

ANNEX D TEST DATA

For

Project No.:	8232EU012001W
Client:	Shenzhen Mfish Cultural Technology Co., Ltd.
Product Name:	OSKULL OWS
Model No.:	OSKULLOWS01
FCC ID:	2BGZV-OSKULLOWS01
Technology:	Bluetooth BDR&EDR
Test Engineer:	<i>Mikoy zhu</i>
Test Date:	2024-08-25

Test Summary

Item	Result
Duty Cycle	Pass
Bandwidth	Pass
Maximum Conducted Output Power	Pass
Carrier Frequency Separation	Pass
Number of Hopping Frequencies	Pass
Time of Occupancy (Dwell Time)	Pass
Unwanted Emissions In Non-restricted Frequency Bands	Pass

Left Ear

1. Duty Cycle

1.1 Test Result

1.1.1 Ant1

Ant1								
Mode	TX Type	Frequency (MHz)	Packet Type	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
GFSK	SISO	2402	DH5	2.894	3.750	77.17	1.13	0.01
		2441	DH5	2.894	3.751	77.15	1.13	0.04
		2480	DH5	2.894	3.751	77.15	1.13	0.03
π/4DQPSK	SISO	2402	2DH5	2.899	3.749	77.33	1.12	0.04
		2441	2DH5	2.900	3.751	77.31	1.12	0.03
		2480	2DH5	2.899	3.750	77.31	1.12	0.03

