

FCC CERTIFICATION TEST REPORT

Applicant	:	Hannto Technology Co., Ltd.
Address	:	Room 704, Building 1, No.88, Shengrong Road, Pudong, Shanghai, China.
Equipment under Test	:	Photo Printer
Model No.	:	DHP515, DHP514
Trade Mark	:	Liene / Liene / Optional
FCC ID	:	2AZHDDHP515
Manufacturer	:	Hannto Technology Co., Ltd.
Address	:	Room 704, Building 1, No.88, Shengrong Road, Pudong, Shanghai, China.

Issued By: Suzhou Dongdian Testing Service Co.,Ltd.

Address: Phase II, No.16 Runsheng Road, Suzhou Industrial Park, Suzhou, People's Republic of China.

Tel: +86-0512-62531270, E-mail: ddt@dgddt.com, <http://www.ddttest.com>



REPORT

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Test Report Declare

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Manufacturer	:	Hannto Technology Co., Ltd.
Address	:	Room 704, Building 1, No.88, Shengrong Road, Pudong, Shanghai, China.

Test Standard Used: 47 CFR FCC Part 15 Subpart C (Section 15.247)

Test procedure used: ANSI C63.10:2020+Corr.1:2023

We Declare:

The equipment described above is tested by Suzhou Dongdian Testing Service Co.,Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Suzhou Dongdian Testing Service Co.,Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC&ISED standards.

Report No:	DDT-B24120205-3E01		
Sample No:	Y24120205-05		
Date of Receipt:	Dec. 06, 2024	Date of Test:	Dec. 06, 2024~ Dec. 18, 2024

Prepared By:

Bacon Dong

Bacon Dong/Engineer

Reviewed By:

Leon Wu

Leon Wu/Director

Authorized By:

Chris Zhong

Chris Zhong/EMC Manager

Note:

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Suzhou Dongdian Testing Service Co., Ltd.

The results reported herein have been performed in accordance with the laboratory's terms of accreditation.

This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products.

This report does not imply that the product(s) has met the criteria for certification.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Dec. 25, 2024	

1. Summary of Test Results

Description of Test Item	Standard	Verdict
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1) ANSI C63.10:2020+CORR.1:2023	Pass
20 dB Bandwidth and 99% Bandwidth	FCC Part 15: 15.215 ANSI C63.10:2020+CORR.1:2023	Pass
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1) ANSI C63.10:2020+CORR.1:2023	Pass
Number of Hopping Channel	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10:2020+CORR.1:2023	Pass
Dwell Time	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10:2020+CORR.1:2023	Pass
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.10:2020+CORR.1:2023	Pass
Band Edge Compliance	FCC Part 15: 15.247(d) ANSI C63.10:2020+CORR.1:2023	Pass
Power Line Conducted Emissions	FCC Part 15: 15.207 ANSI C63.10:2020+CORR.1:2023	Pass
Antenna Requirement	FCC Part 15: 15.203	Pass

Note: The measurement result for the sample received is <Pass> according to < ANSI C63.10:2020+CORR.1:2023, FCC CFR 47 Part 2, FCC CFR 47 Part 15C> when <Accuracy Method> decision rule is applied.

2. General Test Information

2.1. Description of EUT

EUT* Name	: Photo Printer
Model Number	: DHP515, DHP514
Difference of model number	The DHP 514 model has one battery, DHP 515 model does not have a battery. The DHP 514 contains all components of the DHP 515.
Test Model	DHP514
EUT function description	: Please reference user manual of this device
Power Supply	: Input:100-240V~ 50/60Hz 1.0A
Operation Frequency	: 2402MHz-2480MHz
Modulation	: GFSK, Pi/4 DQPSK, 8DPSK
Data Rate	: 1Mbps, 2Mbps, 3Mbps
Antenna Type	: PCB Antenna
Antenna Gain	-2.55 dBi (Declare by customer and the lab isn't responsible for the value)
Serial Number	: N/A

Note1: The lab isn't responsible for the value provide by customer(Such as RF cable loss, antenna gain etc..)

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

25	2427	52	2454	
26	2428	53	2455	

2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Description	Remark
N/A	N/A	N/A	N/A	N/A

2.3. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	EMC Compliance	SN
Laptop	ASUS	FX506LI10750-0DABXHA4X10	FCC/CE	LANRCX04 696543F

2.4. Block diagram of EUT configuration for test



Test software: BR BlueletSuite.EXE

The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode as below table.

Tested mode, channel, information			
Mode	Setting Tx Power	Channel	Frequency (MHz)
GFSK hopping on Tx mode	7	CH0 to CH78	2402 to 2480
$\pi/4$ -DQPSK hopping on Tx mode	7	CH0 to CH78	2402 to 2480
8DPSK hopping on Tx mode	7	CH0 to CH78	2402 to 2480
GFSK hopping off Tx mode	/	CH0	2402
	/	CH39	2441
	/	CH78	2480
$\pi/4$ -DQPSK hopping off Tx mode	/	CH0	2402
	/	CH39	2441
	/	CH78	2480
8DPSK hopping off Tx mode	/	CH0	2402
	/	CH39	2441
	/	CH78	2480

2.5. Deviations of test standard

No deviation.

2.6. Test environment conditions

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

Temperature range:	21-25 °C
Humidity range:	40-75%

Pressure range:	86-106 kPa
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2.7. Test laboratory

Lab Information	Company Name: Suzhou Dongdian Testing Service Co.,Ltd. Address: Phase II, No.16 Runsheng Road, Suzhou Industrial Park, Suzhou, People's Republic of China. Tel: +86-0512-62531270, E-mail: ddt@dgddt.com, http://www.ddttest.com
Accreditation Certificate	A2LA (Certificate No.: 7346.01) Suzhou Dongdian Testing Service Co.,Ltd. has been assessed and proved to be in compliance with A2LA. FCC (FCC Designation No.: CN1397) Suzhou Dongdian Testing Service Co.,Ltd. has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules. IC (IC Designation No.: 32952; CAB No.:CN0182) Suzhou Dongdian Testing Service Co.,Ltd. has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.
Note 1: All tests measurement facilities use to collect the measurement data are located at Phase II, No.16 Runsheng Road, Suzhou Industrial Park, Suzhou, China. Note 2: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. These measurements below 30MHz had been correlated to measurements performed on an OFS. Note 3: The test anechoic chamber in Suzhou Dongdian Testing Service Co.,Ltd had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.	

2.8. Measurement uncertainty

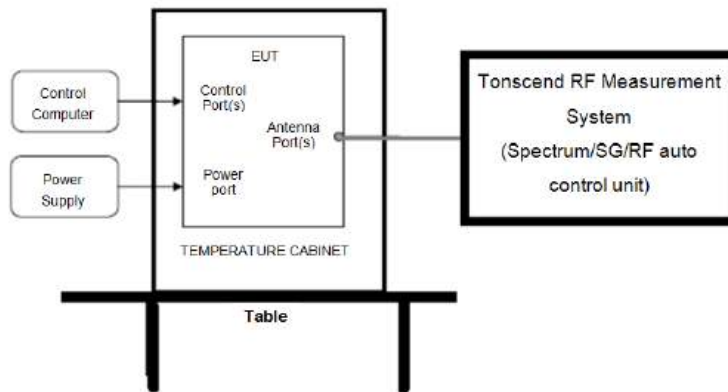
Test Item	Uncertainty
Max Peak Conducted Output Power	±1.5 dB
Bandwidth	±1.9%
Carrier Frequency Separation	±1.9%
Maximum Power Spectral Density Level	±1.5dB
Number of Hopping Channel	±1.9%
Time of Occupancy	±0.56 %
Band-edge Spurious Emission	±1.9%
Conducted RF Spurious Emission	30MHz-30MHz:±1.5 dB
	1GHz-12.75GHz: ± 1.9dB
	12.75GHz-26.5GHz: ±2.1dB
Uncertainty for Power line conduction emission test	3.4 dB (150 kHz - 30 MHz)
Radiated Emissions (30MHz to 1GHz) at 3m Chamber	3.7dB
Radiated Emissions (Above 1GHz) at 3m Chamber	4.4 dB(1GHz-6GHz)
	4.7 dB(6GHz-18GHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3. Equipment Used During Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
RF Conducted Test					
MXG Vector Signal Generator(100kHz-6GHz)	Agilent	N5182A	MY50144775	2024/1/30	1 Year
Spectrum Analyzer(9kHz-40GHz)	R&S	FSV40-N	101642	2024/1/30	1 Year
Vector Signal Generator(4kHz-7.125GHz)	R&S	SMCV100B	103781	2024/1/30	1 Year
WIDBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	167141	2024/1/30	1 Year
Signal Analyzer(10Hz-26.5GHz)	Keysight	N9020B	MY56080159	2024/3/12	1 Year
RF Control Unit	Tonscend	JS0806-3	24A80620795	2024/4/11	1 Year
Signal Generator	R&S	SMF 100A	101396	2024/2/21	1 Year
Programmable Temperature Humidity Chamber	Zhi Xiang	ZXGDJS-225L	ZX20171127A	2024/4/11	1 Year
Temperature, humidity and pressure recorder	Huahanwei	TH10R	c00286000Ebc	2024/1/30	1 Year
Test Software	TONSCEND	JS1120-3	3.5.39	N/A	N/A
Radiated Spurious Emission 3m EMI Chamber					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	R&S	ESC17	101138	2024/01/30	1 Year
Signal Analyzer	R&S	FSV40	101730	2024/02/21	3 Year
Hybrid antenna	TESEQ	CBL6141B	27421	2024/01/10	3 Year
Horn Antenna	ETS	ETS 3117	157735	2024/01/19	3 Year
Pre-Amplifier_HF	COM-MW	DPA8-1000-18000-1012	9BH231242575	2024/01/30	1 Year
Temperature, humidity and pressure recorder	Huahanwei	TH10R	c0222020002F	2024/1/30	1 Year
3m Anechoic Chamber	CeRuiTong	3m-SAC	N/A	2024/5/10	3 Year
Test Software	TONSCEND	JS32-RE	5.0.0	N/A	N/A
Power Line Conducted Emissions Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESC13	101705	2024/1/30	1 Year
Two-Line V-Network	Rohde & Schwarz	ENV216	101063	2024/1/30	1 Year
Test software	TONSCEND	JS32-CE	5.0.0	N/A	N/A

4. Maximum Peak Output Power

4.1. Block diagram of test setup



4.2. Limits

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts, the e.i.r.p shall not exceed 4W.

4.3. Test procedure

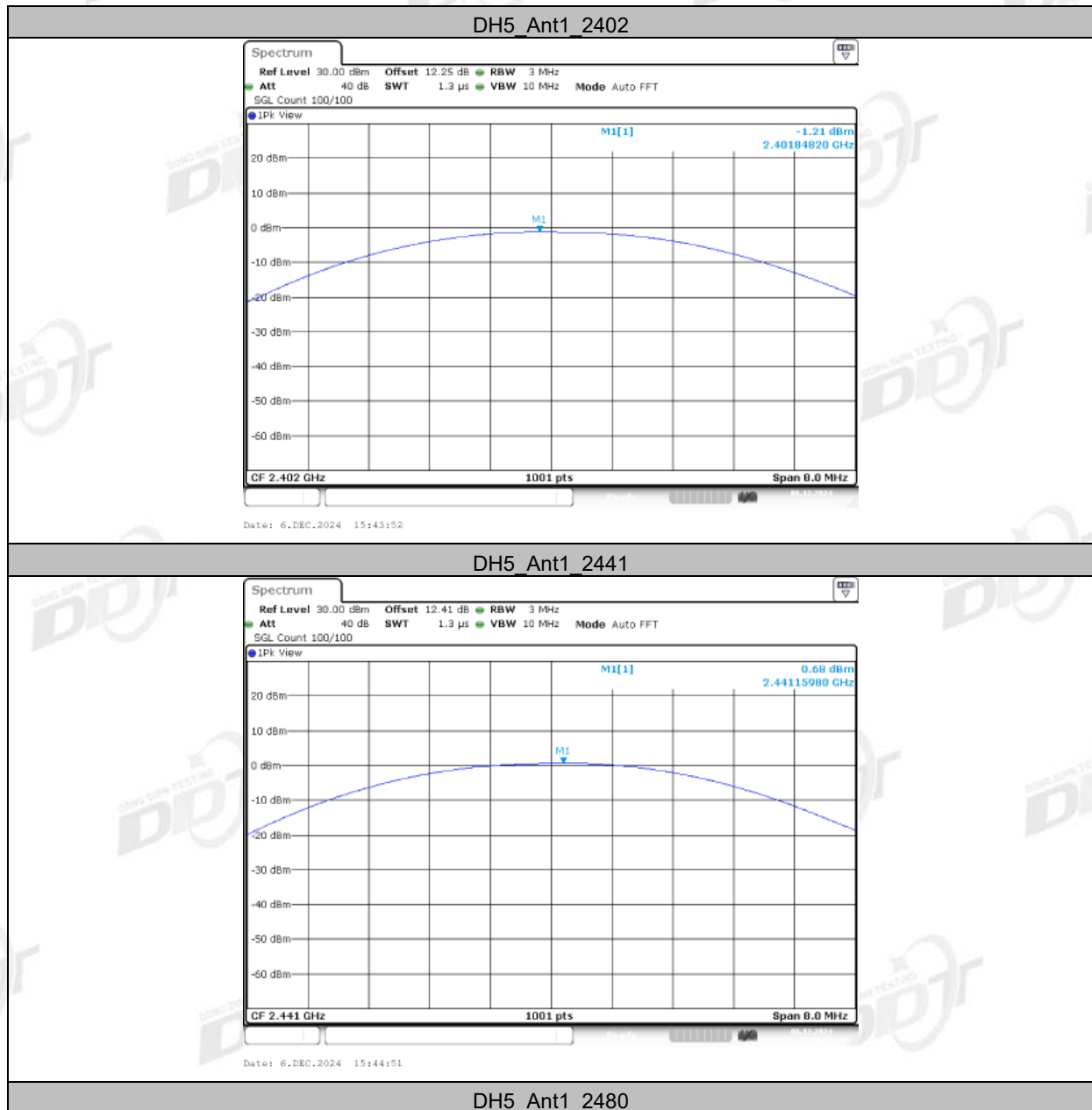
- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Measure the maximum output power of EUT by spectrum analyzer with PK detector and RBW=3 MHz (above 20 dB bandwidth of measured signal), VBW=10 MHz

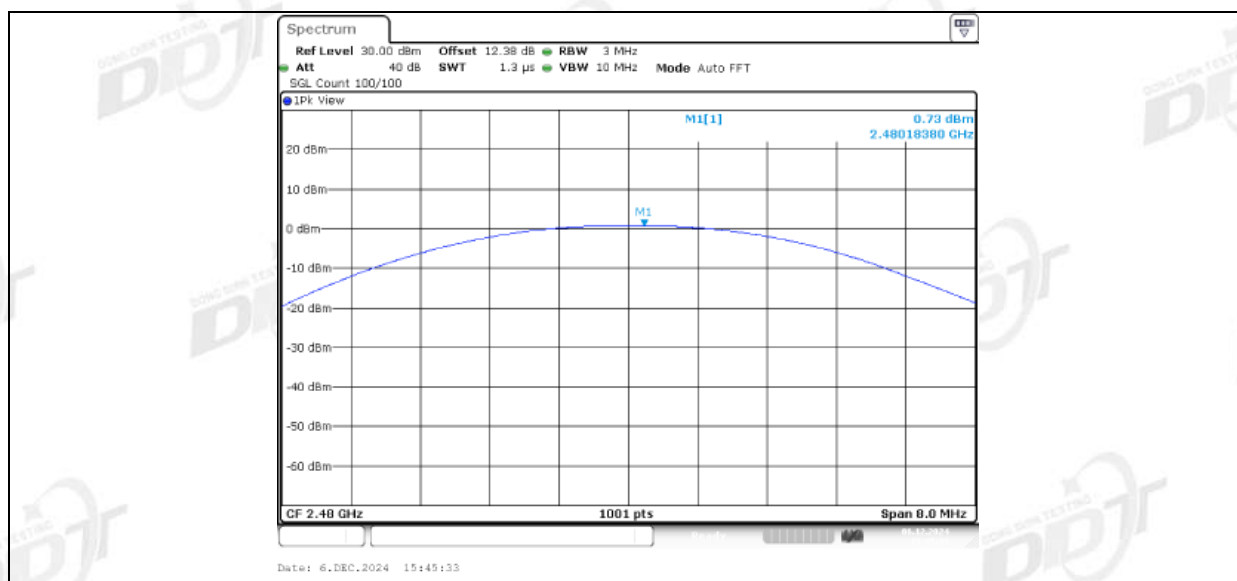
Note: The attenuator loss was inputted into spectrum analyzer as amplitude offset.

4.4. Test result

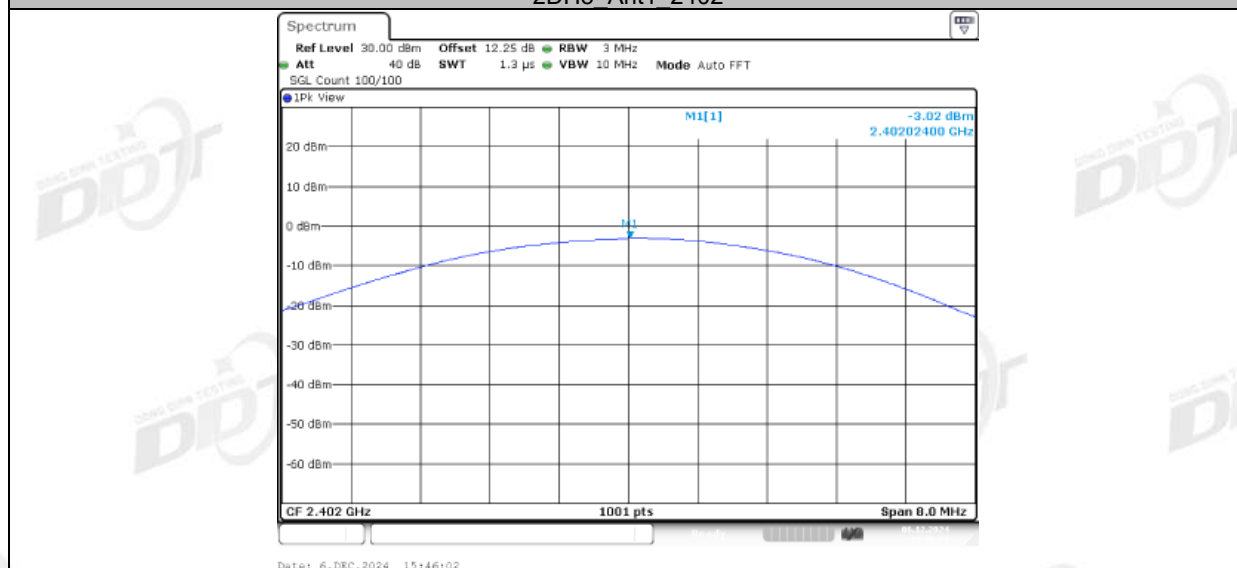
Mode	Antenna	Freq. (MHz)	Result (dBm)	Limit (dBm)	Verdict
GFSK	ANT1	2402	-1.21	≤20.97	Pass
	ANT1	2441	0.68	≤20.97	Pass
	ANT1	2480	0.73	≤20.97	Pass
$\pi/4$ -DQPSK	ANT1	2402	-3.02	≤20.97	Pass
	ANT1	2441	-1.00	≤20.97	Pass
	ANT1	2480	-1.17	≤20.97	Pass
8DPSK	ANT1	2402	-1.83	≤20.97	Pass
	ANT1	2441	-0.18	≤20.97	Pass
	ANT1	2480	-0.11	≤20.97	Pass

4.5. Original test data

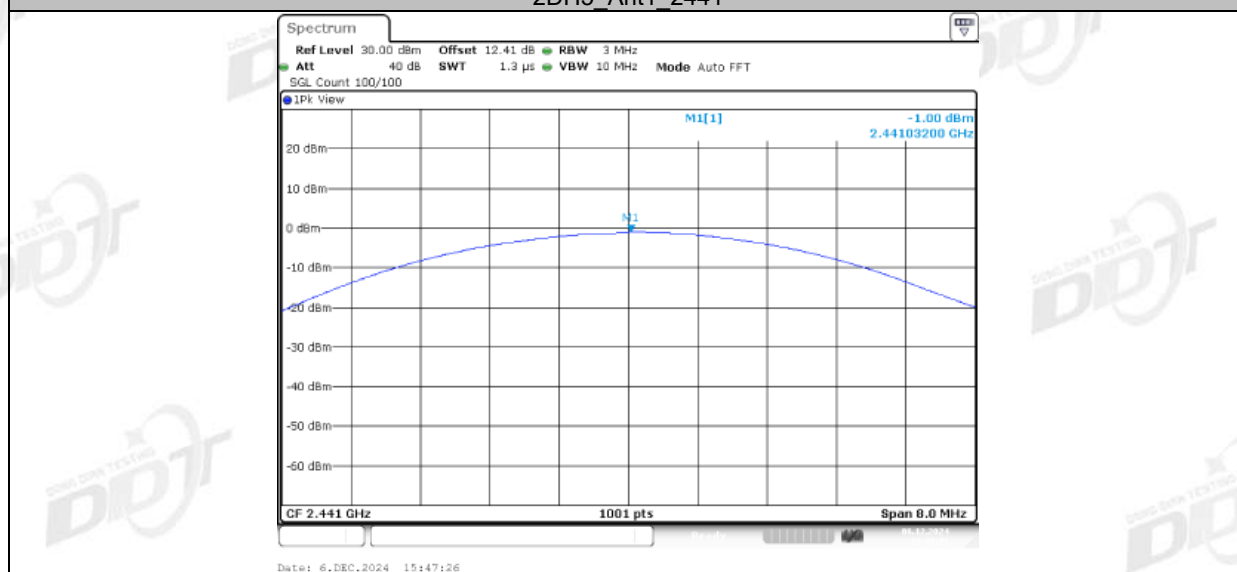




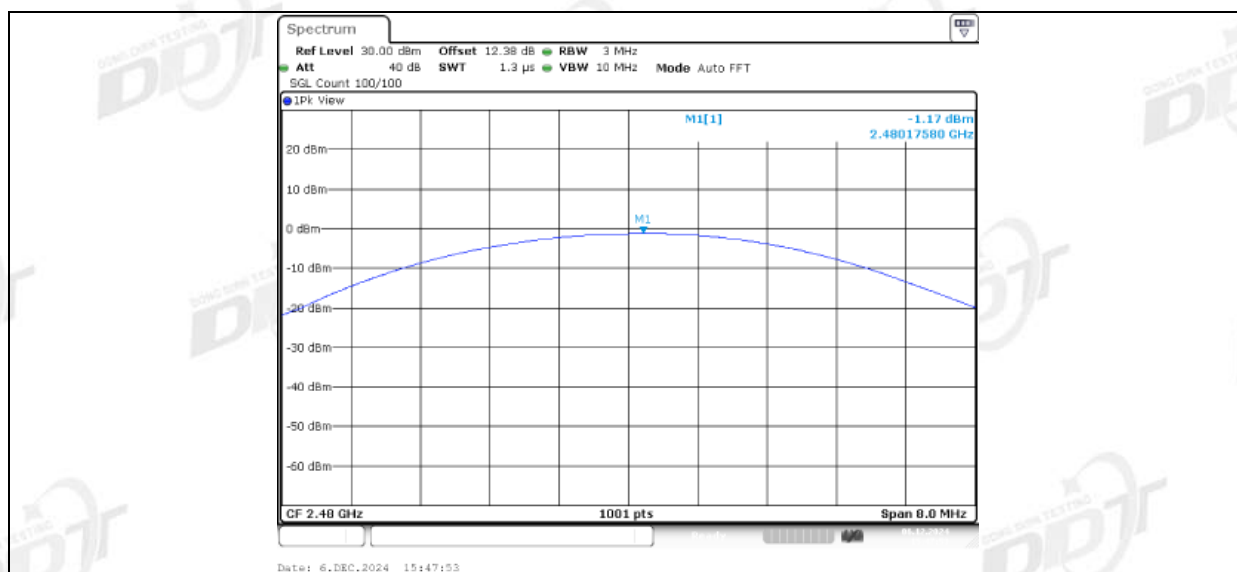
2DH5 Ant1 2402



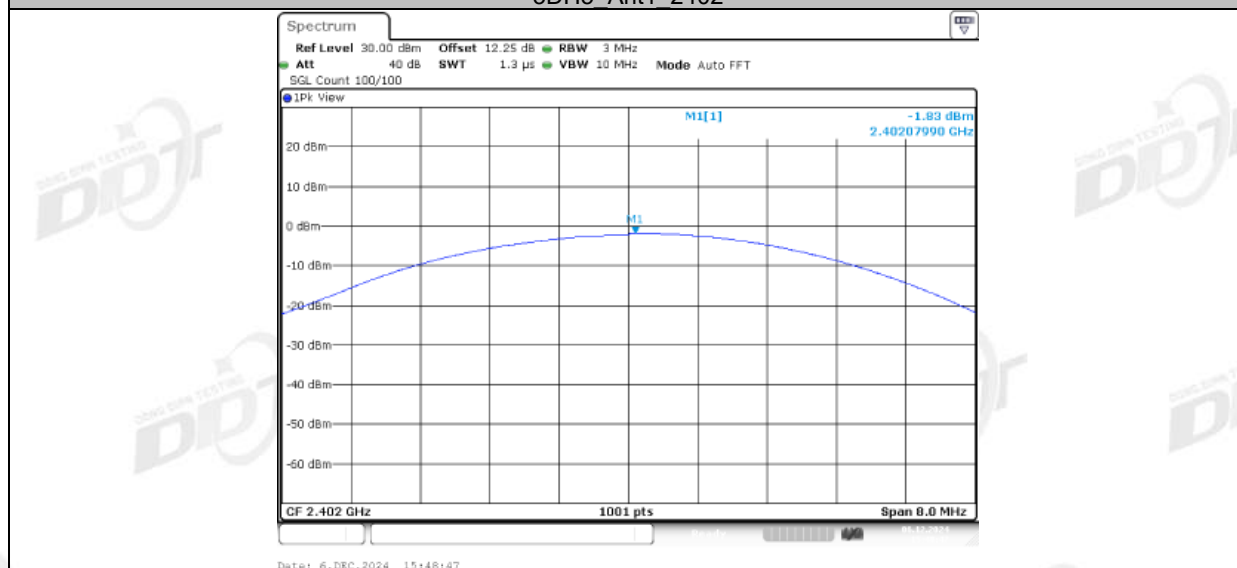
2DH5 Ant1 2441



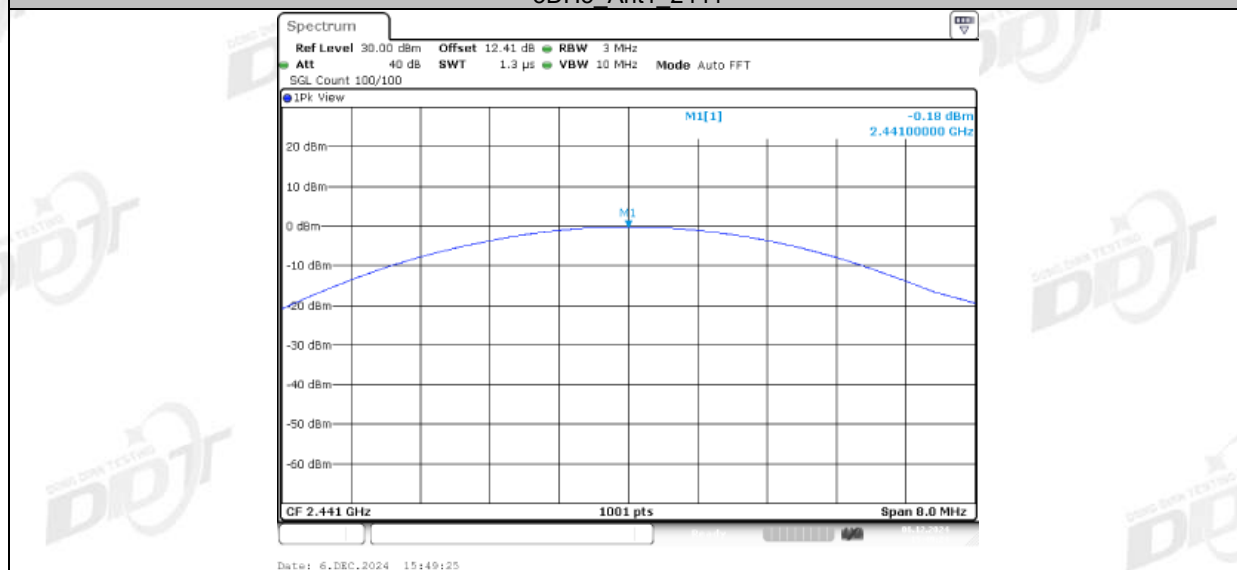
2DH5 Ant1 2480



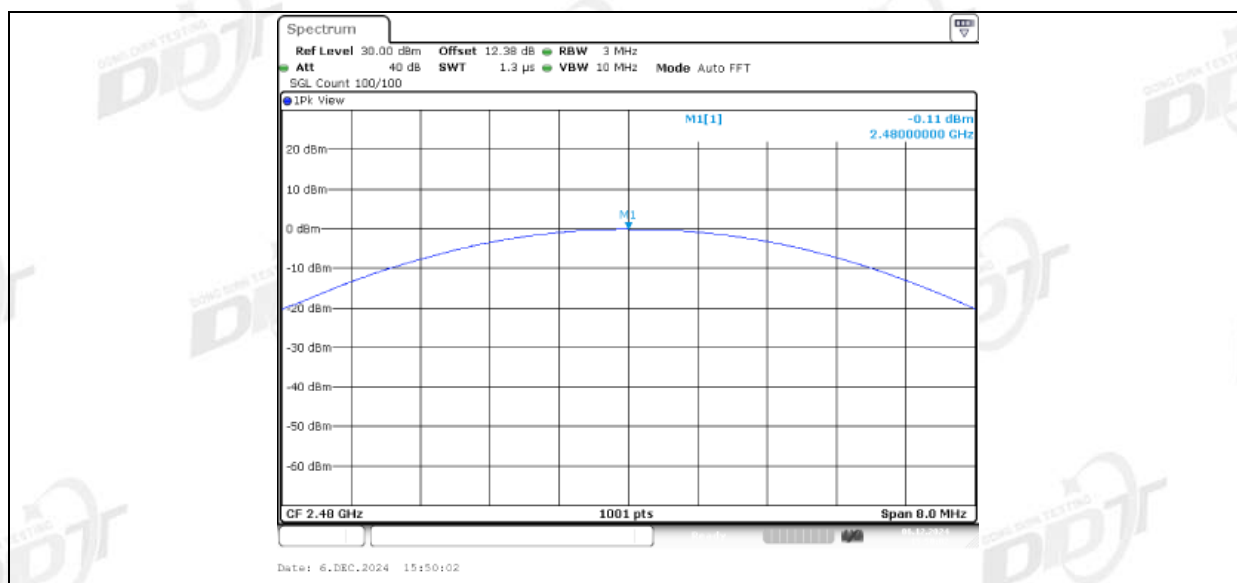
3DH5 Ant1 2402



3DH5 Ant1 2441



3DH5 Ant1 2480



5. 20 dB Bandwidth and 99% Bandwidth

5.1. Block diagram of test setup

Same as section 4.1

5.2. Limits

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

5.3. Test procedure

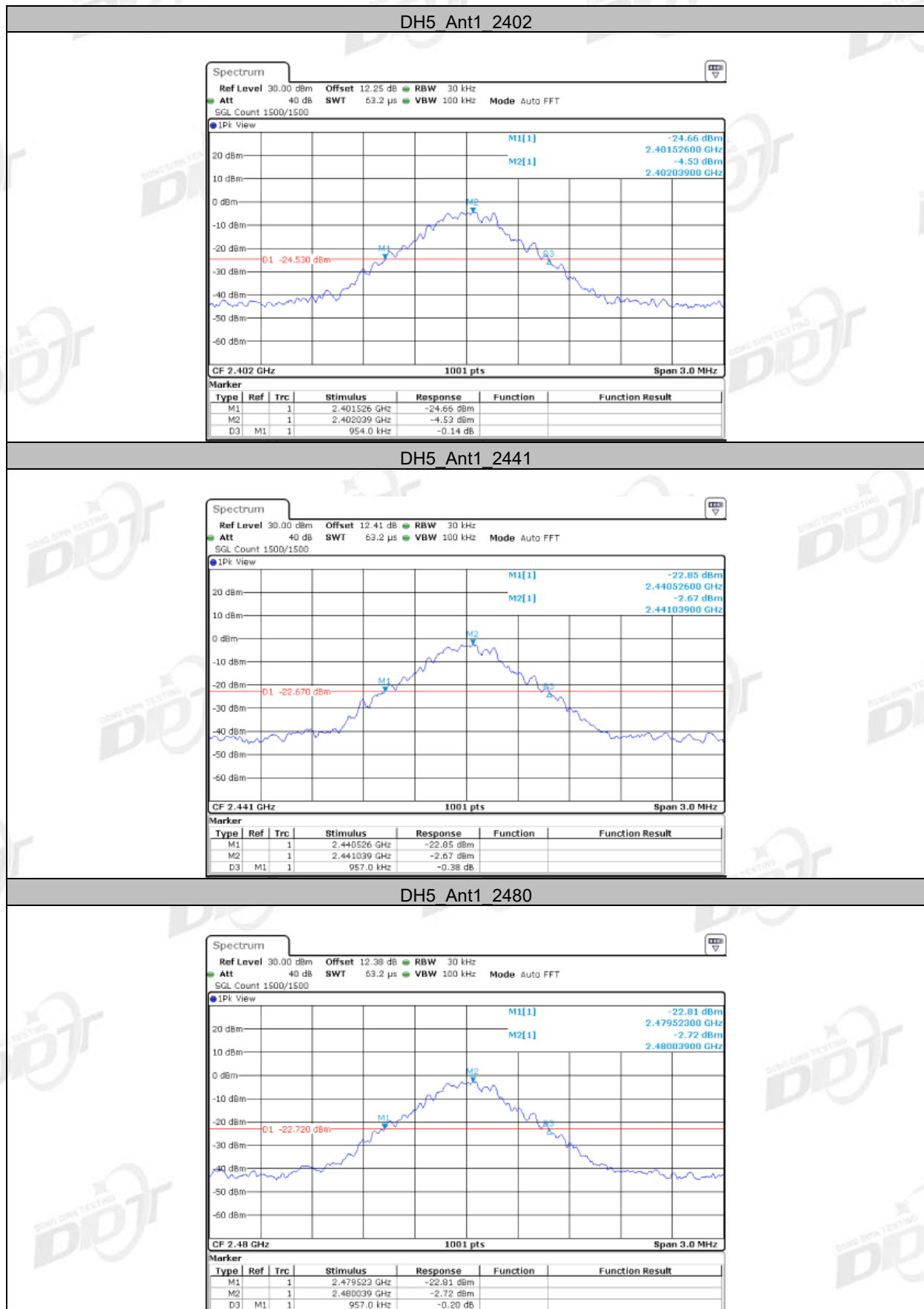
- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30 kHz RBW and 100 kHz VBW. The 20 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20 dB.

