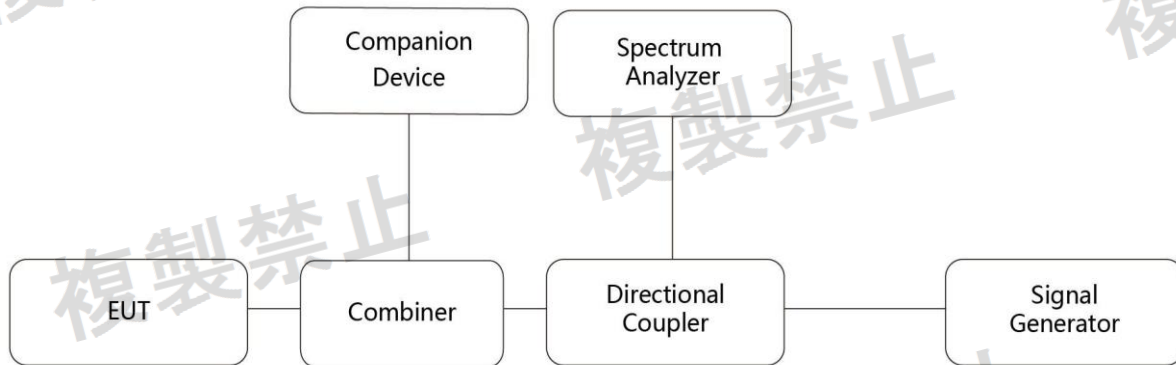
G : 受信アンテナの絶対利得 [dBi]

F : キャリア周波数 [MHz]

5.9.2. Test Procedure

1. A spectrum analyzer or similar device shall be used to observe a sample of the modulated transmitter's radio frequency power output.
2. Link EUT and Access Point to Directional Coupler input port.
3. Link Signal Generator and Spectrum Analyzer to test port and output port in the Directional Coupler separately.
4. A positive Peak Detector function in Spectrum Analyzer must be used.
5. Set the Span to Zero.
6. Press the Signal Generator on and it will output the Carrier Signal. When the Link breaks off, wait a minute and press the Signal Generator off. After a while, reset the Link and done the test.

5.9.3. Test Setup

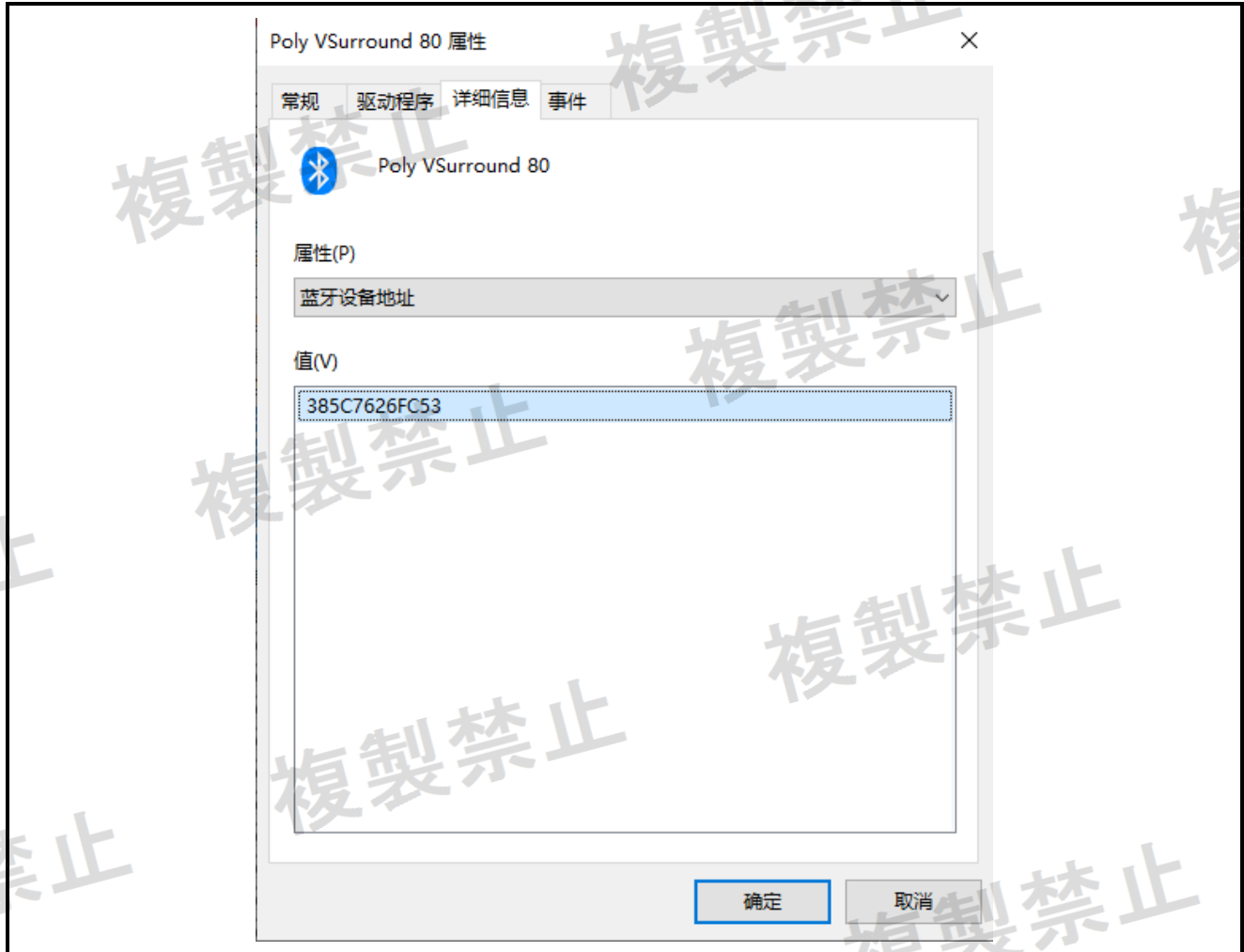


5.9.4. Test Result

The requirement is compulsory for DSSS & OFDM equipment with frequencies from 5.150 MHz up to 5.725 MHz and for equipment with 40 MHz channel spacing in the 2.4 GHz band. For equipment using frequency hopping, this requirement is not applicable.

5.10. Interference Prevention Measurement

When the EUT work on normal operation, we can read the unique MAC address form the PC. Therefore, this device can have Interference Prevention Function.



Appendix A - EUT Photograph

Refer to “2211RSU003-JE” file.

Appendix B - Test Setup Photograph

Refer to “2211RSU003-JT” file.