Right Ear

1 Duty Cycle

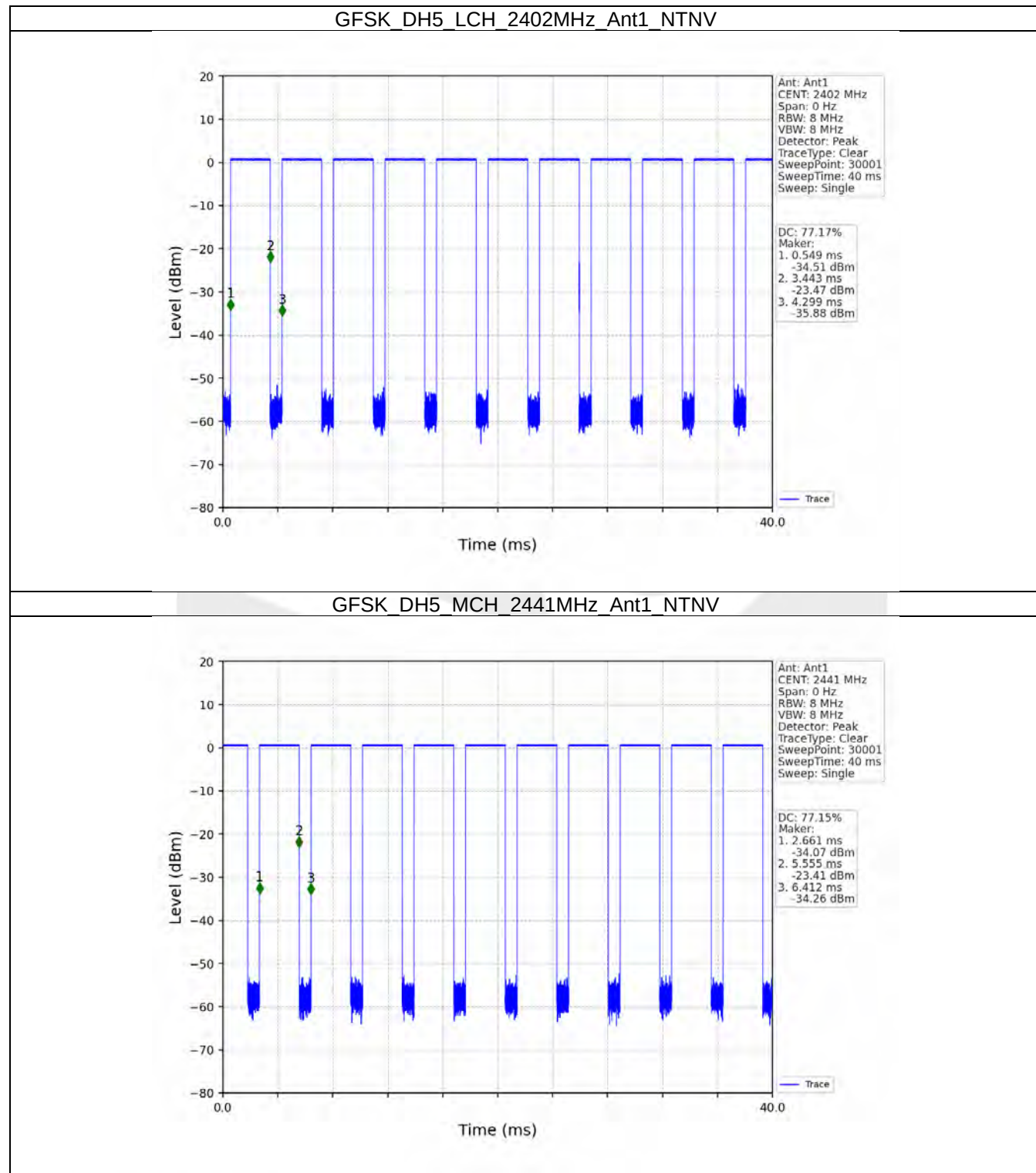
1.1 Test Result

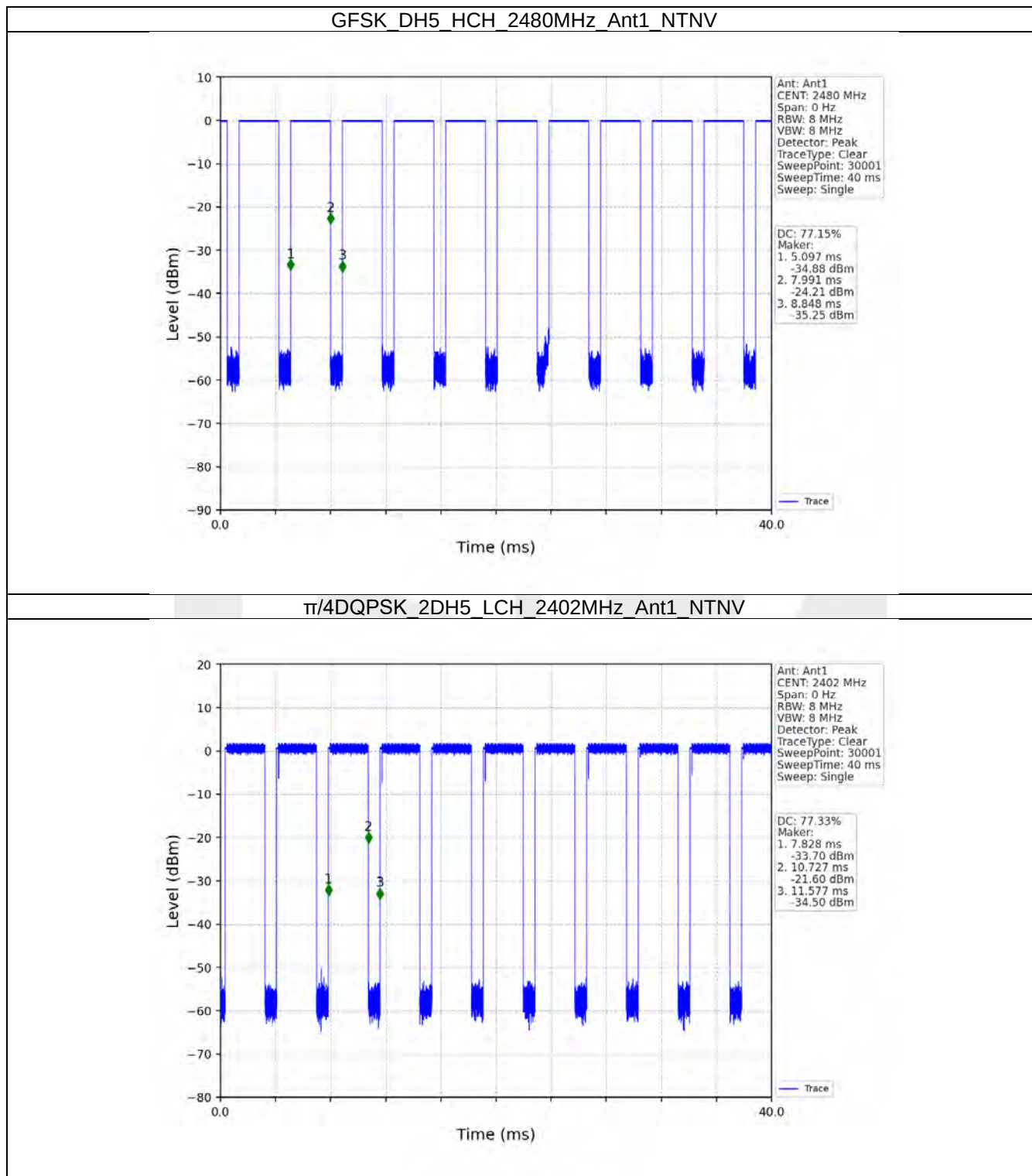
1.1.1 Ant1

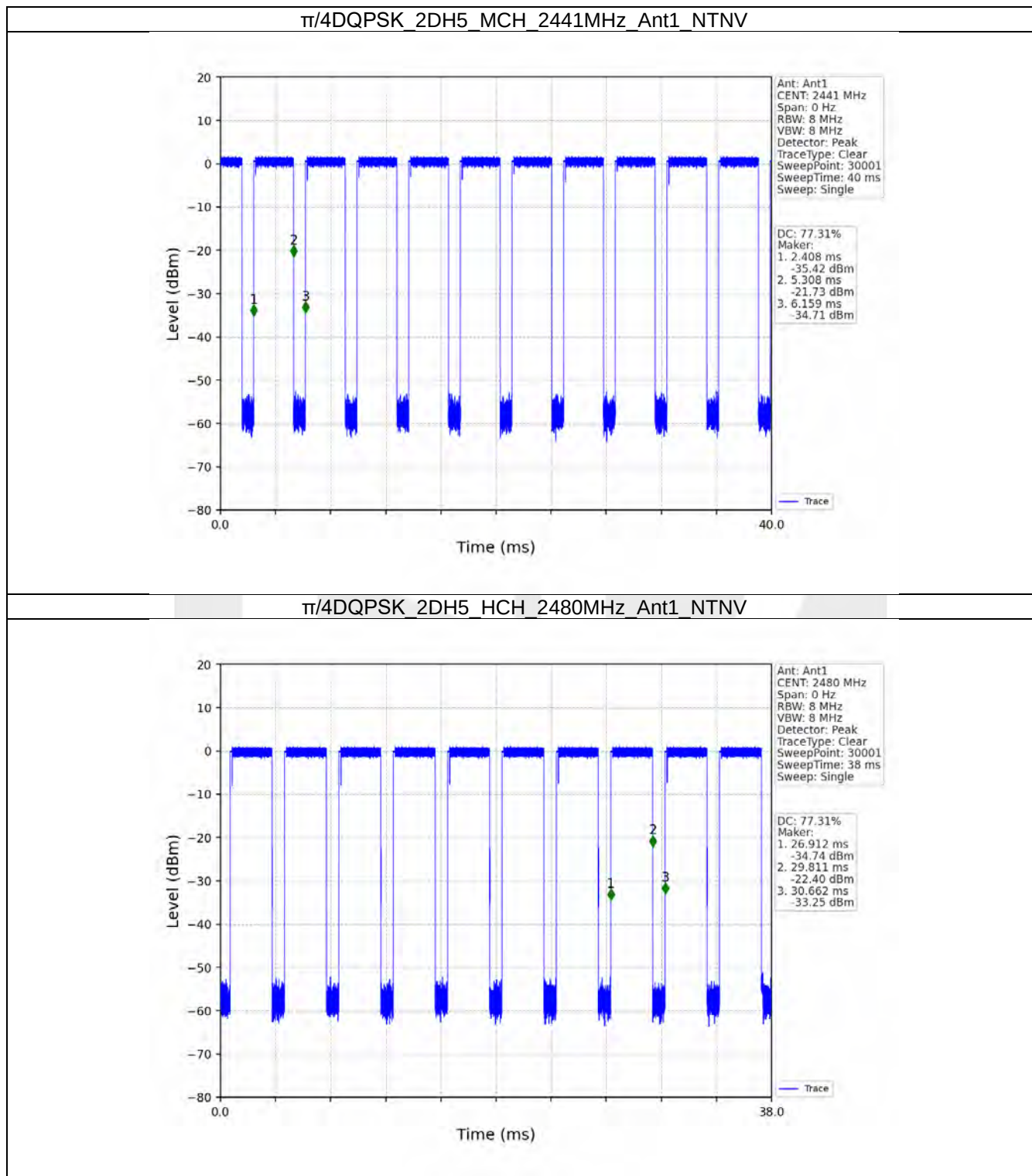
Ant1								
Mode	TX Type	Frequency (MHz)	Packet Type	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
GFSK	SISO	2402	DH5	2.884	3.749	76.93	1.14	0.01
		2441	DH5	2.884	3.749	76.93	1.14	0.03
		2480	DH5	2.884	3.749	76.93	1.14	0.03
π/4DQPSK	SISO	2402	2DH5	2.895	3.751	77.18	1.12	0.03
		2441	2DH5	2.895	3.751	77.18	1.12	0.03
		2480	2DH5	2.894	3.750	77.17	1.13	0.03