5.4. Test result

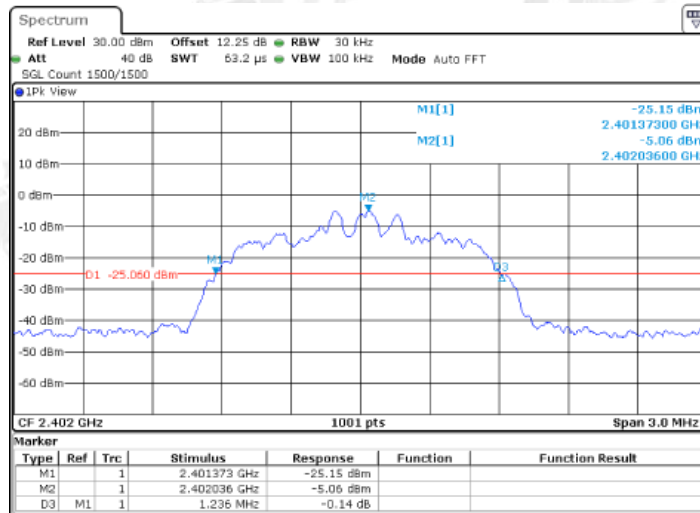
Left side:

Mode	Freq. (MHz)	20 dB bandwidth Result (MHz)	Verdict
GFSK	2402	0.95	Pass
	2441	0.96	Pass
	2480	0.96	Pass
$\pi/4$ -DQPSK	2402	1.24	Pass
	2441	1.28	Pass
	2480	1.23	Pass
8DPSK	2402	1.27	Pass
	2441	1.25	Pass
	2480	1.25	Pass

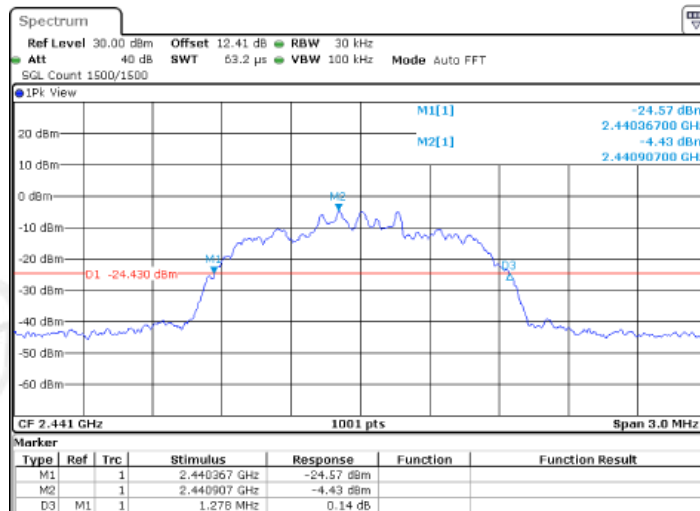
5.5. Original test data



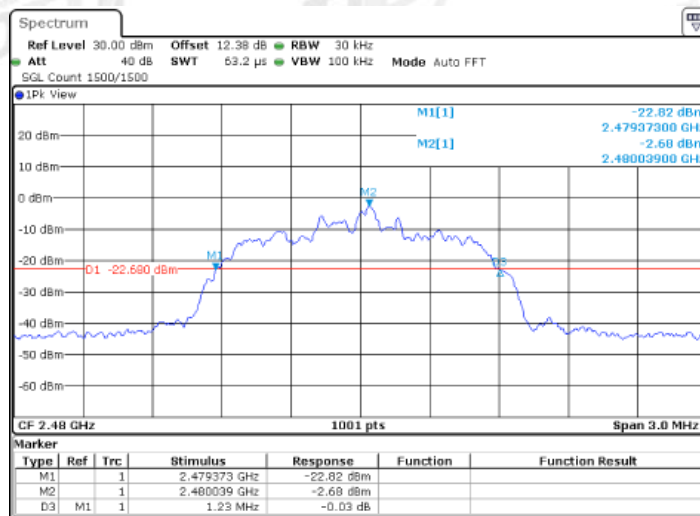
2DH5_Ant1_2402



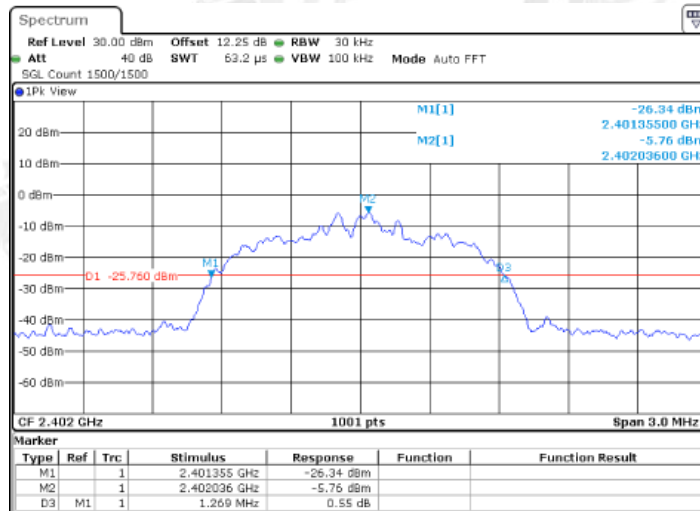
2DH5_Ant1_2441



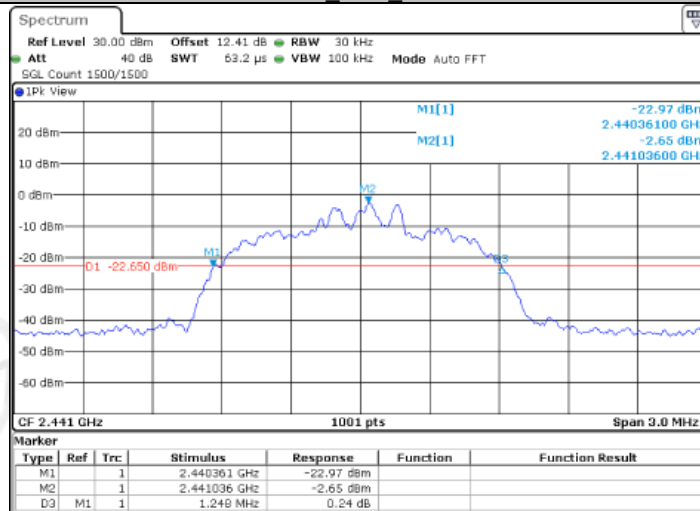
2DH5_Ant1_2480



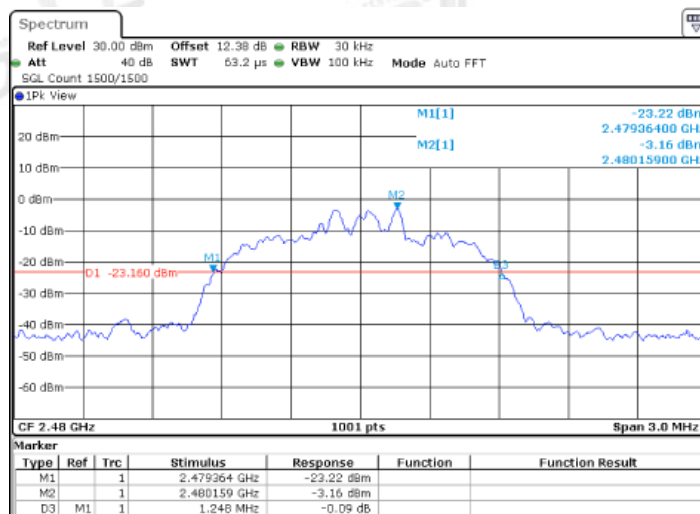
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



6. Carrier Frequency Separation

6.1. Block diagram of test setup

Same as section 4.1

6.2. Limits

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

6.3. Test procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
Video (or average) bandwidth (VBW) $\geq$ RBW.

6.4. Test result

Mode	Channel separation (MHz)	Limit (MHz) 2/3 of 20dB bandwidth	Verdict
GFSK	0.838	≥ 0.640	Pass
$\pi/4$ -DQPSK	1.232	≥ 0.853	Pass
8DPSK	0.991	≥ 0.847	Pass

6.5. Original test data



7. Number of Hopping Channel

7.1. Block diagram of test setup

Same as section 4.1

7.2. Limits

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

7.3. Test procedure

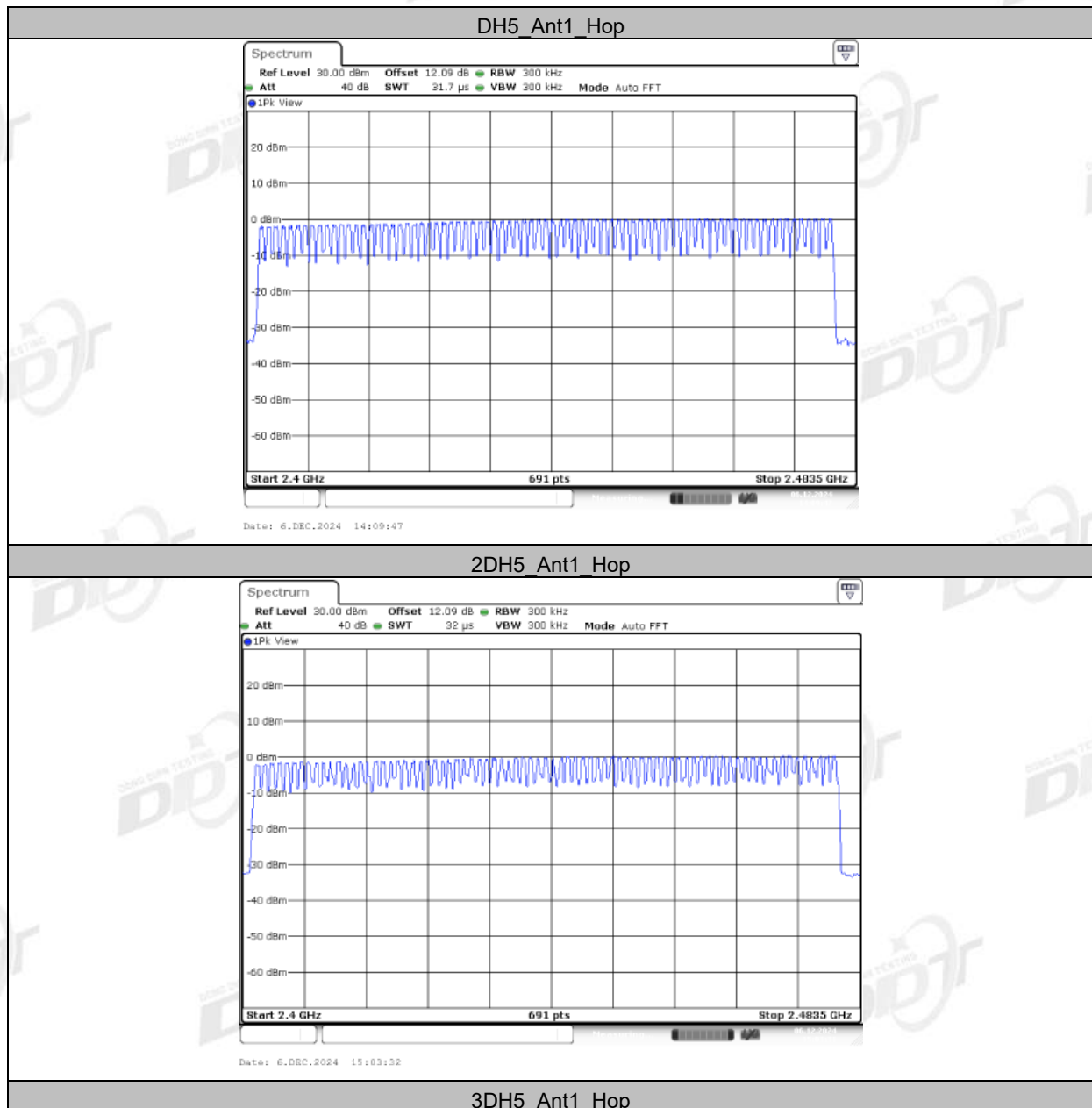
- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel.
 $VBW \geq RBW$.
- (3) spacing or the 20 dB bandwidth, whichever is smaller.

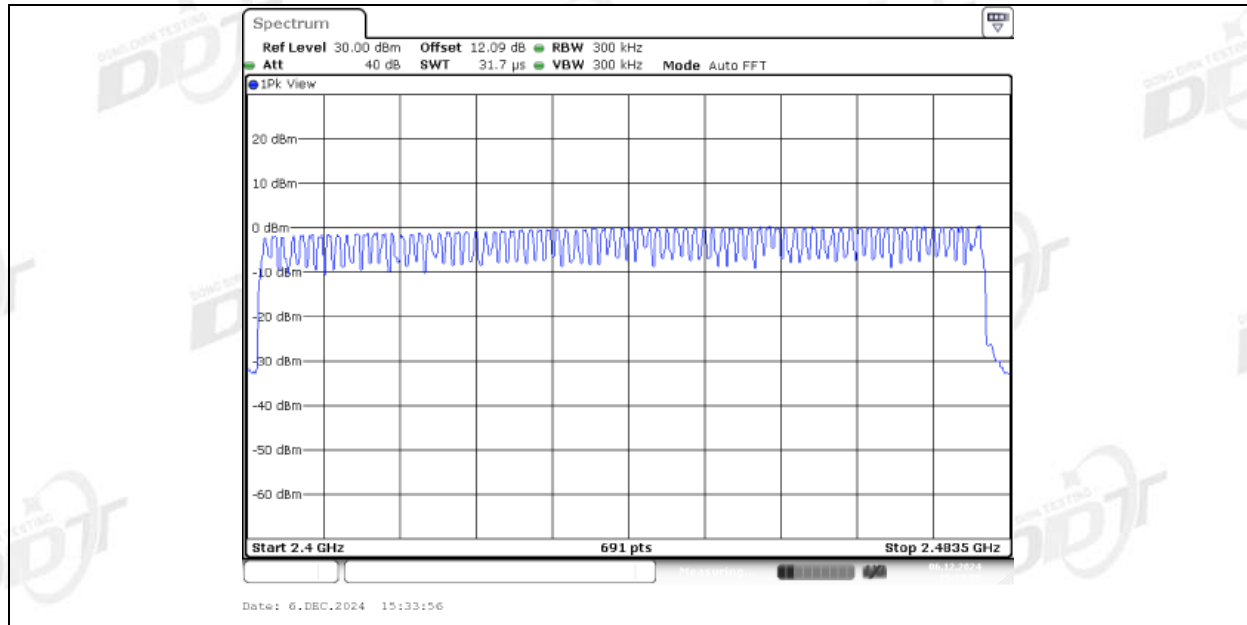
7.4. Test result

Left side:

Mode	Number of hopping channels	Limit	Verdict
GFSK	79	>15	Pass
$\pi/4$ -DQPSK	79	>15	Pass
8DPSK	79	>15	Pass

7.5. Original test data





8. Time of Occupancy

8.1. Block diagram of test setup

Same as section 4.1

8.2. Limits

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

8.3. Test procedure

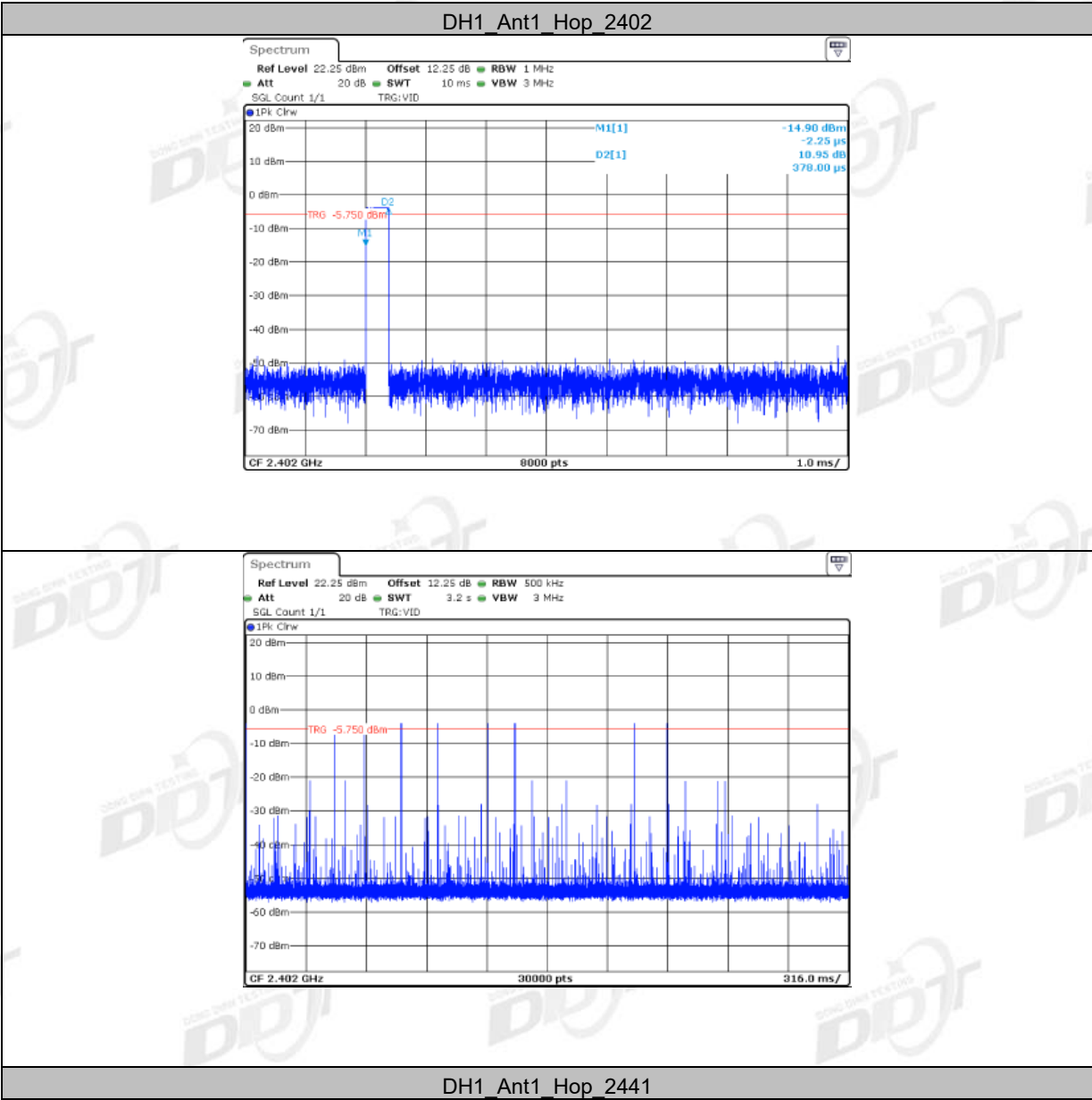
- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) The test period: $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$
- (3) Measure the hopping number and on time of each pulse with spectrum analyzer in zero span set, and calculate dwell time with formula $\text{Dwell time} = \text{total hops} \times \text{pulse's on time}$.

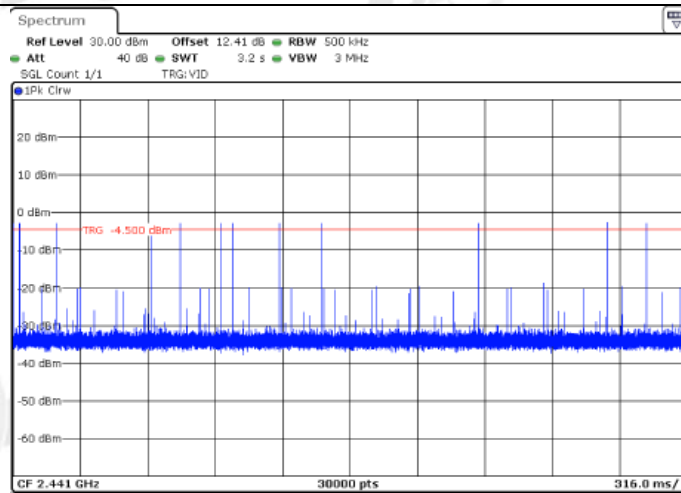
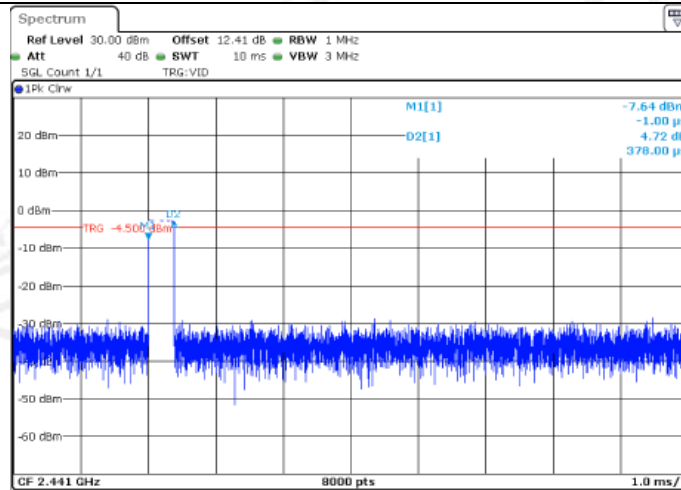
8.4. Test result

TestMode	Antenna	Freq(MHz)	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop_2402	0.378	90	0.034	≤0.4	PASS
		Hop_2441	0.378	120	0.045	≤0.4	PASS
		Hop_2480	0.378	140	0.053	≤0.4	PASS
DH3	Ant1	Hop_2402	1.625	30	0.049	≤0.4	PASS
		Hop_2441	1.625	70	0.114	≤0.4	PASS
		Hop_2480	1.625	70	0.114	≤0.4	PASS
DH1	Ant1	Hop_2402	2.863	80	0.229	≤0.4	PASS
		Hop_2441	2.865	60	0.172	≤0.4	PASS
		Hop_2480	2.867	50	0.143	≤0.4	PASS
2DH1	Ant1	Hop_2402	0.388	170	0.066	≤0.4	PASS
		Hop_2441	0.388	70	0.027	≤0.4	PASS
		Hop_2480	0.388	90	0.035	≤0.4	PASS
2DH3	Ant1	Hop_2402	1.631	70	0.114	≤0.4	PASS
		Hop_2441	1.631	70	0.114	≤0.4	PASS
		Hop_2480	1.631	100	0.163	≤0.4	PASS
2DH5	Ant1	Hop_2402	2.872	60	0.172	≤0.4	PASS
		Hop_2441	2.872	60	0.172	≤0.4	PASS
		Hop_2480	2.873	40	0.115	≤0.4	PASS
3DH1	Ant1	Hop_2402	0.388	110	0.043	≤0.4	PASS
		Hop_2441	0.388	130	0.05	≤0.4	PASS

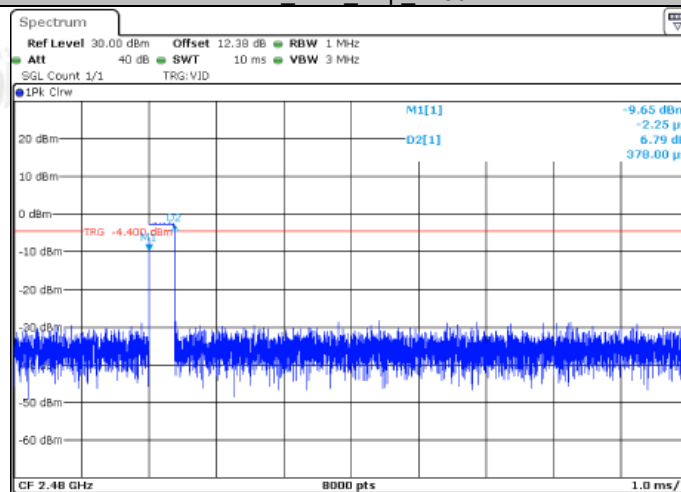
		Hop_2480	0.388	130	0.05	≤0.4	PASS
3DH3	Ant1	Hop_2402	1.629	90	0.147	≤0.4	PASS
		Hop_2441	1.630	50	0.082	≤0.4	PASS
		Hop_2480	1.630	40	0.065	≤0.4	PASS
3DH5	Ant1	Hop_2402	2.874	30	0.086	≤0.4	PASS
		Hop_2441	2.873	50	0.144	≤0.4	PASS
		Hop_2480	2.874	90	0.259	≤0.4	PASS

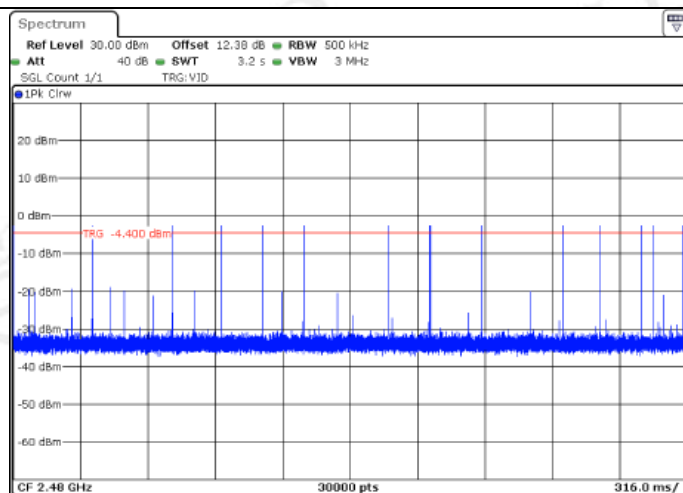
8.5. Original test data



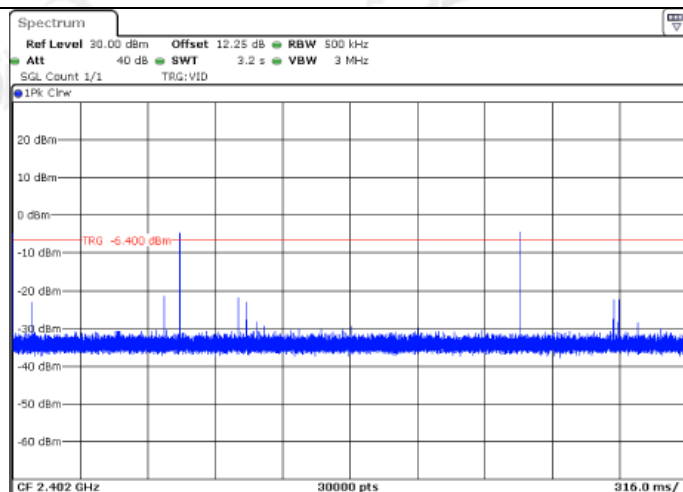
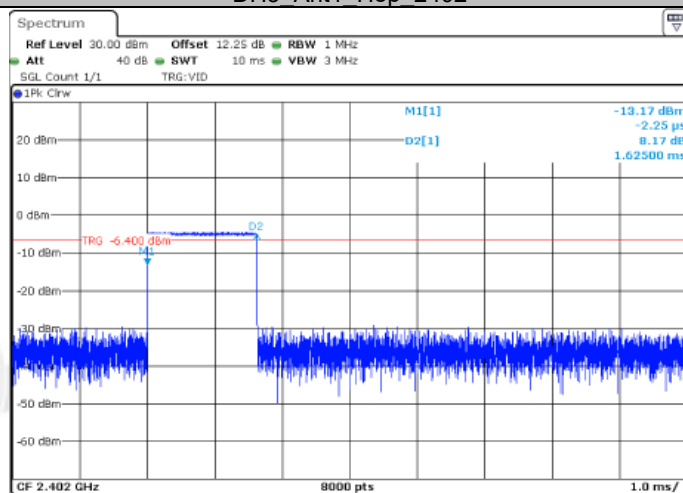


DH1_Ant1_Hop_2480

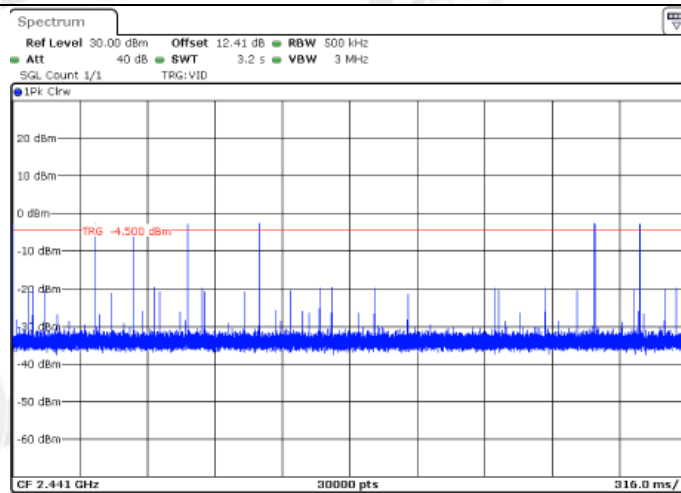
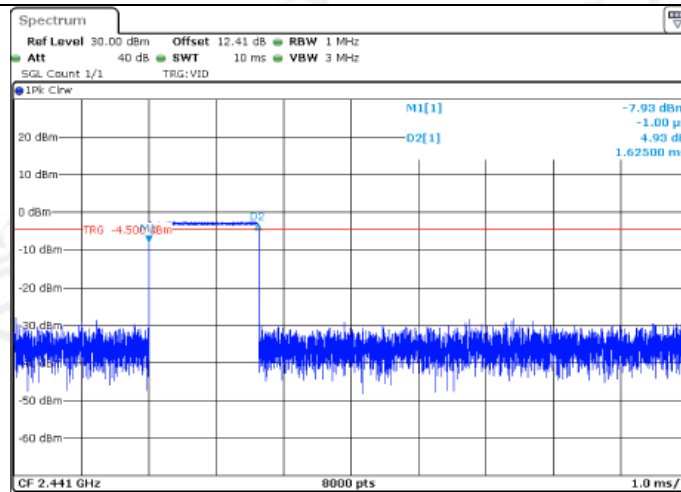




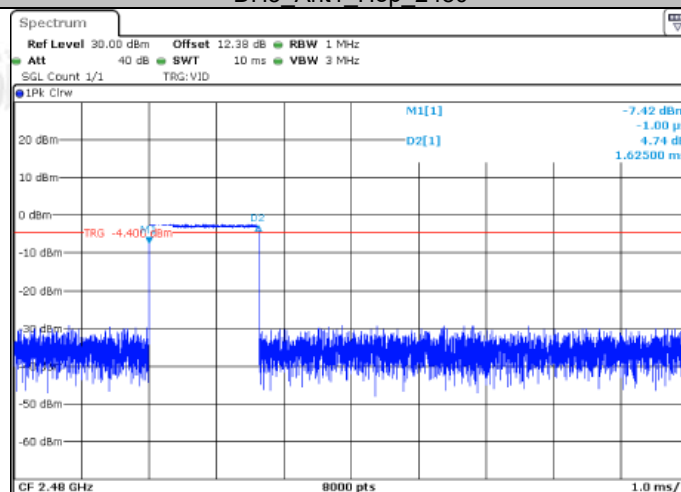
DH3_Ant1_Hop_2402

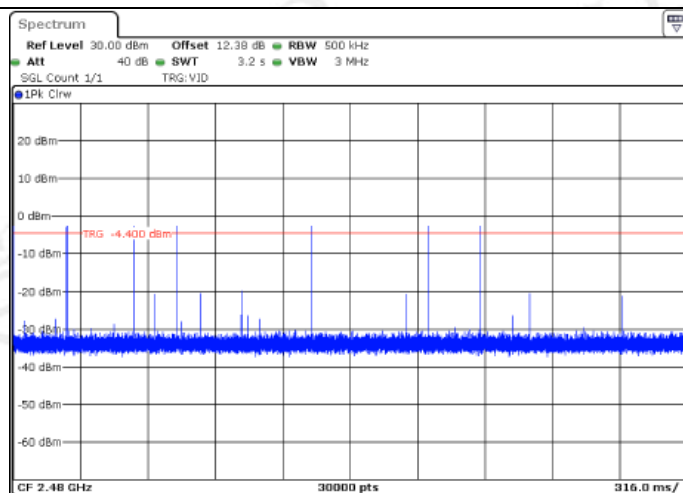


DH3_Ant1_Hop_2441

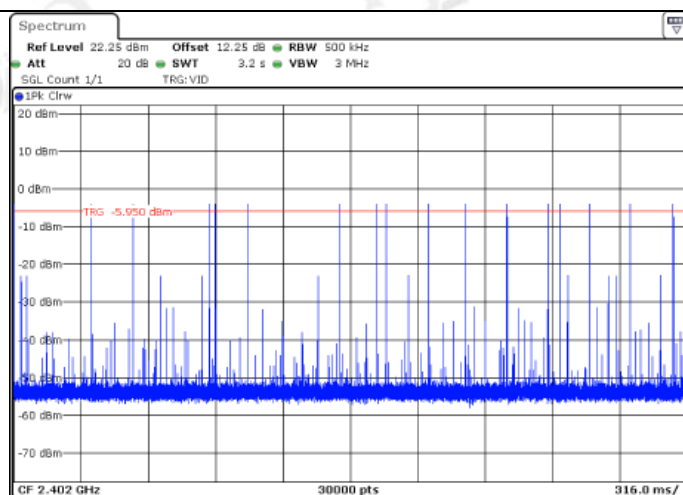
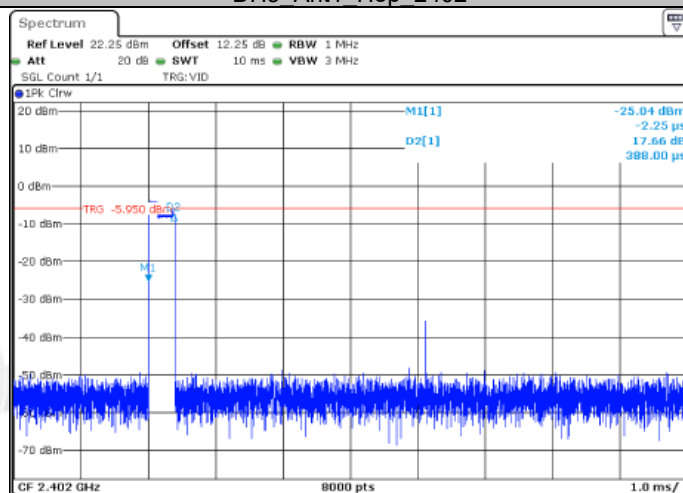


DH3_Ant1_Hop_2480

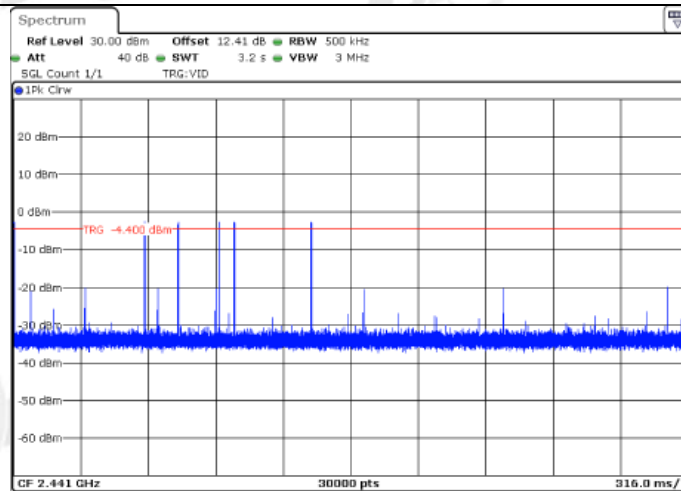
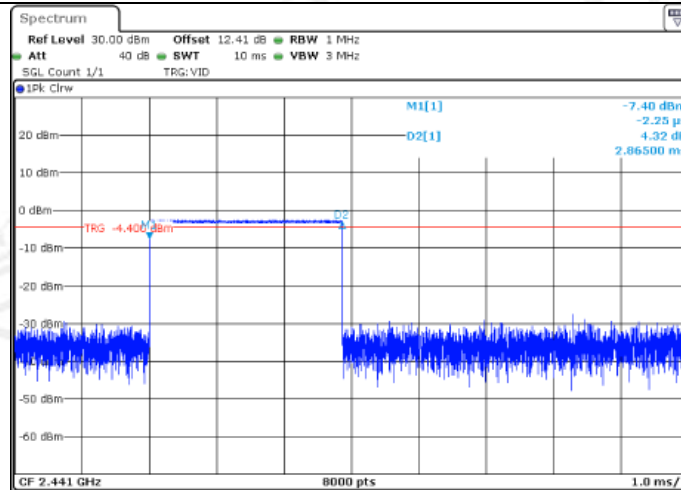




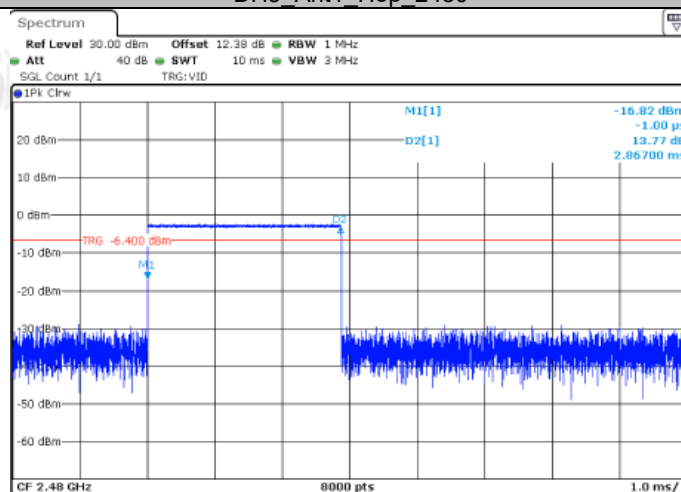
DH5_Ant1_Hop_2402

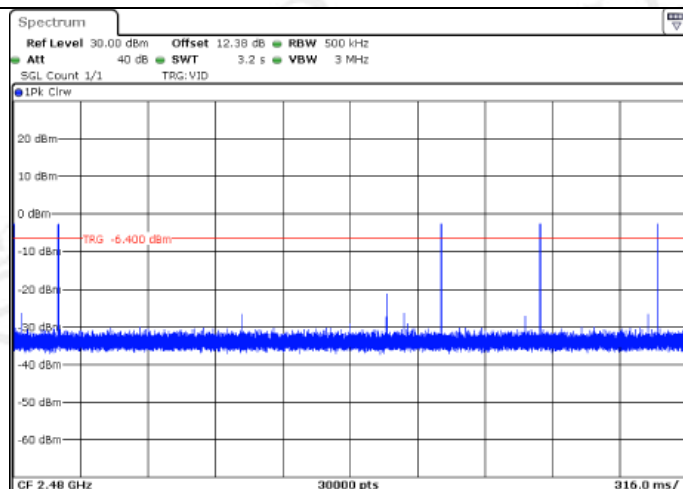


DH5_Ant1_Hop_2441

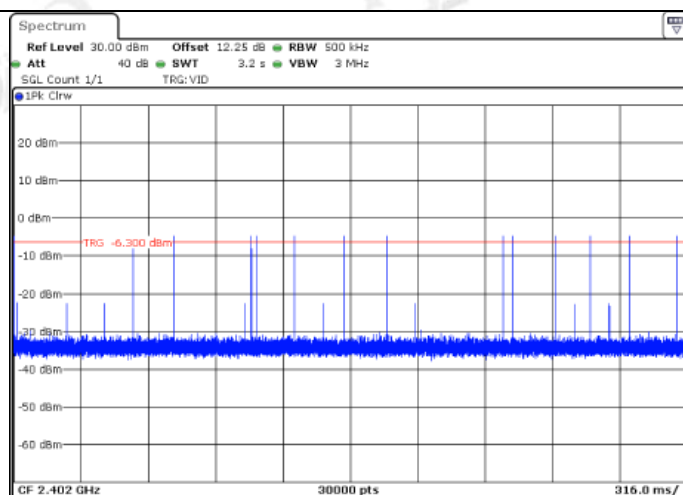
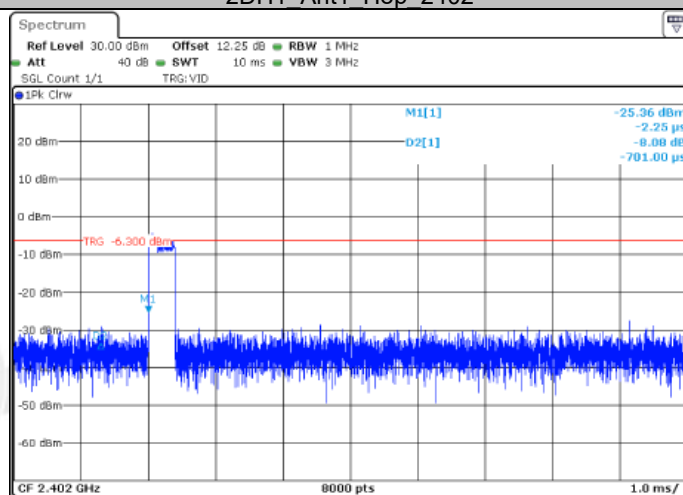


DH5_Ant1_Hop_2480

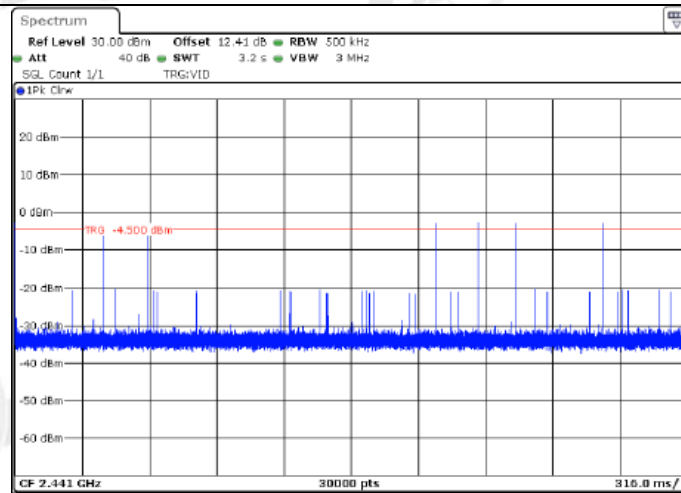
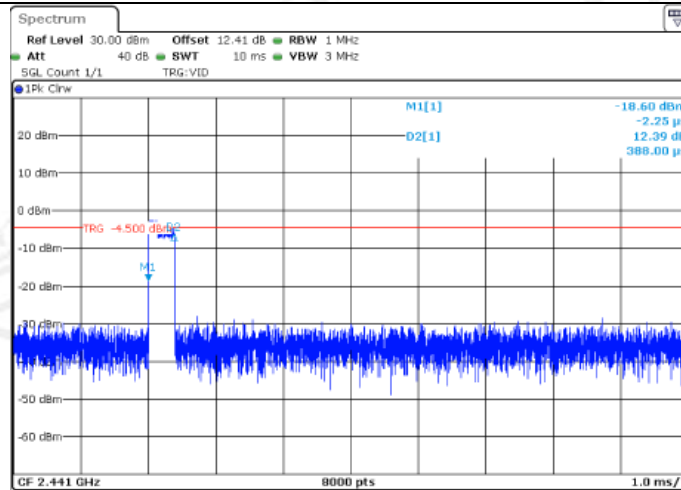




