FCC - TEST REPORT

Report Number	:	**68.950.23.0959.01**	Date of Issue:	**2023-12-12**
Model	:	**TA2C-CS8**		
Product Type	:	TABLET PC		
Applicant	:	ODS Corporation		
Address	:	2-5 Kanda suda cho, Chiyoda ku, Tokyo 101-0041, Japan		
Manufacturer	:	ODS Corporation		
Address	:	2-5 Kanda suda cho, Chiyoda ku, Tokyo 101-0041, Japan		
Test Result	:	■ **Positive** ☐ **Negative**		
Total pages including Appendices	:	**61**		

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2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District Shenzhen 518052 P.R. China
Telephone:	86 755 8828 6998
Fax:	86 755 828 5299
FCC Registration No.:	514049
FCC Designation Number:	CN5009

3 Description of the Equipment Under Test

Product:	TABLET PC
Model no.:	TA2C-CS8
FCC ID:	2BDQY-TA2C-CS8
Options and accessories:	Adapter Model: ICP30A-050-3000 Input: 100-240VAC 50/60Hz, 0.8A Output: 5VDC, 3A Manufacturer: Shenzhen Shi Ying Yuan Electronics Co., Ltd.
Rating:	3.8VDC, 6000mAh, (Supplied by Rechargeable Li-ion Battery) or 5VDC (Supplied by external adapter for Charging rechargeable battery)
RF Transmission Frequency:	2402MHz-2480MHz
No. of Operated Channel:	79
Modulation:	GFSK, π/4-DQPSK, 8DPSK
Antenna Type:	Internal antenna
Antenna Gain:	4.7dBi
Description of the EUT:	EUT is a TABLET PC with Bluetooth Low Energy/Bluetooth BDR+EDR, 2.4GHz Wi-Fi and 5GHz Wi-Fi functions Only Bluetooth BR+EDR included in this report.

NOTE 1: The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2021 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to KDB 558074 D01 15.247 Meas Guidance v05r02 Measurement Guidance and ANSI C63.10-2020.

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5 Summary of Test Results

Technical Requirements			
FCC Part 15 Subpart C			
Test Condition		Test Site	Test Result
§15.207	Conducted emission AC power port	Site 1	Pass
§15.247(b)(1)	Conducted peak output power	Site 1	Pass
§15.247(a)(1)	20dB bandwidth and 99% occupied bandwidth	Site 1	Pass
§15.247(a)(1)	Carrier channel frequency separation	Site 1	Pass
§15.247(a)(1)(iii)	Number of hopping frequencies	Site 1	Pass
§15.247(a)(1)(iii)	Dwell Time - Average Time of Occupancy	Site 1	Pass
§15.247(d)	Spurious RF conducted emissions	Site 1	Pass
§15.247(d)	Band edge	Site 1	Pass
§15.247(d) & §15.209 & §15.205	Spurious radiated emissions for transmitter	Site 1	Pass
§15.203	Antenna requirement	See note 2	Pass

Note 1: N/A=Not Applicable.
Note 2: The EUT use an Internal antenna, which gain is 4.7dBi. In accordance to §15.203, it is considered sufficiently to comply with the provisions of this section.

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6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2BDQY-TA2C-CS8, complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C rules.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

☐ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Sample Received Date:	2023-11-17
Testing Start Date:	2023-11-17
Testing End Date:	2023-12-05

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch

Reviewed by:	Prepared by:	Tested by:
John Zhi	Joe Gu	Carry Cai
Section Manager	Project Engineer	Test Engineer

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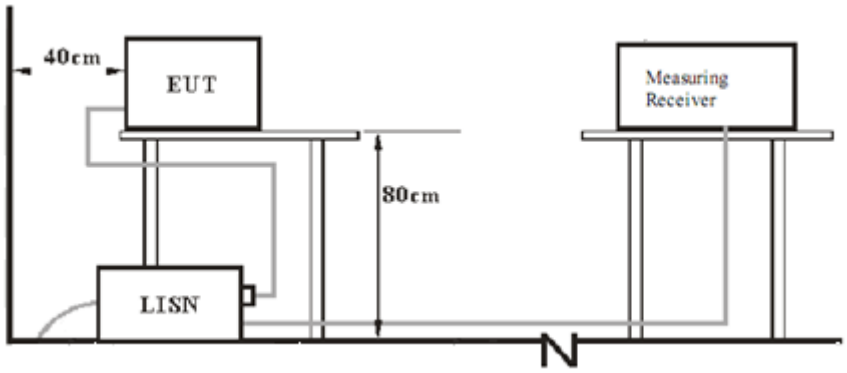
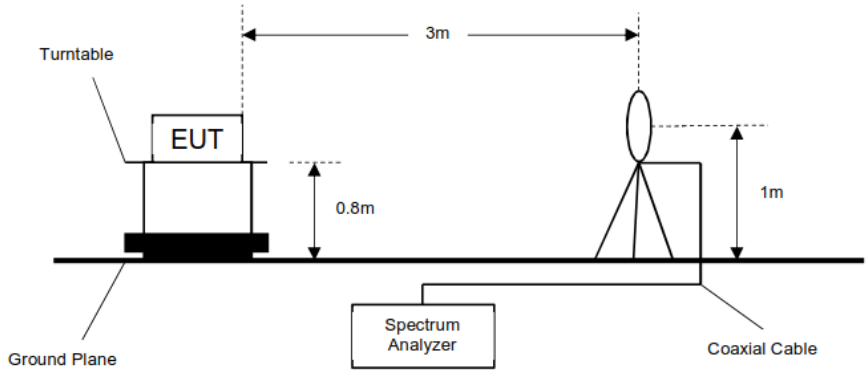
7 Test Setups

7.1 AC Power Line Conducted Emission test setups

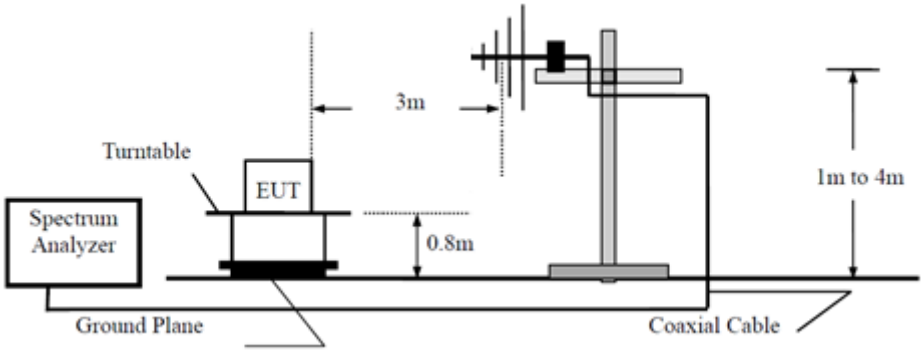


7.2 Radiated test setups

9KHz - 30MHz



30MHz - 1GHz



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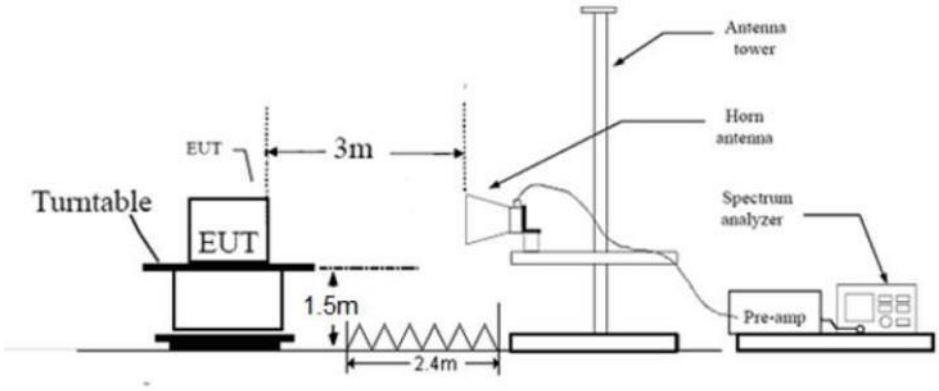
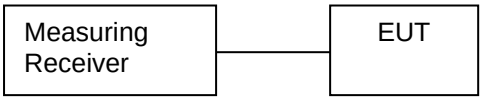
Above 1GHz