1.2 Test Graph(Left Ear)

1.2.1 Ant1

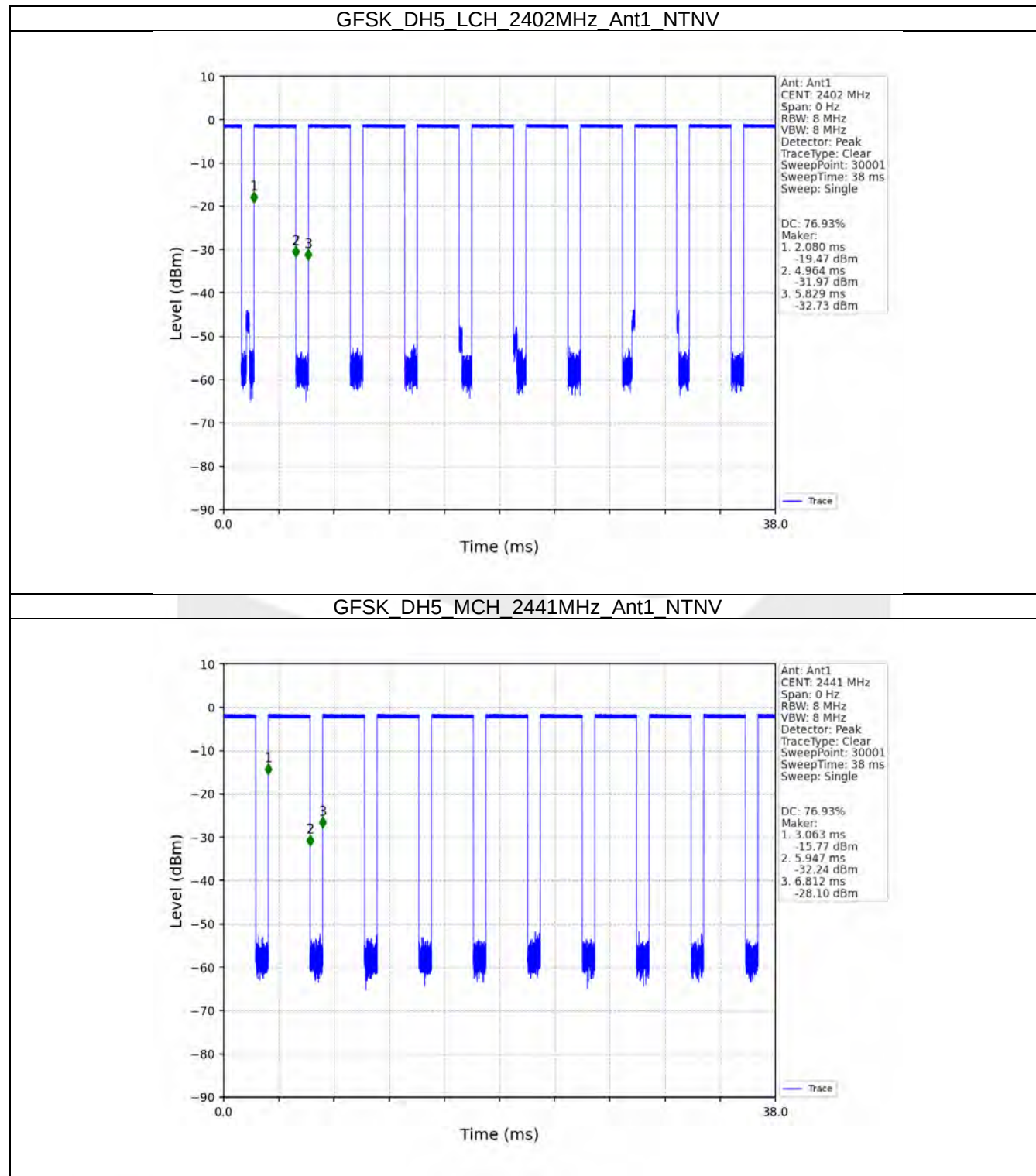


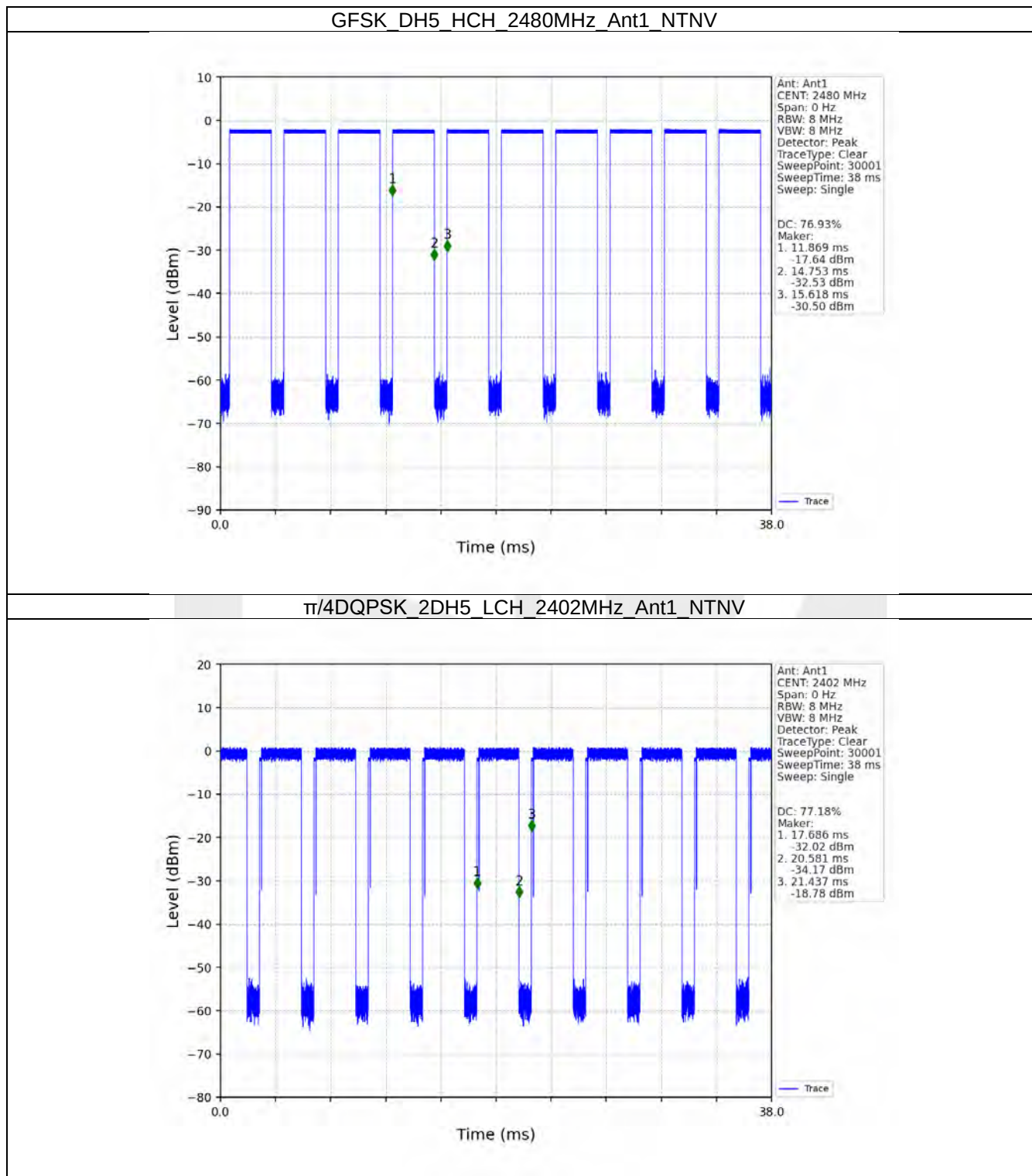


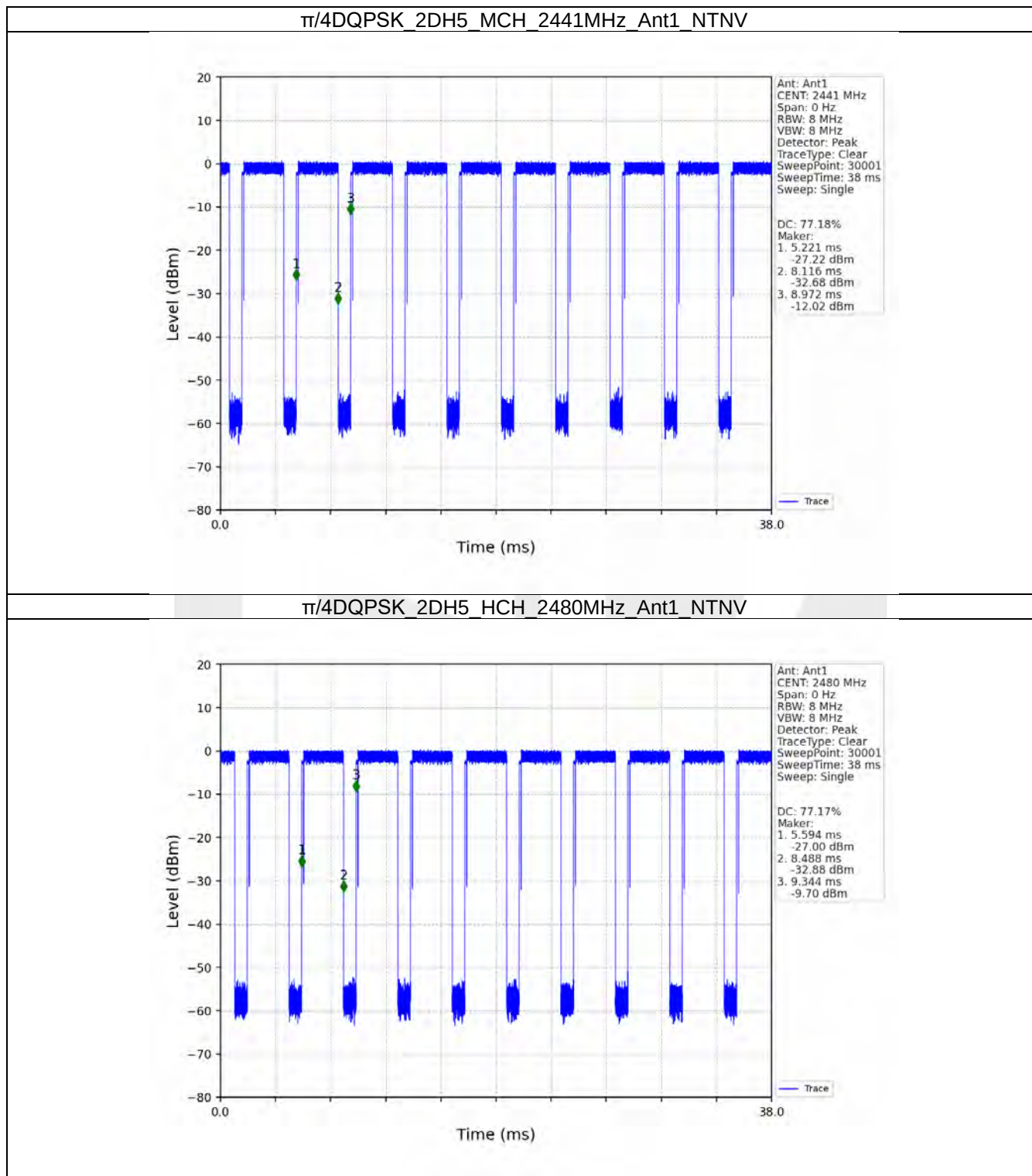


1.2 Test Graph(Right Ear)

1.2.1 Ant1







Left Ear

2. Bandwidth

2.1 Test Result

2.1.1 OBW

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	0.885	/	Pass
		2441	DH5	1	0.896	/	Pass
		2480	DH5	1	0.896	/	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	1	1.180	/	Pass
		2441	2DH5	1	1.182	/	Pass
		2480	2DH5	1	1.185	/	Pass

2.1.2 20dB BW

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	0.966	/	Pass
		2441	DH5	1	1.025	/	Pass
		2480	DH5	1	1.012	/	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	1	1.324	/	Pass
		2441	2DH5	1	1.329	/	Pass
		2480	2DH5	1	1.336	/	Pass

Right Ear

2. Bandwidth

2.1 Test Result

2.1.1 OBW

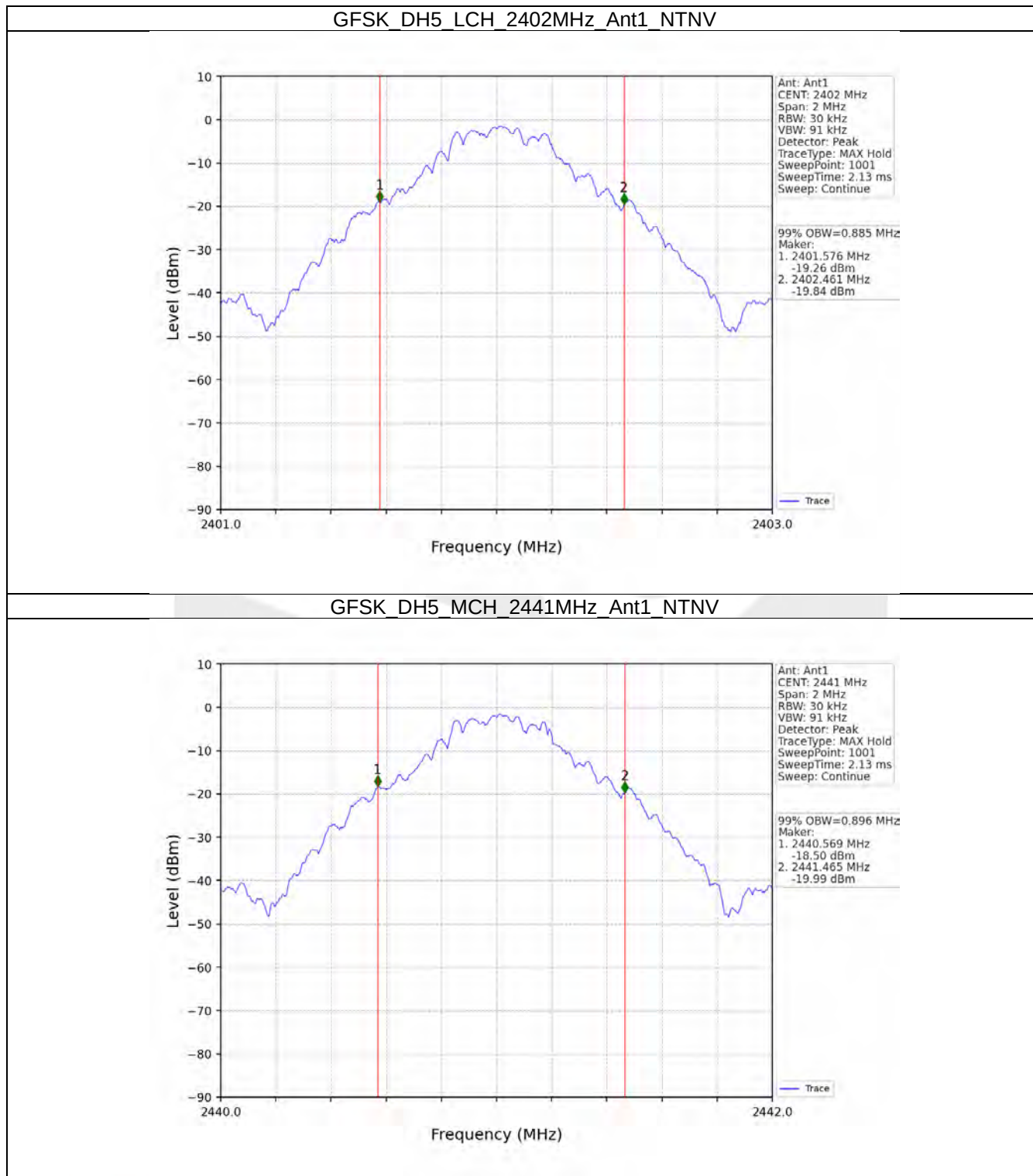
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	99% Occupied Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	0.825	/	Pass
		2441	DH5	1	0.825	/	Pass
		2480	DH5	1	0.826	/	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	1	1.177	/	Pass
		2441	2DH5	1	1.179	/	Pass
		2480	2DH5	1	1.177	/	Pass