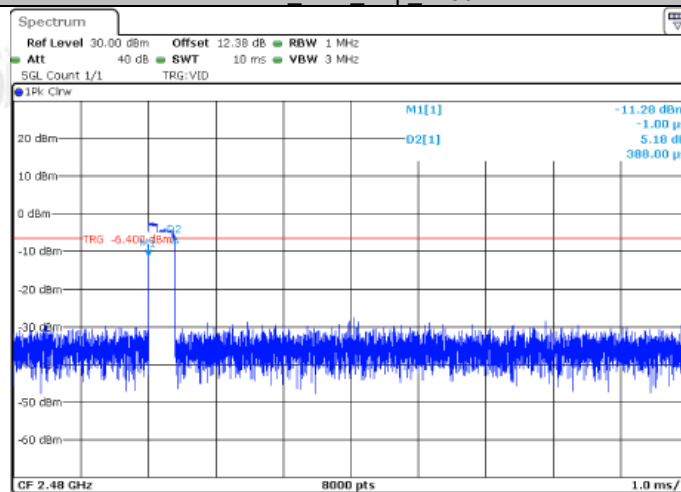
2DH1_Ant1_Hop_2402

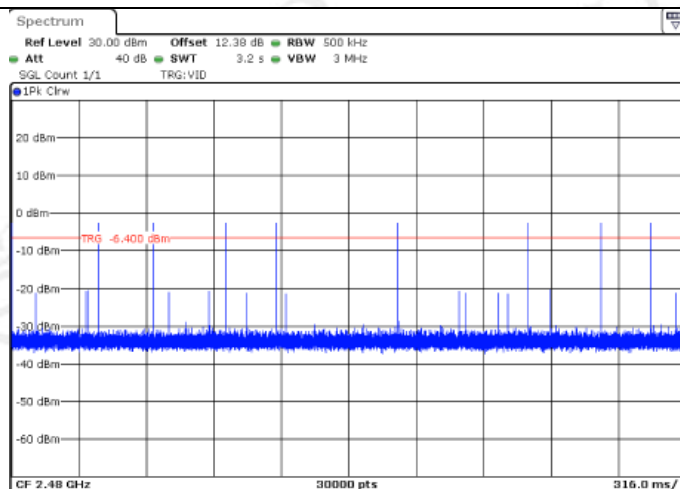


2DH1_Ant1_Hop_2441

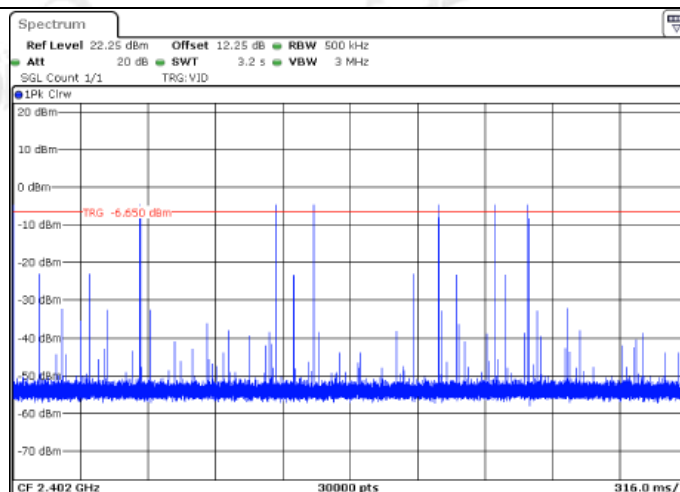
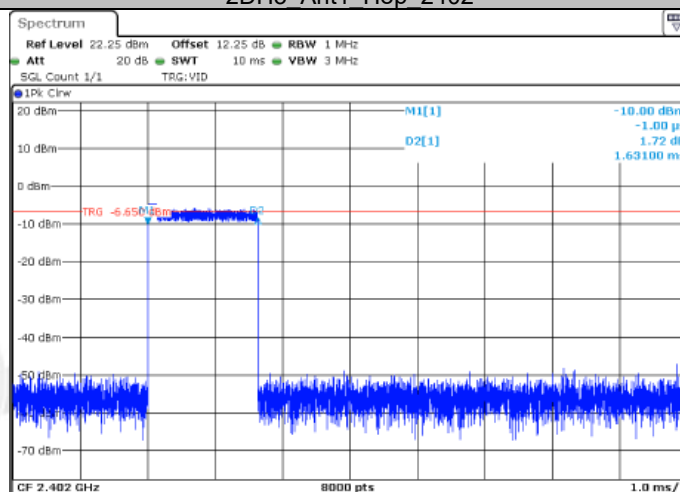


2DH1_Ant1_Hop_2480

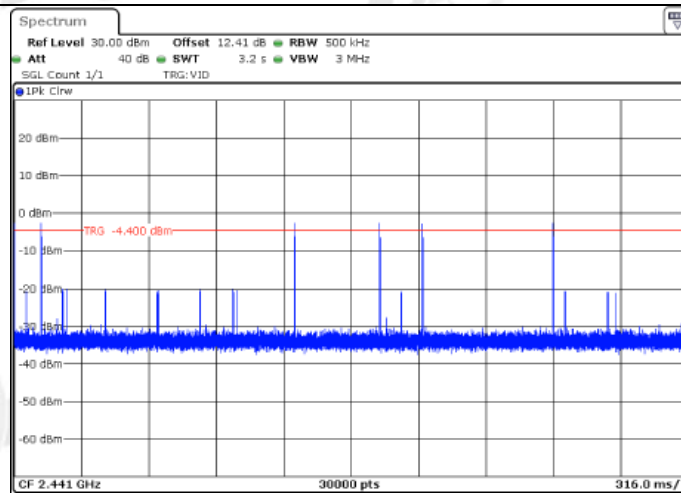
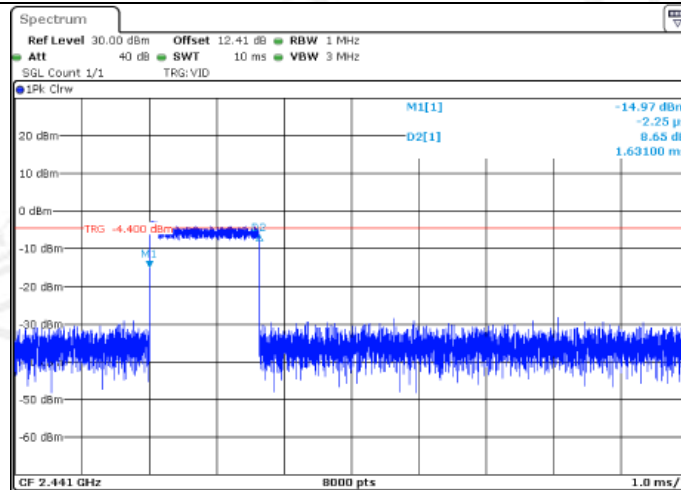




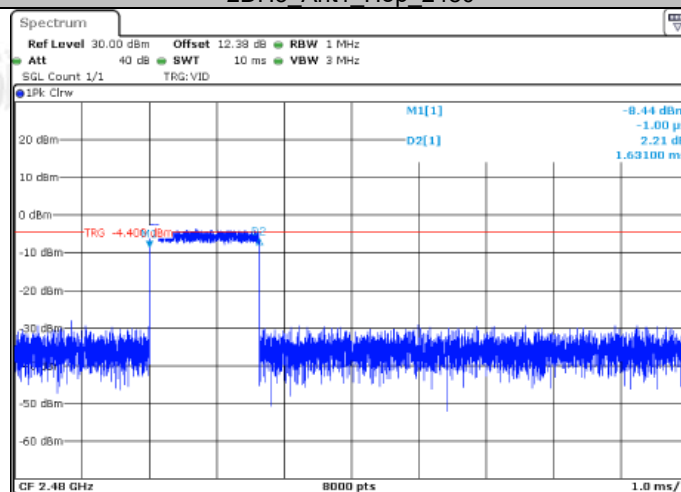
2DH3 Ant1 Hop 2402

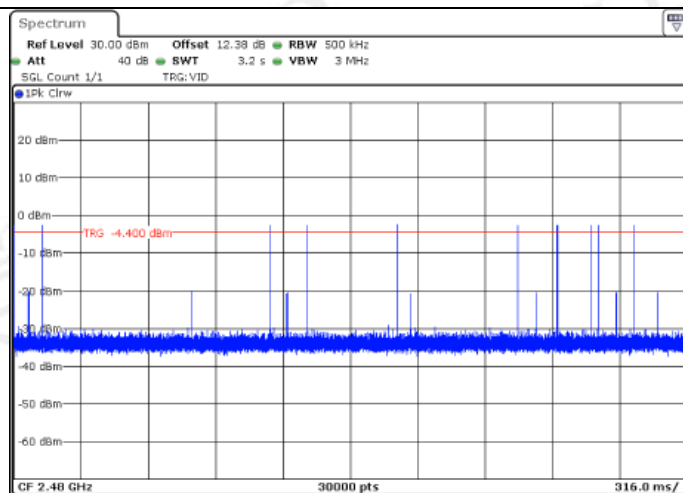


2DH3 Ant1 Hop 2441

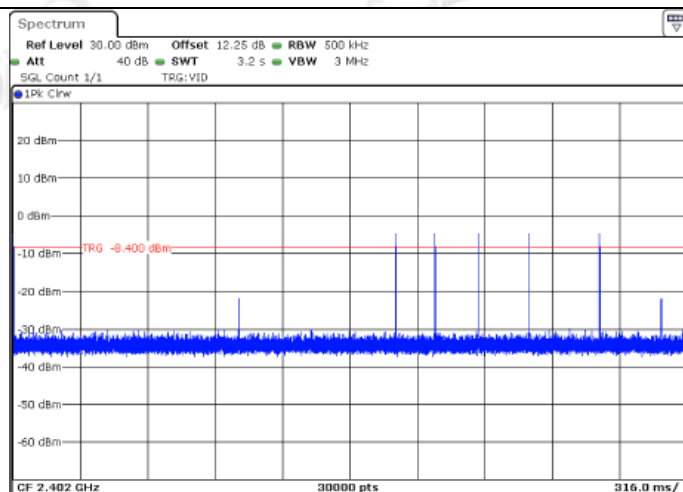
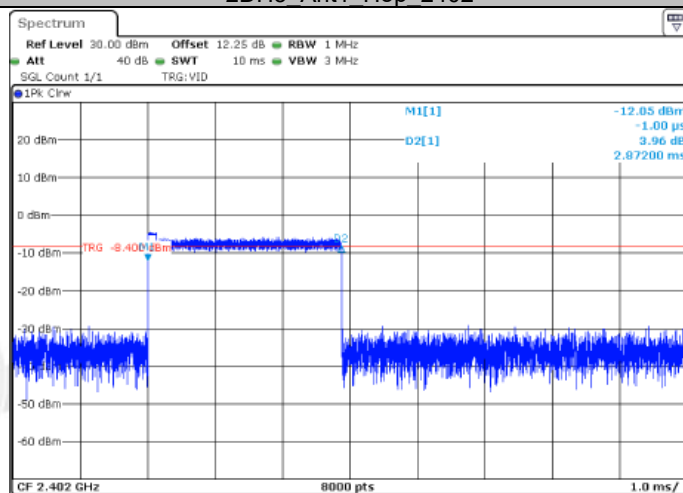


2DH3_Ant1_Hop_2480

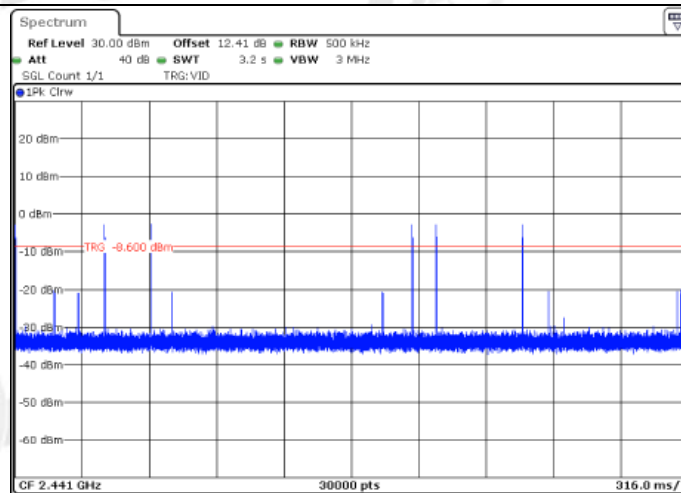
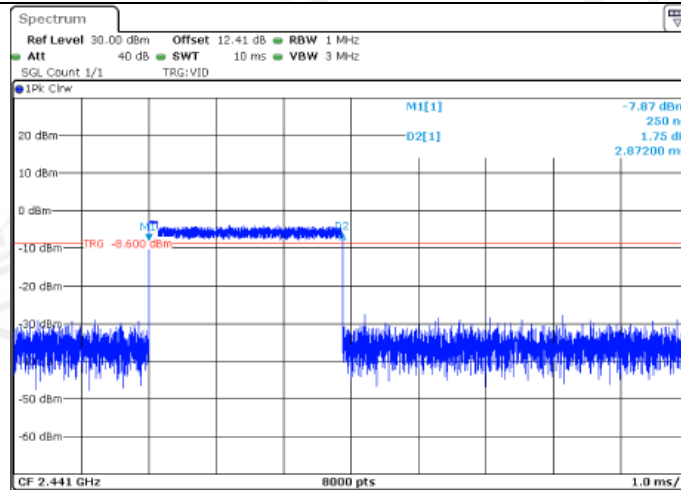




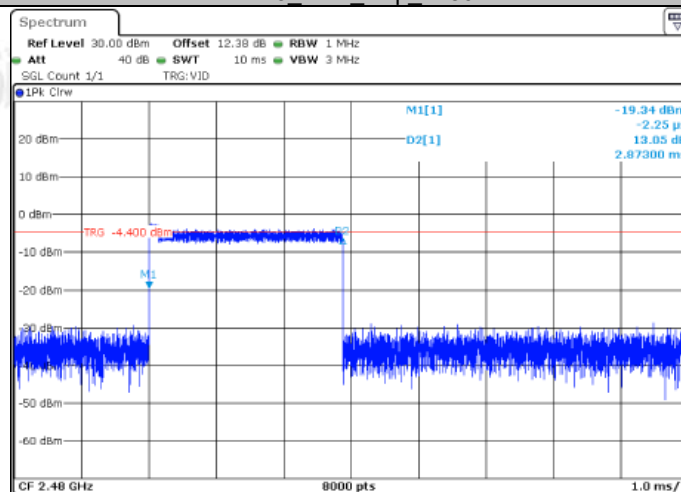
2DH5 Ant1 Hop 2402

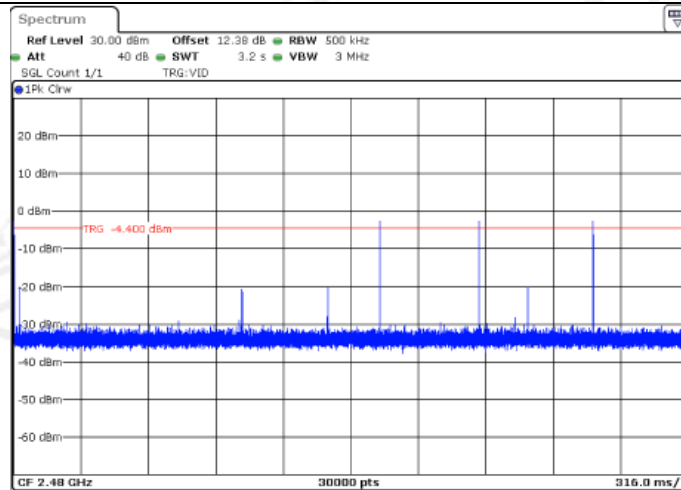


2DH5 Ant1 Hop 2441

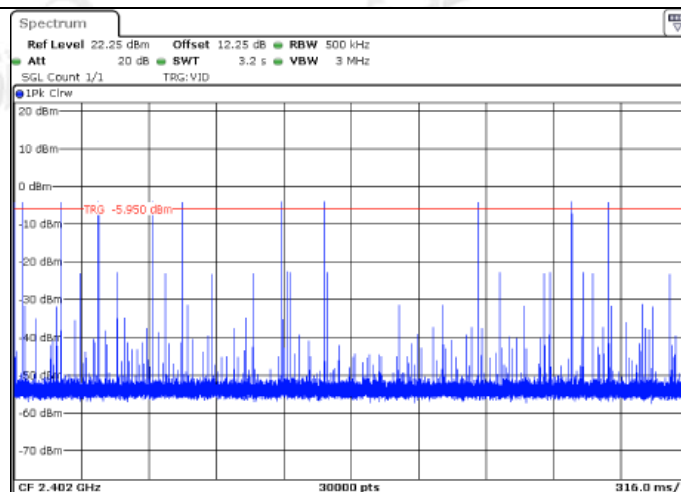
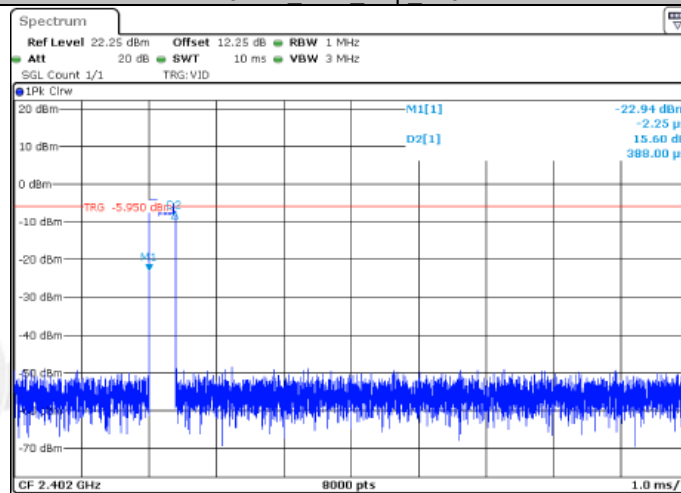


2DH5_Ant1_Hop_2480

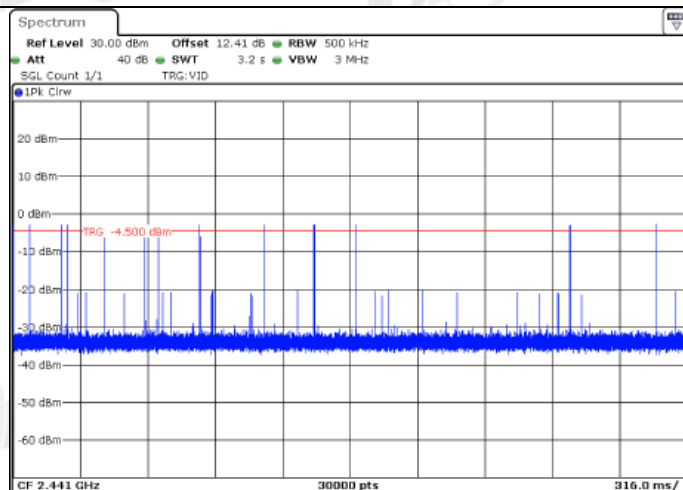
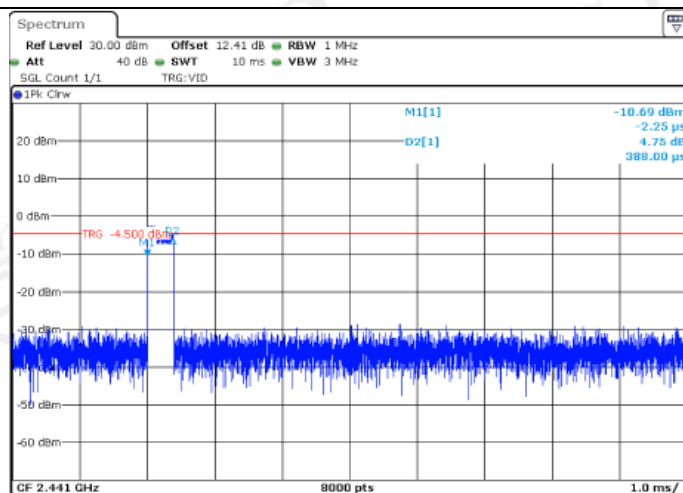




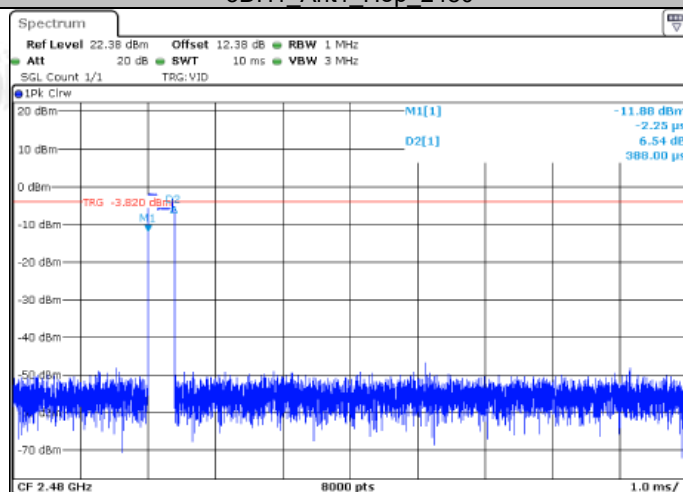
3DH1_Ant1_Hop_2402

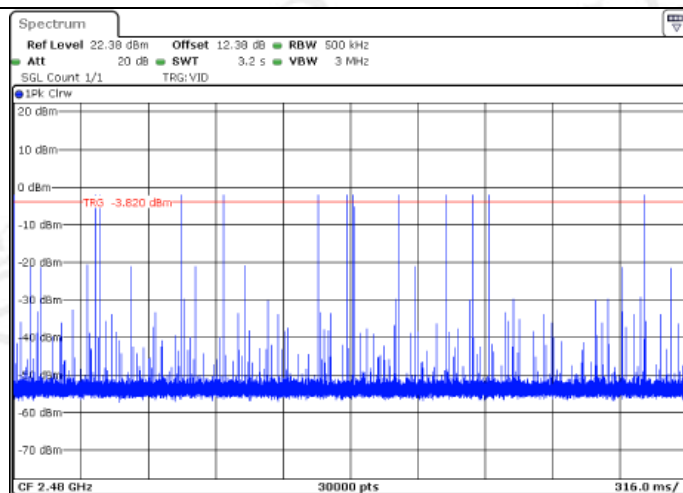


3DH1_Ant1_Hop_2441

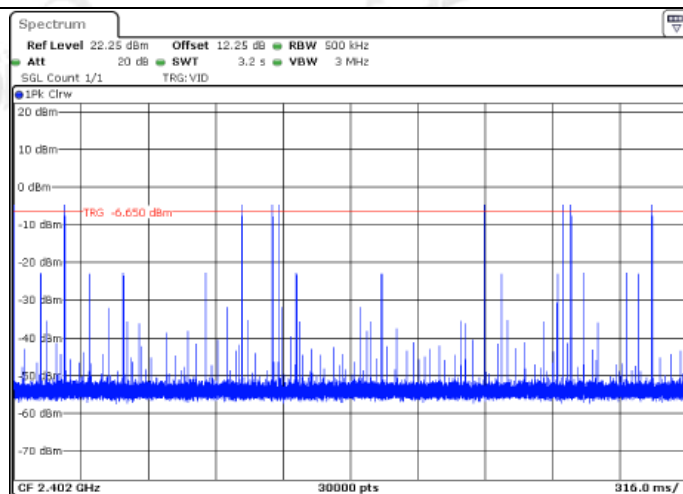
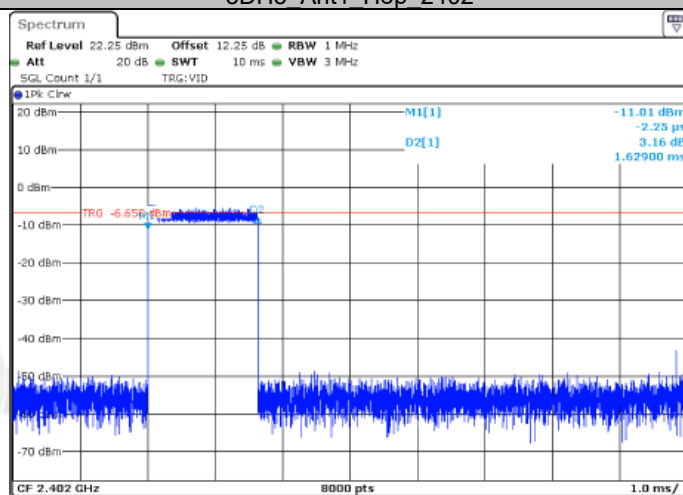


3DH1_Ant1_Hop_2480

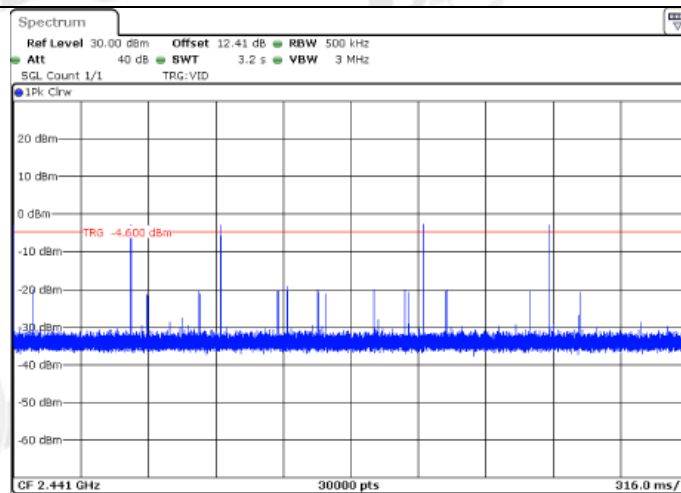
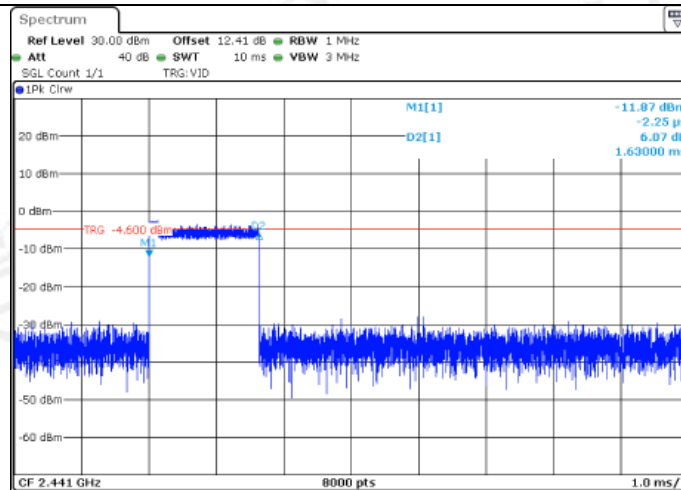




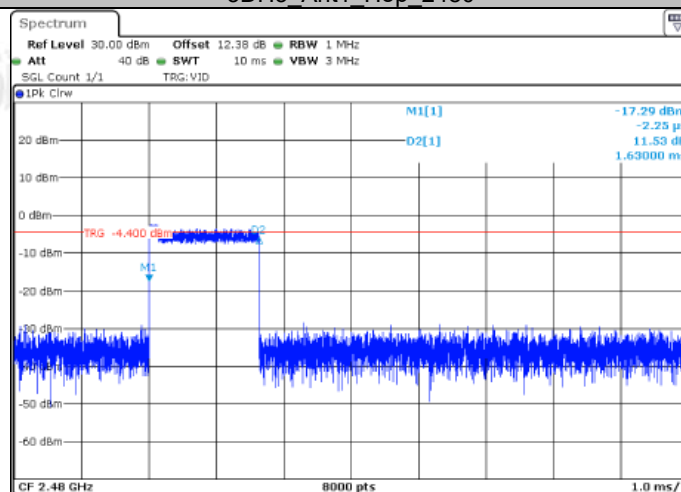
3DH3 Ant1 Hop 2402

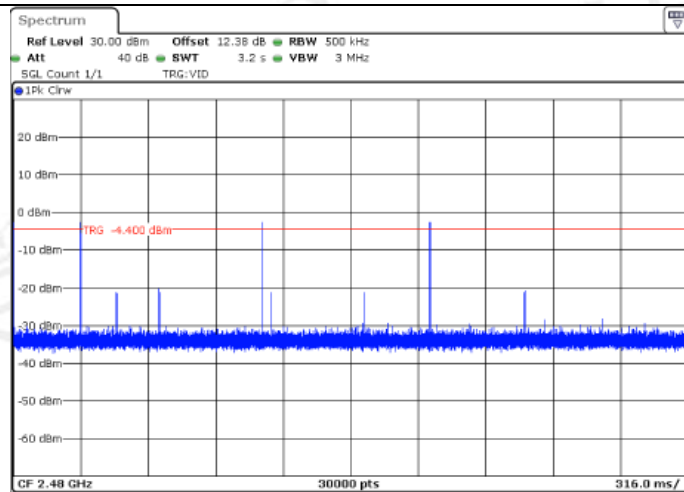


3DH3 Ant1 Hop 2441

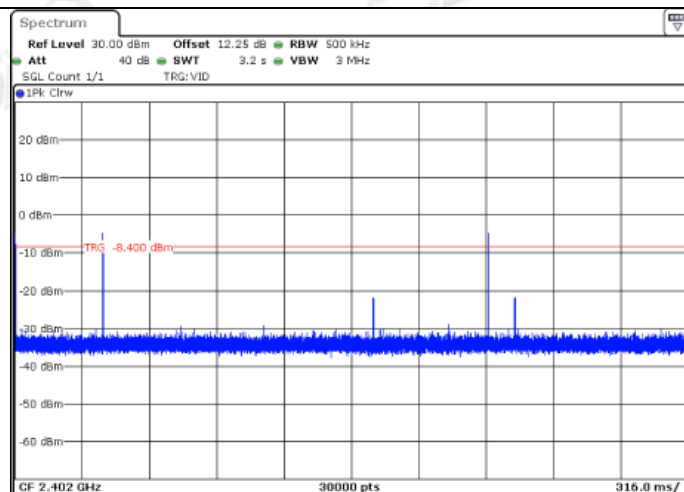
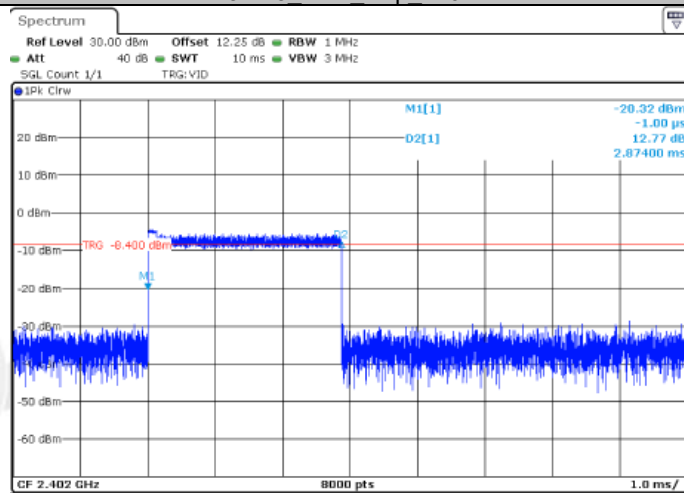


3DH3_Ant1_Hop_2480

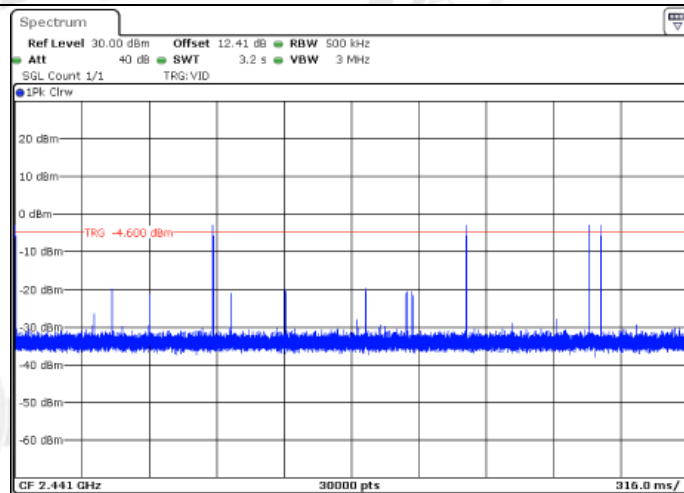
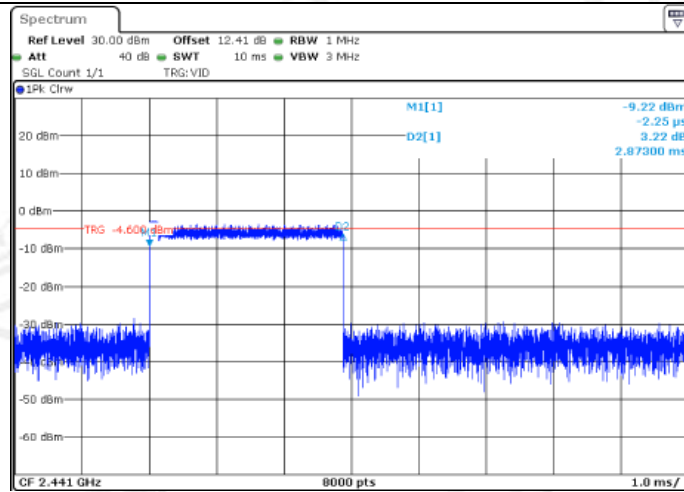




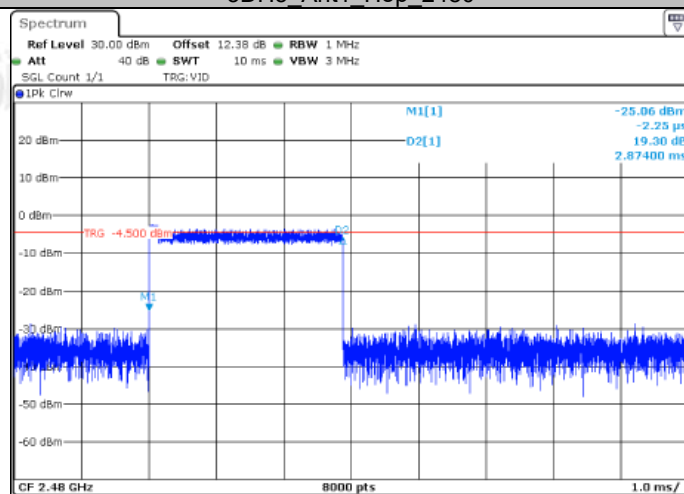
3DH5 Ant1 Hop 2402

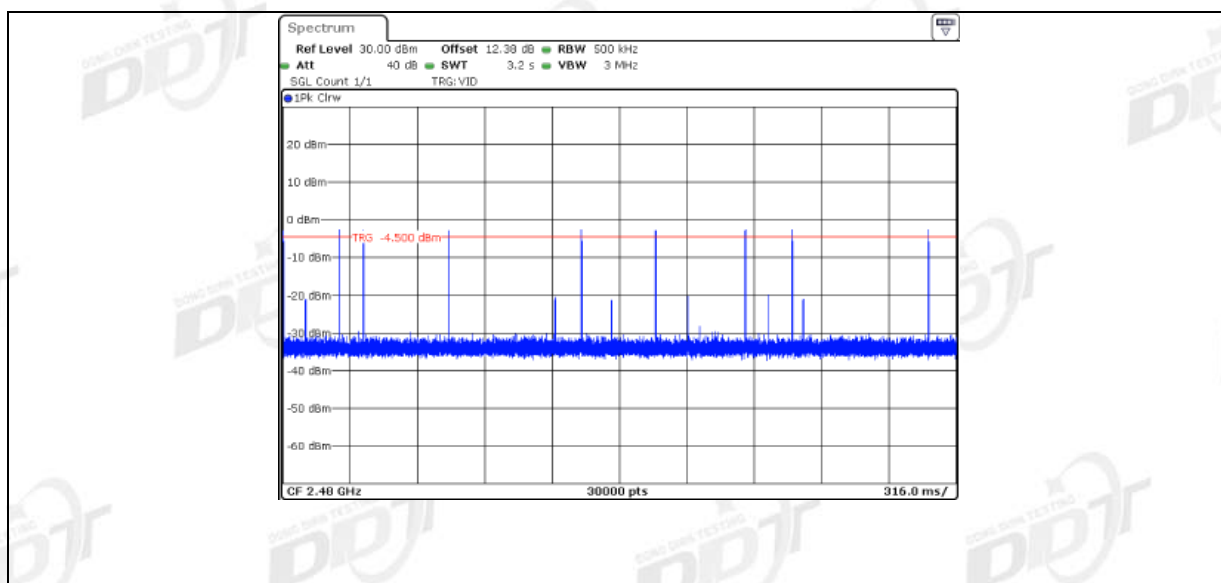


3DH5 Ant1 Hop 2441



3DH5_Ant1_Hop_2480





9. Band Edge Compliance (Conducted Method)

9.1. Block diagram of test setup

Same as section 4.1

9.2. Limit

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

9.3. Test Procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Set the spectrum analyzer as follows:

RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Number of measurement points	$\geq \text{span/RBW}$
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

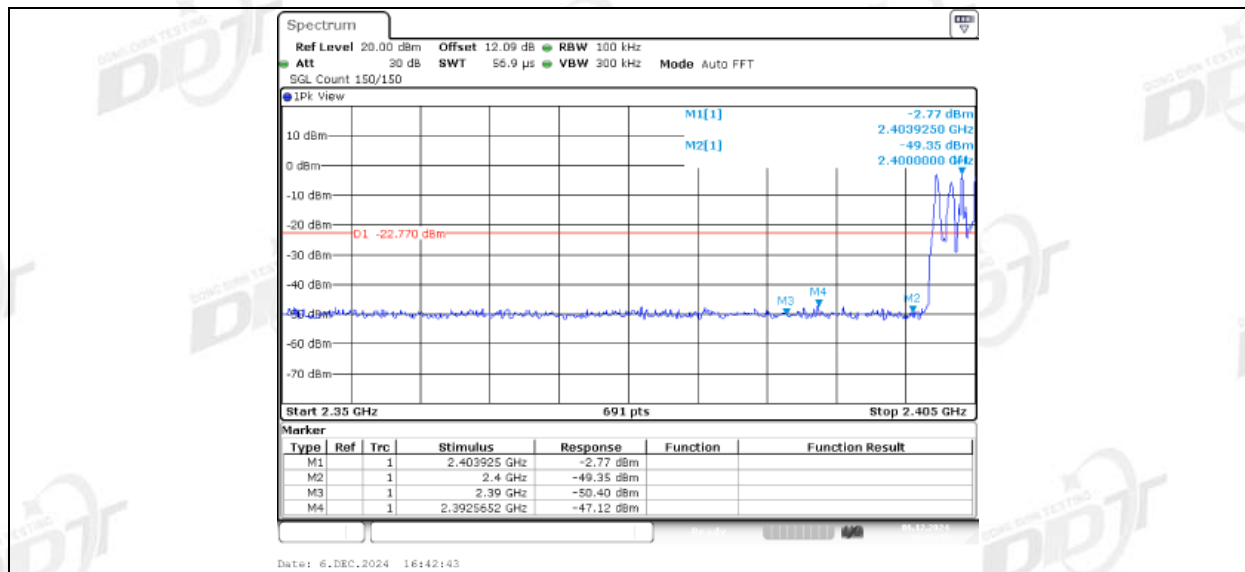
(3) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

9.4. Test result

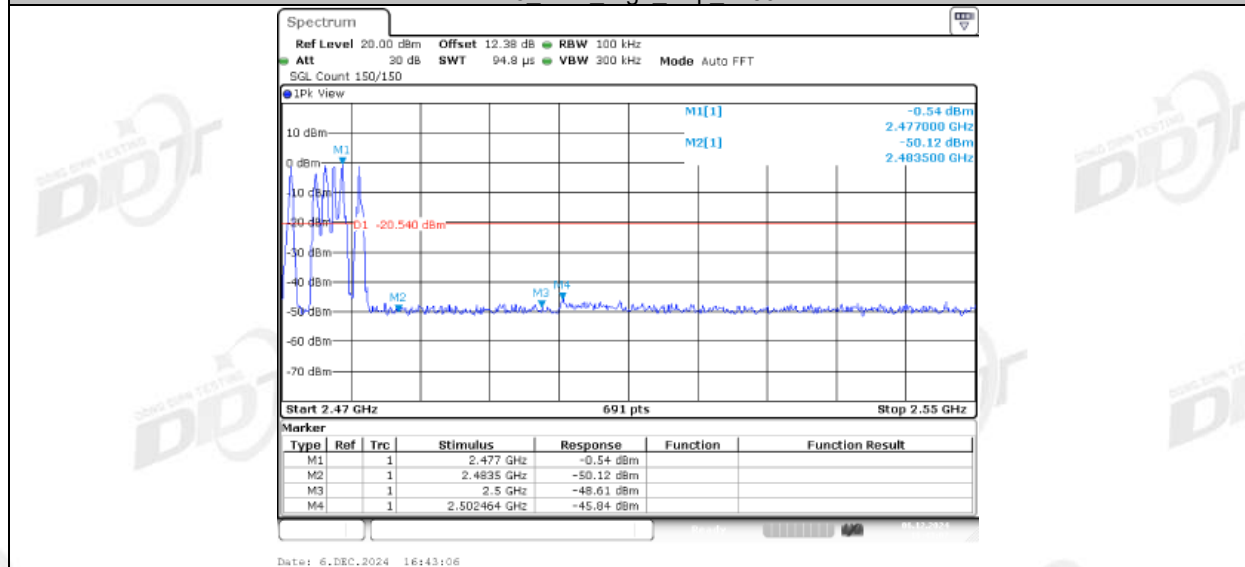
Mode	Freq. (MHz)	Verdict
GFSK	Hopping off 2402	Pass
	Hopping off 2480	Pass
	Hopping on	Pass
$\pi/4$ -DQPSK	Hopping off 2402	Pass
	Hopping off 2480	Pass
	Hopping on	Pass
8DPSK	Hopping off 2402	Pass
	Hopping off 2480	Pass
	Hopping on	Pass