7.3 Conducted RF test setups



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8 Systems Test Configuration

Auxiliary Equipment Used during Test:

Description	Manufacturer	Model NO.	S/N
Notebook	LENOVO	X220	429044C

The system was configured to hopping mode and non-hopping mode.

Hopping mode: typical working mode (normal hopping status)

Non-hopping mode: The system was configured to operate at a signal channel transmitting. The test software allows the configuration and operation at the worst-case duty and the highest transmit power.

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9 Technical Requirement

9.1 Conducted Emission

Test Method

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. Both sides of AC line were checked for maximum conducted interference.
6. The frequency range from 150 kHz to 30 MHz was searched.
7. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

Limit

According to §15.207, Conducted Emission limit as below:

Frequency MHz	QP Limit dBµV	AV Limit dBµV
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

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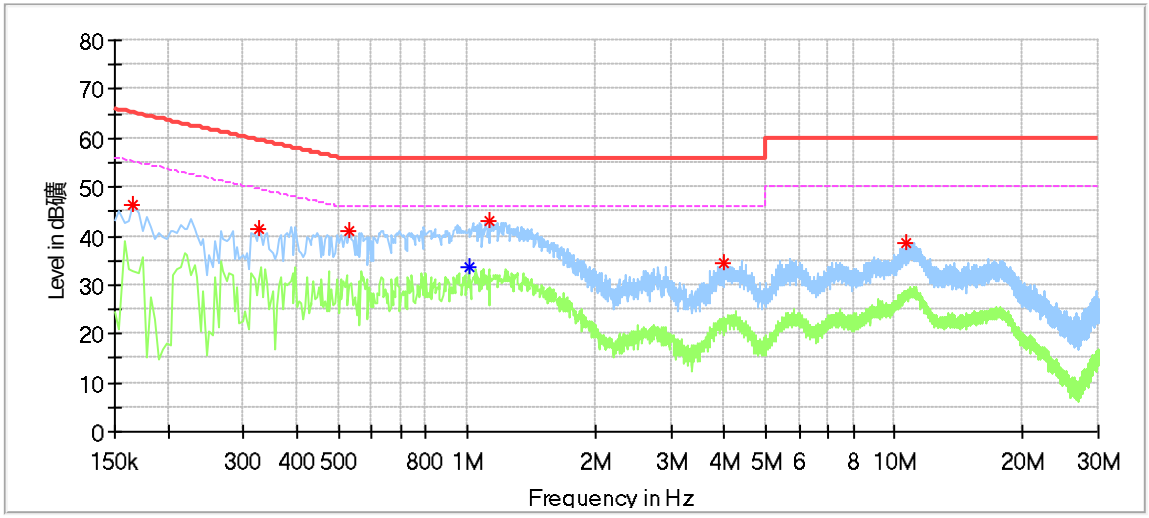
Conducted Emission

Product Type	:	TABLET PC
M/N	:	TA2C-CS8
Operating Condition	:	Transmit mode
Test Specification	:	Line
Comment	:	AC 120V/60Hz(External adapter)



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.166000	46.27	---	65.16	18.89	L1	9.54
0.326000	41.58	---	59.55	17.97	L1	9.57
0.530000	41.00	---	56.00	15.00	L1	9.59
1.010000	---	33.61	46.00	12.39	L1	9.60
1.126000	42.91	---	56.00	13.09	L1	9.60
4.006000	34.58	---	56.00	21.42	L1	9.70
10.594000	38.63	---	60.00	21.37	L1	9.96

Remark:
Level=Reading Level + Correction Factor
Correction Factor=Cable Loss + LISN Factor
(The Reading Level is recorded by software which is not shown in the sheet)

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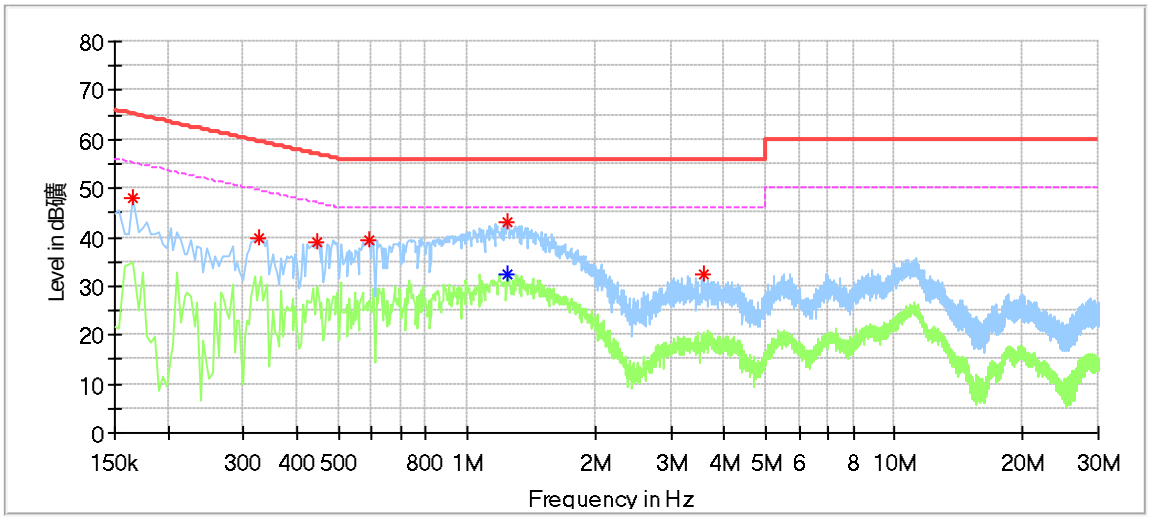
Conducted Emission

Product Type	:	TABLET PC
M/N	:	TA2C-CS8
Operating Condition	:	Transmit mode
Test Specification	:	Neutral
Comment	:	AC 120V/60Hz(External adapter)



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.166000	48.03	---	65.16	17.13	N	9.57
0.326000	39.63	---	59.55	19.93	N	9.60
0.446000	38.97	---	56.95	17.98	N	9.61
0.590000	39.38	---	56.00	16.62	N	9.63
1.246000	---	32.55	46.00	13.45	N	9.63
1.250000	43.05	---	56.00	12.95	N	9.63
3.586000	32.27	---	56.00	23.73	N	9.71

Remark:
Level=Reading Level + Correction Factor
Correction Factor=Cable Loss + LISN Factor
(The Reading Level is recorded by software which is not shown in the sheet)

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9.2 Conducted Peak Output Power

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Use the following test receiver settings:
   Span = approximately 5 times the 20dB bandwidth, centered on a hopping channel
   RBW > the 20dB bandwidth of the emission being measured, VBW≥RBW,
   Sweep = auto, Detector function = peak, Trace = max hold
4. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power and record the results in the test report.
5. Repeat above procedures until all frequencies measured were complete.