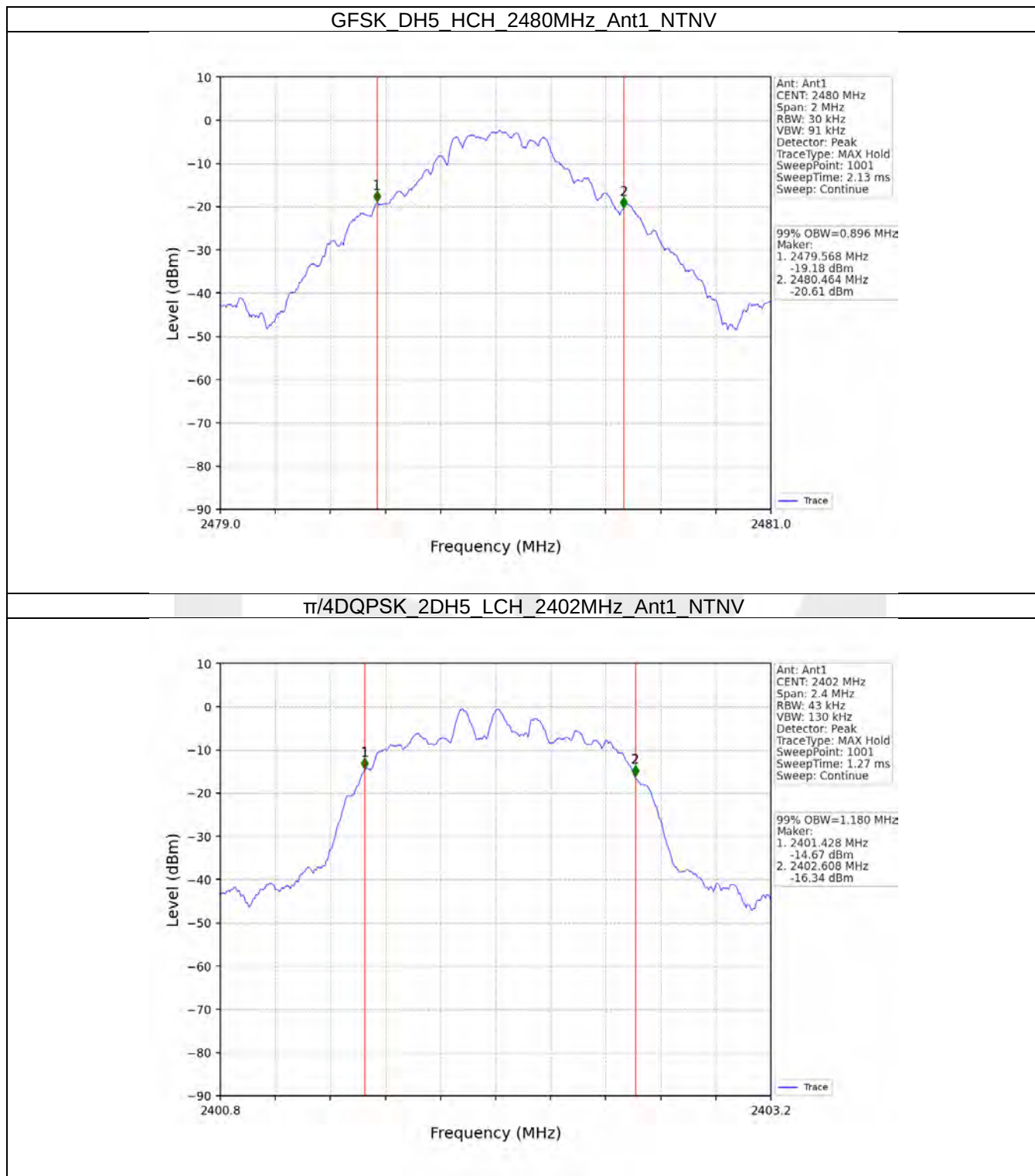
2.1.2 20dB BW

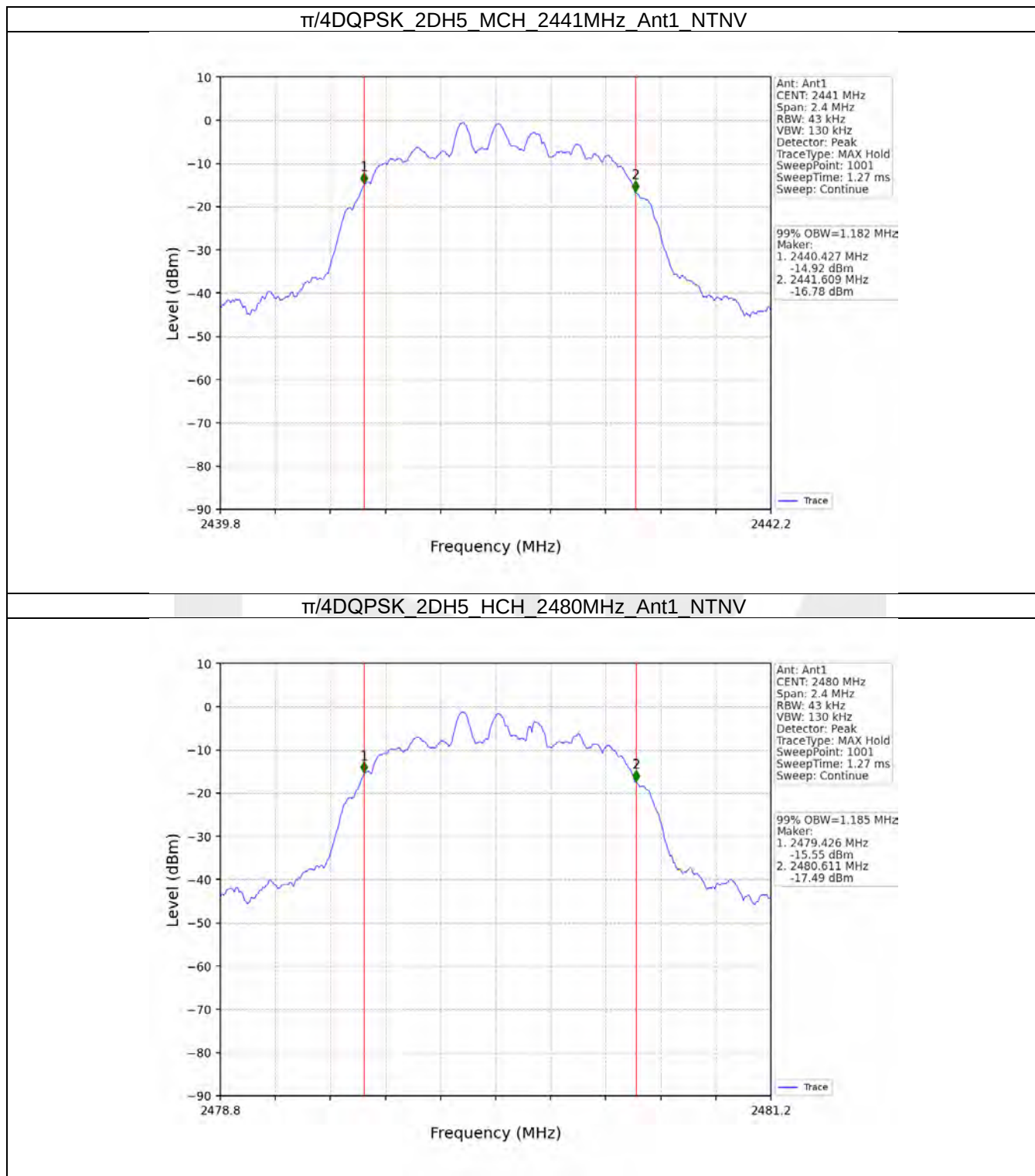
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	20dB Bandwidth (MHz)		Verdict
					Result	Limit	
GFSK	SISO	2402	DH5	1	0.935	/	Pass
		2441	DH5	1	0.936	/	Pass
		2480	DH5	1	0.938	/	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	1	1.297	/	Pass
		2441	2DH5	1	1.294	/	Pass
		2480	2DH5	1	1.294	/	Pass