9.5. Original test data

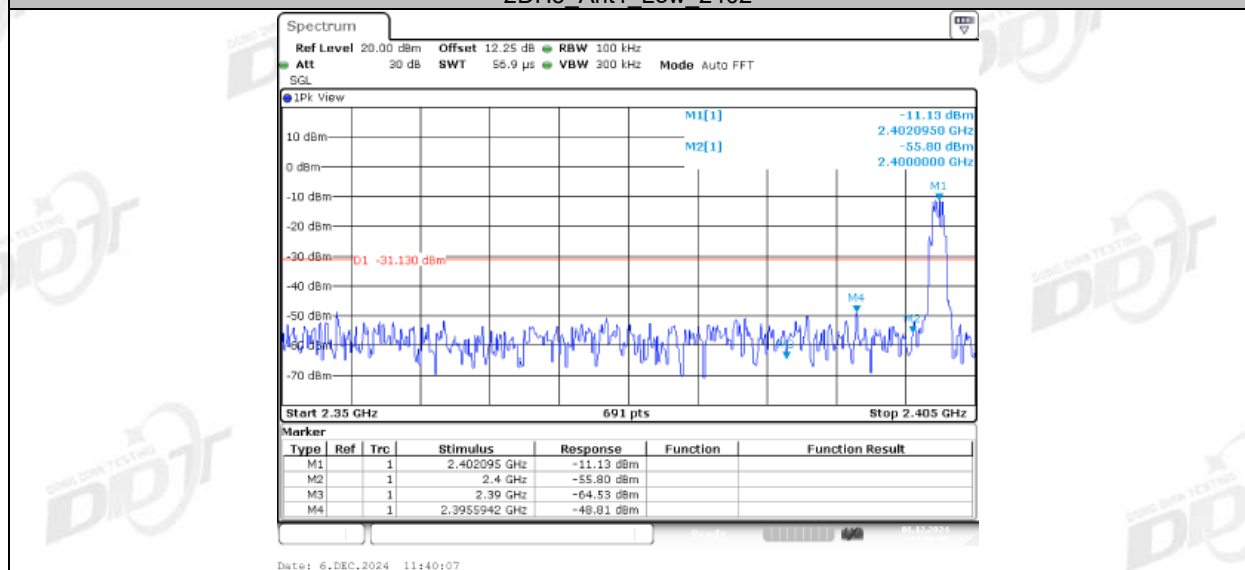




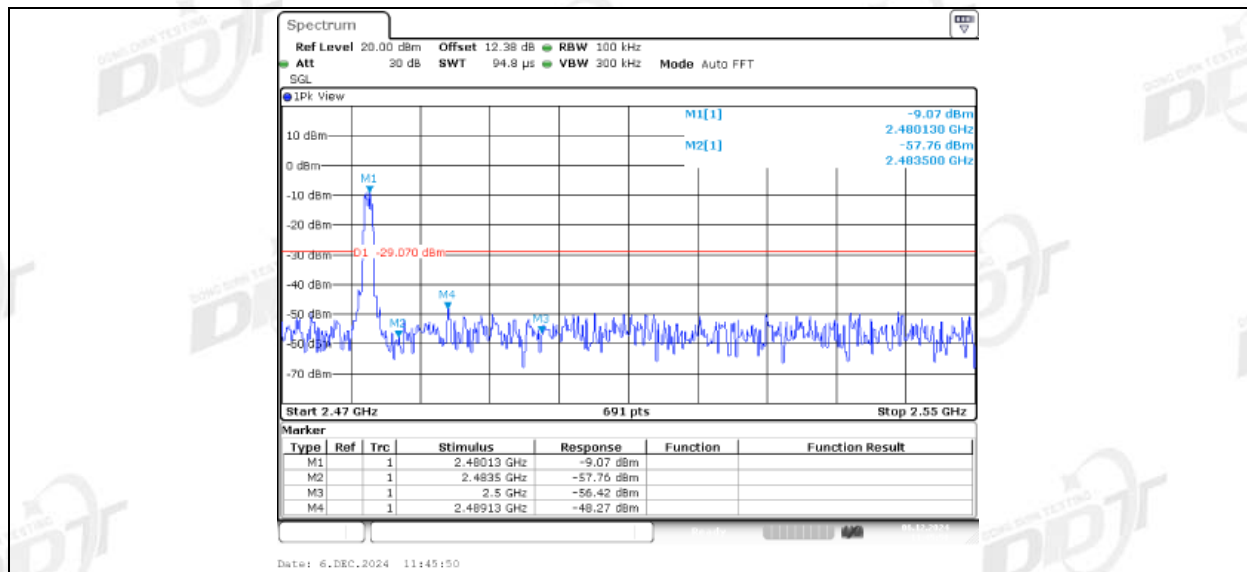
DH5 Ant1 High Hop 2480



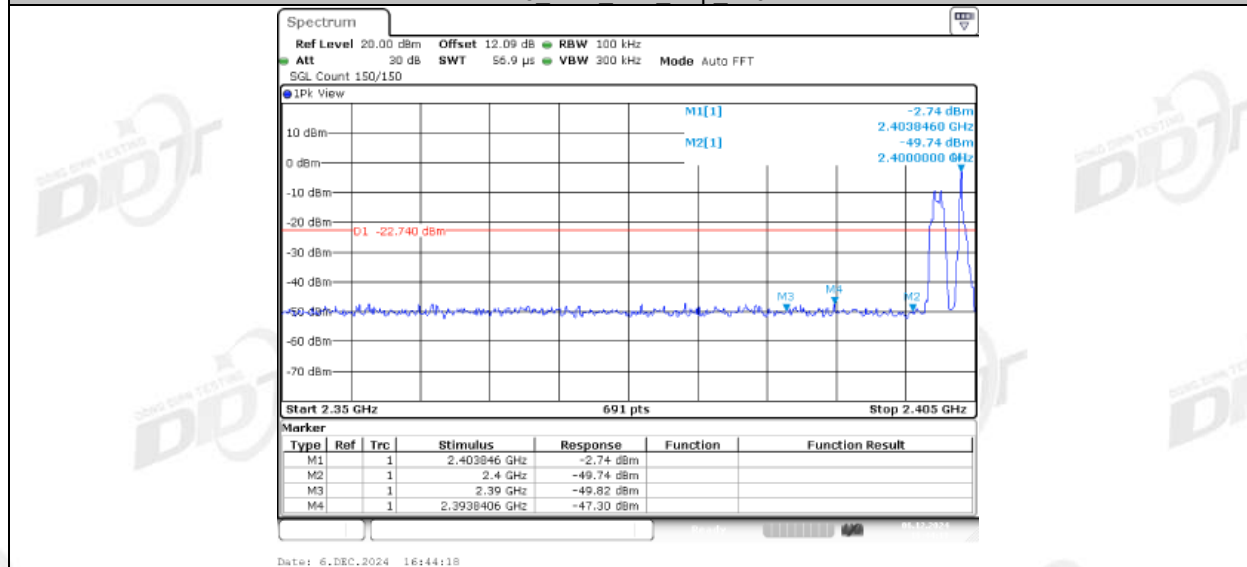
2DH5 Ant1 Low 2402



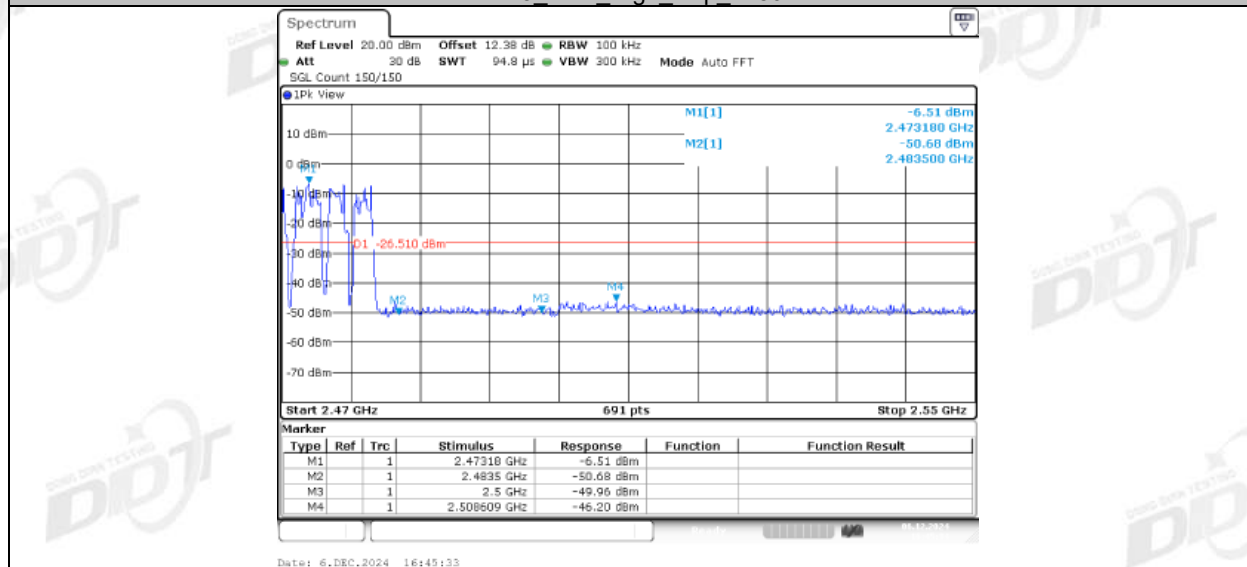
2DH5 Ant1 High 2480



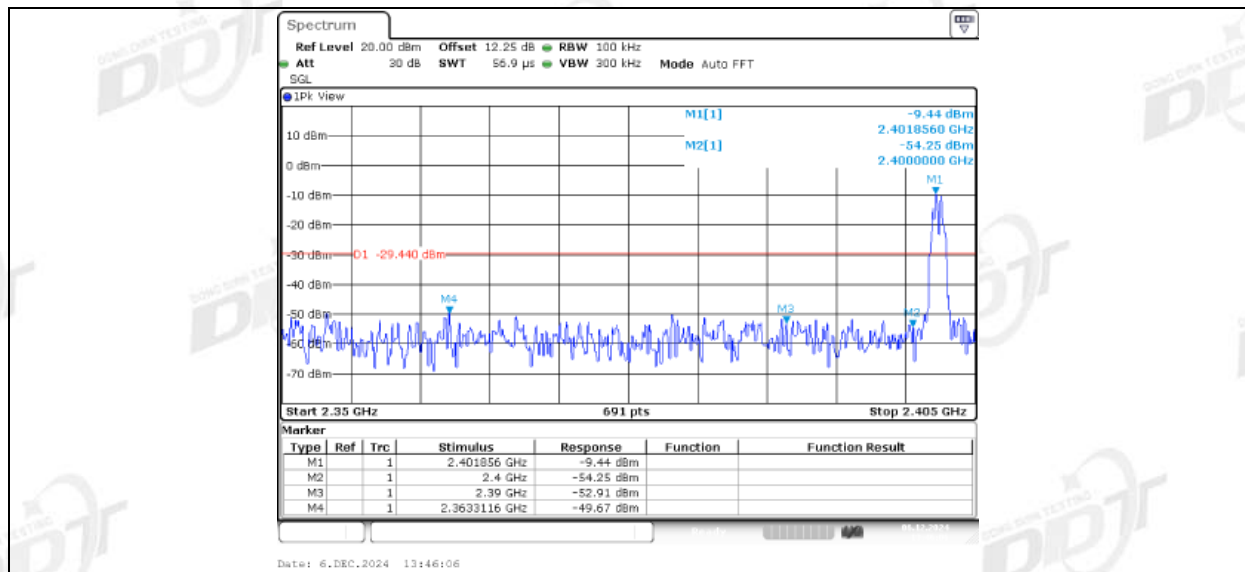
2DH5 Ant1 Low Hop 2402



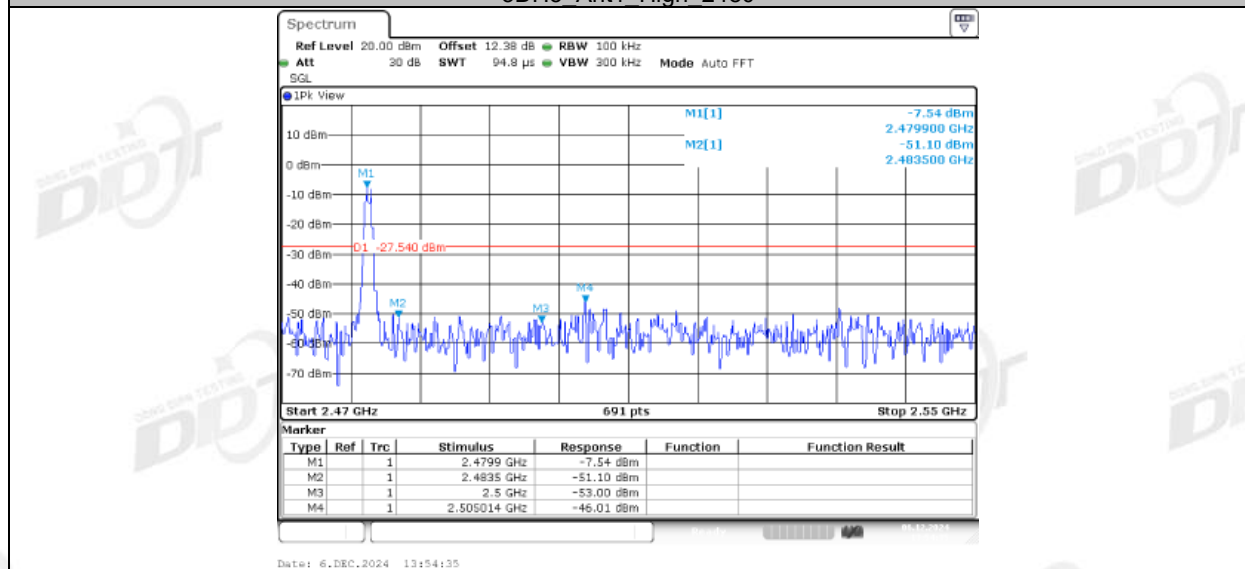
2DH5 Ant1 High Hop 2480



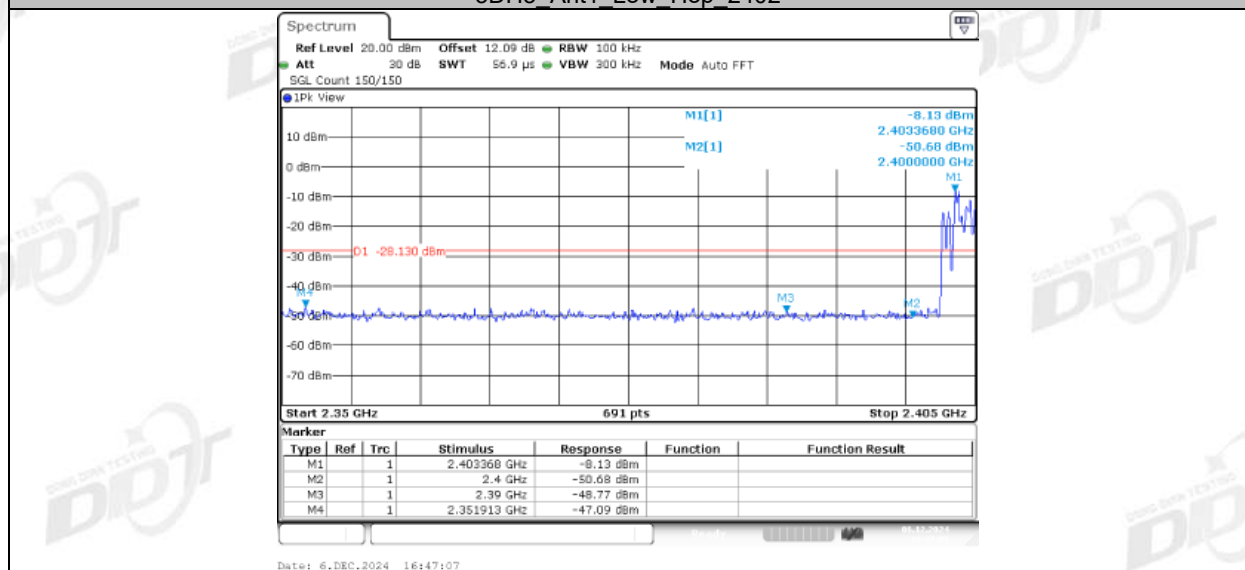
3DH5 Ant1 Low 2402



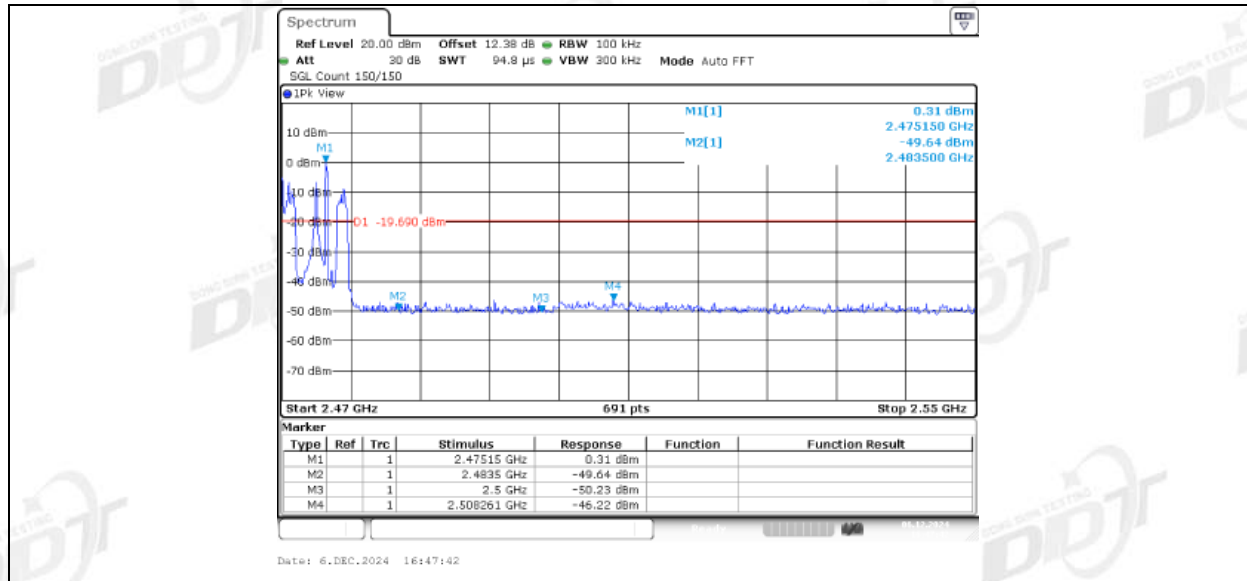
3DH5 Ant1 High 2480



3DH5 Ant1 Low Hop 2402



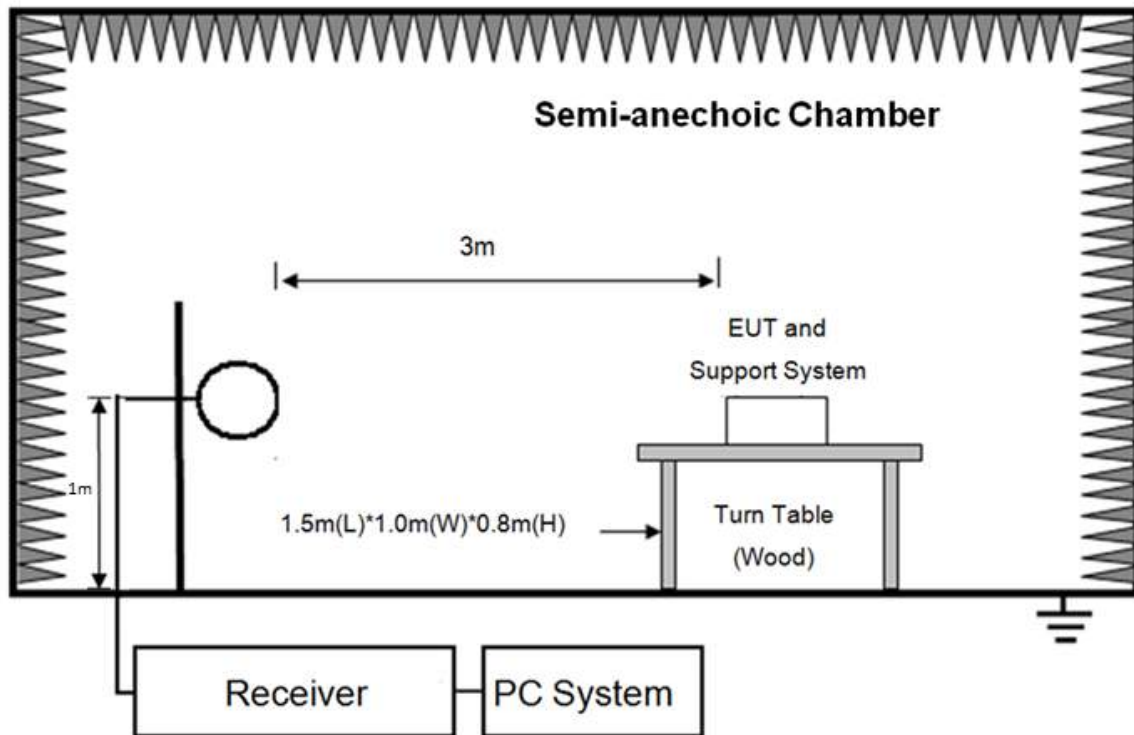
3DH5 Ant1 High Hop 2480



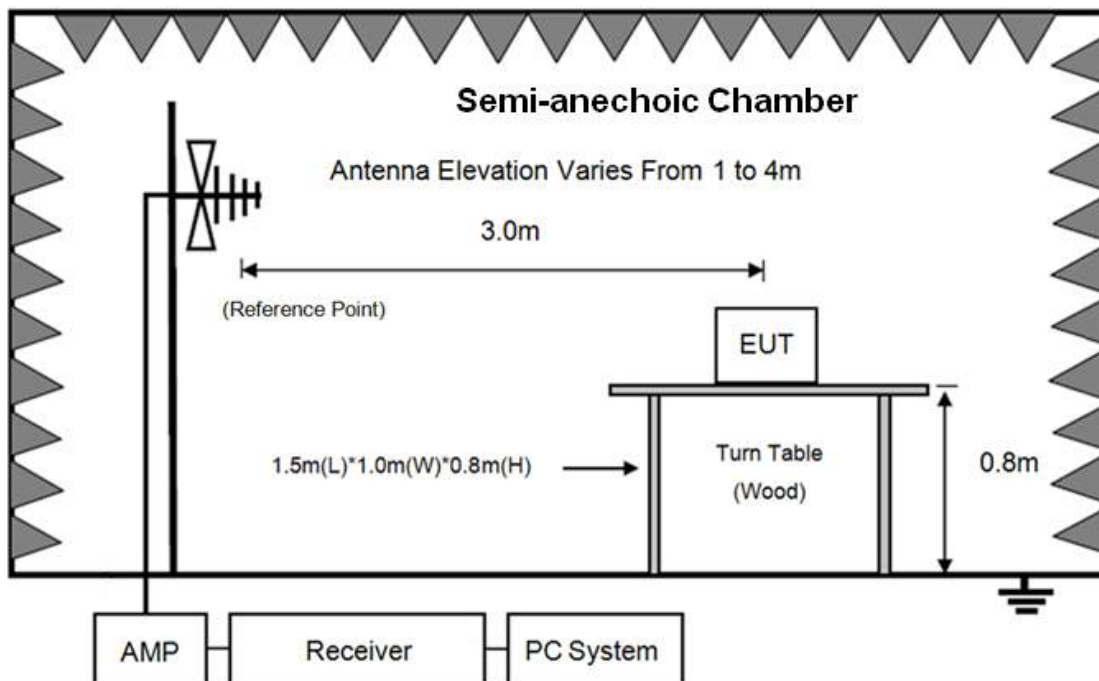
10. Radiated Emission

10.1. Block diagram of test setup

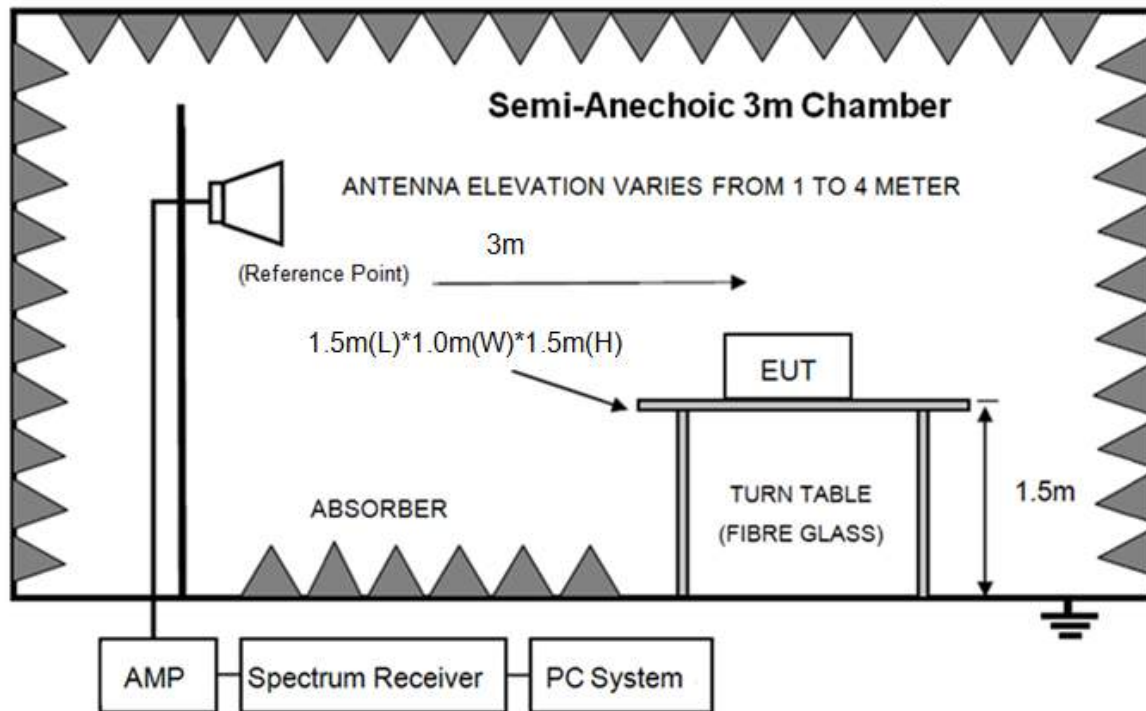
In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz - 1 GHz:



In 3 m Anechoic Chamber, test setup diagram for frequency above 1 GHz:



Note: For harmonic emissions test an appropriate high pass filter was inserted in the input port of AMP.

10.2. Limit

(1) FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.1772&4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.2072&4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

²Above 38.6

(2) FCC 15.209 Limit.

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009 ~ 0.490	300	$2400/\text{F}(\text{kHz})$	$67.6-20\log(\text{F})$
0.490 ~ 1.705	30	$24000/\text{F}(\text{kHz})$	$87.6-20\log(\text{F})$
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

Note: (1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz and above 1000 MHz, radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30 MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3\text{m}}(\text{dB}\mu\text{V/m}) = \text{Limit}_{30\text{m}}(\text{dB}\mu\text{V/m}) + 40\log(30\text{m}/3\text{m})$$

(3) Limit for this EUT

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20 dB below the fundamental emissions or comply with 15.209 limits.

10.3. Test Procedure

(1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber for below 1G and 150 cm above the ground plane inside a fully-anechoic chamber for above 1G.

(2) Test antenna was located 3 m from the EUT on an adjustable mast, and the antenna used as below table.

Test frequency range	Test antenna used	Test antenna distance
9 kHz - 30 MHz	Active Loop antenna	3 m
30 MHz - 1 GHz	Trilog Broadband Antenna	3 m
1 GHz - 18 GHz	Double Ridged Horn Antenna (1 GHz - 18 GHz)	3 m
18 GHz - 40 GHz	Horn Antenna (18 GHz - 40 GHz)	3 m

According ANSI C63.10:2020+CORR.1:2023 clause 6.4.4.2 and 6.5.3, for measurements below 30 MHz, the loop antenna was positioned with its plane vertical from the EUT and rotated about its vertical axis for maximum response at each azimuth position around the EUT. And the loop antenna also is positioned with its plane horizontal at the specified distance from the EUT. The center of the loop is 1 m above the ground. For measurement above 30 MHz, the trilog Broadband

Antenna or Horn Antenna was located 3 m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

(3) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9 kHz to 26 GHz:

(a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1 m to 4 m (Except loop antenna, it's fixed 1 m above ground.)

(b) Change work frequency or channel of device if practicable.

(c) Change modulation type of device if practicable.

(d) Change power supply range from 85% to 115% of the rated supply voltage

(e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9 kHz to 26 GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 18 GHz to 26 GHz, so below final test was performed with frequency range from 9 kHz to 18 GHz.

(4) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed according to ANSI C63.10:2020+CORR.1:2023 on Radiated Emission test.

(5) The emissions from 9 kHz to 1 GHz were measured based on CISPR QP detector except for the frequency bands 9 - 90 kHz, 110 - 490 kHz, for emissions from 9 kHz - 90 kHz, 110 kHz - 490 kHz and above 1 GHz were measured based on average detector, for emissions above 1 GHz, peak emissions also be measured and need comply with Peak limit.

(6) The emissions from 9 kHz to 1 GHz, QP or average values were measured with EMI receiver with below RBW.

Frequency band	RBW
9 kHz - 150 kHz	200 Hz
150 kHz - 30 MHz	9 kHz
30 MHz - 1 GHz	120 kHz

(7) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1 MHz, VBW is set at 3 MHz for Peak measure; According ANSI C63.10:2020+CORR.1:2023 clause 4.1.4.2.2 procedure for average measure.

(8) X axis, Y axis, Z axis are tested, and worse setup X axis is reported.

10.4. Test result

Pass. (See below detailed test result)

All the emissions except fundamental emission from 9 kHz to 26 GHz were comply with 15.209 limits.

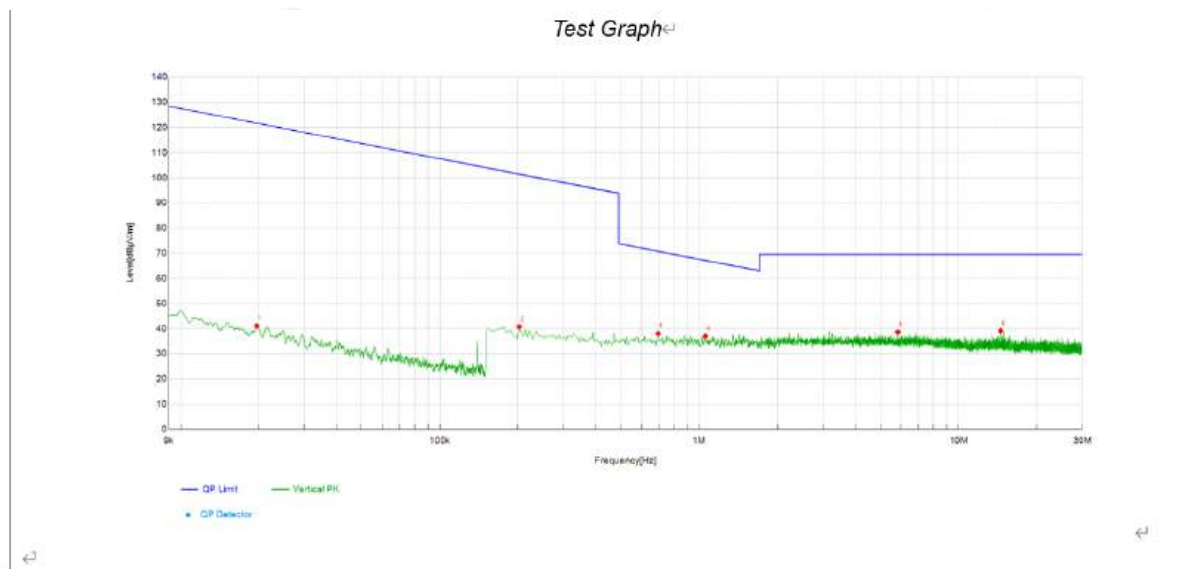
Note1: For emissions 9KHz to 30 MHz and 18 GHz to 26 GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions 9KHz to 30 MHz and 18 GHz to 26 GHz, the final test was only performed with EUT working in the worst case Pi/4 DQPSK, Tx 2402 MHz mode.

Note2: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

Note3: Scan with all modes, the worst case was recorded in this report.

Radiated Emission test (30MHz-1GHz)

Mode	Test channel	Ant. Pol.
2DH5	2402MHz	N/A

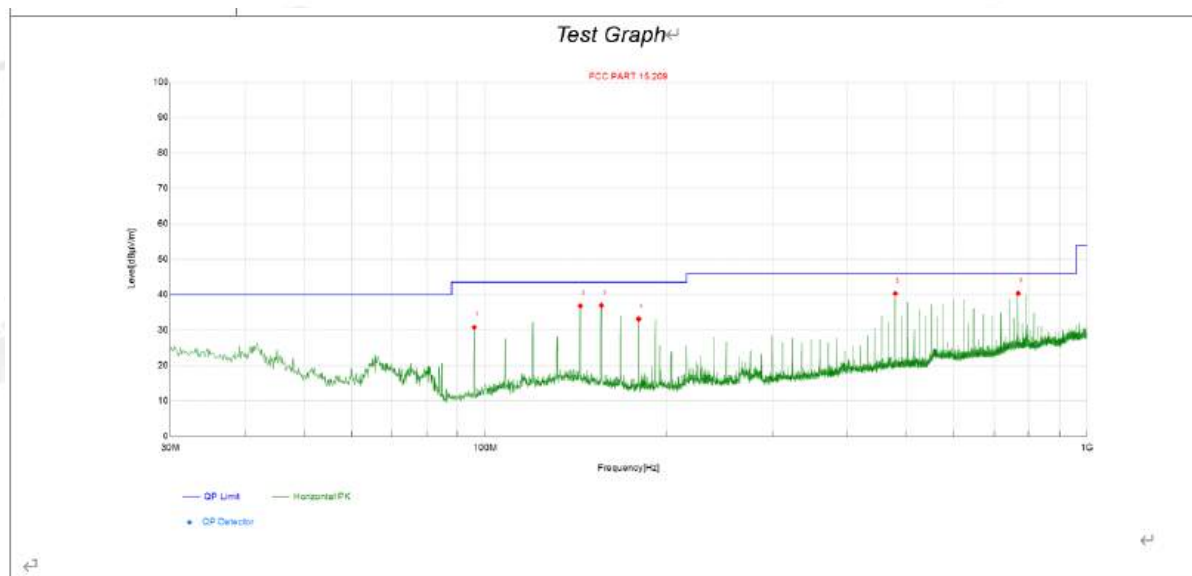


NO.	Frequency [MHz]	Reading [dBUV]	Level [dBUV/m]	Factor [dB/m]	Limit [dBUV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Verdict
1	0.02	20.15	41.11	20.96	121.72	80.61	100	247	PK	PASS
2	0.20	20.34	40.80	20.46	101.49	60.69	100	148	PK	PASS
3	0.69	17.67	38.03	20.36	70.77	32.74	100	24	PK	PASS
4	1.06	16.64	37.03	20.39	67.13	30.10	100	65	PK	PASS
5	5.84	18.32	38.62	20.30	69.54	30.92	100	114	PK	PASS
6	14.53	19.07	39.11	20.04	69.54	30.43	100	100	PK	PASS

Note: If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

Radiated Emission test (30MHz-1GHz)

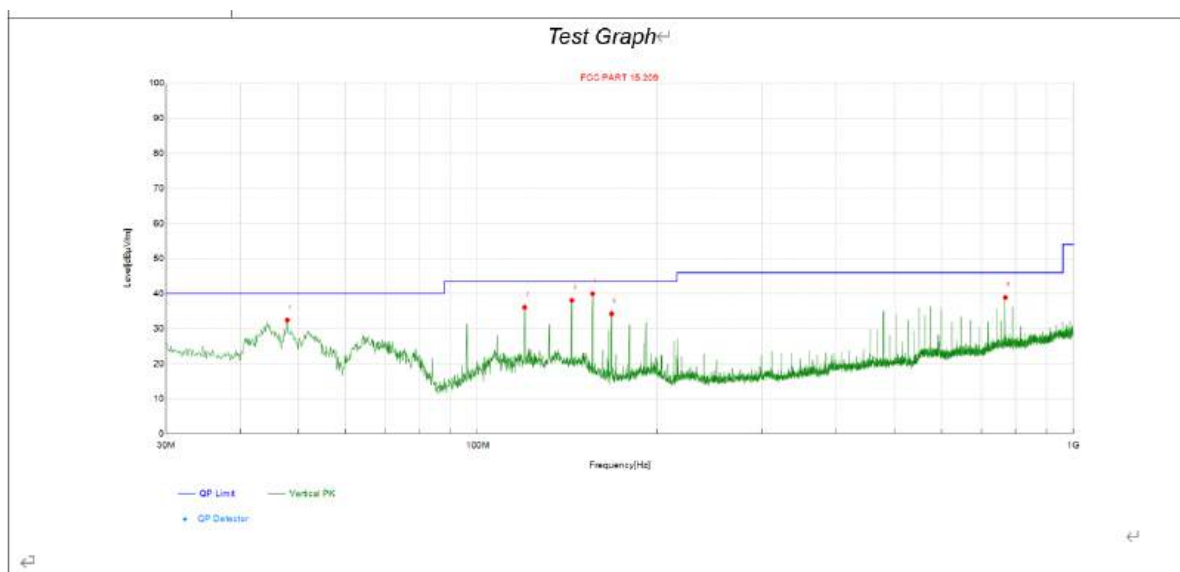
Mode	Test channel	Ant. Pol.
2DH5	2402MHz	Horizontal



Suspected Data List											
NO	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	95.96	50.42	30.76	-19.66	43.50	12.74	200	150	PK	Hori	PASS
2	143.98	53.19	36.83	-16.36	43.50	6.67	200	122	PK	Hori	PASS
3	155.98	53.96	36.93	-17.03	43.50	6.57	200	104	PK	Hori	PASS
4	179.99	51.58	33.08	-18.50	43.50	10.42	200	317	PK	Hori	PASS
5	480.08	50.87	40.30	-10.57	46.00	5.70	200	336	PK	Hori	PASS
6	768.17	45.29	40.32	-4.97	46.00	5.68	100	201	PK	Hori	PASS