Limits

According to §15.247 (b) (1), conducted peak output power limit as below:

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤1	≤30

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Conducted Peak Output Power

Bluetooth Mode GFSK modulation Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2402MHz	7.98	Pass
Middle channel 2441MHz	8.08	Pass
High channel 2480MHz	7.65	Pass

Bluetooth Mode π/4-DQPSK modulation Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2402MHz	9.52	Pass
Middle channel 2441MHz	9.90	Pass
High channel 2480MHz	9.70	Pass

Bluetooth Mode 8DPSK modulation Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2402MHz	9.96	Pass
Middle channel 2441MHz	10.32	Pass
High channel 2480MHz	10.10	Pass

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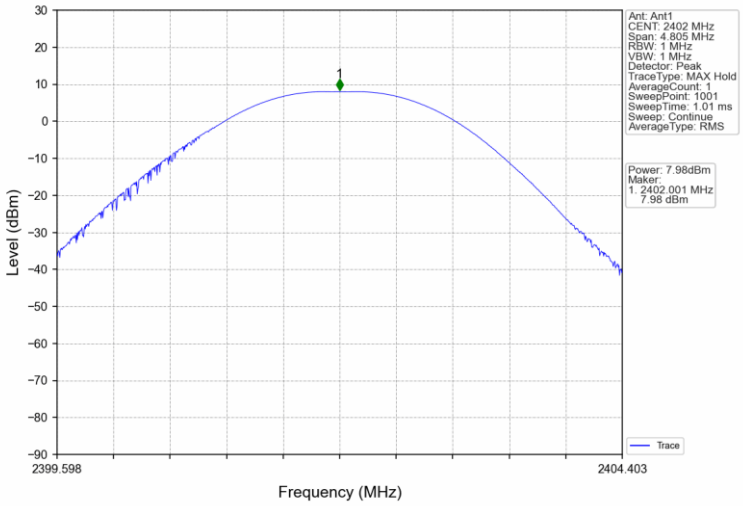
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



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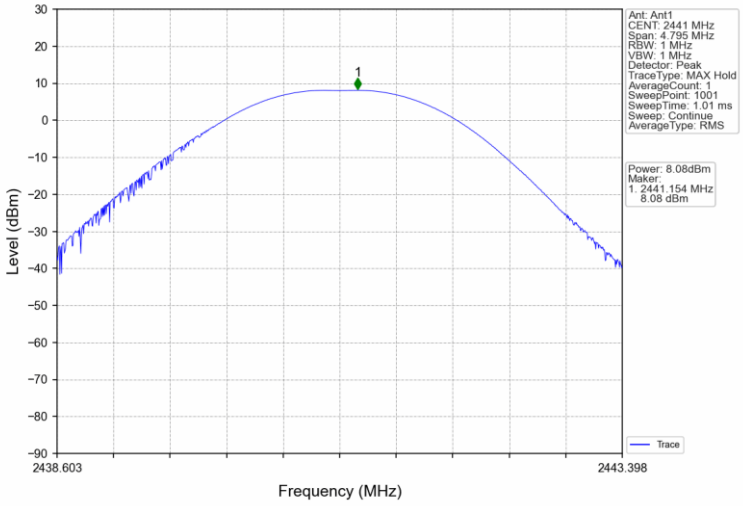

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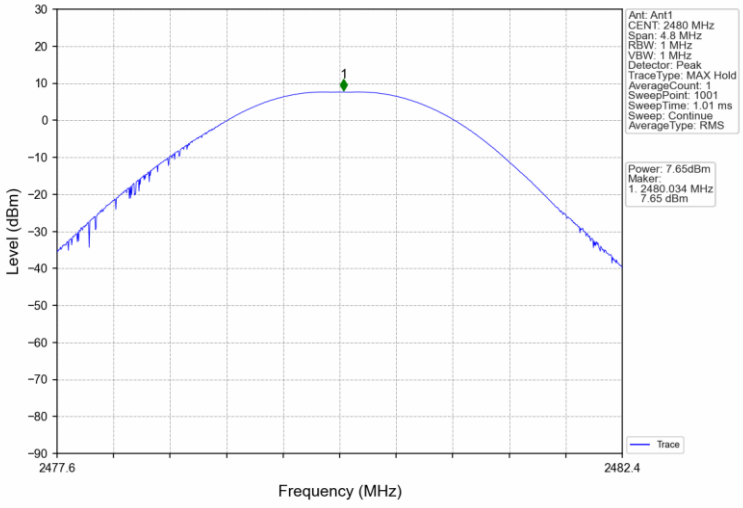

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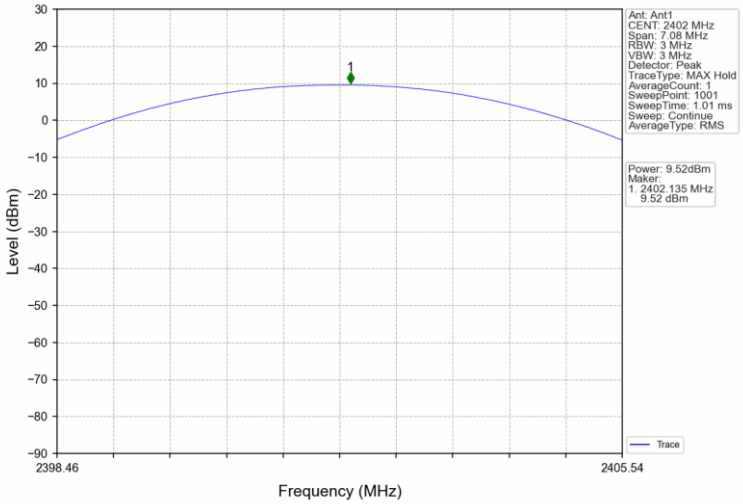
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV

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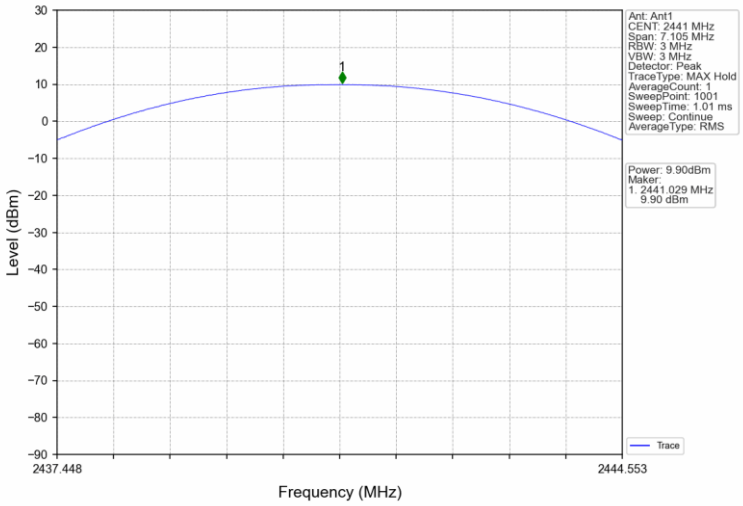
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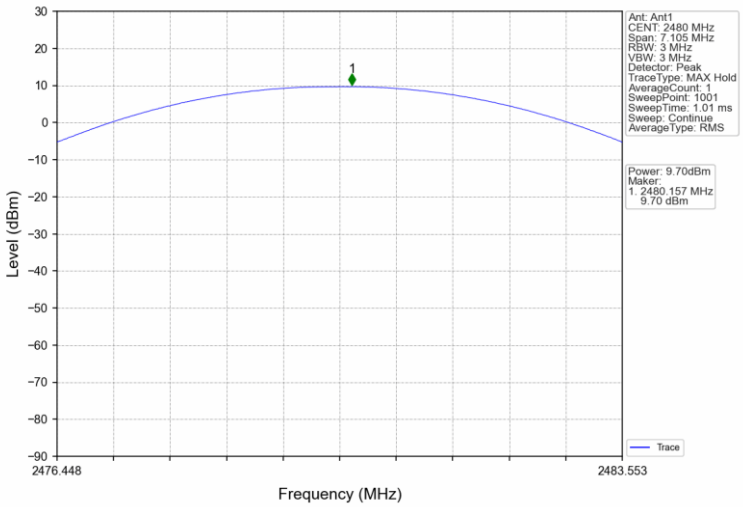
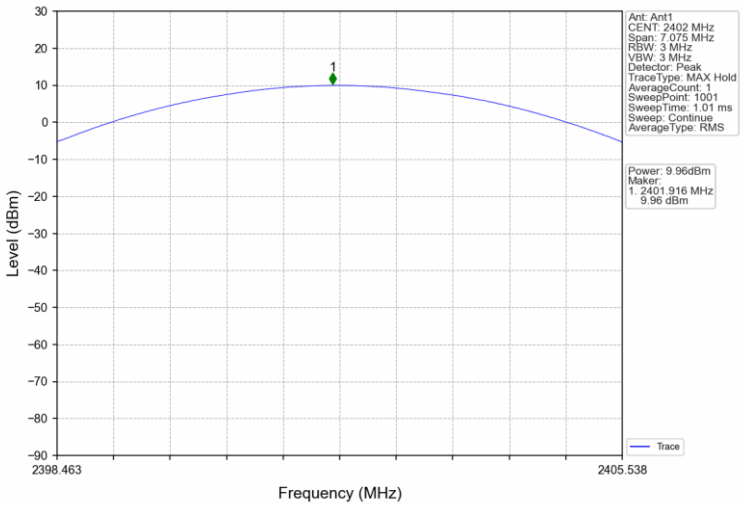
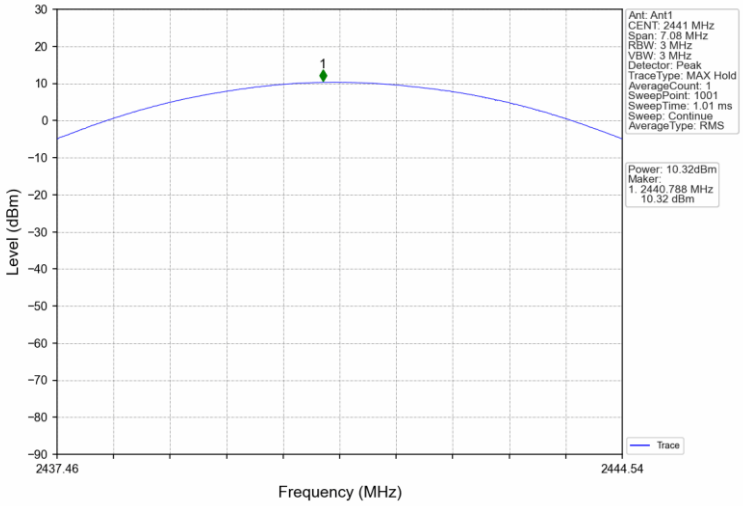


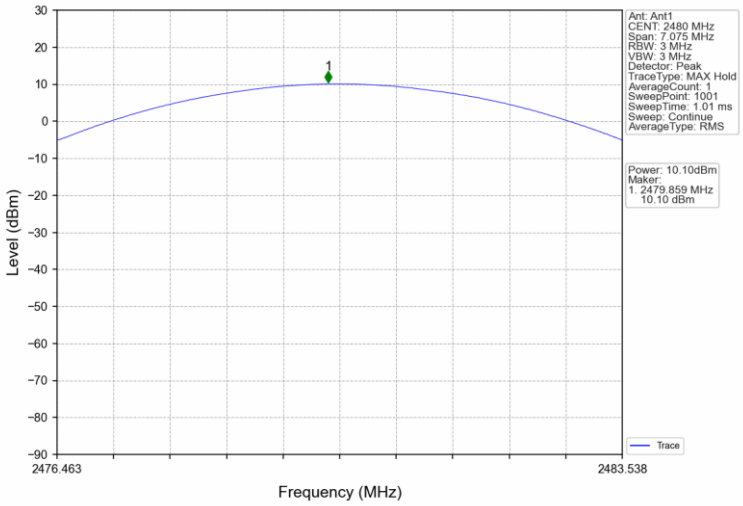
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV



8DPSK_3DH5_MCH_2441MHz_Ant1_NTNV



8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV



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9.3 20 dB Bandwidth and 99% Occupied Bandwidth

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Use the following test receiver settings:
   Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
   RBW ≥ 1% to 5% of the 20 dB bandwidth/99% OBW, VBW≥3RBW,
   Sweep = auto, Detector function = peak, Trace = max hold
4. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Measure the frequency difference of two frequencies that were attenuated 20 dB/99% OBW from the reference level. Record the frequency difference as the emission bandwidth. Record the results.
5. Repeat above procedures until all frequencies measured were complete.