2.2 Test Graph(Left Ear)

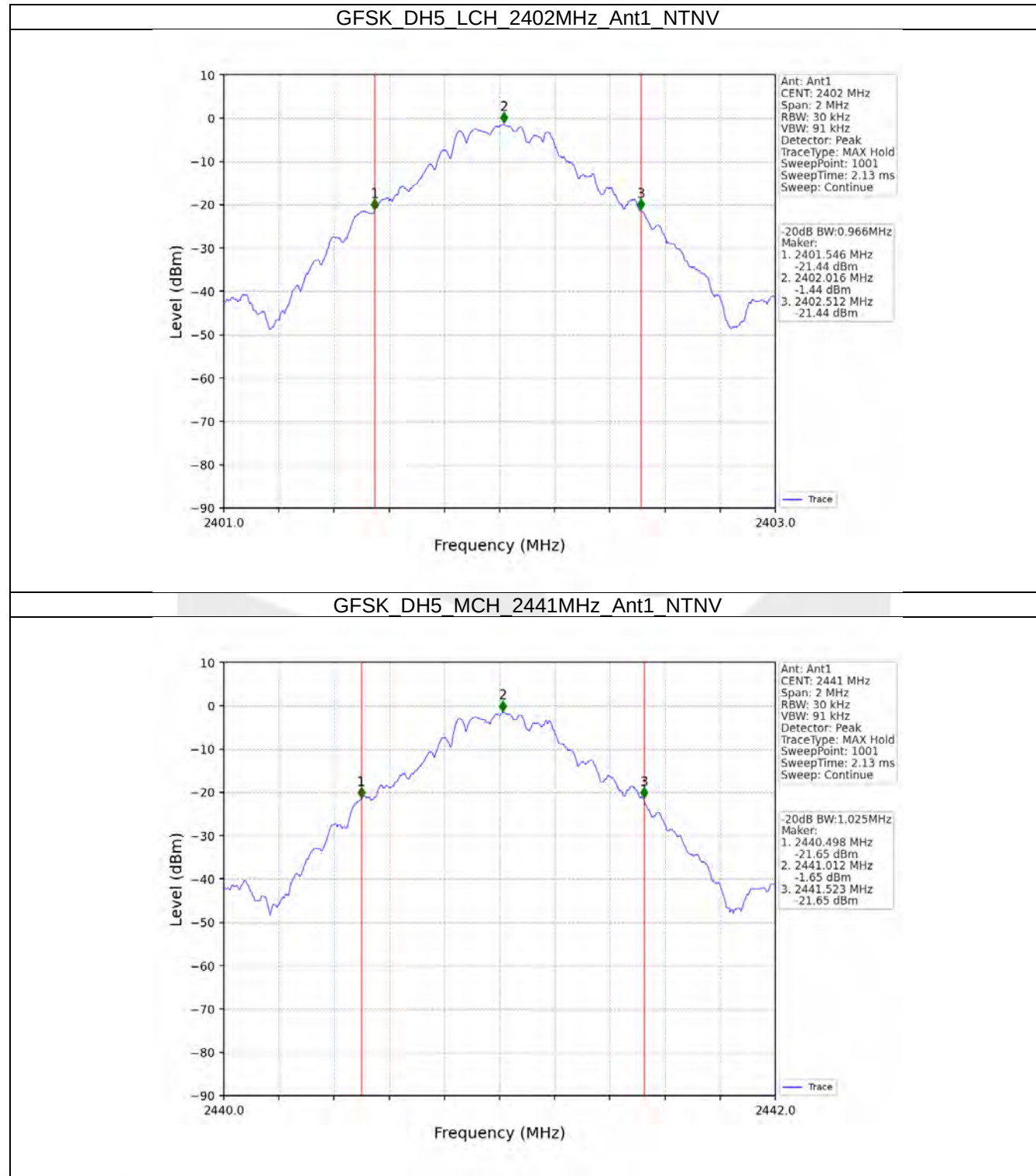
2.2.1 OBW

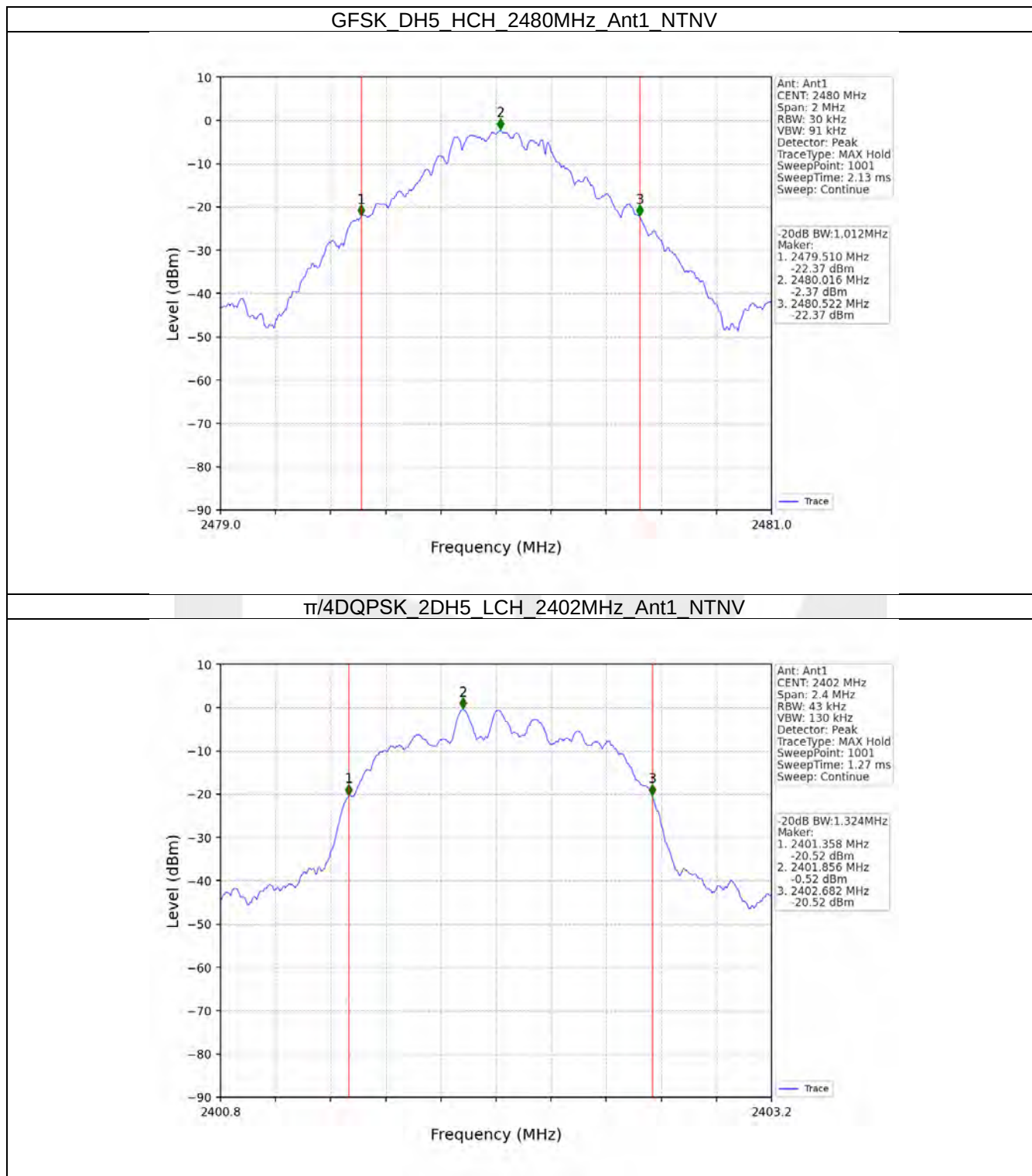


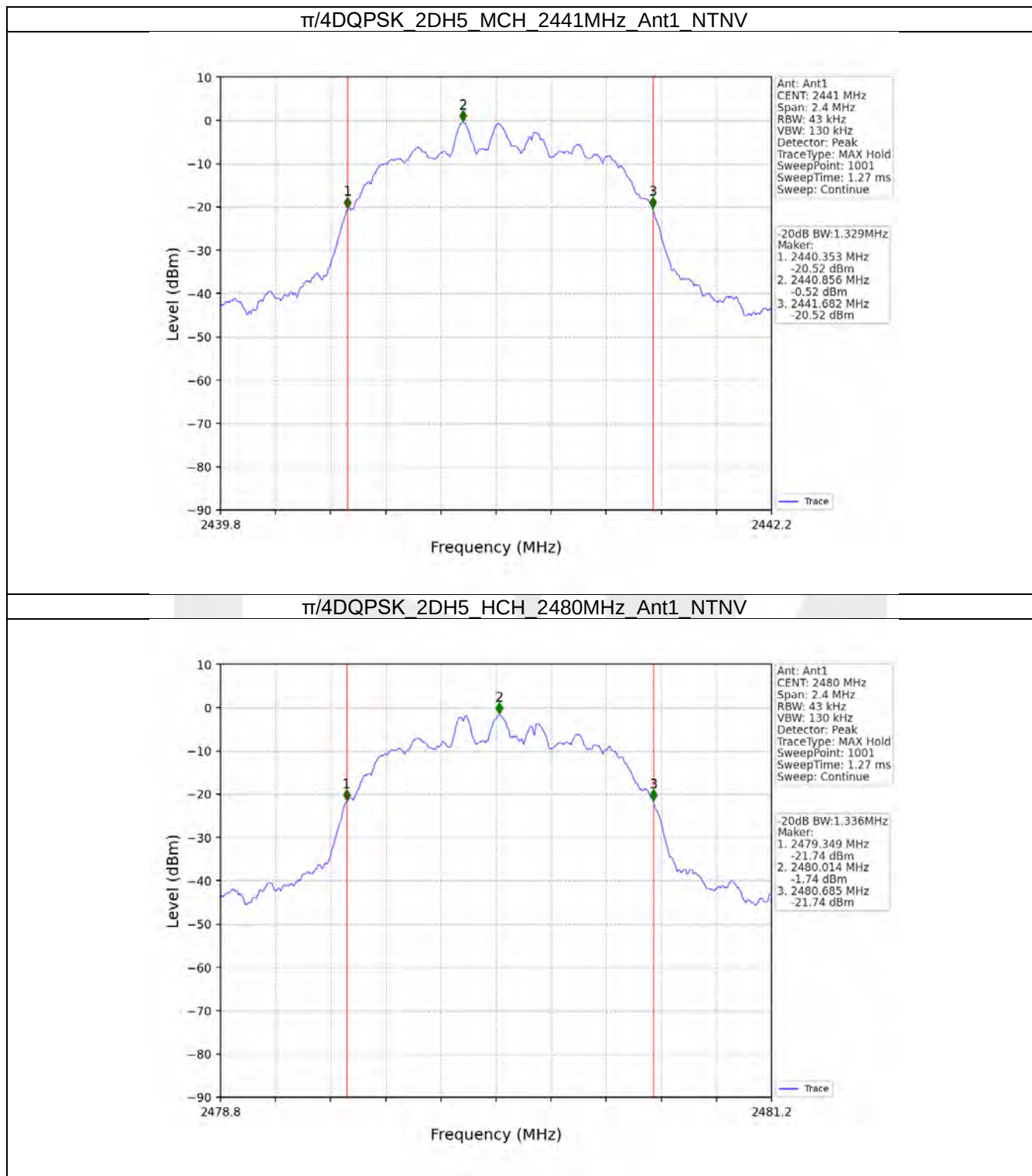




2.2.2 20dB BW

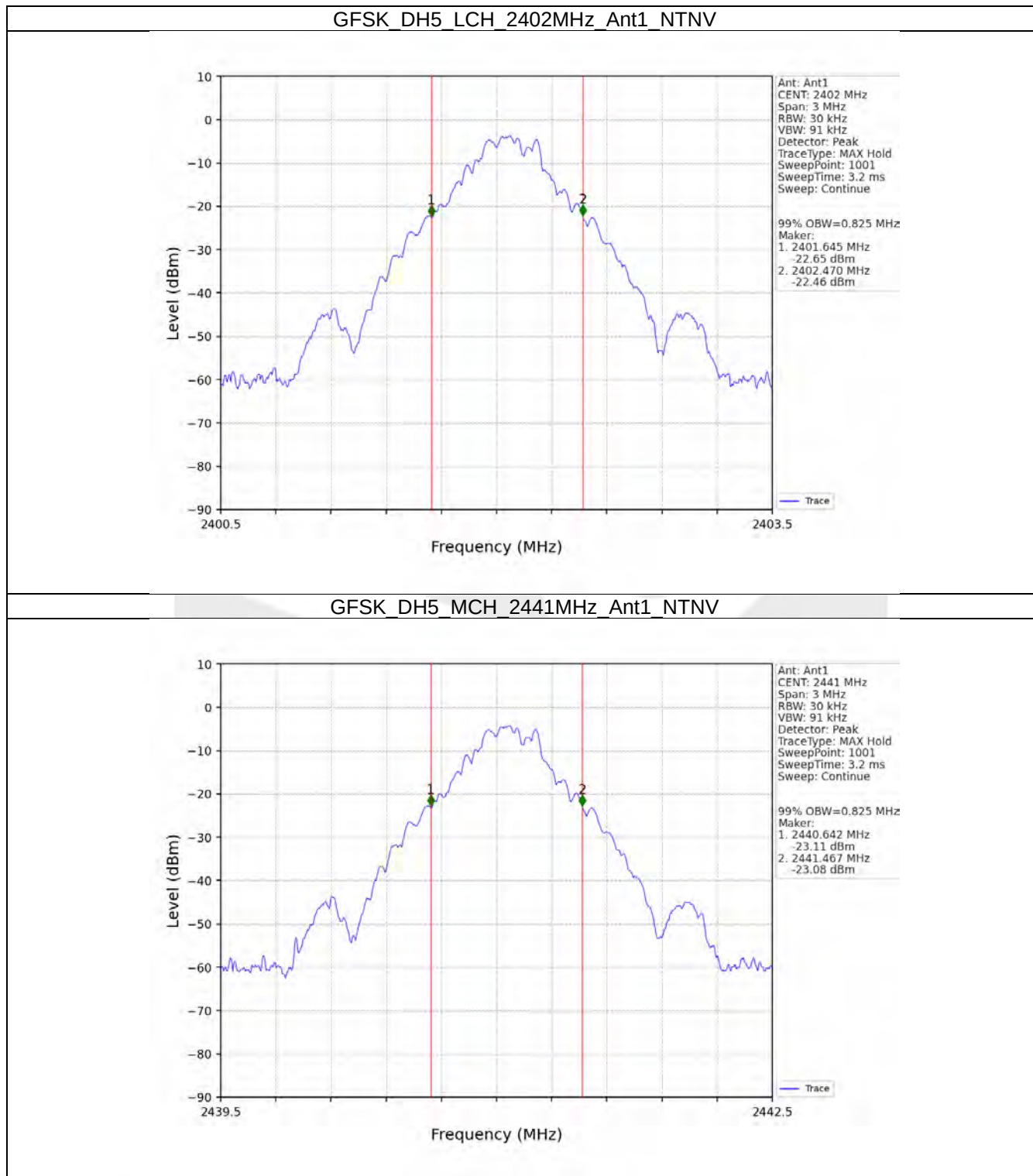