Note: If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

Mode	Test channel	Ant. Pol.
2DH5	2402MHz	Vertical

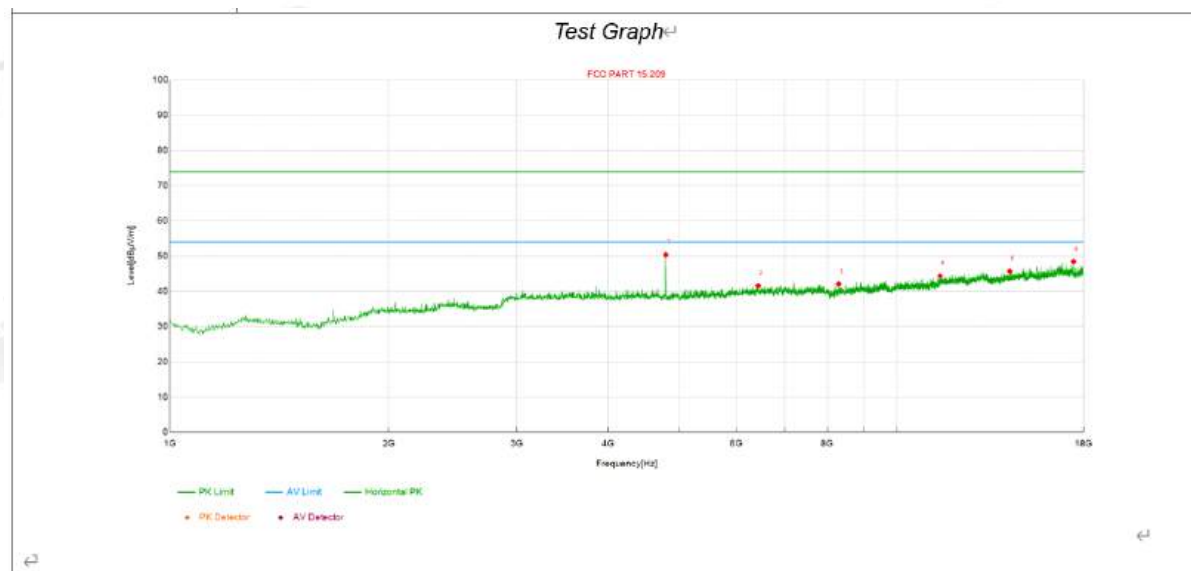


Suspected Data List											
NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	47.95	47.25	32.43	-14.82	40.00	7.57	100	48	PK	Vert	PASS
2	119.97	53.32	36.13	-17.19	43.50	7.37	100	94	PK	Vert	PASS
3	143.98	54.46	38.10	-16.36	43.50	5.40	100	29	PK	Vert	PASS
4	155.98	57.02	39.99	-17.03	43.50	3.51	100	38	PK	Vert	PASS
5	167.98	52.07	34.27	-17.80	43.50	9.23	100	103	PK	Vert	PASS
6	768.17	43.86	38.89	-4.97	46.00	7.11	200	247	PK	Vert	PASS

Note: If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

Radiated Emission test (1GHz-18GHz)

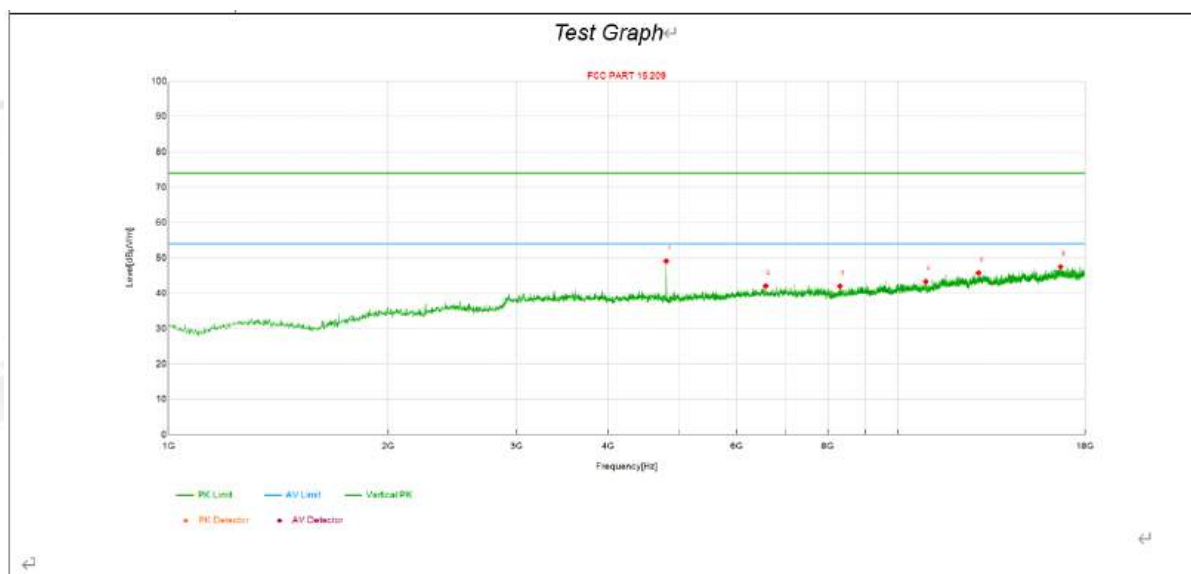
Mode	Test channel	Ant. Pol.
DH5	2402MHz	Horizontal



NO.	Frequency [MHz]	Reading [dBUV]	Level [dBUV/m]	Factor [dB/m]	Limit [dBUV/m]	Margin [dB]	Det	Pol	Verdict
1	4803.75	62.66	50.43	-12.23	74.00	23.57	PK	Hori	PASS
2	6431.50	50.69	41.55	-9.14	74.00	32.45	PK	Hori	PASS
3	8299.38	49.93	42.07	-7.86	74.00	31.93	PK	Hori	PASS
4	11433.75	48.13	44.42	-3.71	74.00	29.58	PK	Hori	PASS
5	14255.75	46.86	45.71	-1.15	74.00	28.29	PK	Hori	PASS
6	17447.50	45.85	48.40	2.55	74.00	25.60	PK	Hori	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

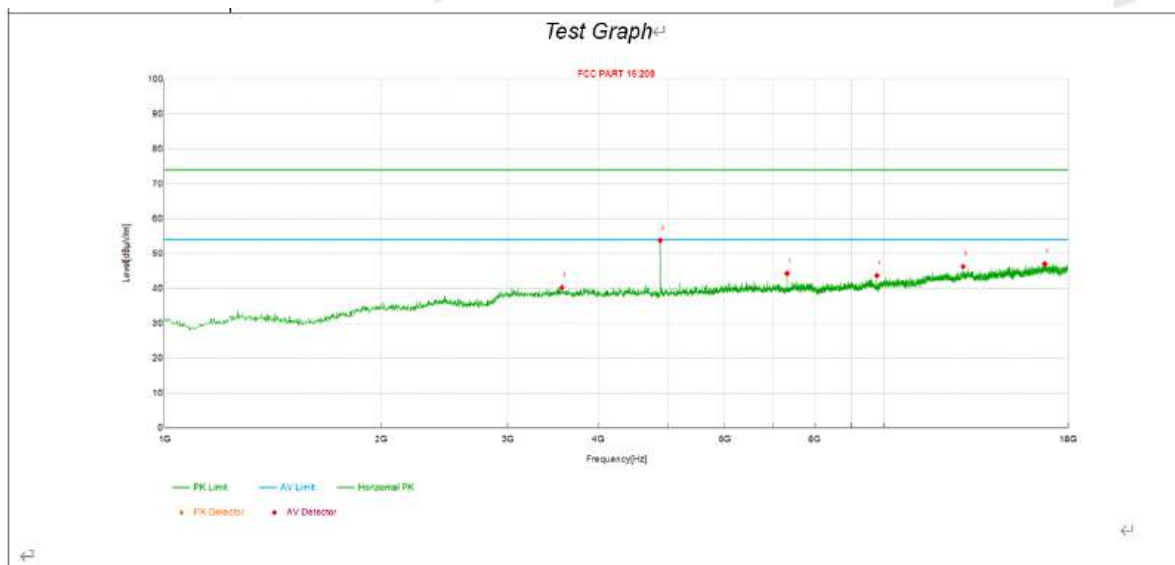
Mode	Test channel	Ant. Pol.
DH5	2402MHz	Vertical



NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Det	Pol	Verdict
1	4803.75	61.39	49.16	-12.23	74.00	24.84	PK	Vert	PASS
2	6573.88	50.99	42.12	-8.87	74.00	31.88	PK	Vert	PASS
3	8305.75	49.93	42.06	-7.87	74.00	31.94	PK	Vert	PASS
4	10900.38	47.69	43.33	-4.36	74.00	30.67	PK	Vert	PASS
5	12868.13	47.59	45.73	-1.86	74.00	28.27	PK	Vert	PASS
6	16659.13	45.27	47.53	2.26	74.00	26.47	PK	Vert	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

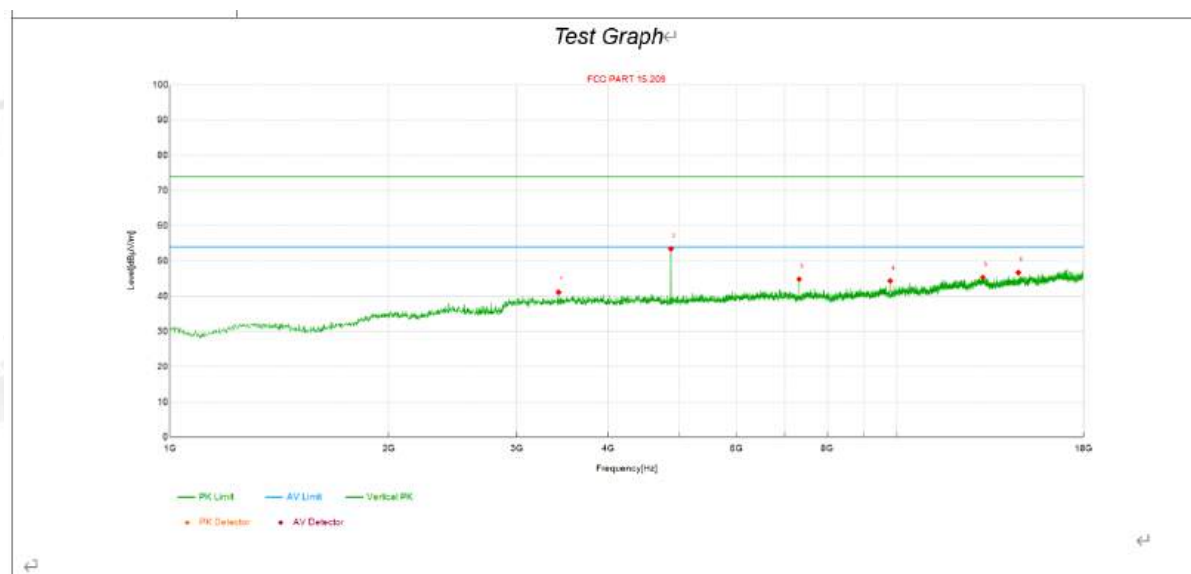
Mode	Test channel	Ant. Pol.
DH5	2441MHz	Horizontal



NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Det	Pol	Verdict
1	3562.75	55.14	40.28	-14.86	74.00	33.72	PK	Hori	PASS
2	4882.38	65.88	53.74	-12.14	74.00	20.26	PK	Hori	PASS
3	7321.88	52.88	44.32	-8.56	74.00	29.68	PK	Hori	PASS
4	9763.50	49.66	43.73	-5.93	74.00	30.27	PK	Hori	PASS
5	12861.75	48.17	46.29	-1.88	74.00	27.71	PK	Hori	PASS
6	16688.88	44.81	47.10	2.29	74.00	26.90	PK	Hori	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

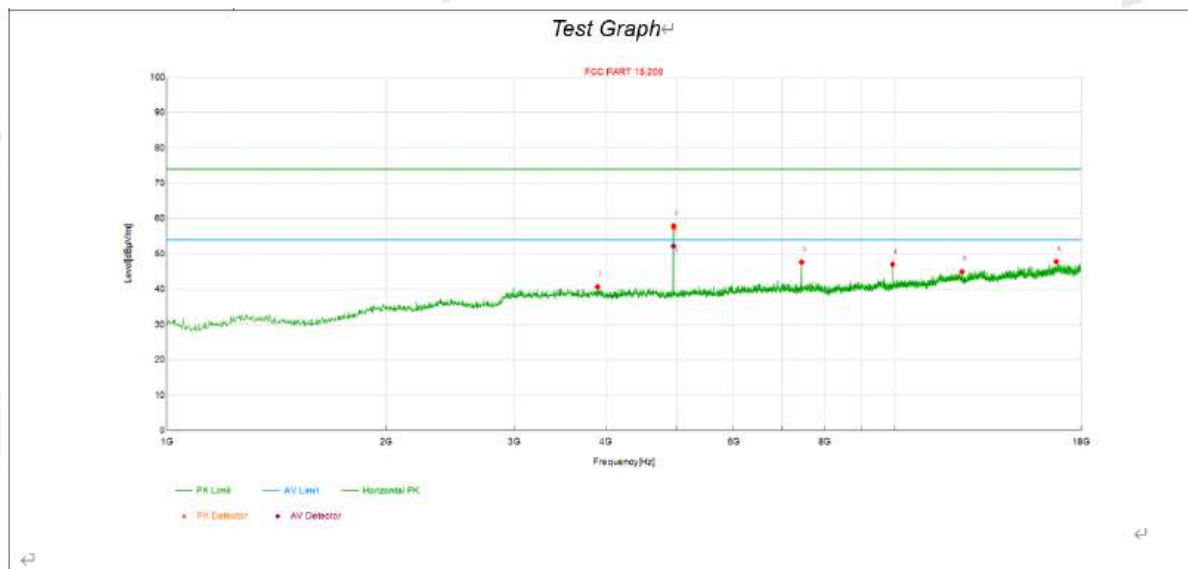
Mode	Test channel	Ant. Pol.
DH5	2441MHz	Vertical



NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Det	Pol	Verdict
1	3422.50	56.67	41.14	-15.53	74.00	32.86	PK	Vert	PASS
2	4882.38	65.62	53.48	-12.14	74.00	20.52	PK	Vert	PASS
3	7324.00	53.37	44.81	-8.56	74.00	29.19	PK	Vert	PASS
4	9763.50	50.27	44.34	-5.93	74.00	29.66	PK	Vert	PASS
5	13091.25	46.88	45.35	-1.53	74.00	28.65	PK	Vert	PASS
6	14644.63	47.02	46.73	-0.29	74.00	27.27	PK	Vert	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

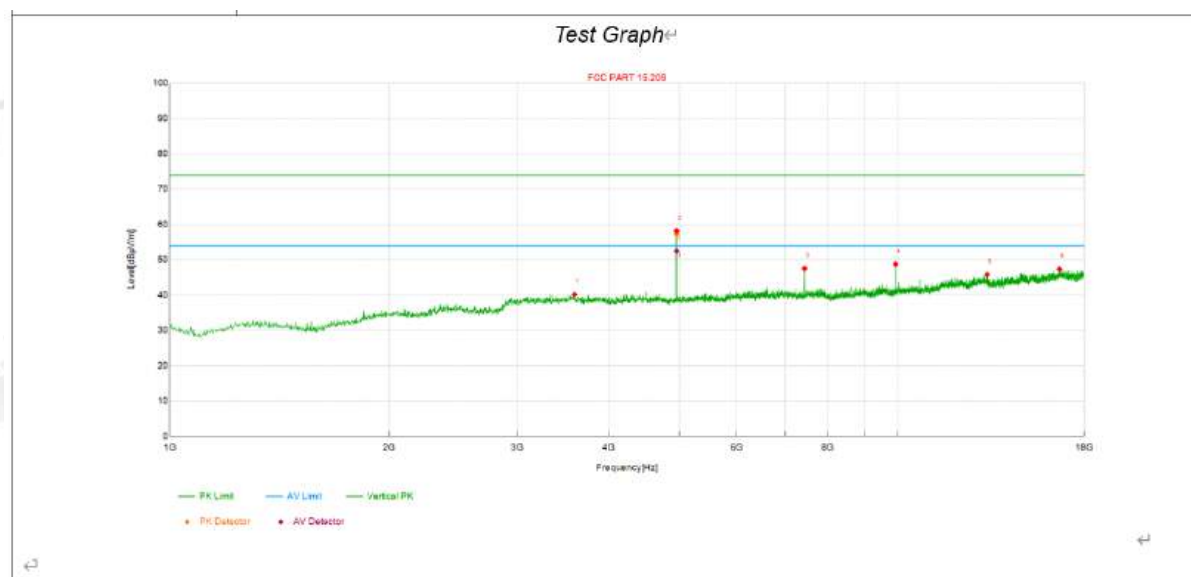
Mode	Test channel	Ant. Pol.
DH5	2480MHz	Horizontal



NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Det	Pol	Verdict
1	3902.75	54.47	40.62	-13.85	74.00	33.38	PK	Hori	PASS
2	4961.00	69.99	57.99	-12.00	74.00	16.01	PK	Hori	PASS
3	4961.00	64.27	52.27	-12.00	54.00	1.73	AV	Hori	PASS
4	7440.88	56.21	47.62	-8.59	74.00	26.38	PK	Hori	PASS
5	9918.63	52.69	47.03	-5.66	74.00	26.97	PK	Hori	PASS
6	12345.38	47.29	44.95	-2.34	74.00	29.05	PK	Hori	PASS
7	16633.63	45.53	47.79	2.26	74.00	26.21	PK	Hori	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

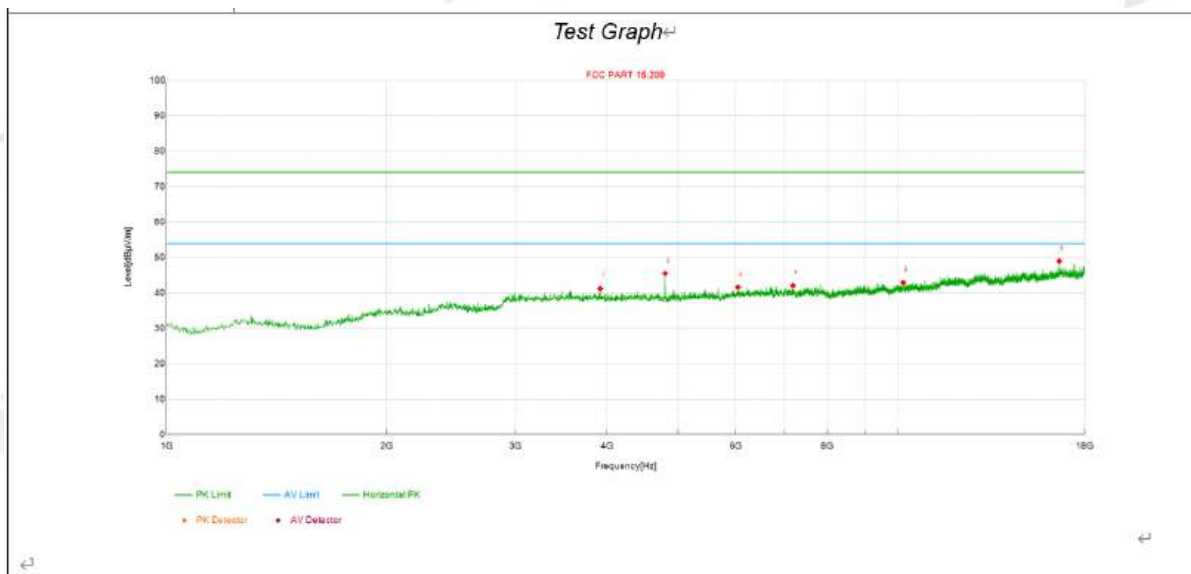
Mode	Test channel	Ant. Pol.
DH5	2480MHz	Vertical



NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Det	Pol	Verdict
1	3592.50	54.97	40.21	-14.76	74.00	33.79	PK	Vert	PASS
2	4961.00	70.16	58.16	-12.00	74.00	15.84	PK	Vert	PASS
3	4961.00	64.48	52.48	-12.00	54.00	1.52	AV	Vert	PASS
4	7438.75	56.15	47.56	-8.59	74.00	26.44	PK	Vert	PASS
5	9918.63	54.41	48.75	-5.66	74.00	25.25	PK	Vert	PASS
6	13244.25	47.55	45.82	-1.73	74.00	28.18	PK	Vert	PASS
7	16648.50	45.10	47.37	2.27	74.00	26.63	PK	Vert	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

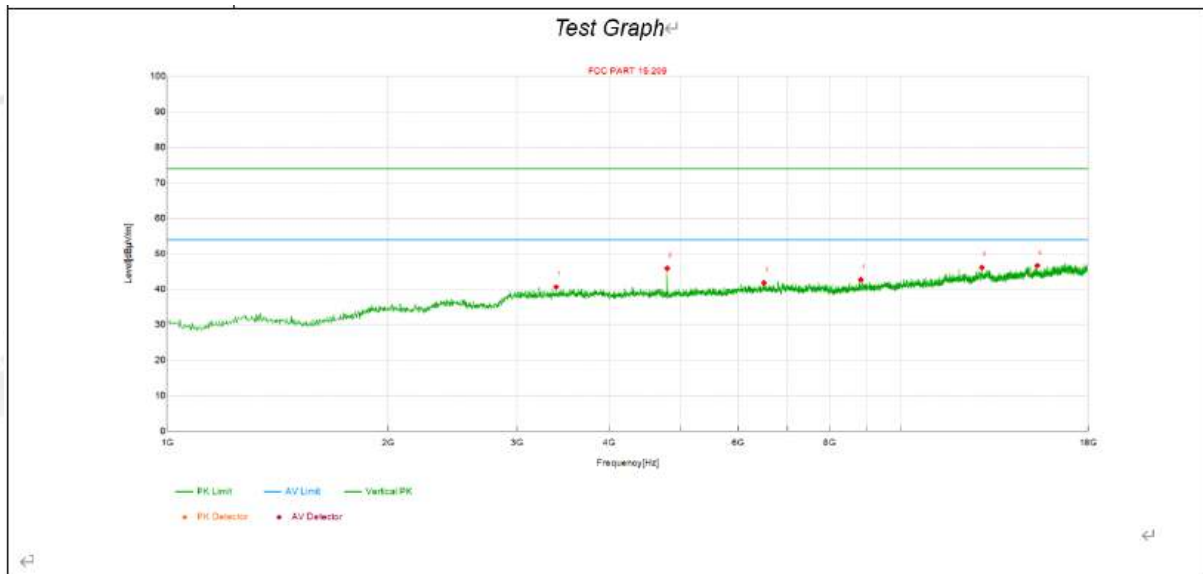
Mode	Test channel	Ant. Pol.
2DH5	2402MHz	Horizontal



NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Det	Pol	Verdict
1	3915.50	55.09	41.22	-13.87	74.00	32.78	PK	Hori	PASS
2	4803.75	57.75	45.52	-12.23	74.00	28.48	PK	Hori	PASS
3	6040.50	51.58	41.63	-9.95	74.00	32.37	PK	Hori	PASS
4	7185.88	50.57	42.08	-8.49	74.00	31.92	PK	Hori	PASS
5	10165.13	48.18	42.89	-5.29	74.00	31.11	PK	Hori	PASS
6	16614.50	46.74	48.99	2.25	74.00	25.01	PK	Hori	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

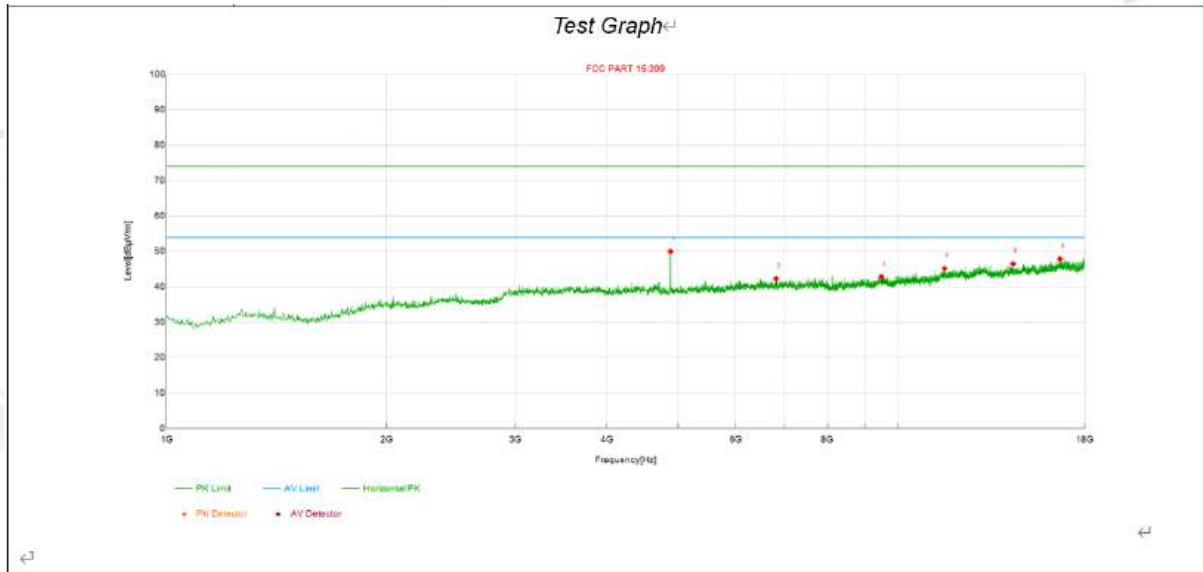
Mode	Test channel	Ant. Pol.
2DH5	2402MHz	Vertical



NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Det	Pol	Verdict
1	3386.38	56.39	40.68	-15.71	74.00	33.32	PK	Vert	PASS
2	4803.75	58.13	45.90	-12.23	74.00	28.10	PK	Vert	PASS
3	6508.00	50.85	41.86	-8.99	74.00	32.14	PK	Vert	PASS
4	8820.00	50.21	42.76	-7.45	74.00	31.24	PK	Vert	PASS
5	12880.88	47.94	46.14	-1.80	74.00	27.86	PK	Vert	PASS
6	15343.75	46.26	46.66	0.40	74.00	27.34	PK	Vert	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

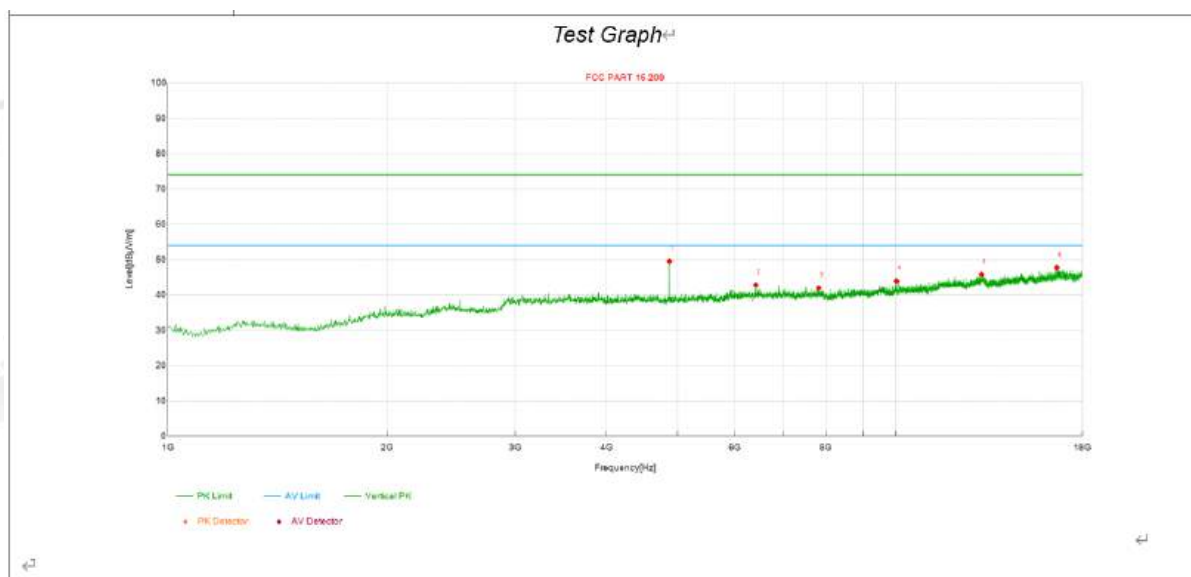
Mode	Test channel	Ant. Pol.
2DH5	2441MHz	Horizontal



NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Det	Pol	Verdict
1	4882.38	62.10	49.96	-12.14	74.00	24.04	PK	Hori	PASS
2	6809.75	50.71	42.25	-8.46	74.00	31.75	PK	Hori	PASS
3	9487.25	49.36	42.83	-6.53	74.00	31.17	PK	Hori	PASS
4	11576.13	48.67	45.25	-3.42	74.00	28.75	PK	Hori	PASS
5	14362.00	47.50	46.48	-1.02	74.00	27.52	PK	Hori	PASS
6	16652.75	45.59	47.85	2.26	74.00	26.15	PK	Hori	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

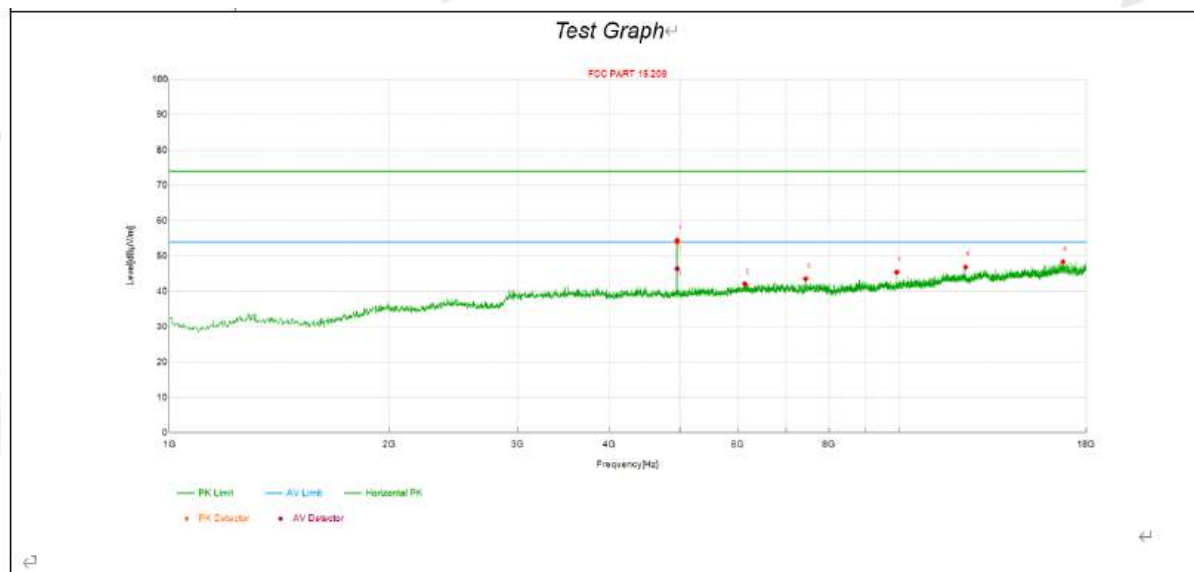
Mode	Test channel	Ant. Pol.
2DH5	2441MHz	Vertical



NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Det	Pol	Verdict
1	4882.38	61.75	49.61	-12.14	74.00	24.39	PK	Vert	PASS
2	6410.25	52.01	42.83	-9.18	74.00	31.17	PK	Vert	PASS
3	7819.13	50.31	41.98	-8.33	74.00	32.02	PK	Vert	PASS
4	10007.88	49.53	43.98	-5.55	74.00	30.02	PK	Vert	PASS
5	13078.50	47.35	45.81	-1.54	74.00	28.19	PK	Vert	PASS
6	16612.38	45.48	47.72	2.24	74.00	26.28	PK	Vert	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

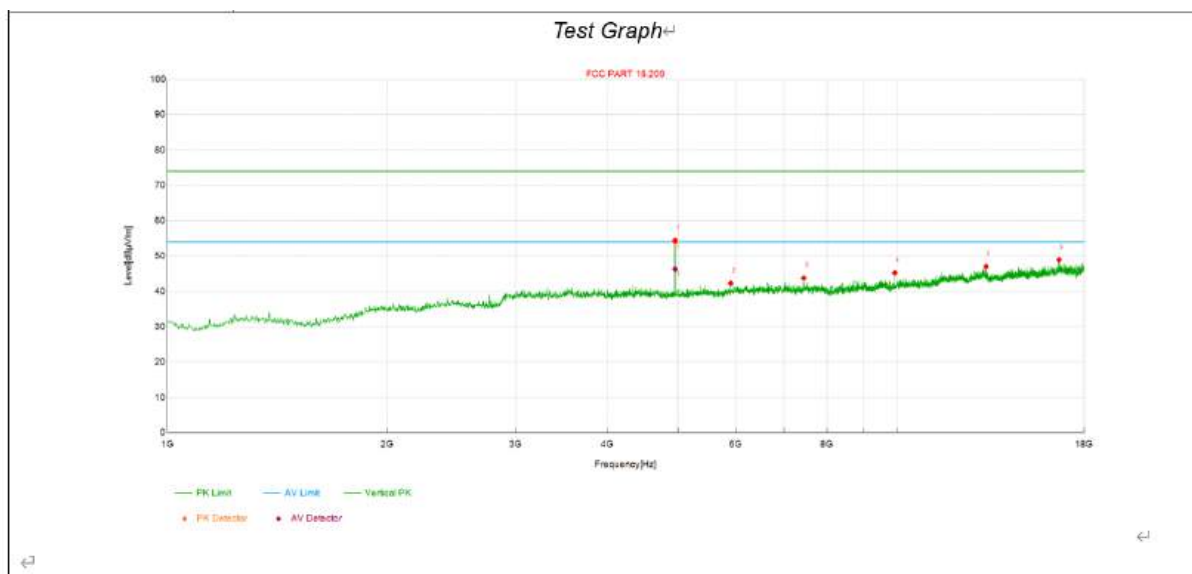
Mode	Test channel	Ant. Pol.
2DH5	2480MHz	Horizontal



NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Det	Pol	Verdict
1	4961.00	66.41	54.41	-12.00	74.00	19.59	PK	Hori	PASS
2	4961.00	58.44	46.44	-12.00	54.00	7.56	PK	Hori	PASS
3	6144.63	51.65	42.06	-9.59	74.00	31.94	PK	Hori	PASS
4	7440.88	52.15	43.56	-8.59	74.00	30.44	PK	Hori	PASS
5	9920.75	51.14	45.48	-5.66	74.00	28.52	PK	Hori	PASS
6	12317.75	49.17	46.85	-2.32	74.00	27.15	PK	Hori	PASS
7	16748.38	46.05	48.34	2.29	74.00	25.66	PK	Hori	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

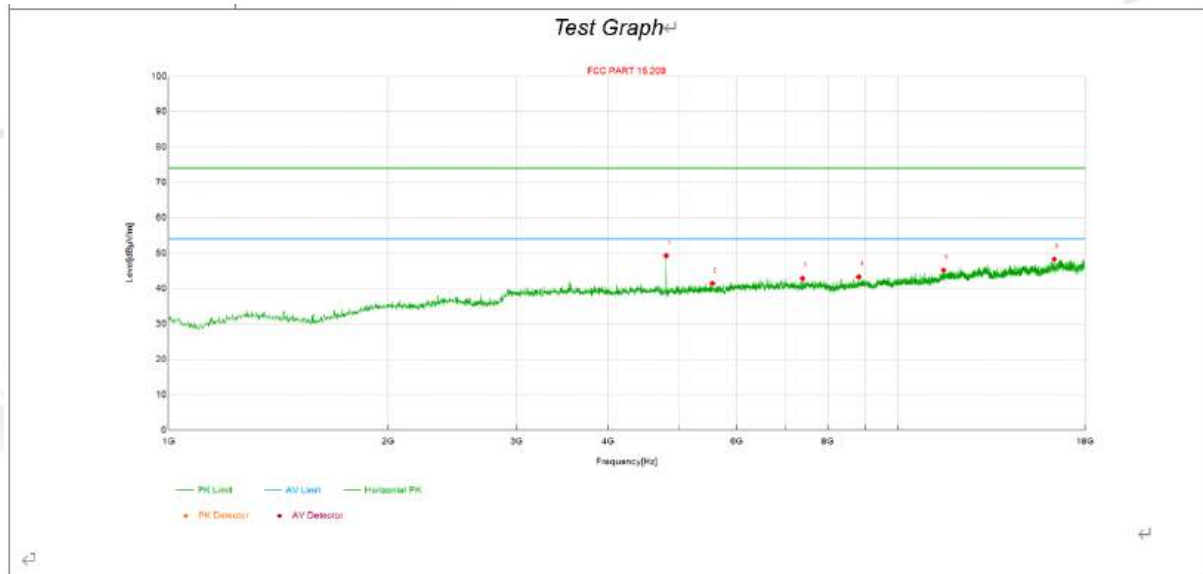
Mode	Test channel	Ant. Pol.
2DH5	2480MHz	Vertical



NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Det	Pol	Verdict
1	4961.00	66.45	54.45	-12.00	74.00	19.55	PK	Vert	PASS
2	4961.00	58.33	46.33	-12.00	54.00	7.67	AV	Vert	PASS
3	5908.75	52.27	42.26	-10.01	74.00	31.74	PK	Vert	PASS
4	7440.88	52.40	43.81	-8.59	74.00	30.19	PK	Vert	PASS
5	9920.75	50.94	45.28	-5.66	74.00	28.72	PK	Vert	PASS
6	13216.63	48.72	47.03	-1.69	74.00	26.97	PK	Vert	PASS
7	16644.25	46.63	48.90	2.27	74.00	25.10	PK	Vert	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

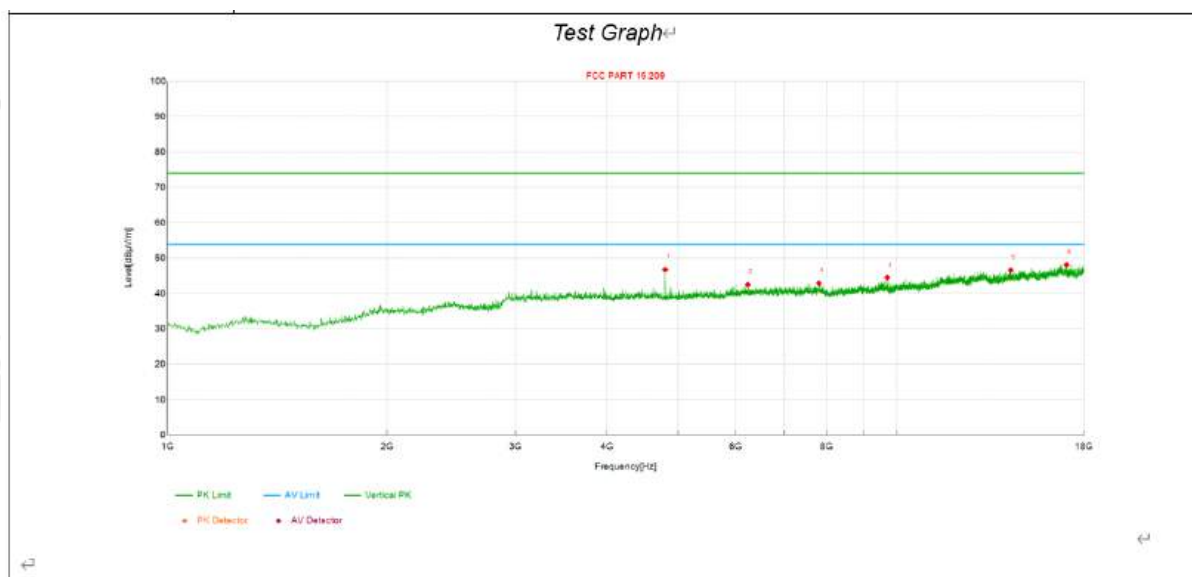
Mode	Test channel	Ant. Pol.
3DH5	2402MHz	Horizontal



NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Det	Pol	Verdict
1	4803.75	61.58	49.35	-12.23	74.00	24.65	PK	Hori	PASS
2	5556.00	52.38	41.49	-10.89	74.00	32.51	PK	Hori	PASS
3	7389.88	51.58	42.89	-8.69	74.00	31.11	PK	Hori	PASS
4	8820.00	50.75	43.30	-7.45	74.00	30.70	PK	Hori	PASS
5	11520.88	48.64	45.19	-3.45	74.00	28.81	PK	Hori	PASS
6	16338.25	46.51	48.31	1.80	74.00	25.69	PK	Hori	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