Limit

According to §15.247(a)(1), 20 dB Bandwidth and 99% Occupied Bandwidth limit as below:

Limit [kHz]
N/A

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20 dB bandwidth and 99% Occupied Bandwidth

Test result

TestMode	Frequency MHz	20 dB Bandwidth MHz	99% Bandwidth MHz	Limit MHz	Result
GFSK	2402	0.961	0.902	--	Pass
GFSK	2441	0.959	0.902	--	Pass
GFSK	2480	0.960	0.900	--	Pass
π/4-DQPSK	2402	1.416	1.234	--	Pass
π/4-DQPSK	2441	1.421	1.235	--	Pass
π/4-DQPSK	2480	1.421	1.236	--	Pass
8DPSK	2402	1.415	1.244	--	Pass
8DPSK	2441	1.416	1.245	--	Pass
8DPSK	2480	1.415	1.243	--	Pass

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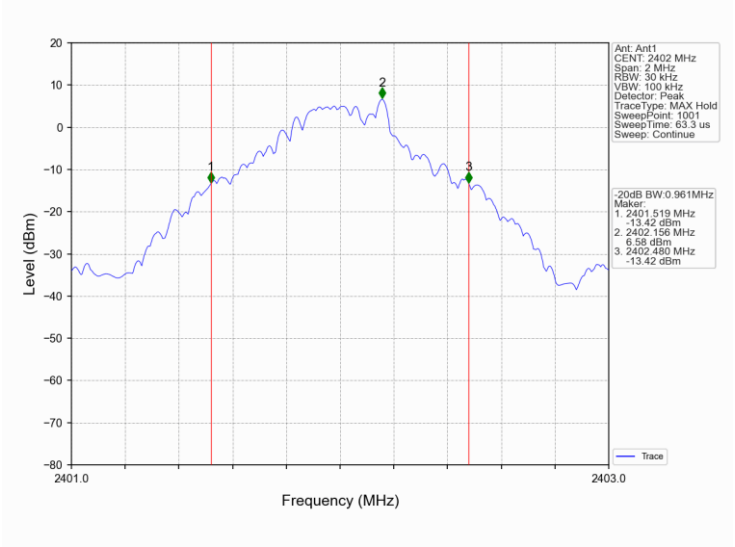
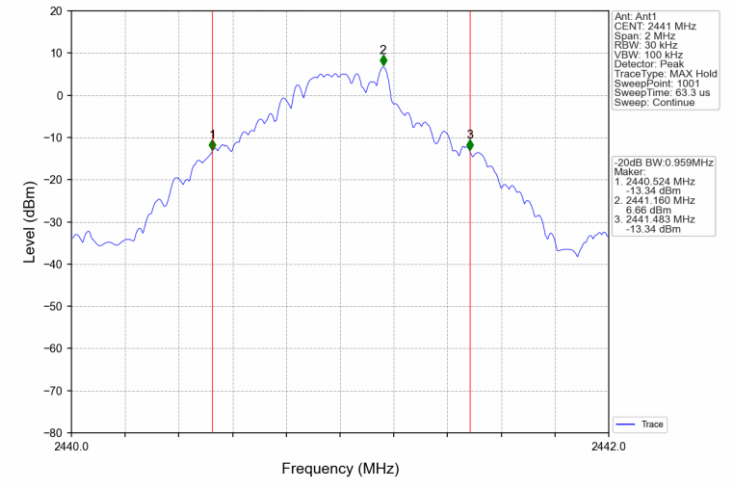
20 dB Bandwidth

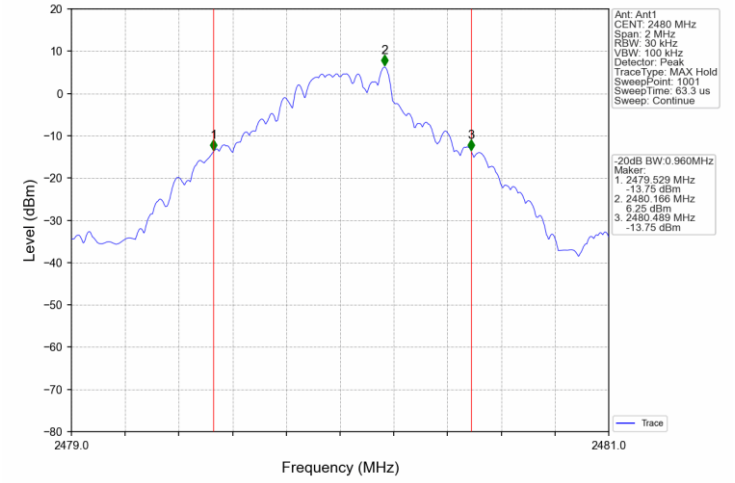
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



GFSK_DH5_MCH_2441MHz_Ant1_NTNV



GFSK_DH5_HCH_2480MHz_Ant1_NTNV



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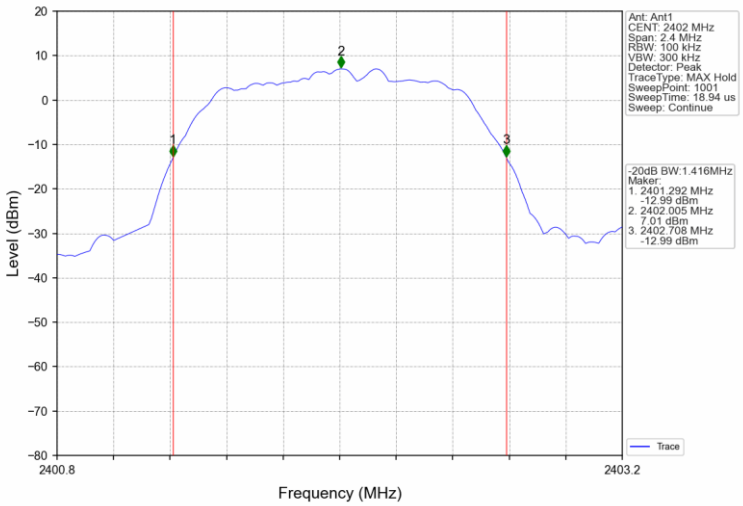
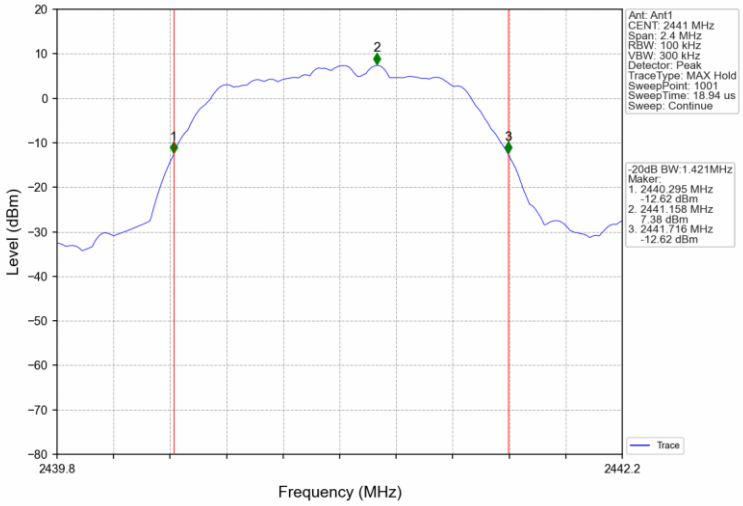
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV


Pi/4DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV


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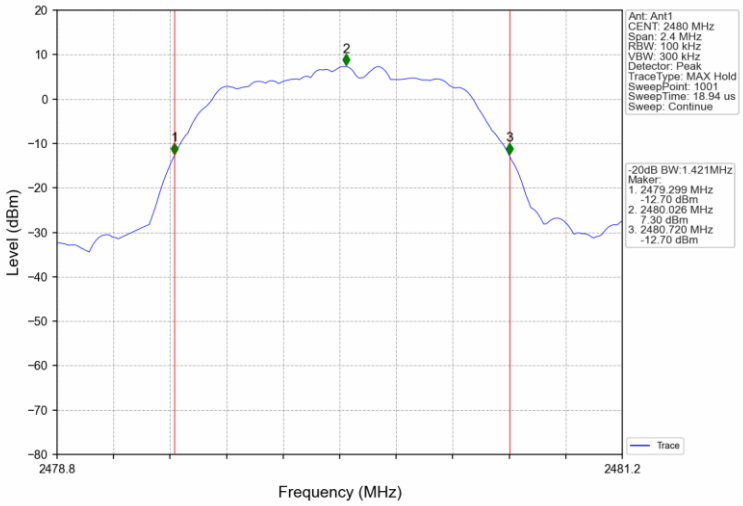