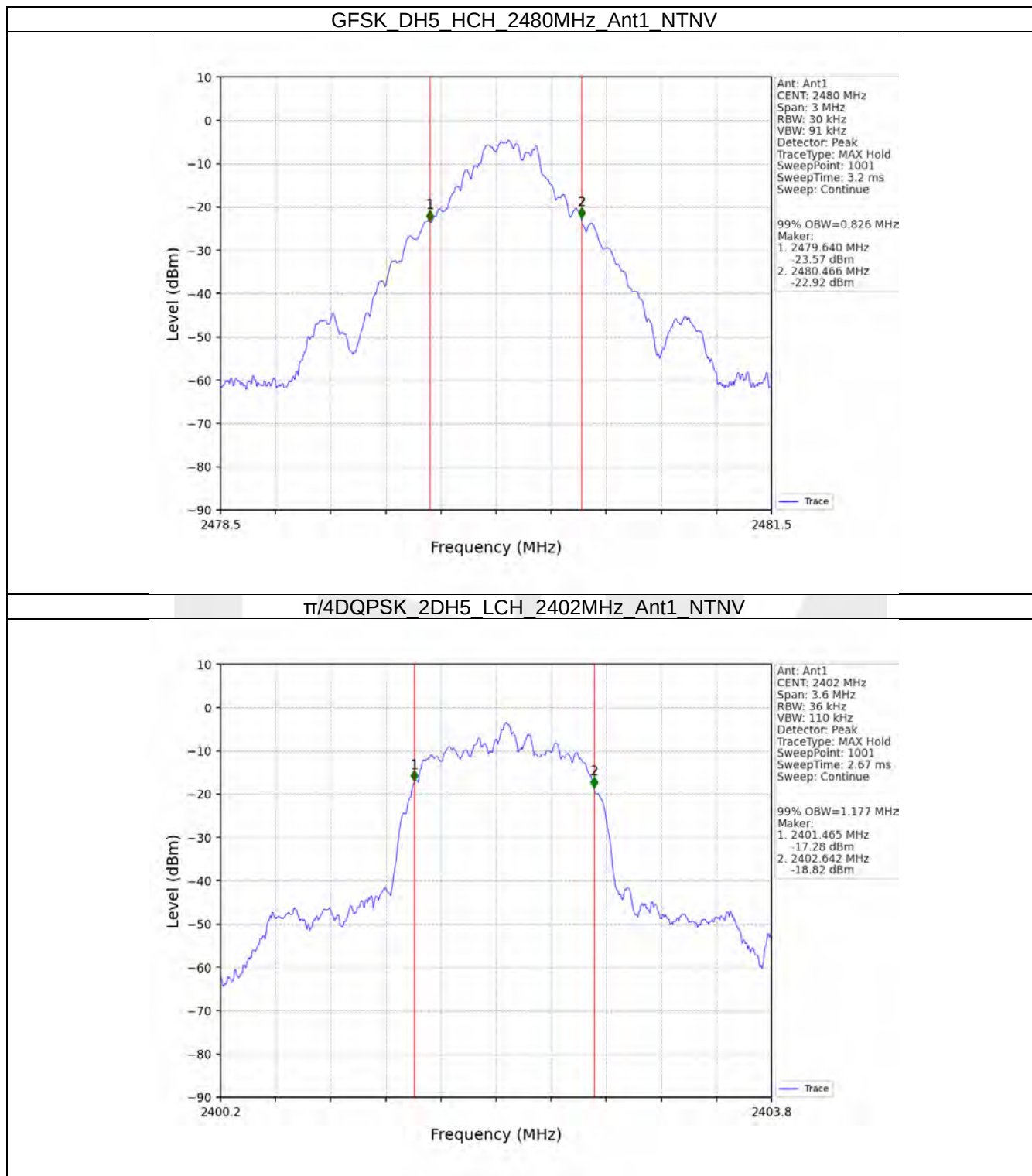


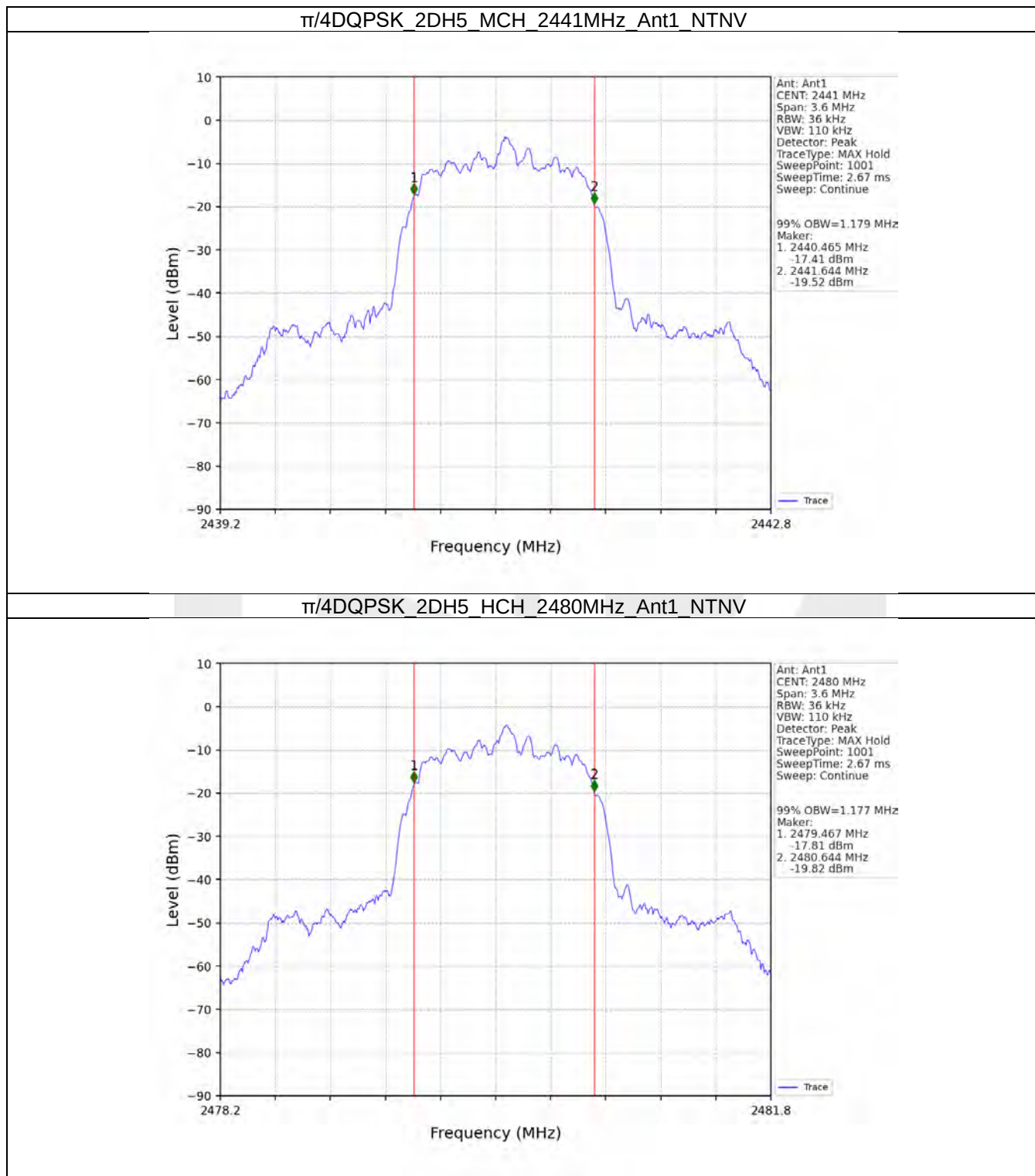


2.2 Test Graph(Right Ear)

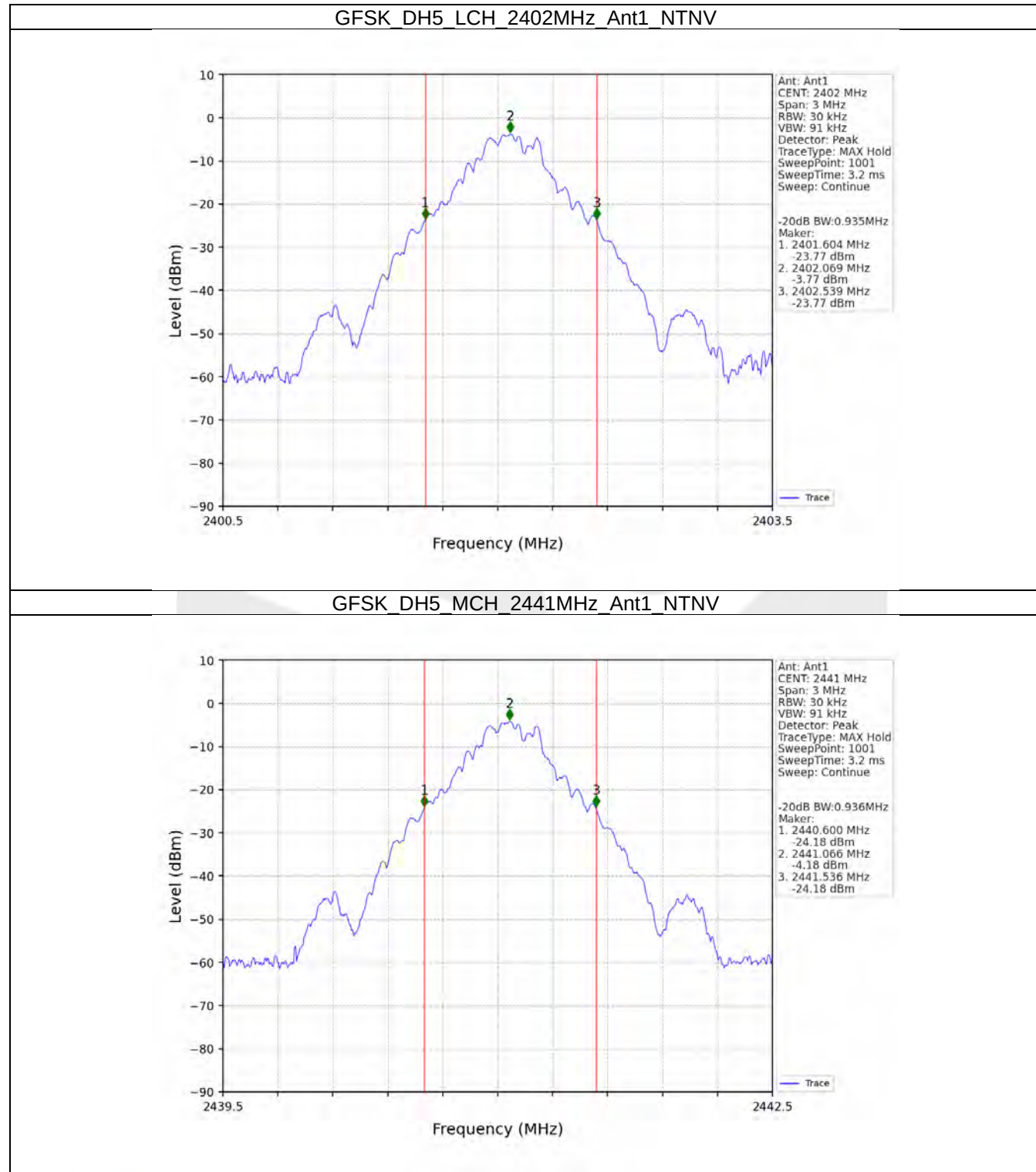
2.2.1 OBW

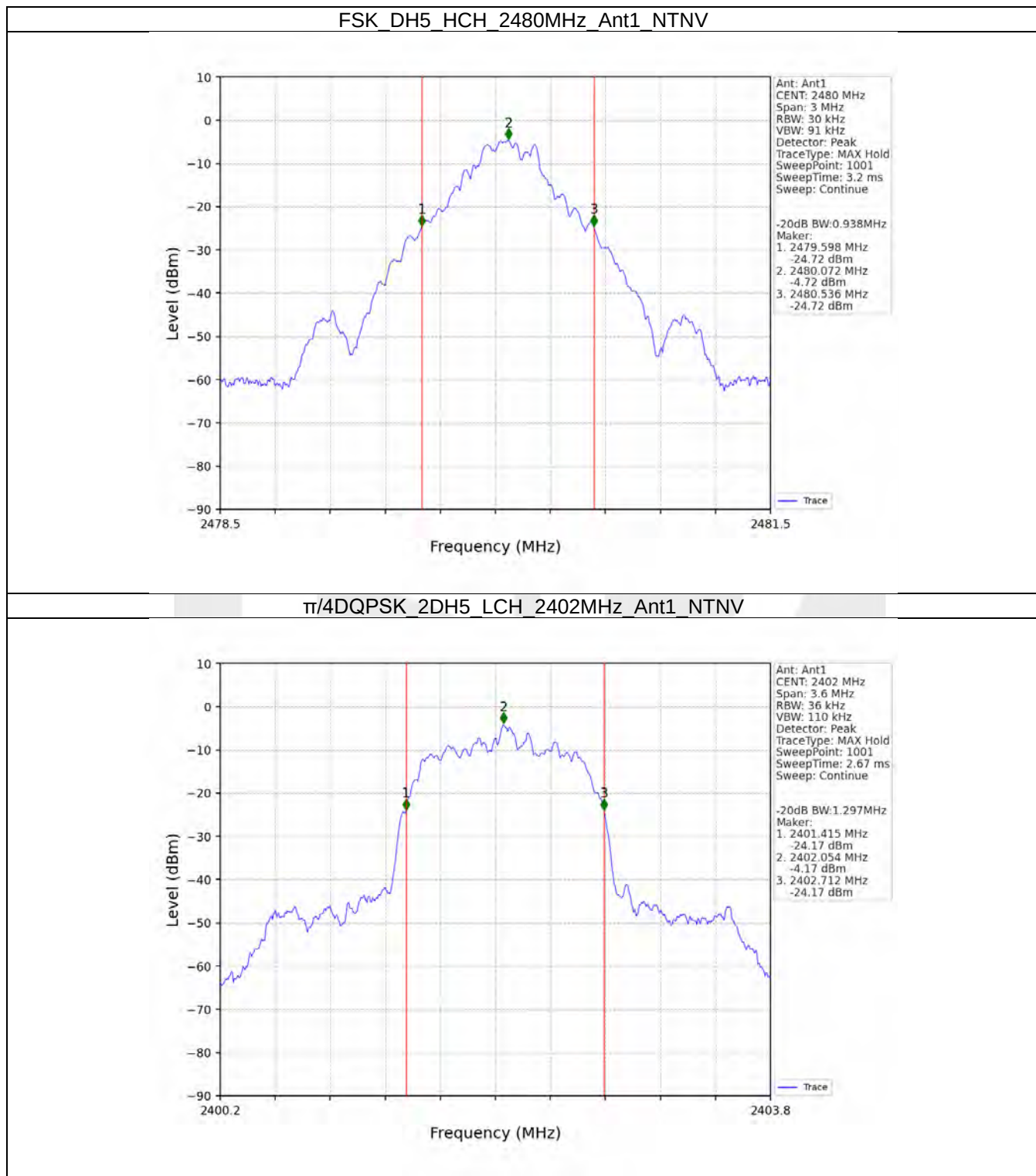


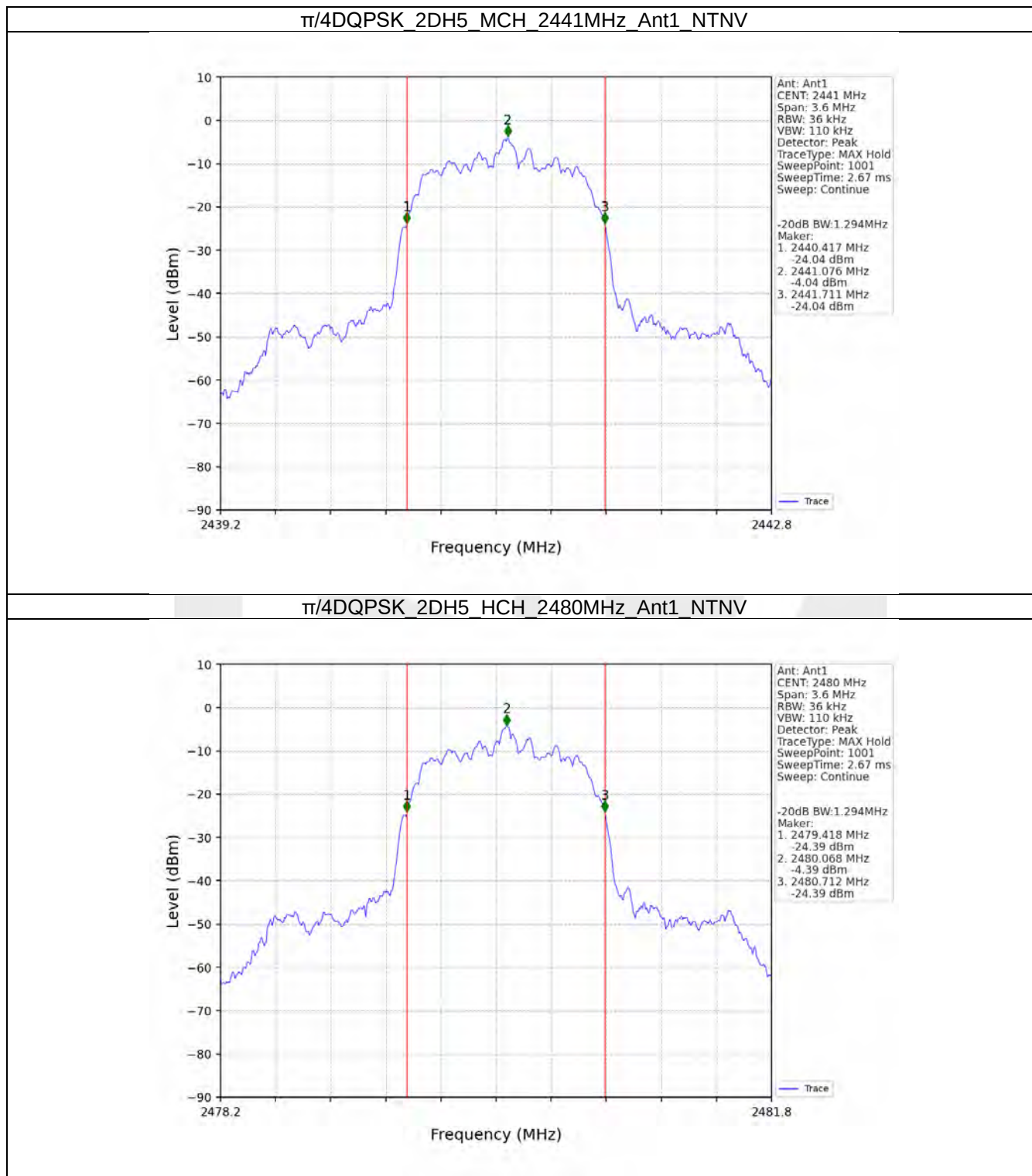