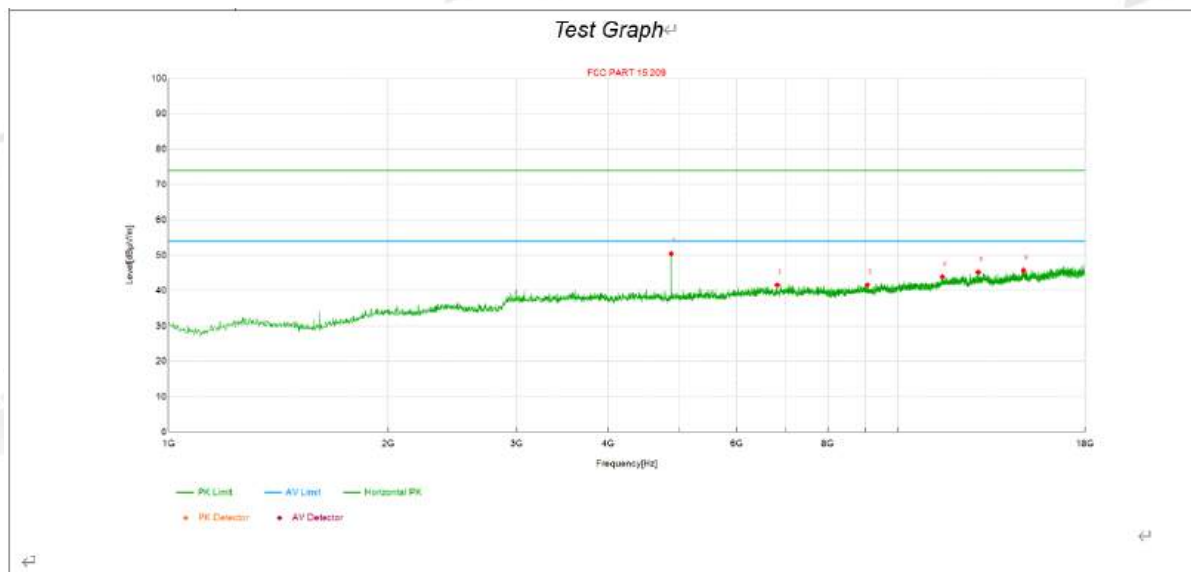
Mode	Test channel	Ant. Pol.
3DH5	2402MHz	Vertical



NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Det	Pol	Verdict
1	4803.75	59.03	46.80	-12.23	74.00	27.20	PK	Vert	PASS
2	6240.25	51.90	42.51	-9.39	74.00	31.49	PK	Vert	PASS
3	7804.25	51.22	42.90	-8.32	74.00	31.10	PK	Vert	PASS
4	9676.38	50.66	44.50	-6.16	74.00	29.50	PK	Vert	PASS
5	14281.25	47.73	46.63	-1.10	74.00	27.37	PK	Vert	PASS
6	17048.00	45.50	48.12	2.62	74.00	25.88	PK	Vert	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

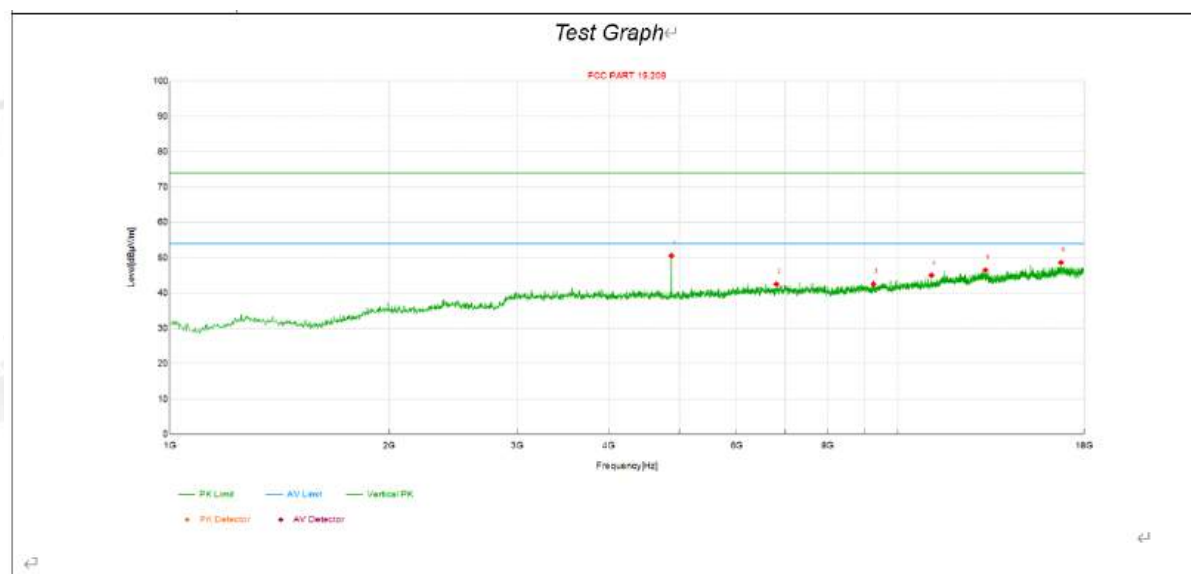
Mode	Test channel	Ant. Pol.
3DH5	2441MHz	Horizontal



NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Det	Pol	Verdict
1	4882.38	62.62	50.48	-12.14	74.00	23.52	PK	Hori	PASS
2	6824.63	50.04	41.61	-8.43	74.00	32.39	PK	Hori	PASS
3	9064.38	48.89	41.66	-7.23	74.00	32.34	PK	Hori	PASS
4	11480.50	47.50	43.96	-3.54	74.00	30.04	PK	Hori	PASS
5	12855.38	47.14	45.22	-1.92	74.00	28.78	PK	Hori	PASS
6	14835.88	45.89	45.69	-0.20	74.00	28.31	PK	Hori	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

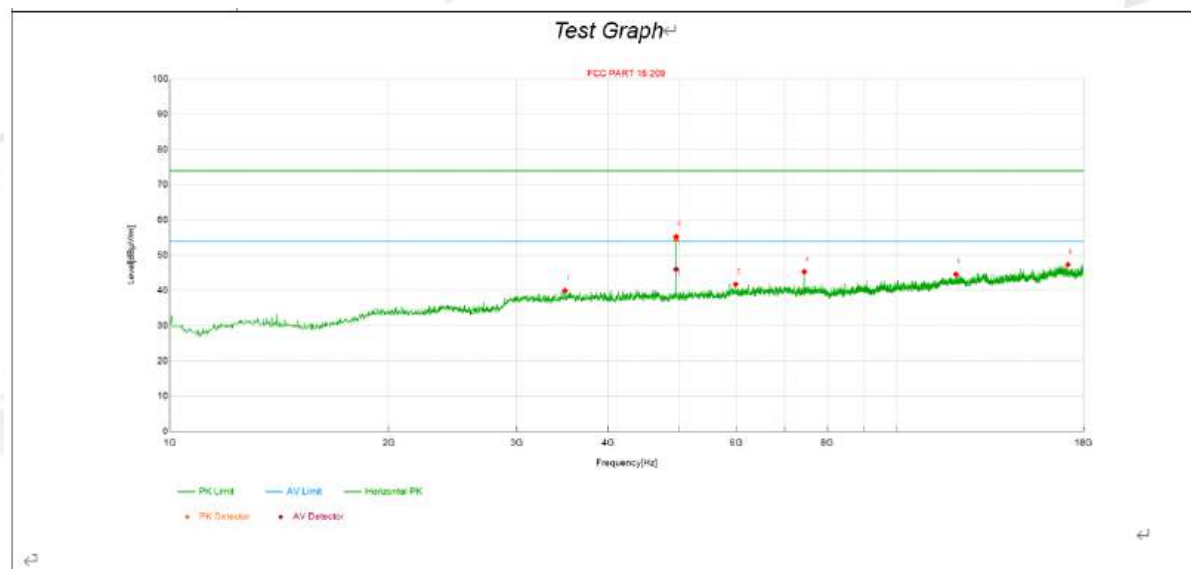
Mode	Test channel	Ant. Pol.
3DH5	2441MHz	Vertical



NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Det	Pol	Verdict
1	4882.38	62.73	50.59	-12.14	74.00	23.41	PK	Vert	PASS
2	6799.13	51.06	42.57	-8.49	74.00	31.43	PK	Vert	PASS
3	9249.25	49.26	42.57	-6.69	74.00	31.43	PK	Vert	PASS
4	11102.25	49.19	45.02	-4.17	74.00	28.98	PK	Vert	PASS
5	13167.75	48.10	46.49	-1.61	74.00	27.51	PK	Vert	PASS
6	16727.13	46.40	48.69	2.29	74.00	25.31	PK	Vert	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

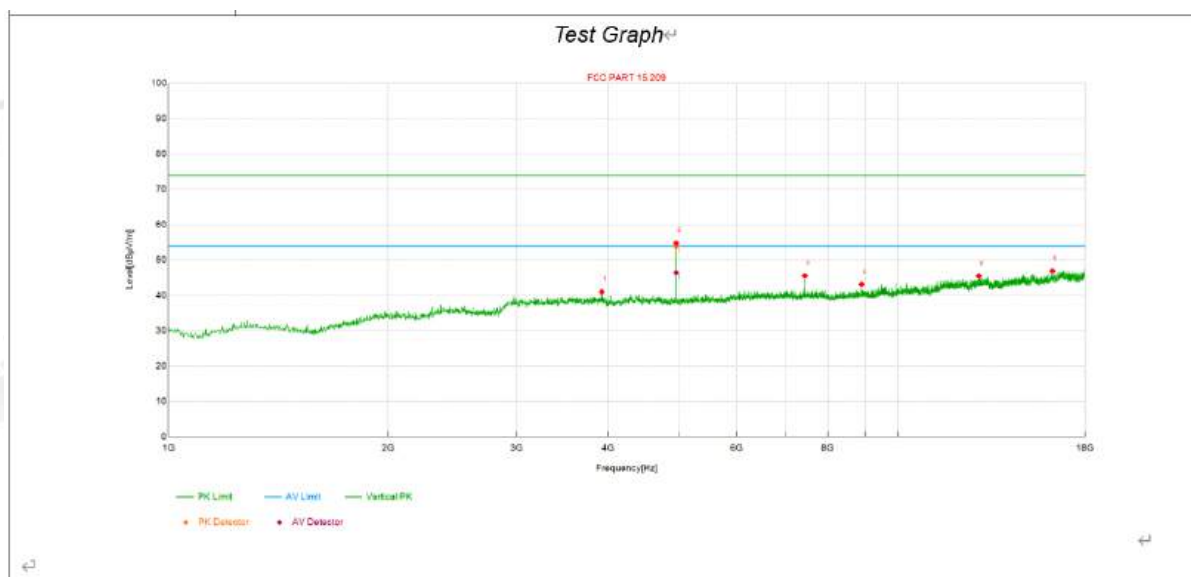
Mode	Test channel	Ant. Pol.
3DH5	2480MHz	Horizontal



NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Det	Pol	Verdict
1	3490.50	55.06	39.92	-15.14	74.00	34.08	PK	Hori	PASS
2	4961.00	67.35	55.35	-12.00	74.00	18.65	PK	Hori	PASS
3	4961.00	58.00	46.00	-12.00	54.00	8.00	AV	Hori	PASS
4	5991.63	51.86	41.77	-10.09	74.00	32.23	PK	Hori	PASS
5	7440.88	53.90	45.31	-8.59	74.00	28.69	PK	Hori	PASS
6	12020.25	47.25	44.59	-2.66	74.00	29.41	PK	Hori	PASS
7	17135.13	44.80	47.29	2.49	74.00	26.71	PK	Hori	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

Mode	Test channel	Ant. Pol.
3DH5	2480MHz	Vertical

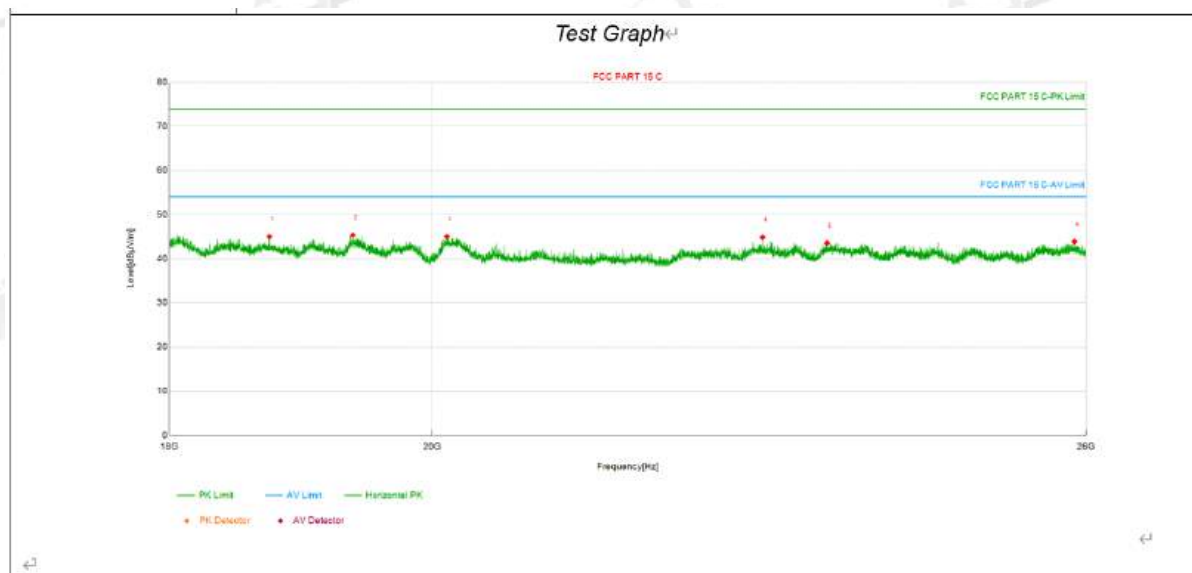


NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Det	Pol	Verdict
1	3924.00	54.92	41.02	-13.90	74.00	32.98	PK	Vert	PASS
2	4961.00	66.82	54.82	-12.00	74.00	19.18	PK	Vert	PASS
3	4961.00	58.40	46.40	-12.00	54.00	7.60	AV	Vert	PASS
4	7440.88	54.09	45.50	-8.59	74.00	28.50	PK	Vert	PASS
5	8896.50	50.53	43.12	-7.41	74.00	30.88	PK	Vert	PASS
6	12876.63	47.23	45.41	-1.82	74.00	28.59	PK	Vert	PASS
7	16246.88	45.27	46.93	1.66	74.00	27.07	PK	Vert	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

Radiated Emission test (18GHz-26GHz)

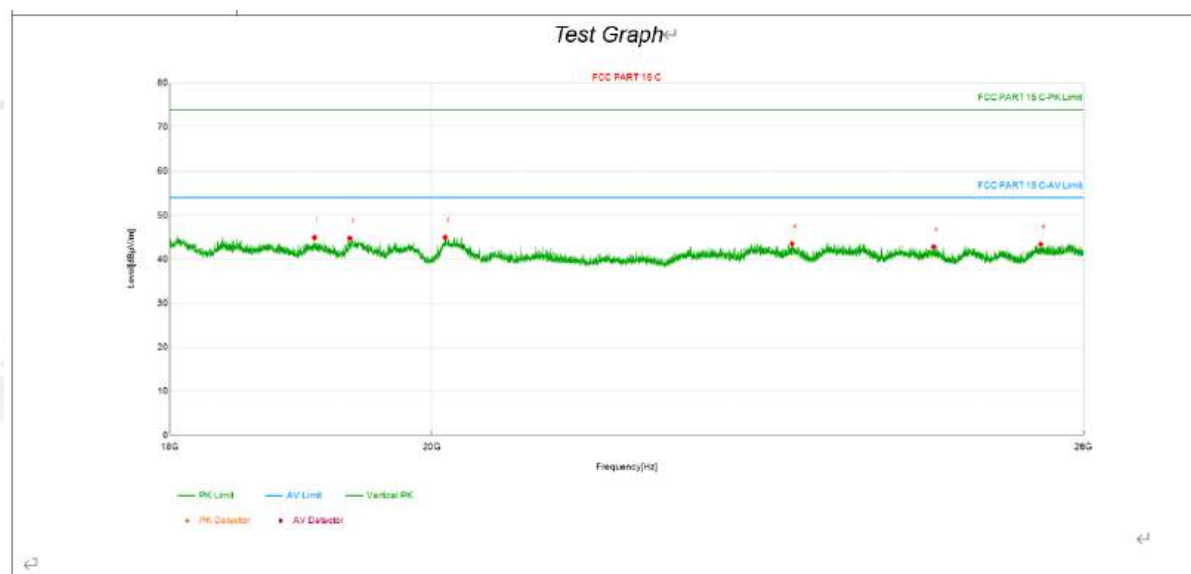
Mode	Test channel	Ant. Pol.
2DH5	2402MHz	Horizontal



Suspected Data List											
NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	18736.00	37.15	45.03	7.88	74.00	28.97	100	339	PK	Hori	PASS
2	19376.00	38.44	45.34	6.90	74.00	28.66	100	200	PK	Hori	PASS
3	20118.00	38.47	45.03	6.56	74.00	28.97	100	132	PK	Hori	PASS
4	22836.00	37.35	44.86	7.51	74.00	29.14	100	32	PK	Hori	PASS
5	23435.00	36.23	43.54	7.31	74.00	30.46	100	3	PK	Hori	PASS
6	25881.00	36.20	43.89	7.69	74.00	30.11	100	290	PK	Hori	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

Mode	Test channel	Ant. Pol.
2DH5	2402MHz	Vertical



Suspected Data List											
NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	19079.00	37.30	44.95	7.65	74.00	29.05	100	278	PK	Vert	PASS
2	19354.00	37.92	44.81	6.89	74.00	29.19	100	189	PK	Vert	PASS
3	20108.00	38.38	44.97	6.59	74.00	29.03	100	71	PK	Vert	PASS
4	23123.00	36.13	43.57	7.44	74.00	30.43	100	150	PK	Vert	PASS
5	24478.00	36.14	42.78	6.64	74.00	31.22	100	309	PK	Vert	PASS
6	25555.00	36.59	43.42	6.83	74.00	30.58	100	3	PK	Vert	PASS

Note: For emissions above 1 GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

11. RF Conducted Spurious Emissions

11.1. Block diagram of test setup

Same as section 4.1

11.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

11.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Establish a reference level by using the following procedure:

Center frequency	Test frequency
RBW:	100 kHz
VBW:	300 kHz
Span	Wide enough to capture the peak level of the in-band emission
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.

(4) Set the spectrum analyzer as follows:

RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Number of measurement points	$\geq \text{span}/\text{RBW}$
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

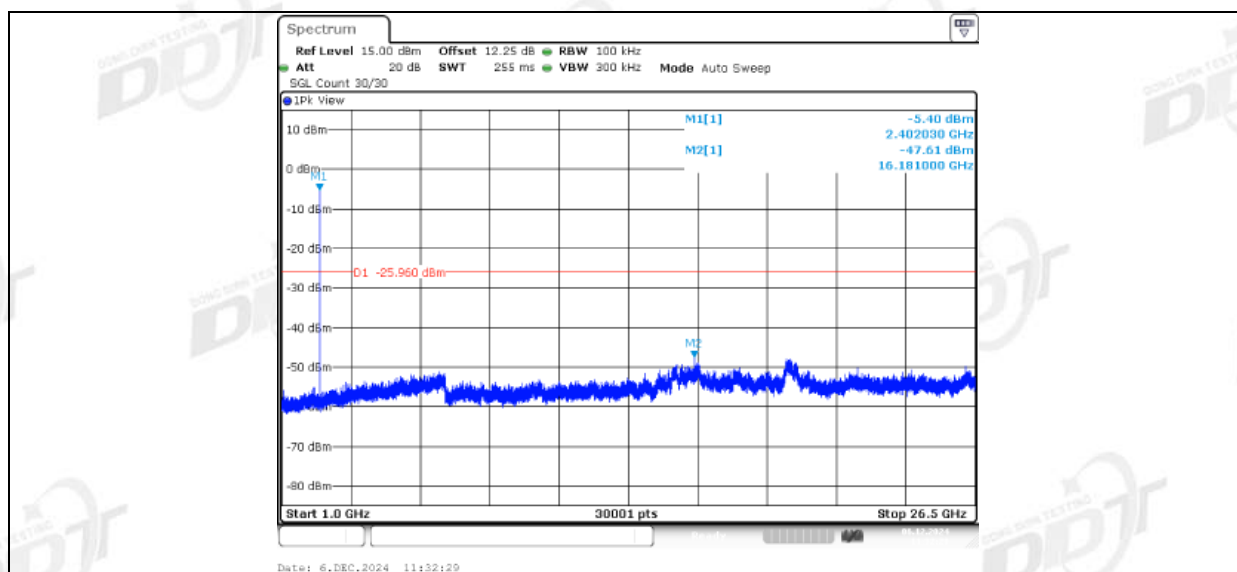
(5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

11.4. Test result

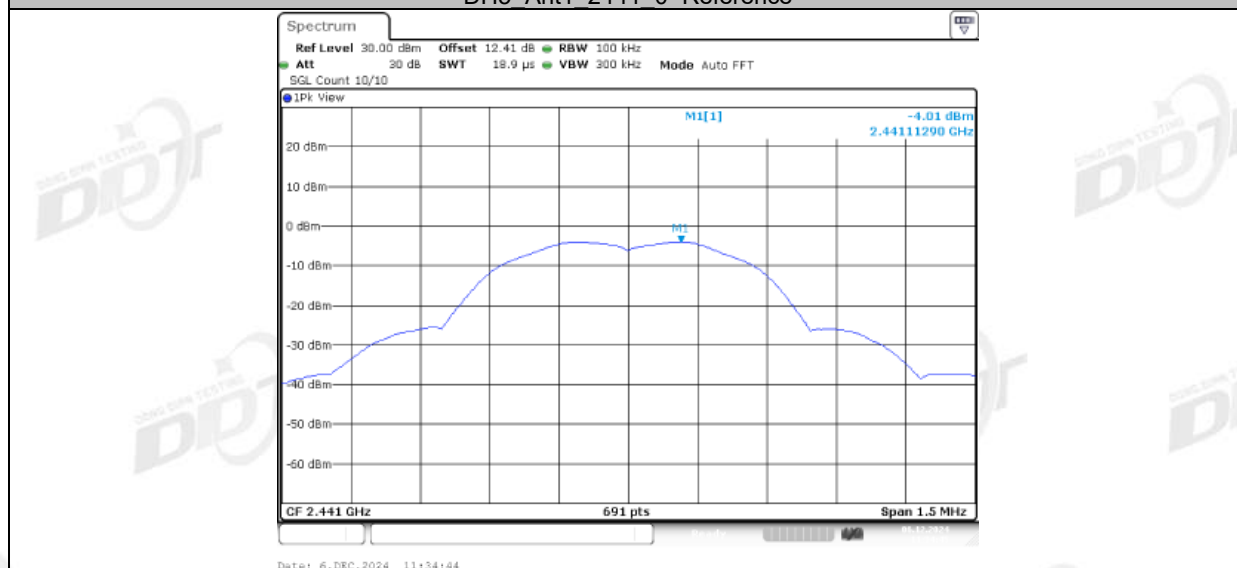
Mode	Freq. (MHz)	Verdict
GFSK	Hopping off 2402	Pass
	Hopping off 2441	Pass
	Hopping off 2480	Pass
$\pi/4$ -DQPSK	Hopping off 2402	Pass
	Hopping off 2441	Pass
	Hopping off 2480	Pass
8DPSK	Hopping off 2402	Pass
	Hopping off 2441	Pass
	Hopping off 2480	Pass