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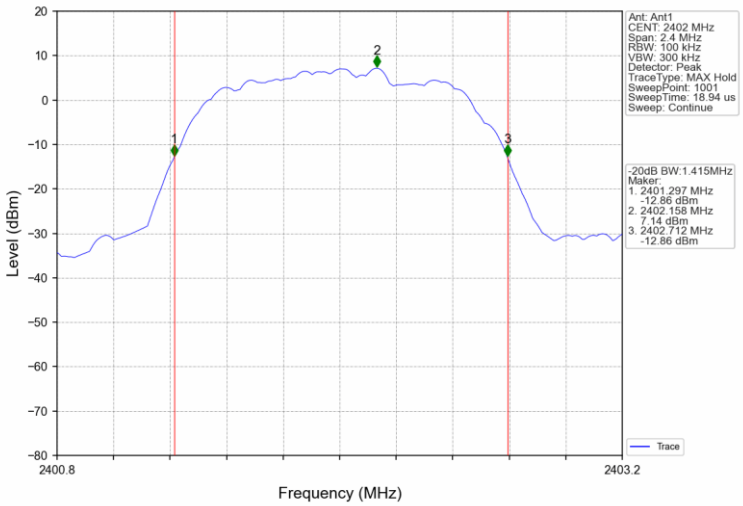
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV

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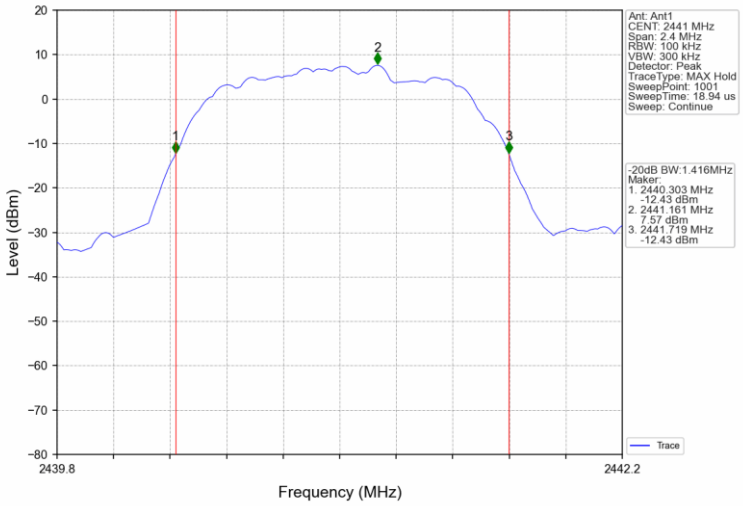
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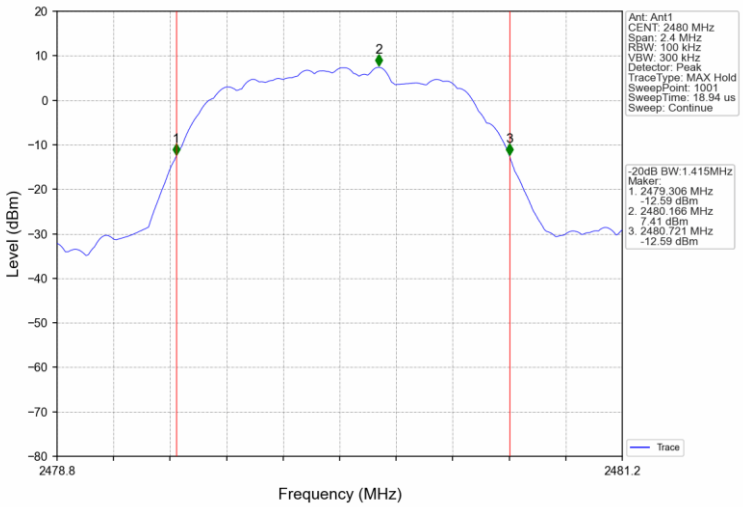

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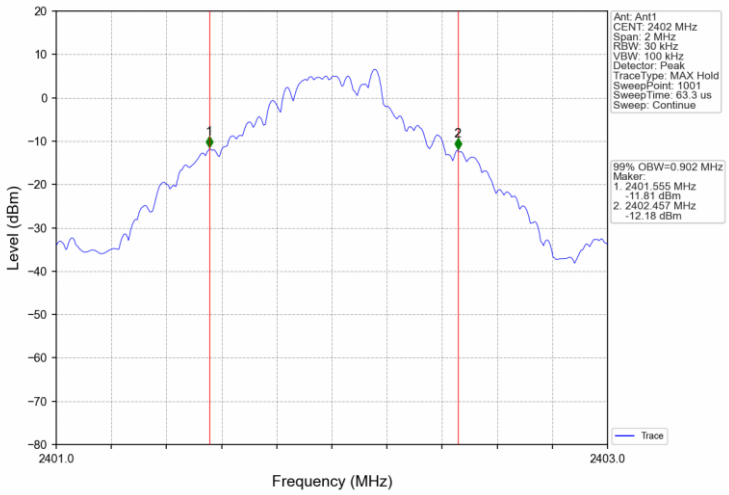
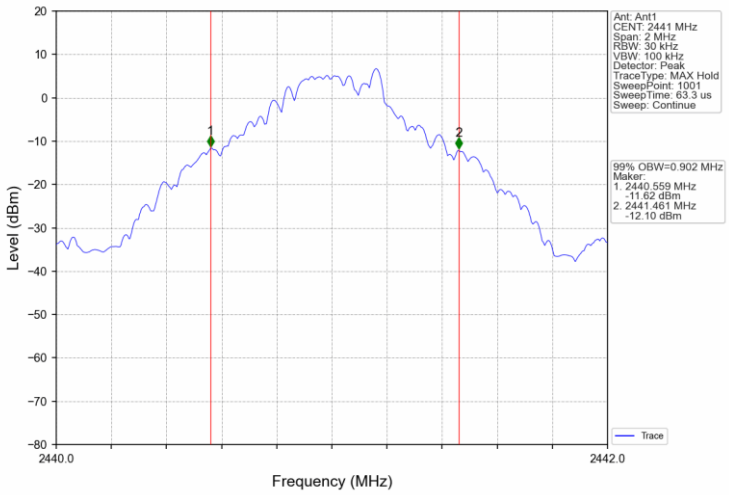
99% Occupied Bandwidth

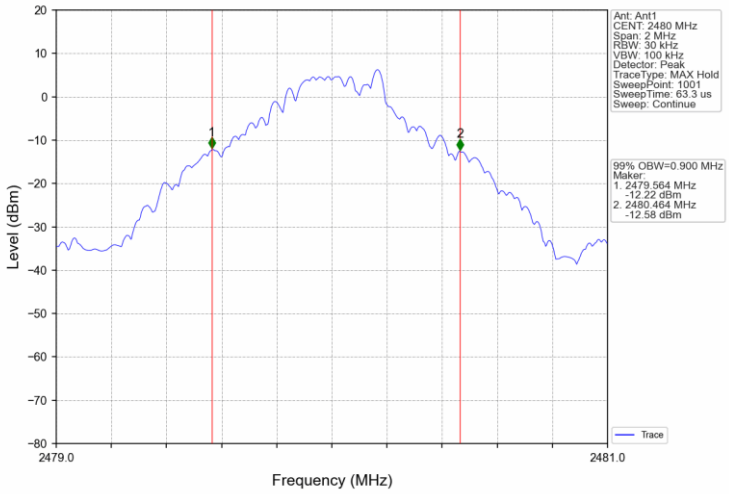
GFSK_DH5_LCH_2402MHz_Ant1_NTNV



GFSK_DH5_MCH_2441MHz_Ant1_NTNV



GFSK_DH5_HCH_2480MHz_Ant1_NTNV



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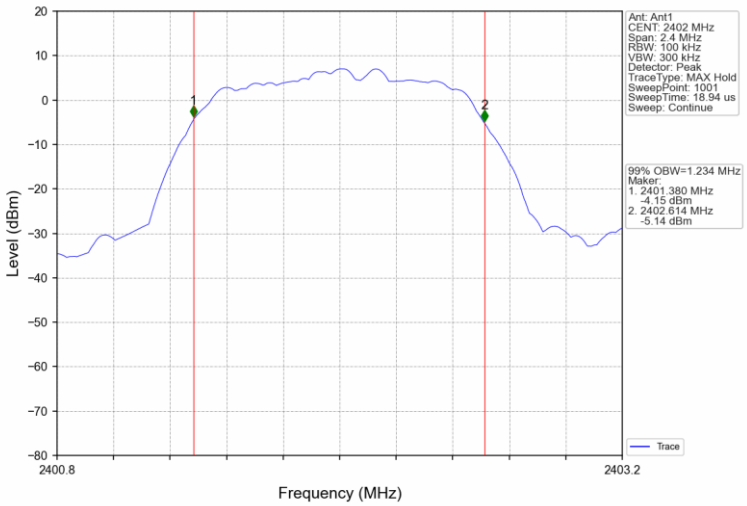
Pi/4DQPSK_2DH5_LCH_2402MHz_Ant1_NTNV

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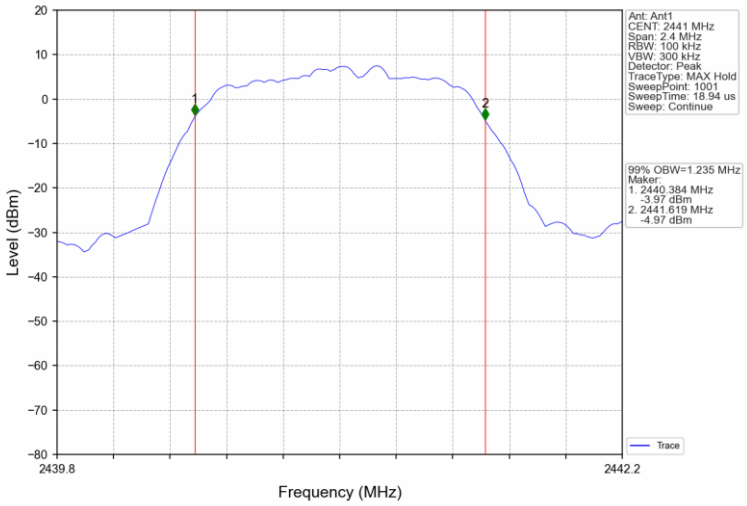
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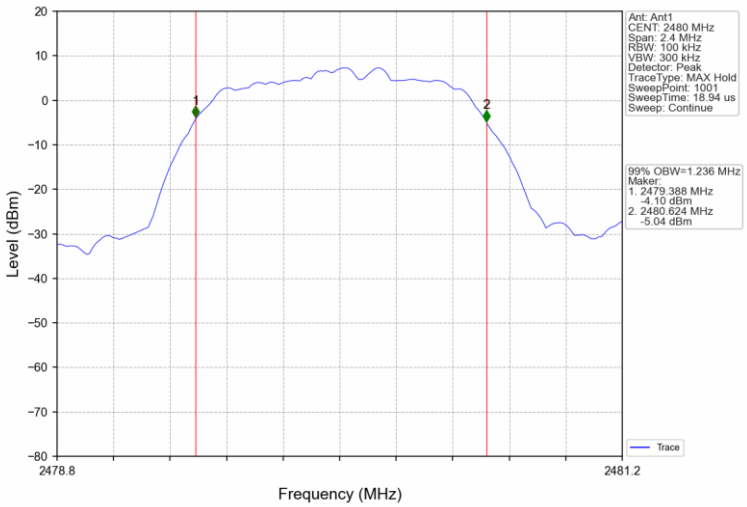

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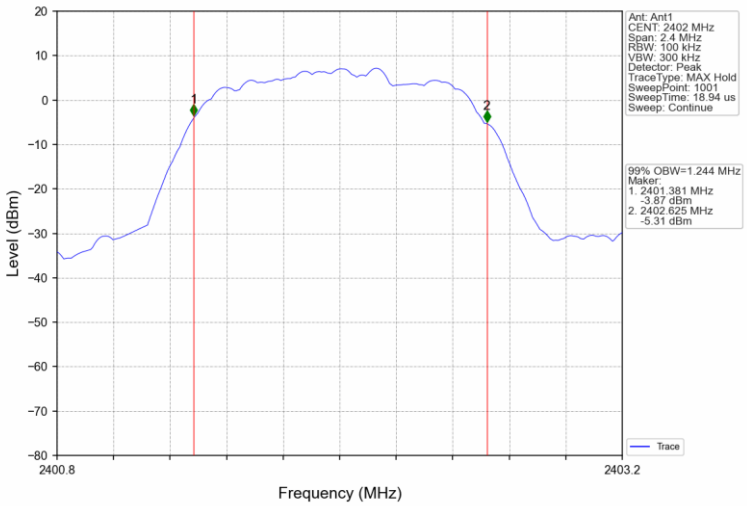
8DPSK_3DH5_LCH_2402MHz_Ant1_NTNV