11.5. Original test data

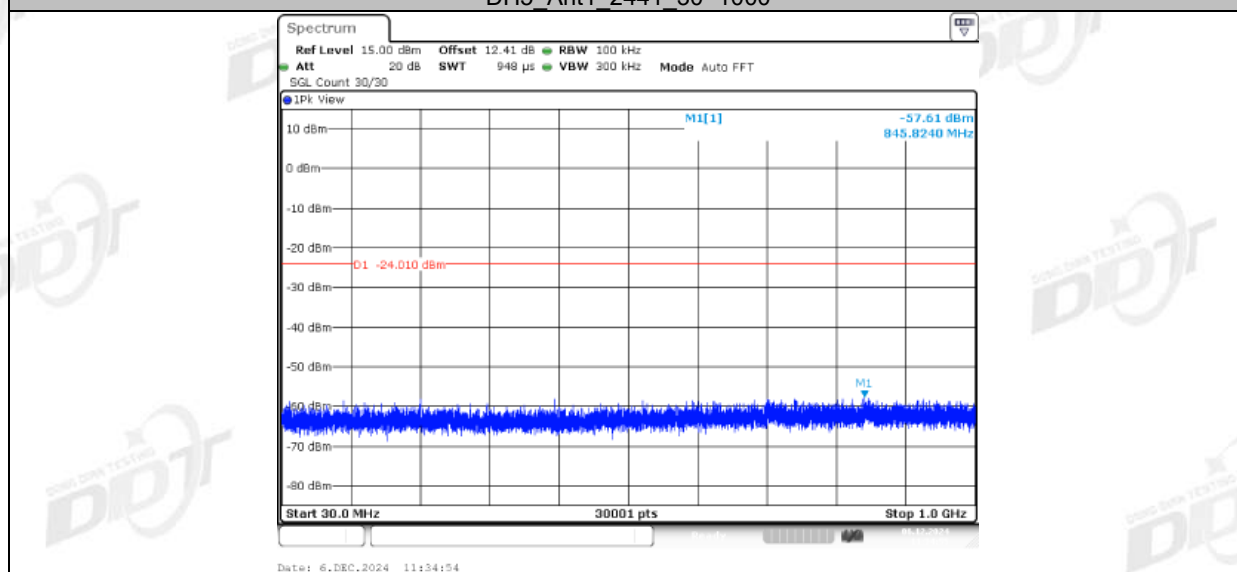




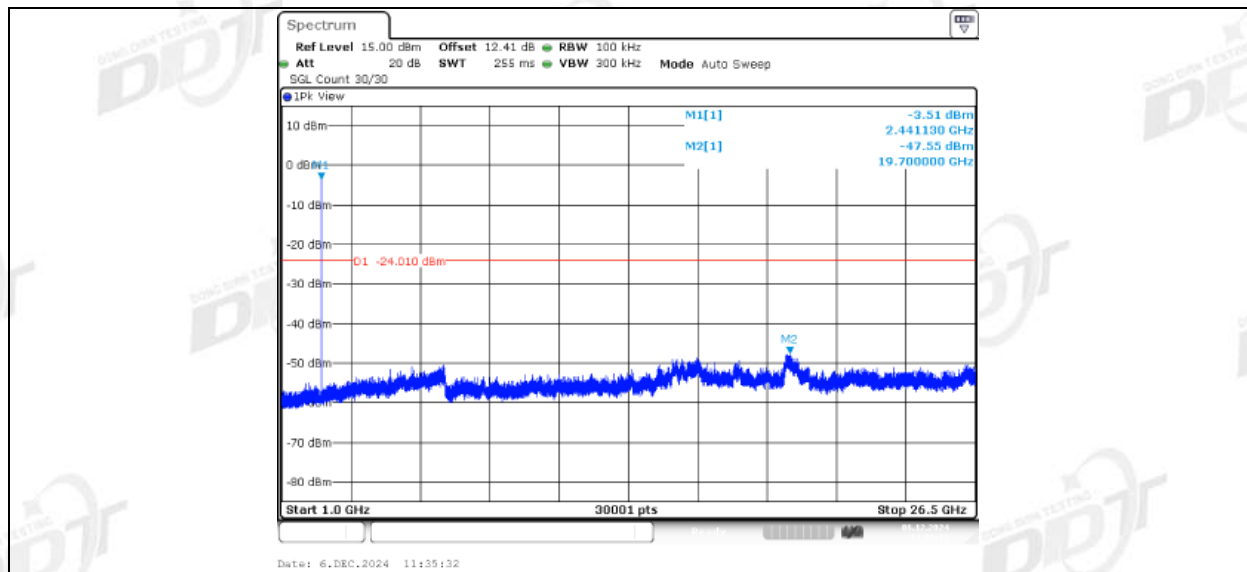
DH5 Ant1 2441 0~Reference



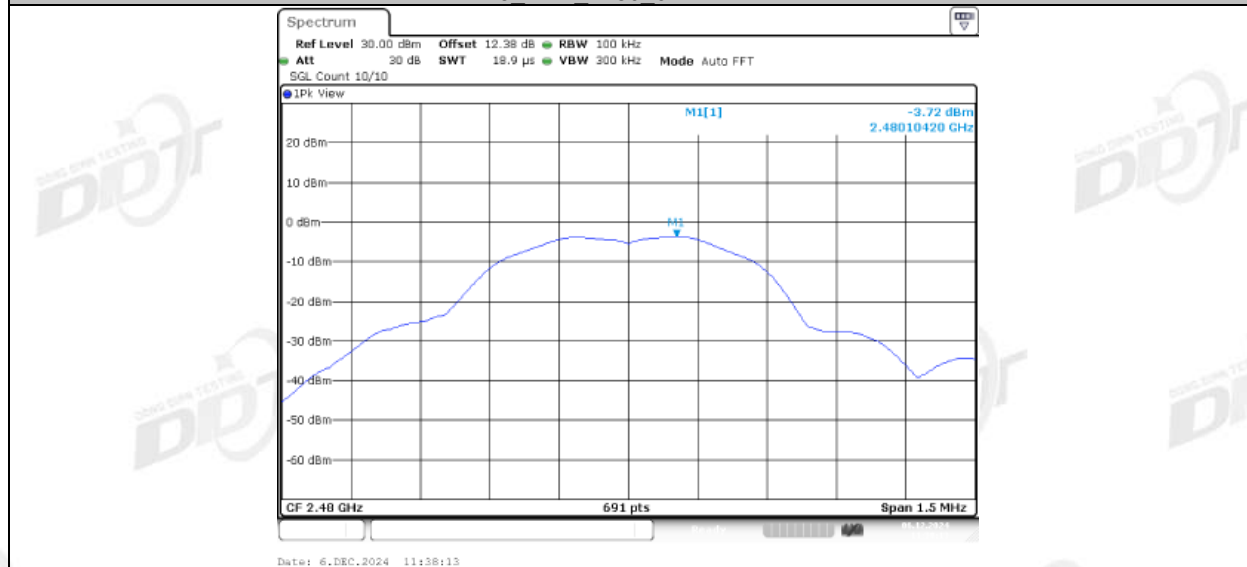
DH5 Ant1 2441 30~1000



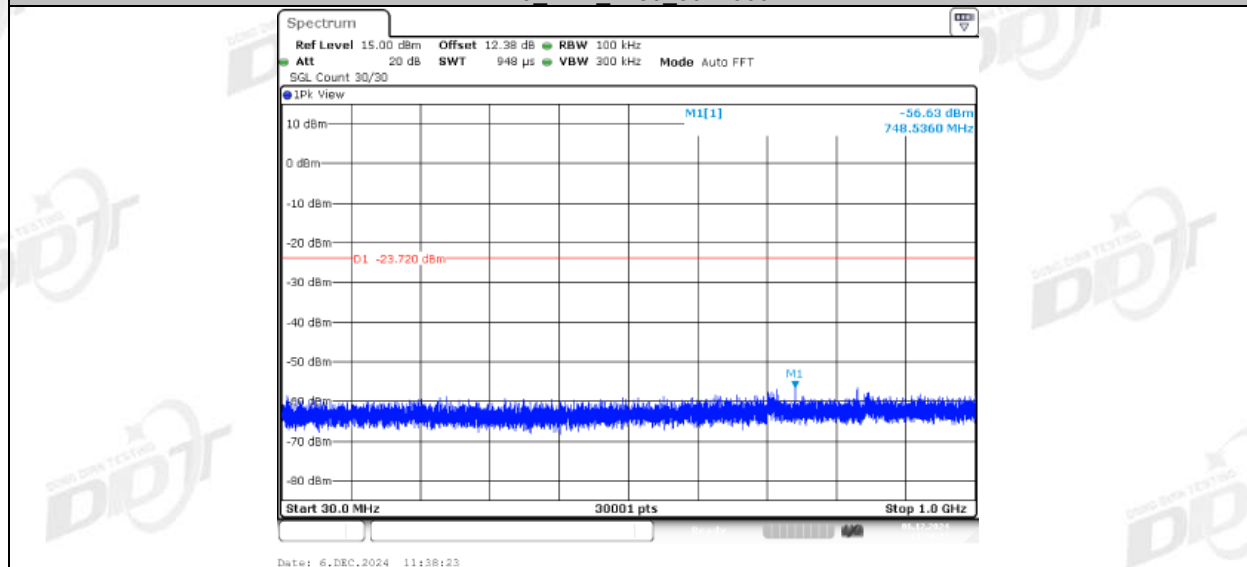
DH5 Ant1 2441 1000~26500



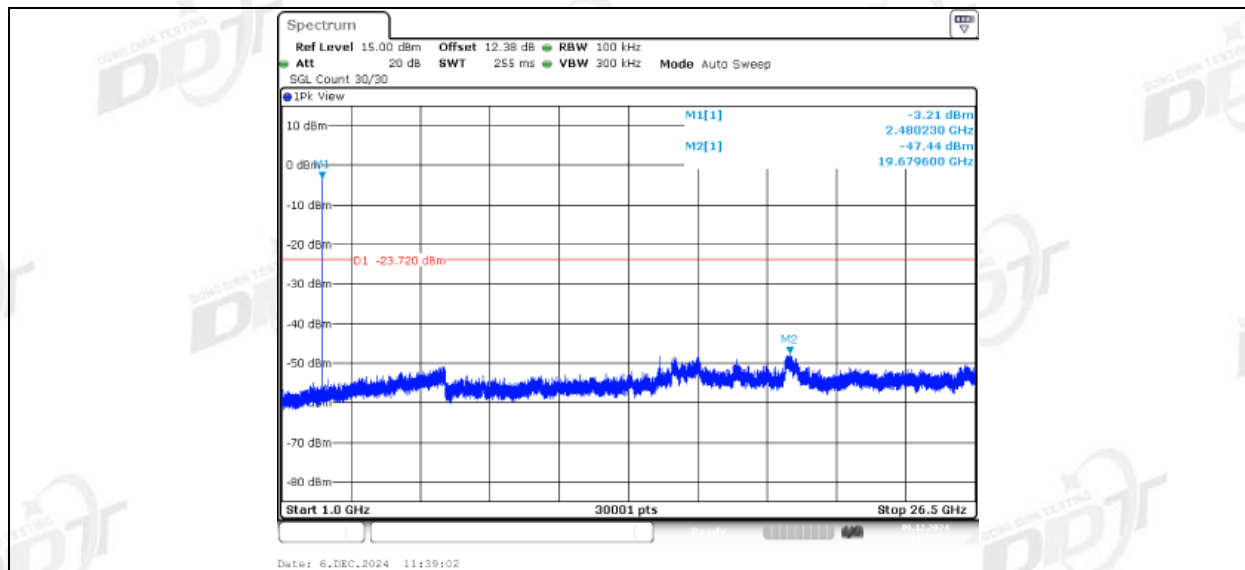
DH5_Ant1_2480_0~Reference



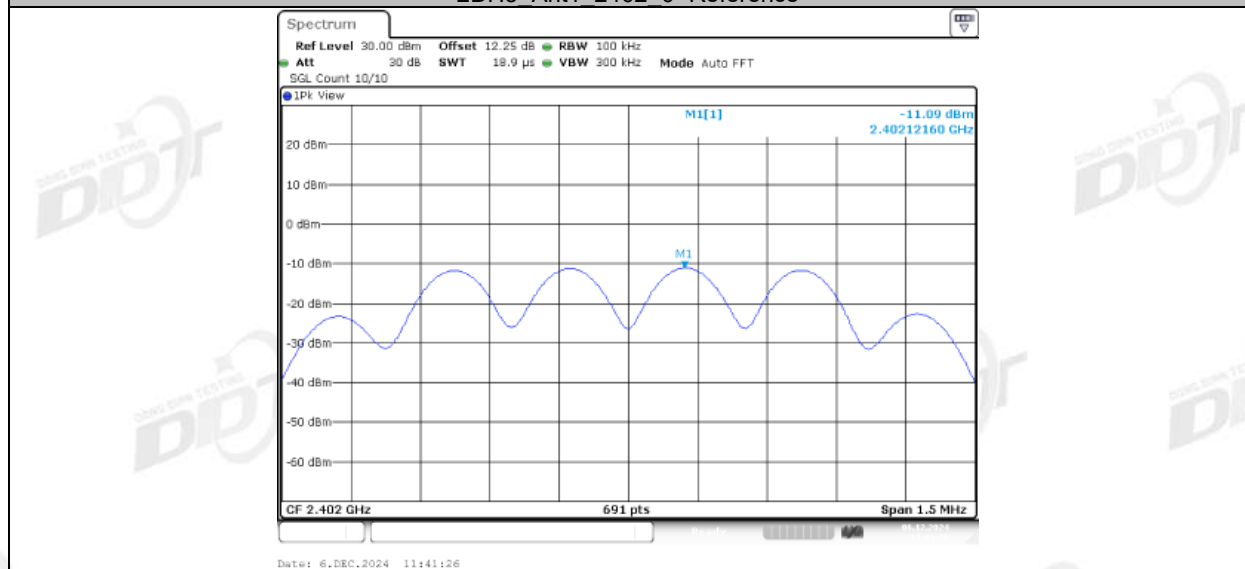
DH5_Ant1_2480_30~1000



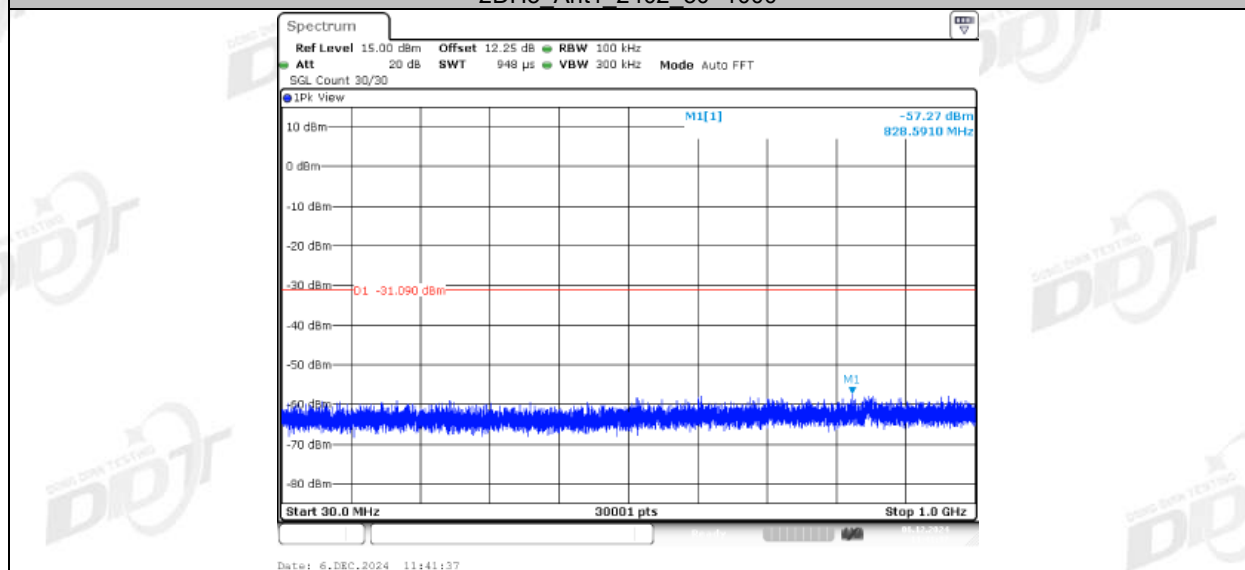
DH5_Ant1_2480_1000~26500



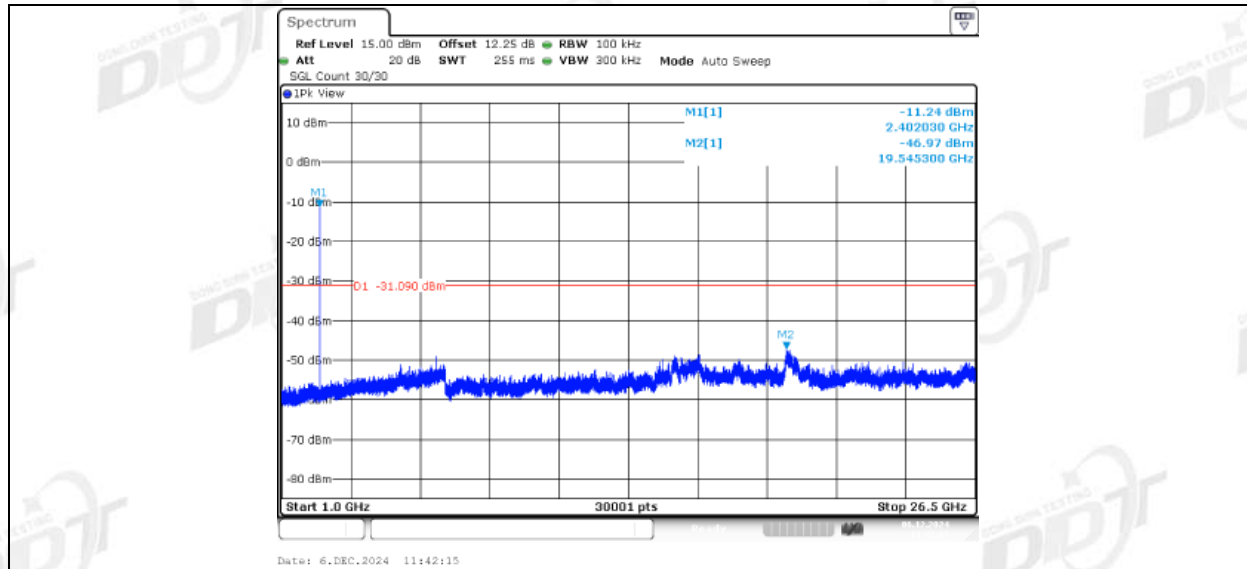
2DH5 Ant1 2402 0~Reference



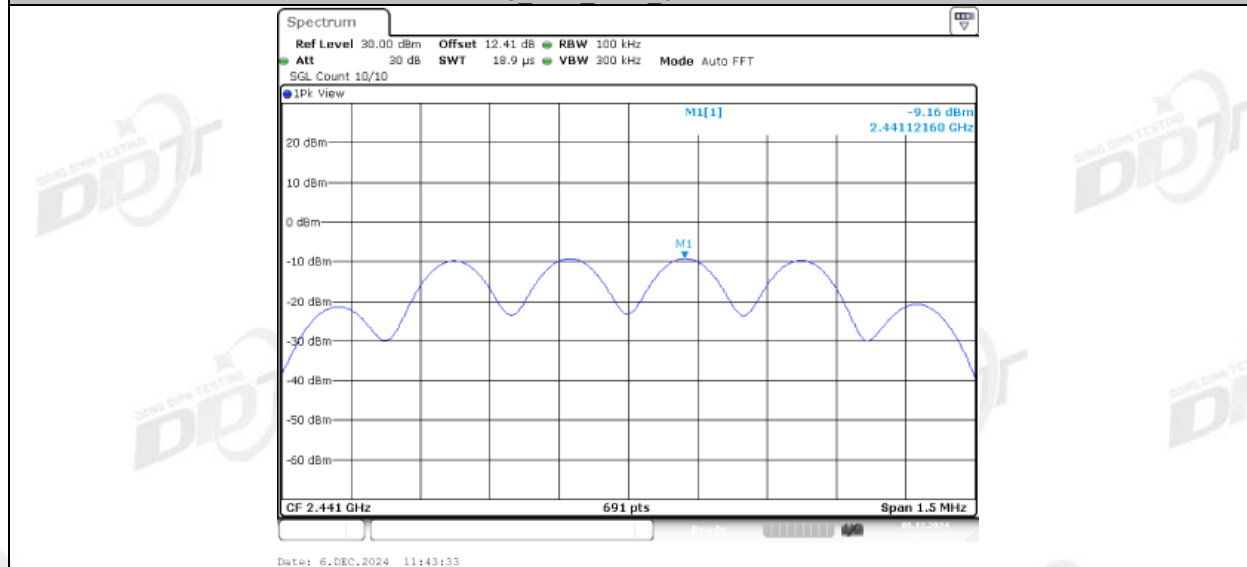
2DH5 Ant1 2402 30~1000



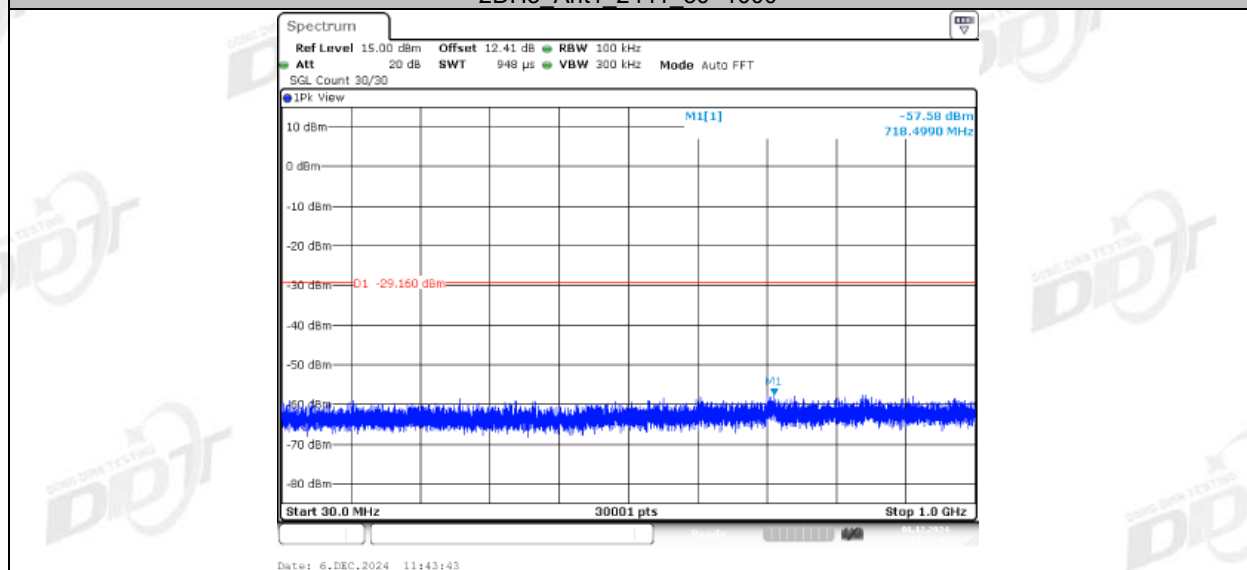
2DH5 Ant1 2402 1000~26500



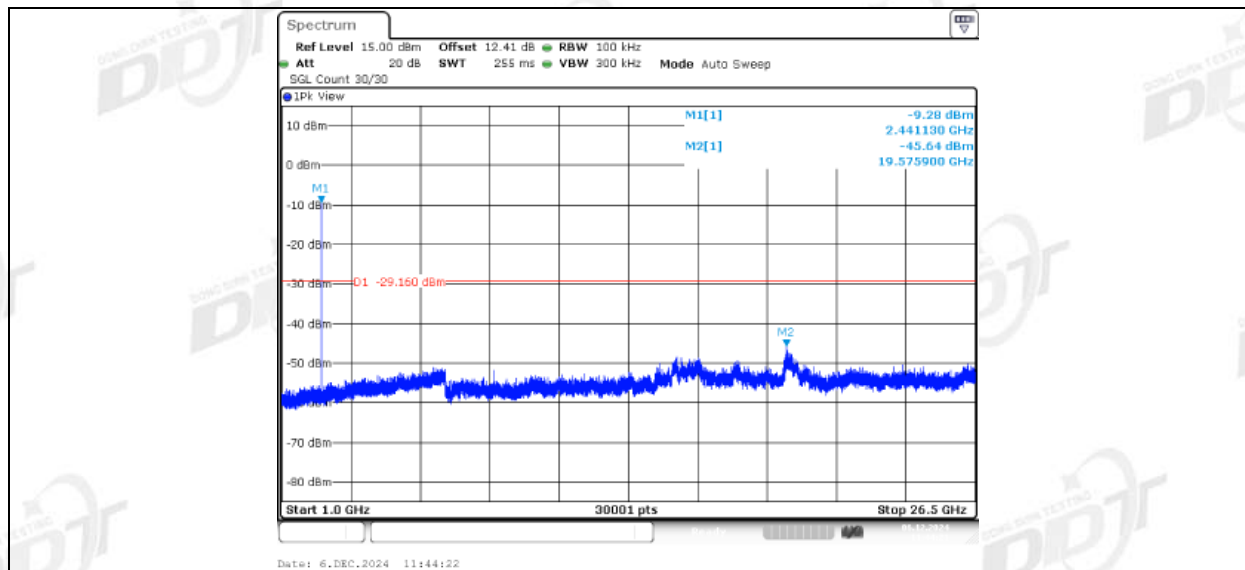
2DH5 Ant1 2441 0~Reference



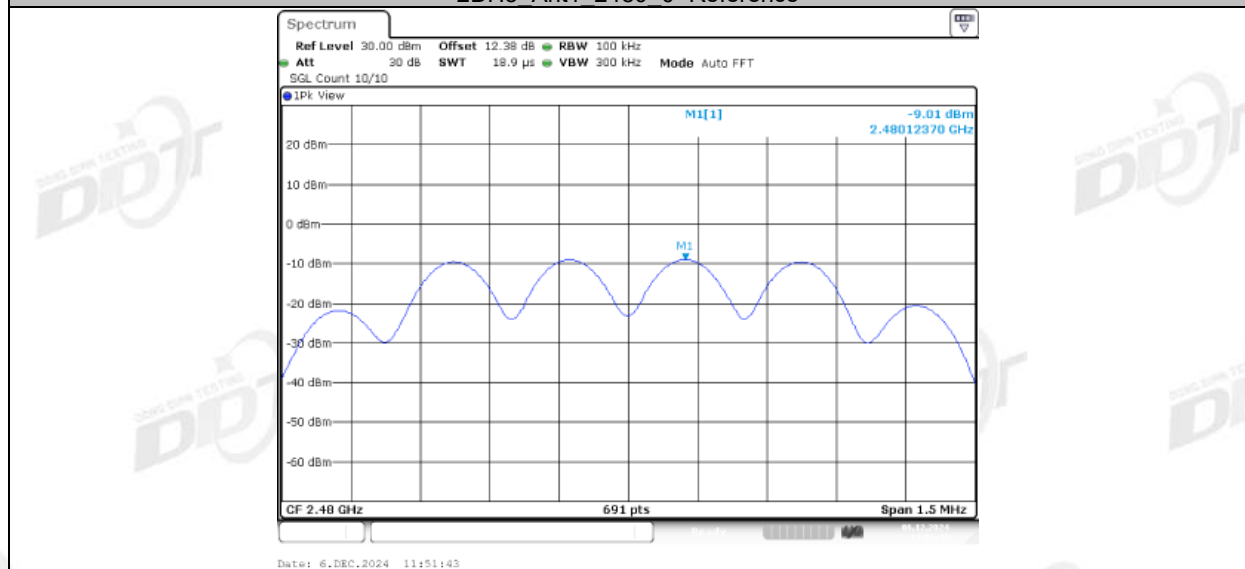
2DH5 Ant1 2441 30~1000



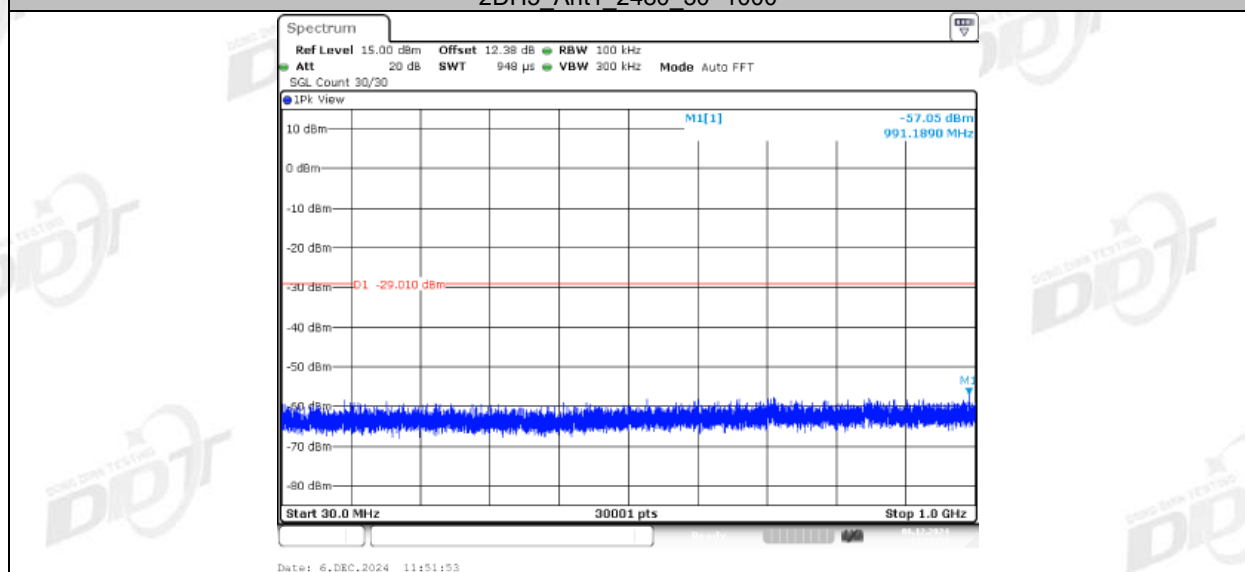
2DH5 Ant1 2441 1000~26500



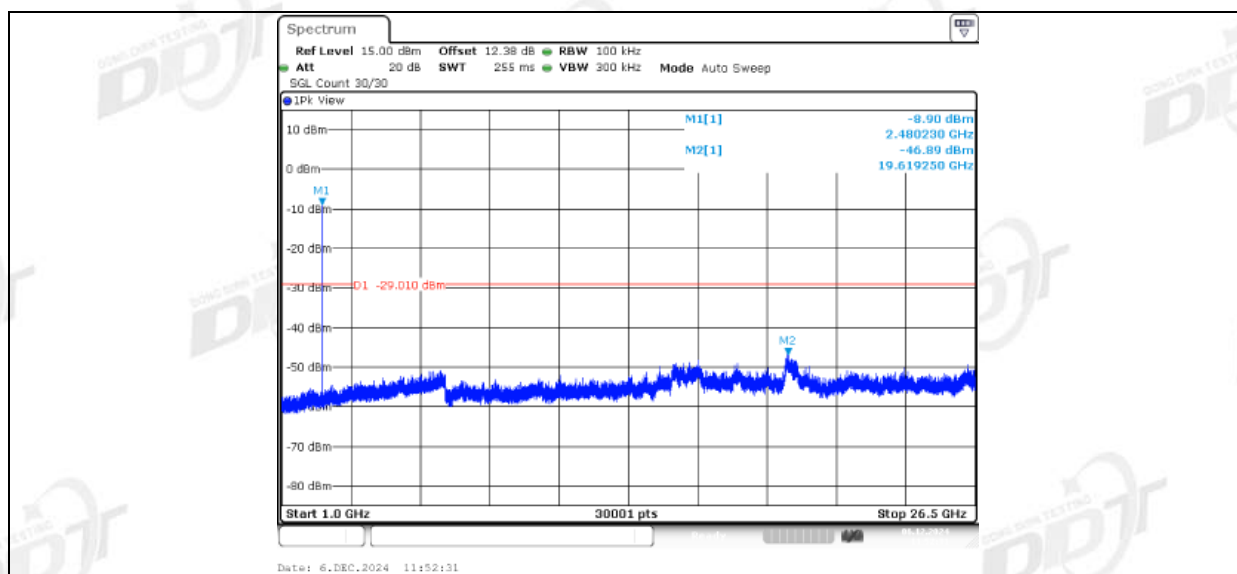
2DH5 Ant1 2480 0~Reference



2DH5 Ant1 2480 30~1000



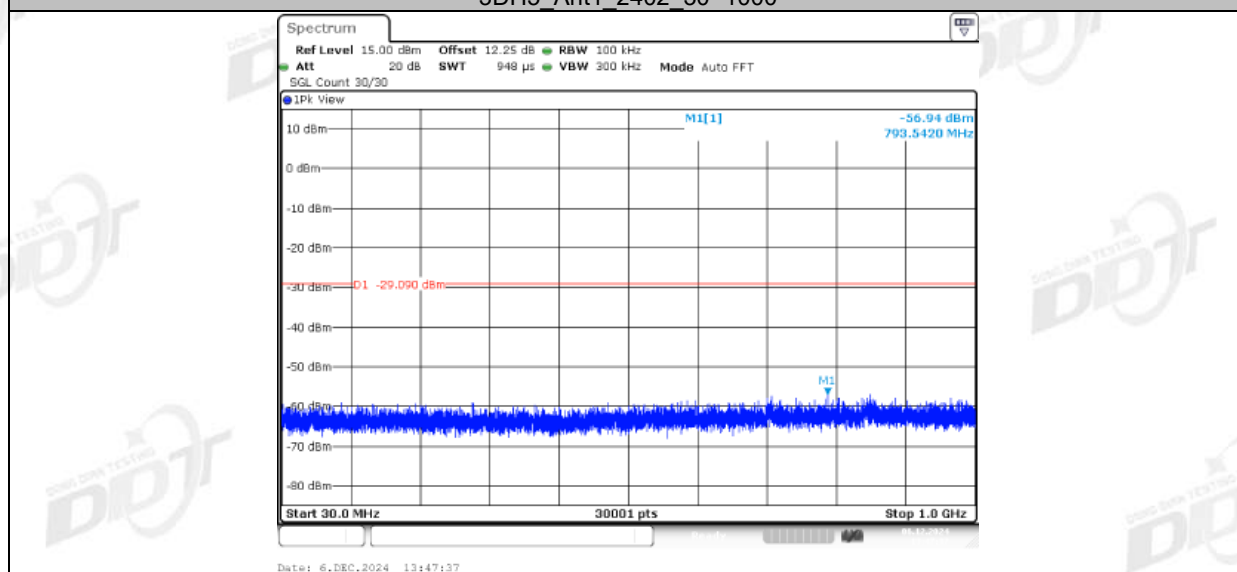
2DH5 Ant1 2480 1000~26500



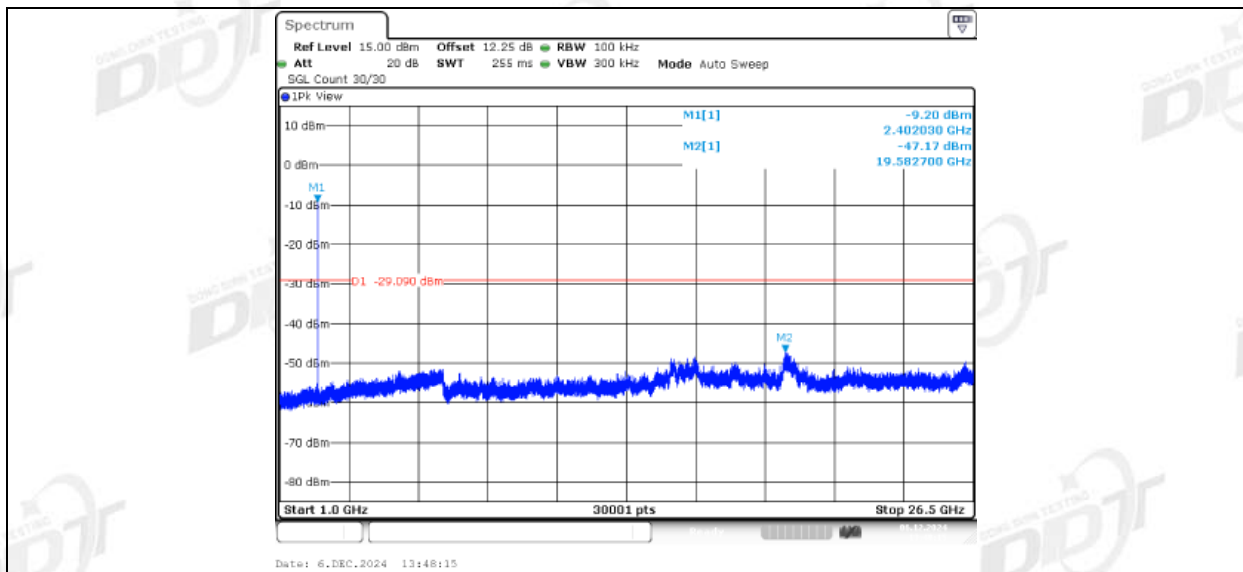
3DH5 Ant1 2402 0~Reference



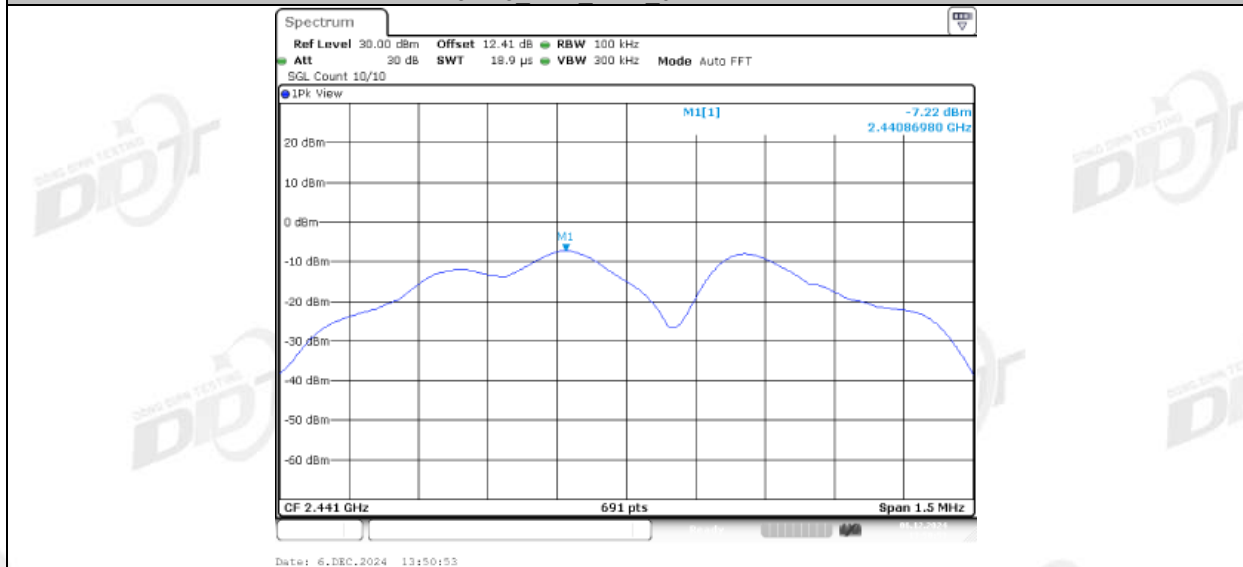
3DH5 Ant1 2402 30~1000



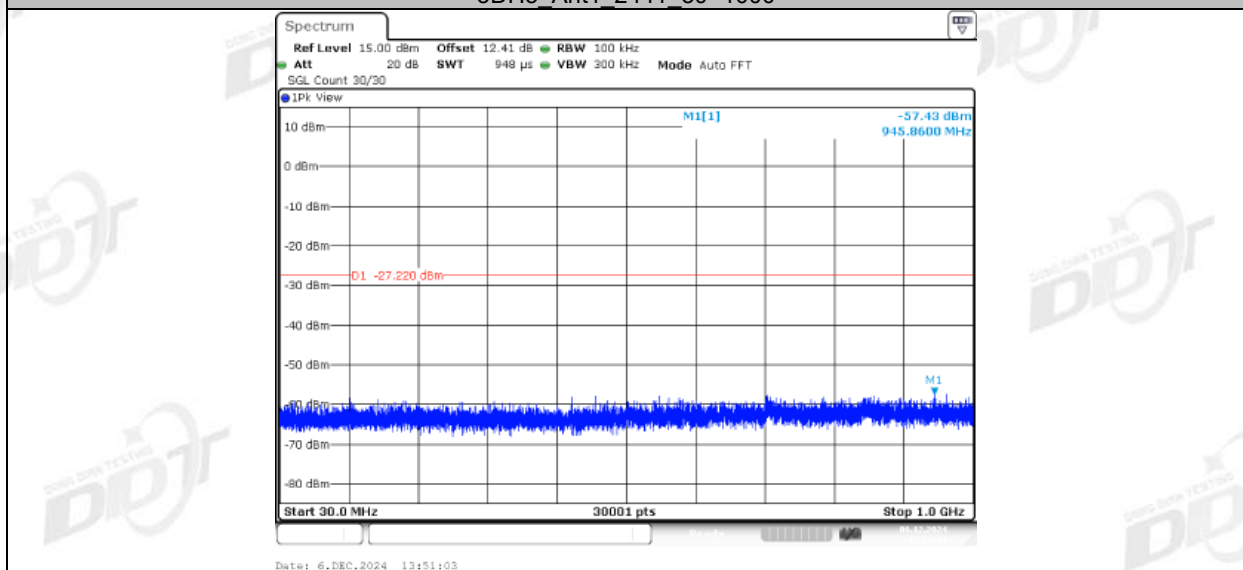
3DH5 Ant1 2402 1000~26500



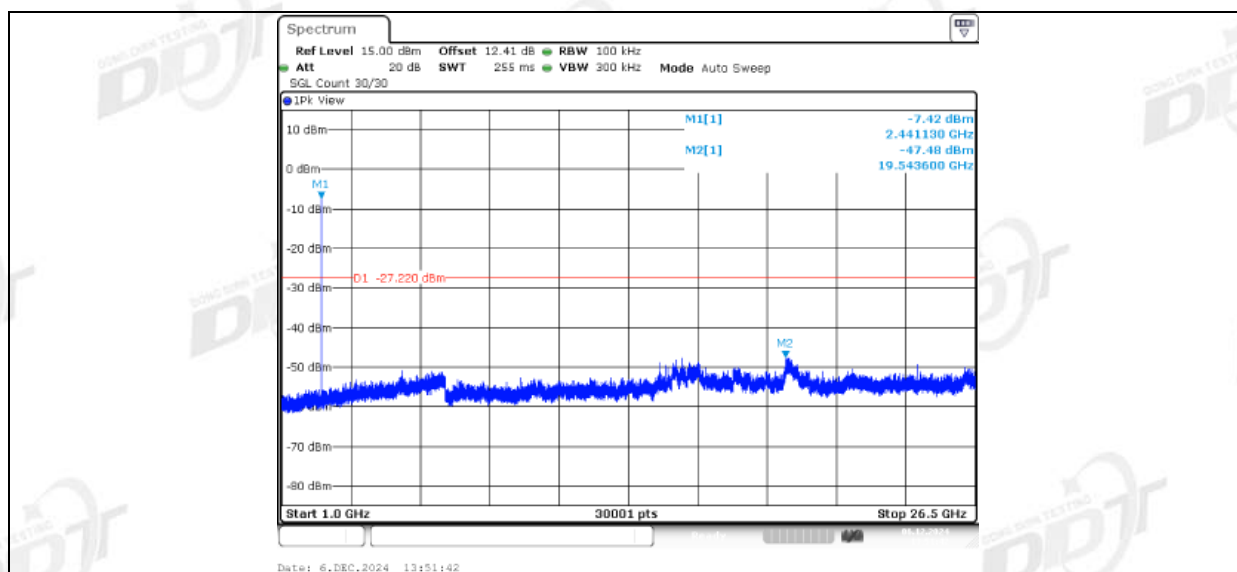
3DH5 Ant1 2441 0~Reference



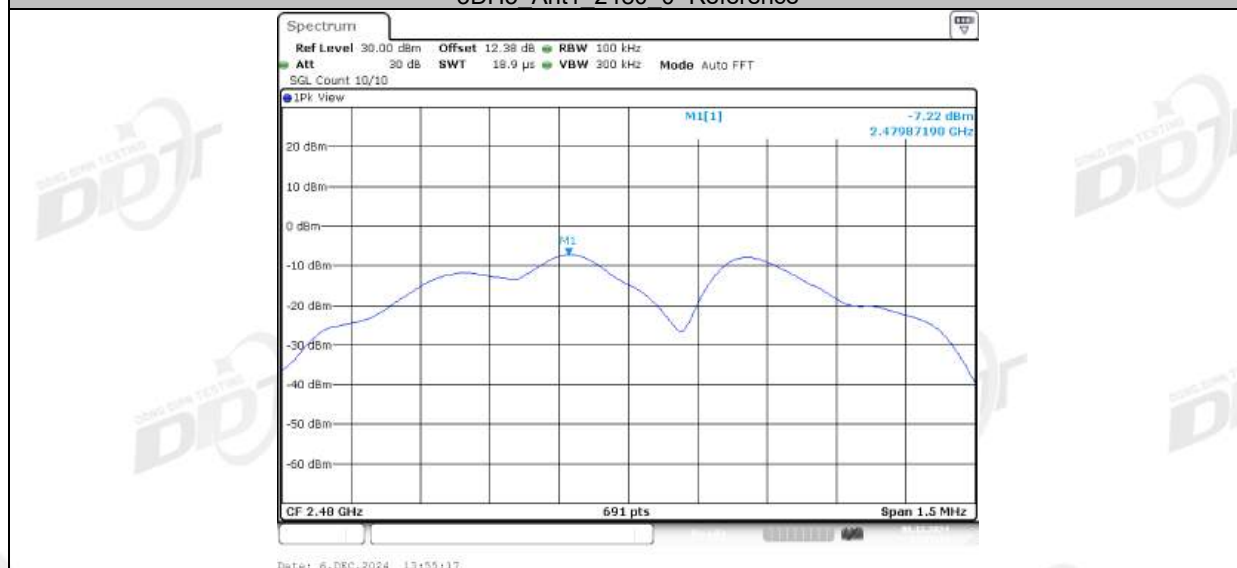
3DH5 Ant1 2441 30~1000



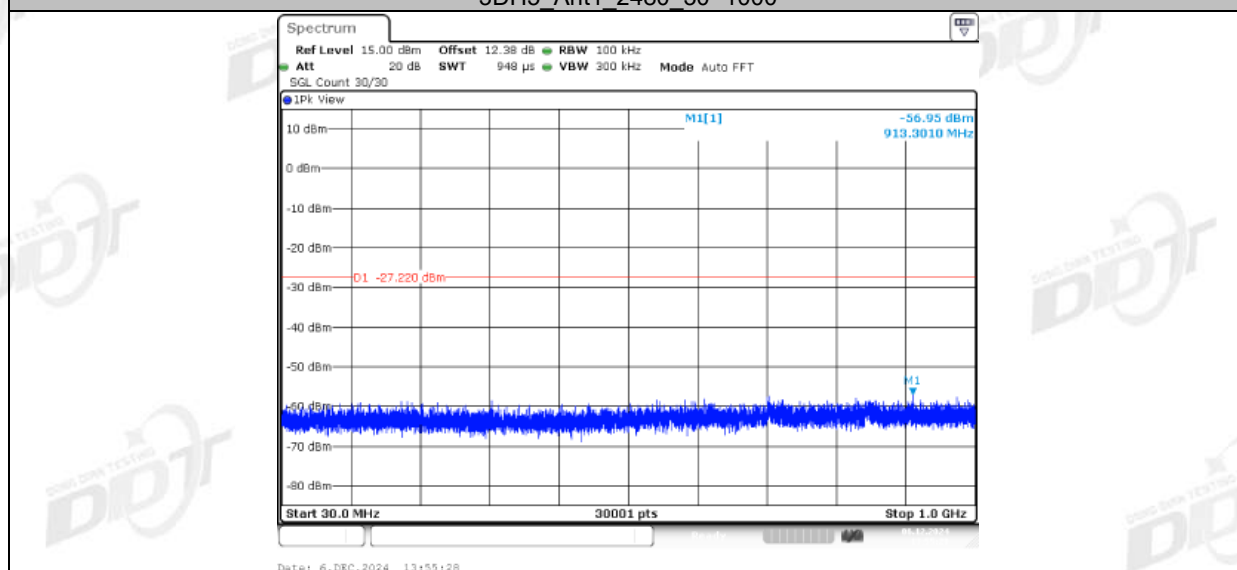
3DH5 Ant1 2441 1000~26500



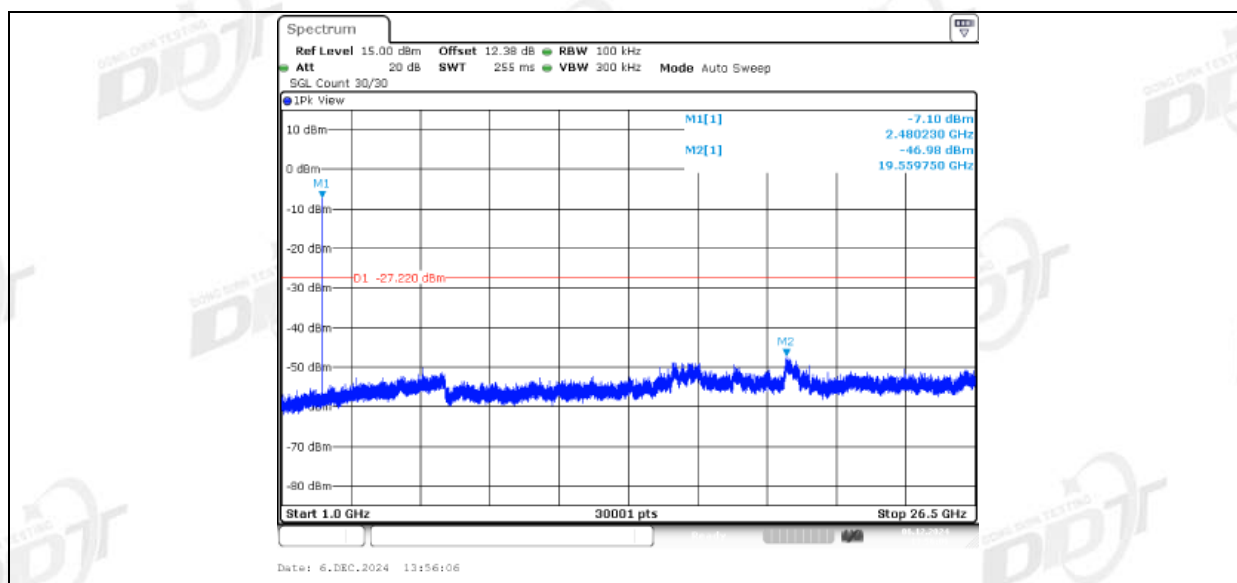
3DH5 Ant1 2480 0~Reference



3DH5 Ant1 2480 30~1000

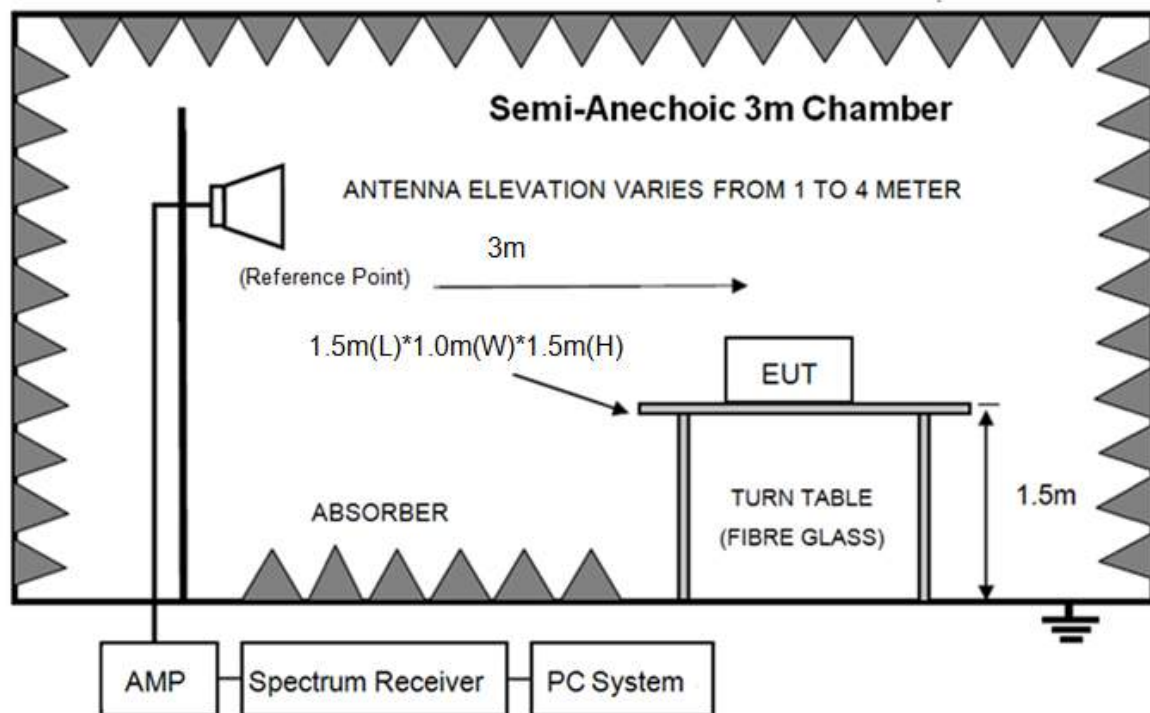


3DH5 Ant1 2480 1000~26500



12. Band Edge Compliance (Radiated Method)

12.1. Block diagram of test setup



12.2. Limit

All restriction band should comply with 15.209, other emission should be at least 20 dB below the fundamental.

12.3. Test Procedure

Same with clause 10.3 except change investigated frequency range from 2310 MHz to 2410 MHz and 2470 MHz to 2500 MHz.

Remark: All restriction band have been tested, and only the worst case is shown in report.

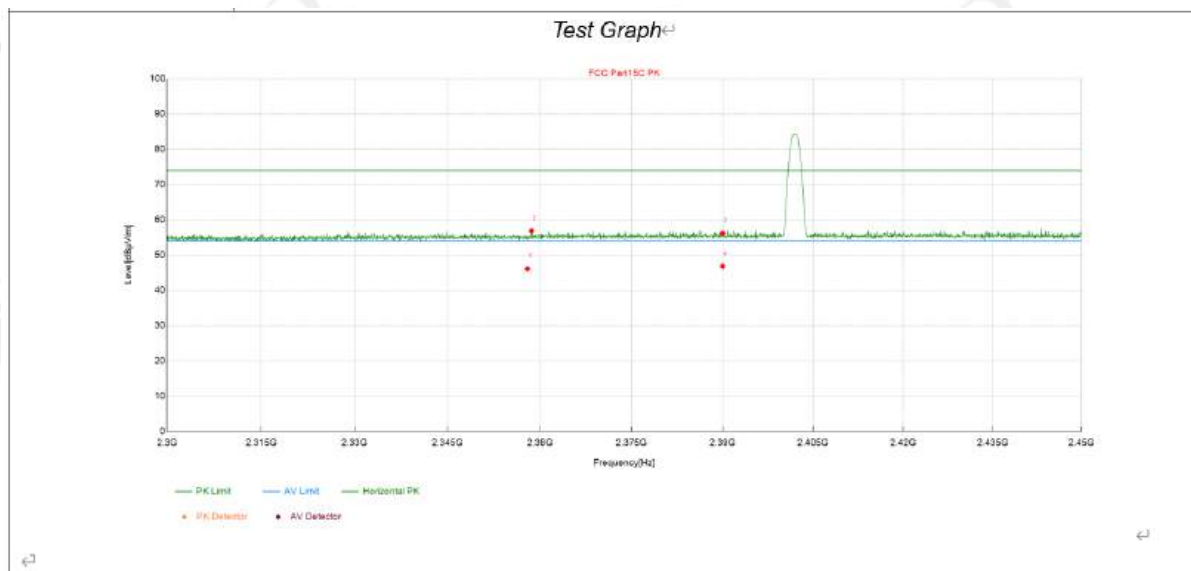
12.4. Test result

Pass. (See below detailed test result)

Remark: hopping on and hopping off mode all have been test, hopping off mode is worse and reported only. Scan with all side, the worst case is right side recorded in this report.