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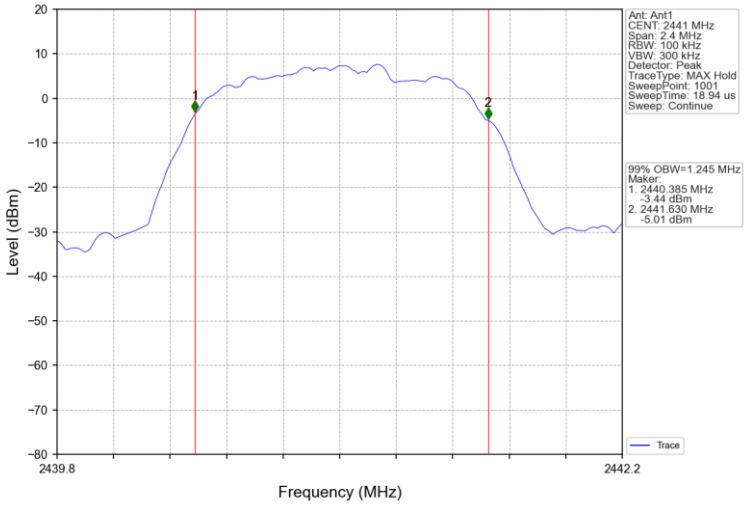
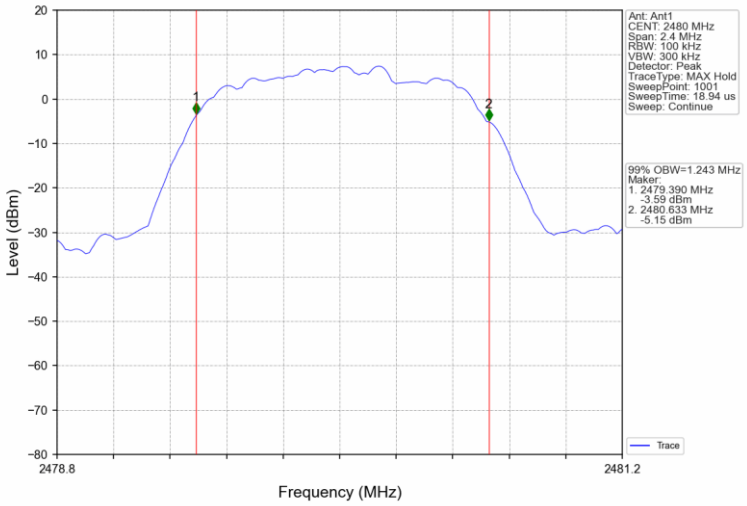


8DPSK_3DH5_HCH_2480MHz_Ant1_NTNV


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9.4 Carrier Frequency Separation

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit to hopping mode.
3. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peaks of two adjacent channels, 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. VBW ≥RBW, Sweep = auto, Detector function = peak.
4. By using the Max-Hold function record the separation of two adjacent channels.
5. Measure the frequency difference of these two adjacent channels by spectrum analyzer marker function. Record the results.
6. Repeat above procedures until all frequencies measured were complete.

Limit

According to §15.247(a)(1), Carrier Frequency Separation limit as below:

Limit kHz
≥25KHz or 2/3 of the 20 dB bandwidth which is greater

Limit

Modulation	Frequency MHz	2/3 of 20 dB Bandwidth kHz
GFSK	2441	641
π/4-DQPSK	2441	947
8DPSK	2441	944

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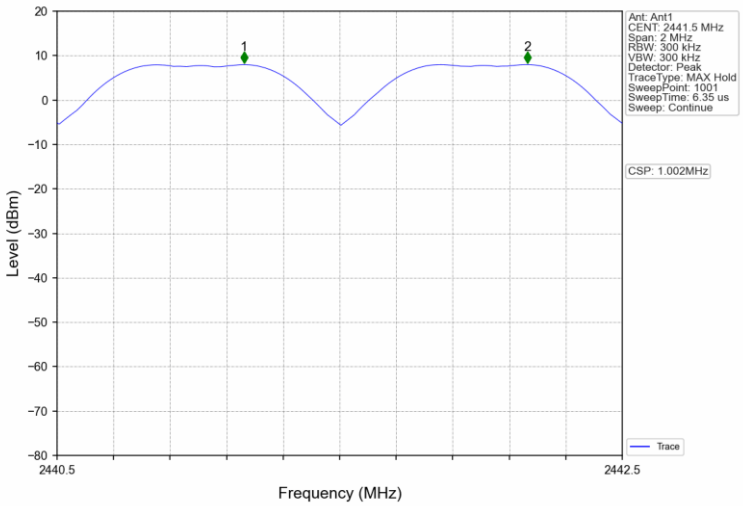
Carrier Frequency Separation

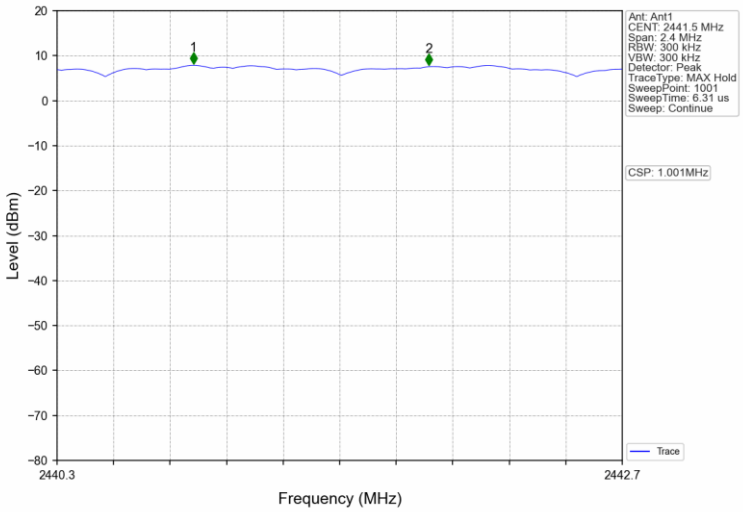
Test result: The measurement was performed with the typical configuration (normal hopping status).

Modulation	Frequency MHz	Carrier Frequency Separation MHz	Result
GFSK	2441	1.002	Pass
π/4-DQPSK	2441	1.001	Pass
8DPSK	2441	0.967	Pass

GFSK_DH5_HOPP_Ant1_NTNV



Pi/4DQPSK_2DH5_HOPP_Ant1_NTNV



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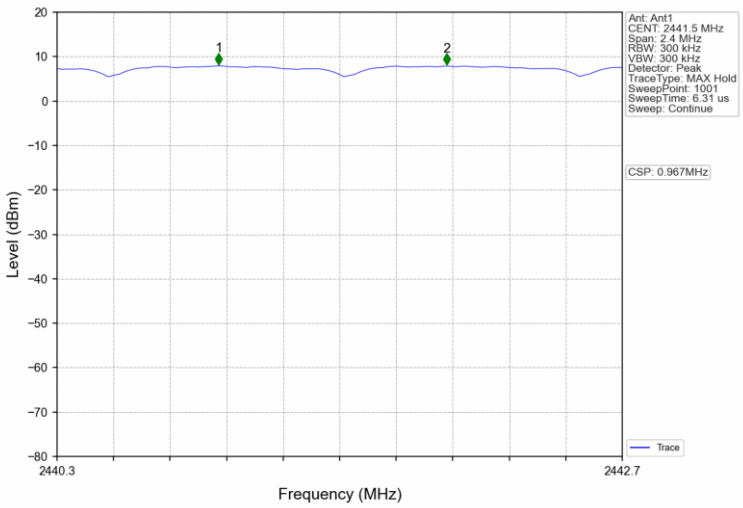
8DPSK_3DH5_HOPP_Ant1_NTNV


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9.5 Number of Hopping Frequencies

Test Method

1. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit to hopping mode.
3. Use the following spectrum analyzer settings:
   Span = the frequency band of operation, RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller, VBW ≥RBW, Sweep = auto, Detector function = peak, Trace=Max hold.
4. Allow the trace to stabilize. It may prove necessary to break the span up to sections, in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

Limit

According to §15.247(a)(1)(iii), Number of Hopping Frequencies limit as below:

Limit number
≥ 15

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