TR-4-E-009 Radiated Emission Test Result

Mode	Test channel	Ant. Pol.
DH5	2402MHz	Horizontal

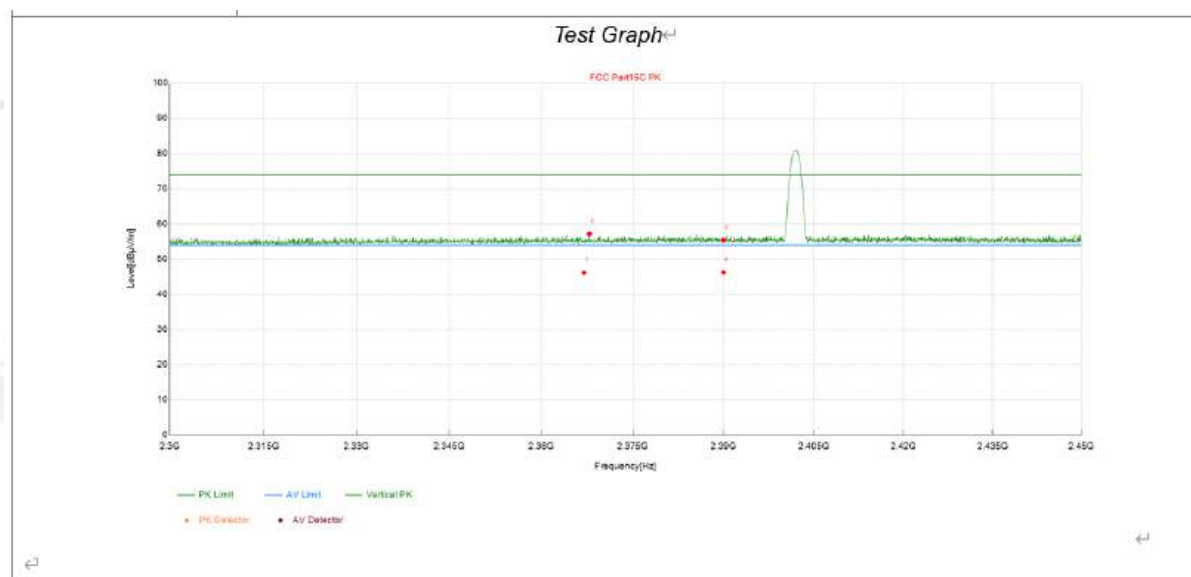


Suspected Data List											
NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	2358.00	46.92	46.11	-0.81	54.00	7.89	100	68	AV	Hori	PASS
2	2358.67	57.64	56.83	-0.81	74.00	17.17	200	211	PK	Hori	PASS
3	2390.00	56.77	56.20	-0.57	74.00	17.80	150	224	PK	Hori	PASS
4	2390.00	47.37	46.80	-0.57	54.00	7.20	100	76	AV	Hori	PASS

Note: 1. Result Level = Read Level + Factor.

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Mode	Test channel	Ant. Pol.
DH5	2402MHz	Vert

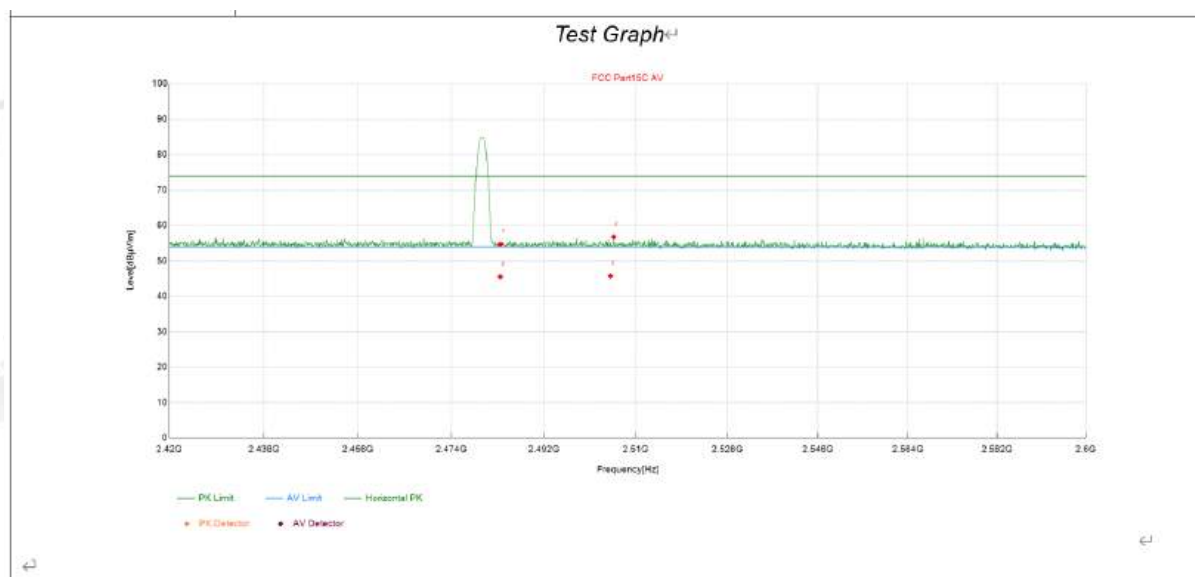


Suspected Data List											
NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	2367.00	46.84	46.10	-0.74	54.00	7.90	100	6	AV	Vert	PASS
2	2367.87	57.89	57.16	-0.73	74.00	16.84	100	145	PK	Vert	PASS
3	2390.00	55.84	55.27	-0.57	74.00	18.73	200	266	PK	Vert	PASS
4	2390.00	46.79	46.22	-0.57	54.00	7.78	150	270	AV	Vert	PASS

Note: 1. Result Level = Read Level + Factor.

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Mode	Test channel	Ant. Pol.
DH5	2480MHz	Horizontal

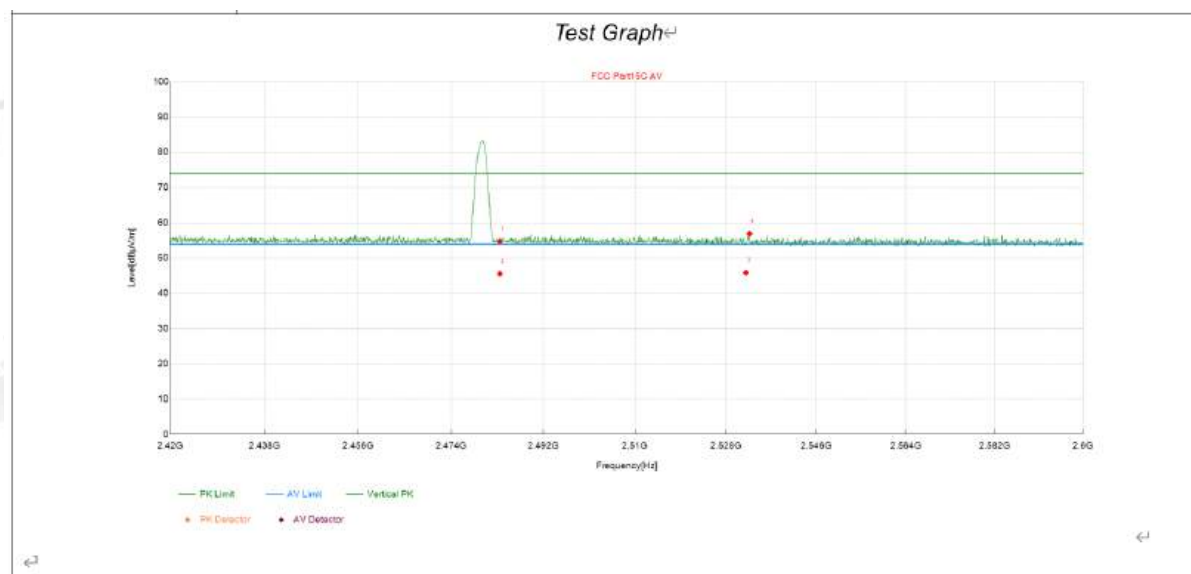


Suspected Data List											
NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	2483.50	55.33	54.68	-0.65	74.00	19.32	200	360	PK	Hori	PASS
2	2483.50	46.14	45.49	-0.65	54.00	8.51	200	0	AV	Hori	PASS
3	2505.00	46.40	45.69	-0.71	54.00	8.31	150	90	AV	Hori	PASS
4	2505.68	57.45	56.74	-0.71	74.00	17.26	100	270	PK	Hori	PASS

Note: 1. Result Level = Read Level + Factor.

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Mode	Test channel	Ant. Pol.
DH5	2480MHz	Vert

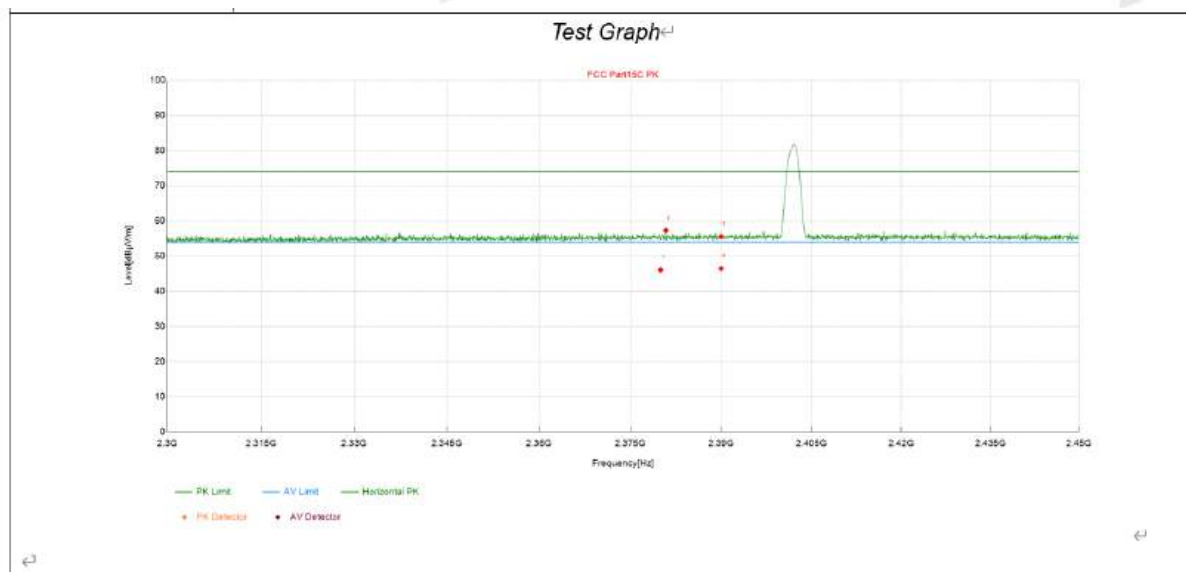


Suspected Data List											
NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	2483.50	55.34	54.69	-0.65	74.00	19.31	150	90	PK	Vert	PASS
2	2483.50	46.19	45.54	-0.65	54.00	8.46	150	0	AV	Vert	PASS
3	2532.00	46.72	45.85	-0.87	54.00	8.15	100	270	AV	Vert	PASS
4	2532.68	57.79	56.91	-0.88	74.00	17.09	100	270	PK	Vert	PASS

Note: 1. Result Level = Read Level + Factor.

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Mode	Test channel	Ant. Pol.
2DH5	2402MHz	Horizontal

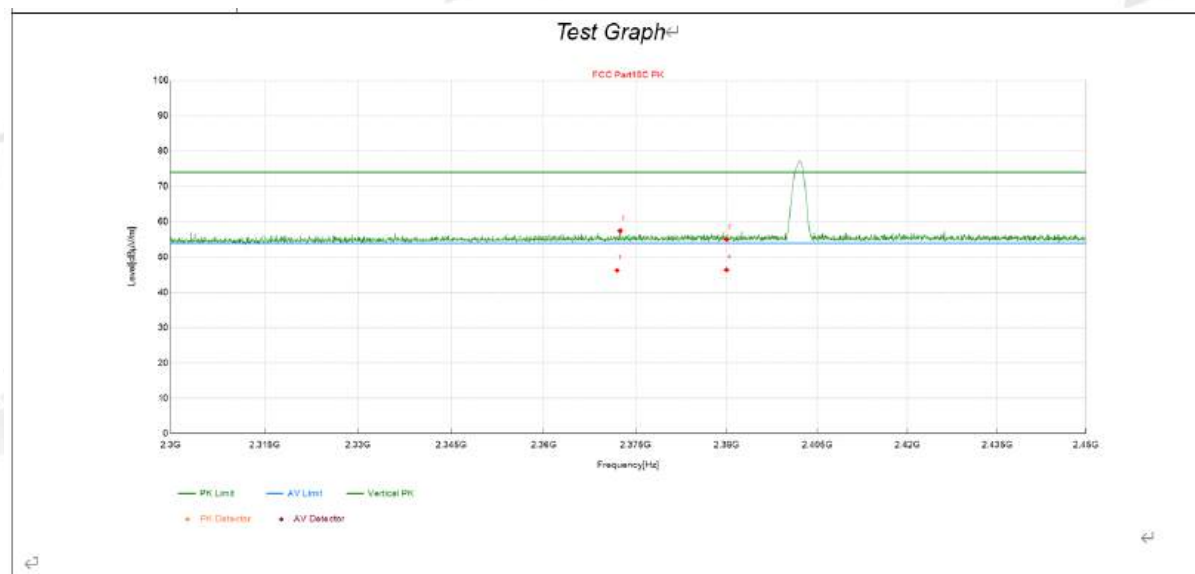


Suspected Data List											
NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	2380.00	46.72	46.08	-0.64	54.00	7.92	100	253	AV	Hori	PASS
2	2380.88	57.93	57.30	-0.63	74.00	16.70	100	86	PK	Hori	PASS
3	2390.00	56.09	55.52	-0.57	74.00	18.48	150	172	PK	Hori	PASS
4	2390.00	47.03	46.46	-0.57	54.00	7.54	100	345	AV	Hori	PASS

Note: 1. Result Level = Read Level + Factor.

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Mode	Test channel	Ant. Pol.
2DH5	2402MHz	Vert

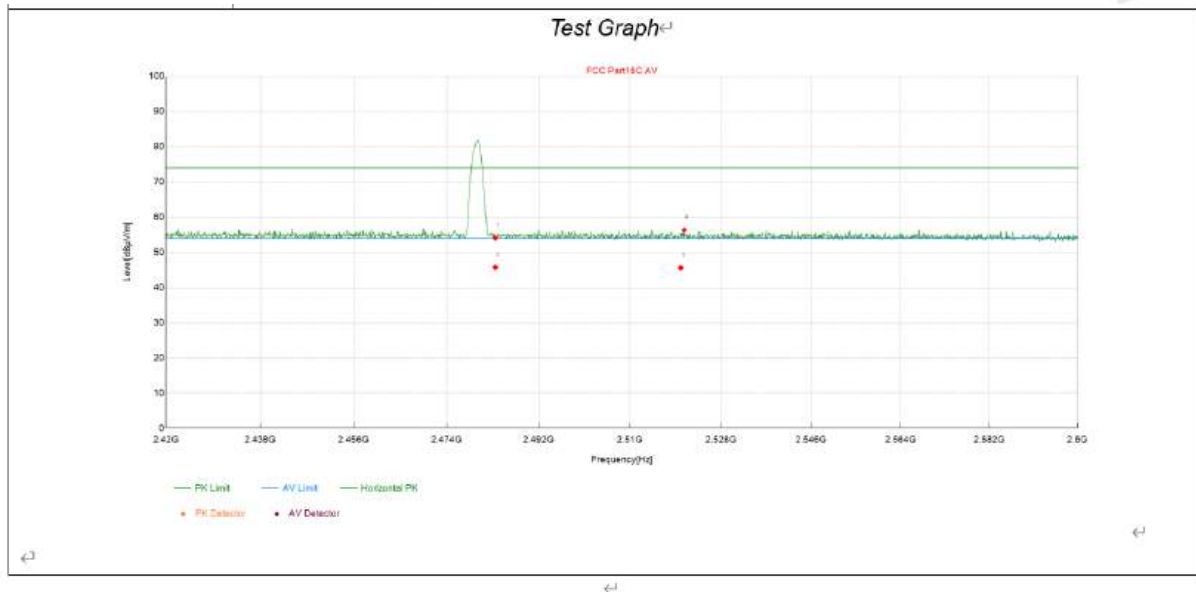


Suspected Data List											
NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	2372.00	46.94	46.23	-0.71	54.00	7.77	150	70	AV	Vert	PASS
2	2372.52	58.11	57.42	-0.69	74.00	16.58	100	272	PK	Vert	PASS
3	2390.00	55.60	55.03	-0.57	74.00	18.97	150	178	PK	Vert	PASS
4	2390.00	46.94	46.37	-0.57	54.00	7.63	150	95	AV	Vert	PASS

Note: 1. Result Level = Read Level + Factor.

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Mode	Test channel	Ant. Pol.
2DH5	2480MHz	Horizontal

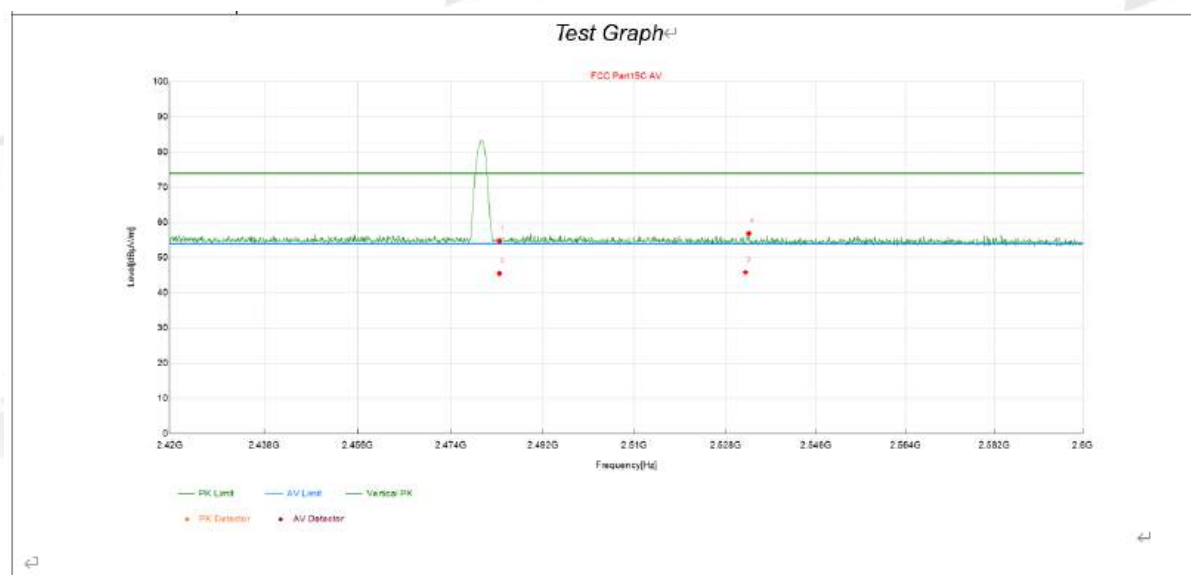


Suspected Data List											
NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	2483.50	54.73	54.08	-0.65	74.00	19.92	200	90	PK	Hori	PASS
2	2483.50	46.37	45.72	-0.65	54.00	8.28	200	180	AV	Hori	PASS
3	2520.00	46.36	45.55	-0.81	54.00	8.45	200	270	AV	Hori	PASS
4	2520.71	57.13	56.32	-0.81	74.00	17.68	200	360	PK	Hori	PASS

Note: 1. Result Level = Read Level + Factor.

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Mode	Test channel	Ant. Pol.
2DH5	2480MHz	Vert

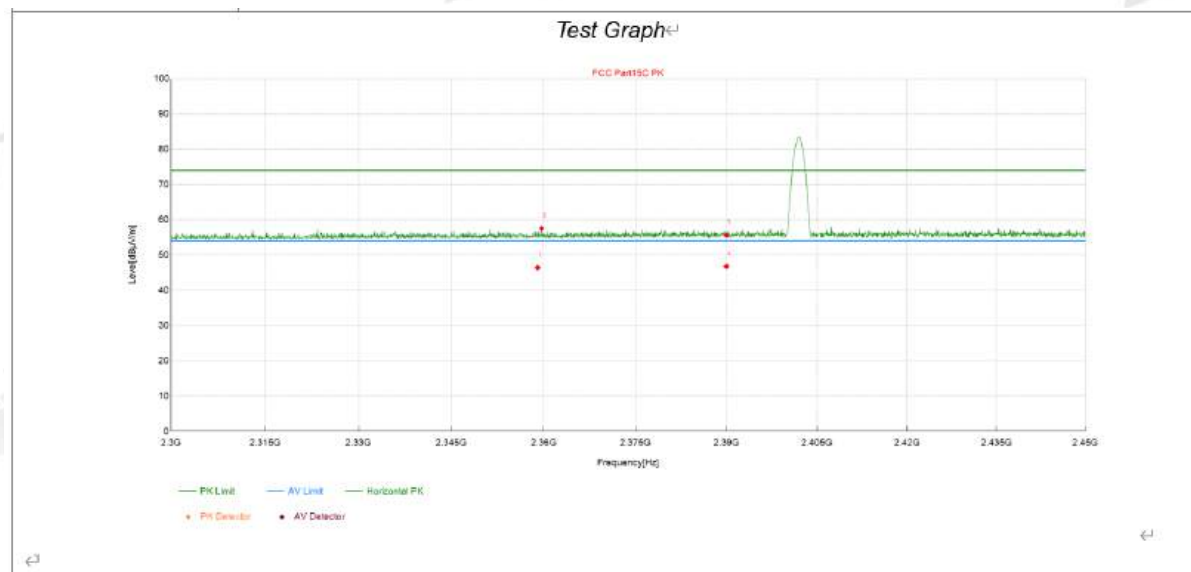


Suspected Data List											
NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	2483.50	55.34	54.69	-0.65	74.00	19.31	150	90	PK	Vert	PASS
2	2483.50	46.19	45.54	-0.65	54.00	8.46	150	0	AV	Vert	PASS
3	2532.00	46.72	45.85	-0.87	54.00	8.15	100	270	AV	Vert	PASS
4	2532.68	57.79	56.91	-0.88	74.00	17.09	100	270	PK	Vert	PASS

Note: 1. Result Level = Read Level + Factor.

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Mode	Test channel	Ant. Pol.
3DH5	2402MHz	Horizontal

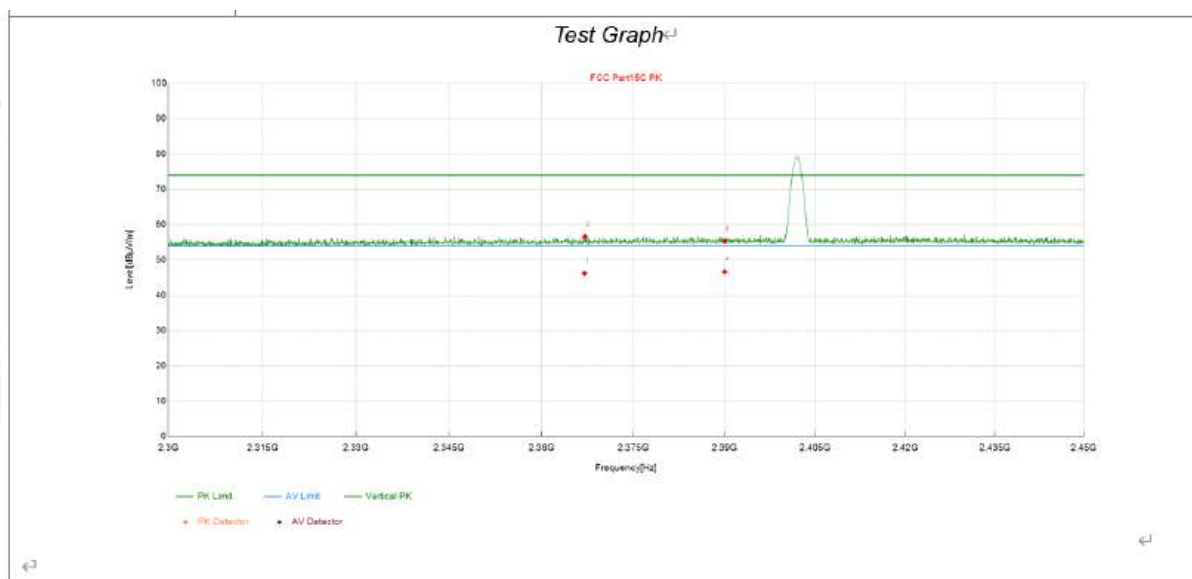


Suspected Data List											
NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	2359.00	47.16	46.35	-0.81	54.00	7.65	100	261	AV	Hori	PASS
2	2359.67	58.33	57.53	-0.80	74.00	16.47	150	360	PK	Hori	PASS
3	2390.00	56.18	55.61	-0.57	74.00	18.39	150	273	PK	Hori	PASS
4	2390.00	47.34	46.77	-0.57	54.00	7.23	150	206	AV	Hori	PASS

Note: 1. Result Level = Read Level + Factor.

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Mode	Test channel	Ant. Pol.
3DH5	2402MHz	Vert

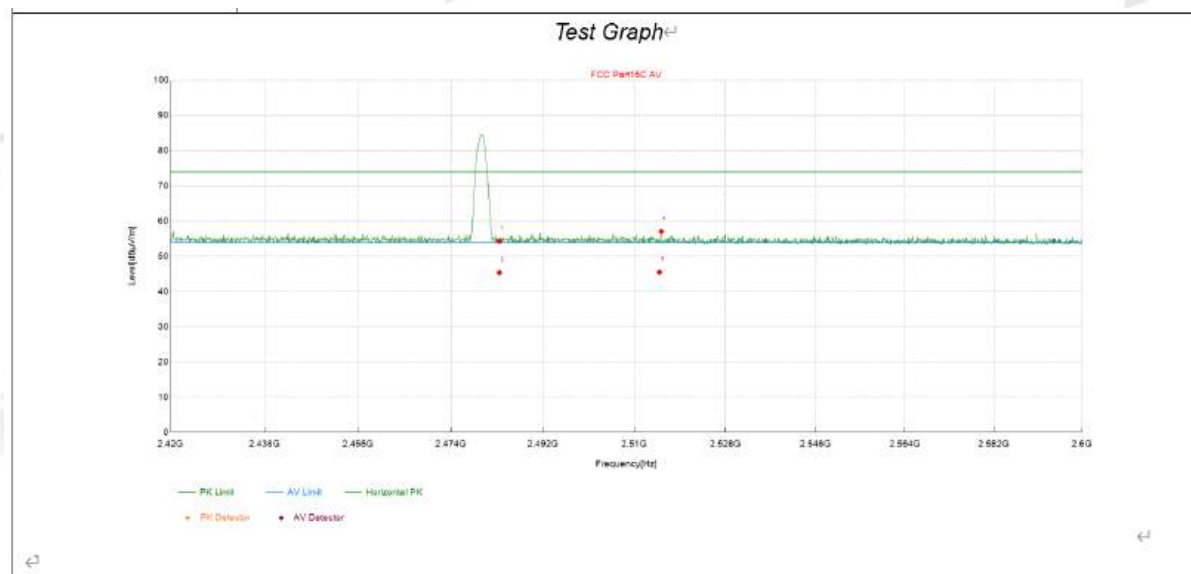


Suspected Data List											
NO.	Frequency [MHz]	Reading [dBμV]	Level [dBμV/m]	Factor [dB/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	2367.00	46.92	46.18	-0.74	54.00	7.82	150	118	AV	Vert	PASS
2	2367.07	57.27	56.53	-0.74	74.00	17.47	100	7	PK	Vert	PASS
3	2390.00	55.88	55.31	-0.57	74.00	18.69	150	25	PK	Vert	PASS
4	2390.00	47.21	46.64	-0.57	54.00	7.36	200	90	AV	Vert	PASS

Note: 1. Result Level = Read Level + Factor.

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Mode	Test channel	Ant. Pol.
3DH5	2480MHz	Horizontal

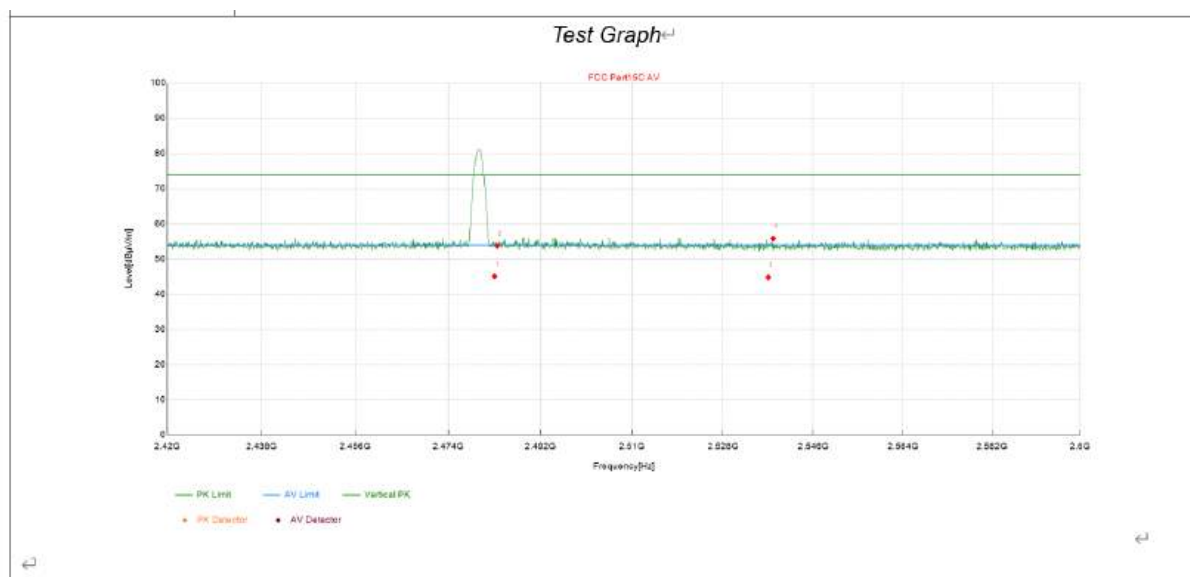


Suspected Data List											
NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Det.	Pol.	Verdict
1	2483.50	54.94	54.29	-0.65	74.00	19.71	150	180	PK	Hori	PASS
2	2483.50	45.99	45.34	-0.65	54.00	8.66	200	90	AV	Hori	PASS
3	2515.00	46.26	45.49	-0.77	54.00	8.51	150	360	AV	Hori	PASS
4	2515.31	57.86	57.09	-0.77	74.00	16.91	150	180	PK	Hori	PASS

Note: 1. Result Level = Read Level + Factor.

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Mode	Test channel	Ant. Pol.
3DH5	2480MHz	Vert



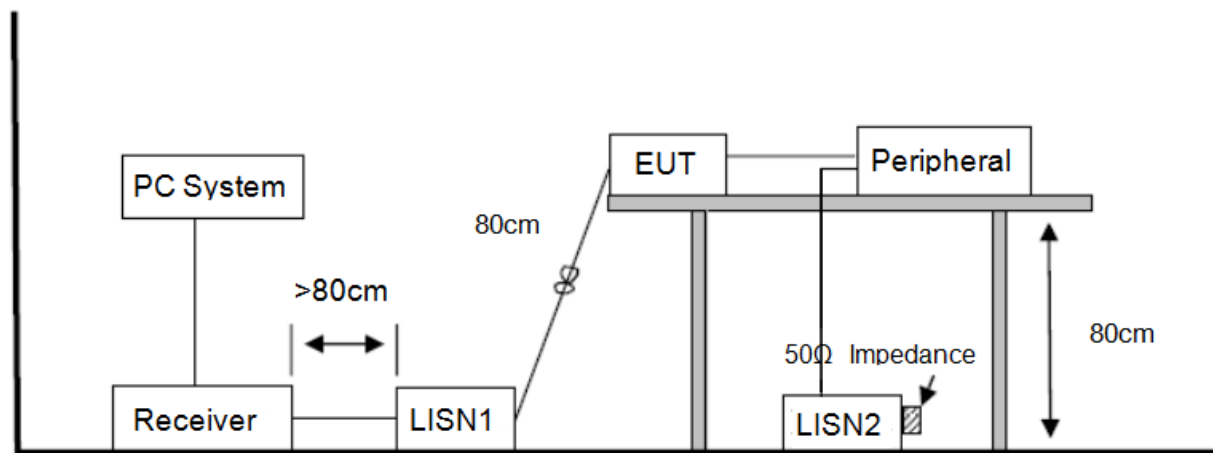
Suspected Data List											
NO.	Frequency [MHz]	Reading [dBuV]	Level [dBuV/m]	Factor [dB/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Det	Pol	Verdict
1	2483.00	45.67	45.03	-0.64	54.00	8.97	200	270	AV	Vert	PASS
2	2483.50	54.35	53.70	-0.65	74.00	20.30	200	270	PK	Vert	PASS
3	2537.00	45.67	44.77	-0.90	54.00	9.23	200	180	AV	Vert	PASS
4	2537.99	56.75	55.84	-0.91	74.00	18.16	200	180	PK	Vert	PASS

Note: 1. Result Level = Read Level + Factor.

2. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

13. Power Line Conducted Emission

13.1. Block diagram of test setup



13.2. Power line conducted emission limits

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150 kHz ~ 500 kHz	66 ~ 56*	56 ~ 46*
500 kHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies.

13.3. Test procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 kHz.

13.4. Test result

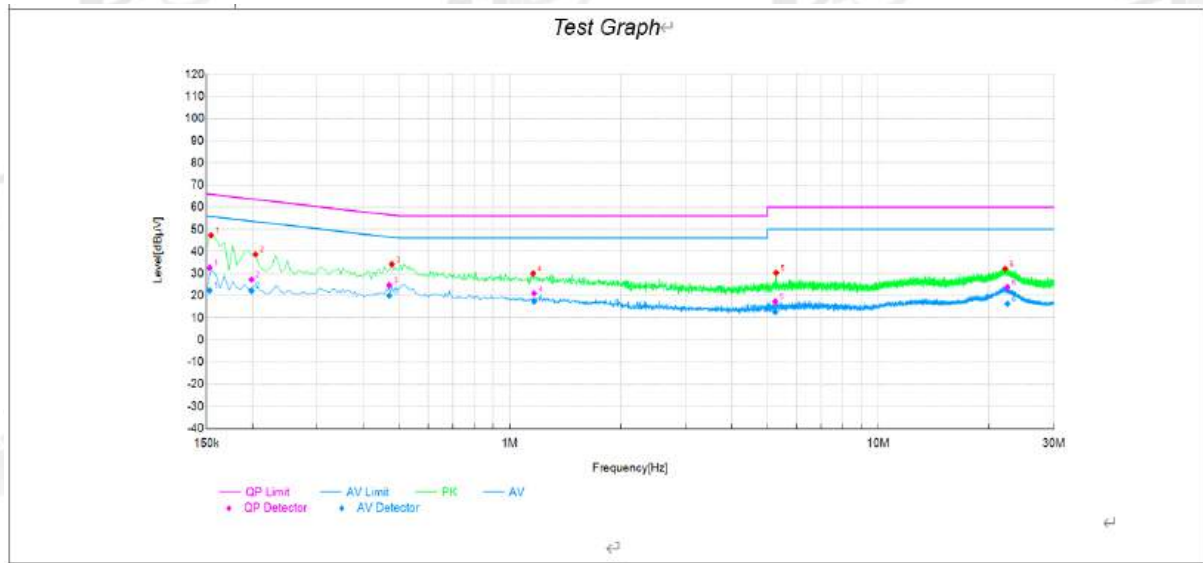
PASS. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: “-----” means Peak detection; “-----” means Average detection.

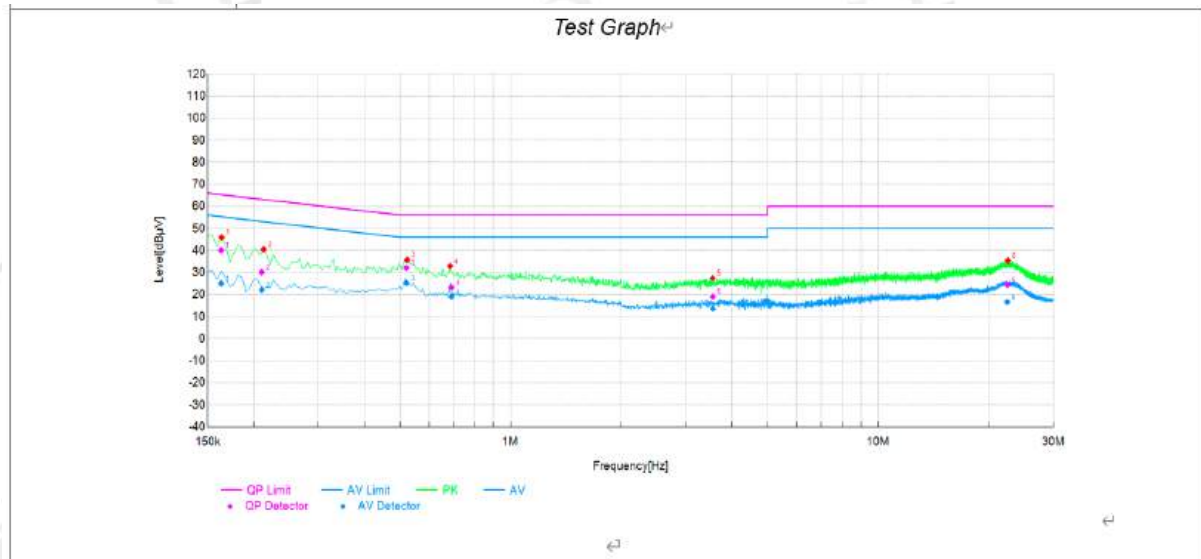
Note3: Pre-test AC conducted emission at both voltage AC 120V/60Hz the final test was only performed with EUT working in GFSK, Tx 2402 MHz mode.

TR-4-E-010 Conducted Emission Test Result



NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBμV]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Phase	Verdict
1	0.1532	19.00	13.63	32.63	65.82	33.19	3.38	22.38	55.82	33.44	L	PASS
2	0.1989	18.99	8.21	27.20	63.66	36.46	3.26	22.25	53.66	31.41	L	PASS
3	0.4709	18.91	5.70	24.61	56.50	31.89	1.14	20.05	46.50	26.45	L	PASS
4	1.1643	18.90	2.10	21.00	56.00	35.00	-1.44	17.46	46.00	28.54	L	PASS
5	5.2566	19.02	-1.64	17.38	60.00	42.62	-6.38	12.64	50.00	37.36	L	PASS
6	22.4184	20.30	3.50	23.80	60.00	36.20	-4.02	16.28	50.00	33.72	L	PASS

Note: Result Level = Read Level + Factor.



NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBuV]	QP Value [dBuV]	QP Limit [dBuV]	QP Margin [dB]	AV Reading [dBuV]	AV Value [dBuV]	AV Limit [dBuV]	AV Margin [dB]	Phase	Verdict
1	0.1631	19.20	20.88	40.08	65.30	25.22	5.87	25.07	55.30	30.23	N	PASS
2	0.2105	19.18	10.98	30.16	63.18	33.02	2.93	22.11	53.18	31.07	N	PASS
3	0.5209	19.10	12.96	32.06	56.00	23.94	6.19	25.29	46.00	20.71	N	PASS
4	0.6911	19.10	4.11	23.21	56.00	32.79	0.07	19.17	46.00	26.83	N	PASS
5	3.5557	19.16	-0.10	19.06	56.00	36.94	-5.57	13.59	46.00	32.41	N	PASS
6	22.4843	20.70	3.78	24.48	60.00	35.52	-4.08	16.62	50.00	33.38	N	PASS

Note: Result Level = Read Level + Factor.

14. Antenna Requirements

14.1. Limit

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

14.2. Result

The antennas used for this product are integrated antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only -2.55 dBi.

15. Test Setup Photograph

Please refer to the appendix file

16. Photos of the EUT

Please refer to the appendix file

END OF REPORT