2.2.2 20dB BW







Left Ear

3. Maximum Conducted Output Power

3.1 Test Result

3.1.1 Power

Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	0.75	≤ 30	Pass
		2441	DH5	0.68	≤ 30	Pass
		2480	DH5	-0.08	≤ 30	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	1.61	≤ 20.97	Pass
		2441	2DH5	1.48	≤ 20.97	Pass
		2480	2DH5	0.76	≤ 20.97	Pass

Right Ear

3. Maximum Conducted Output Power

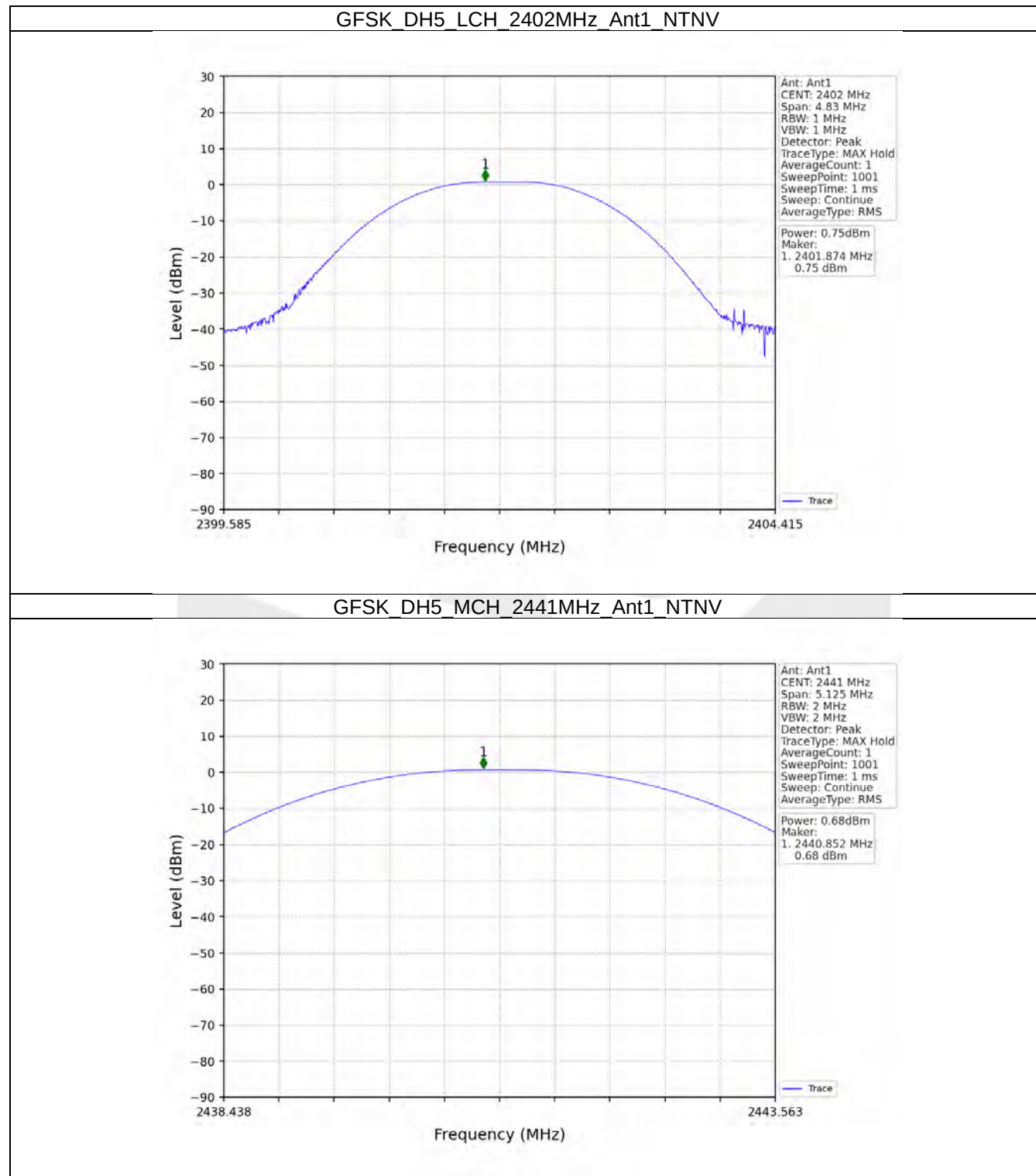
3.1 Test Result

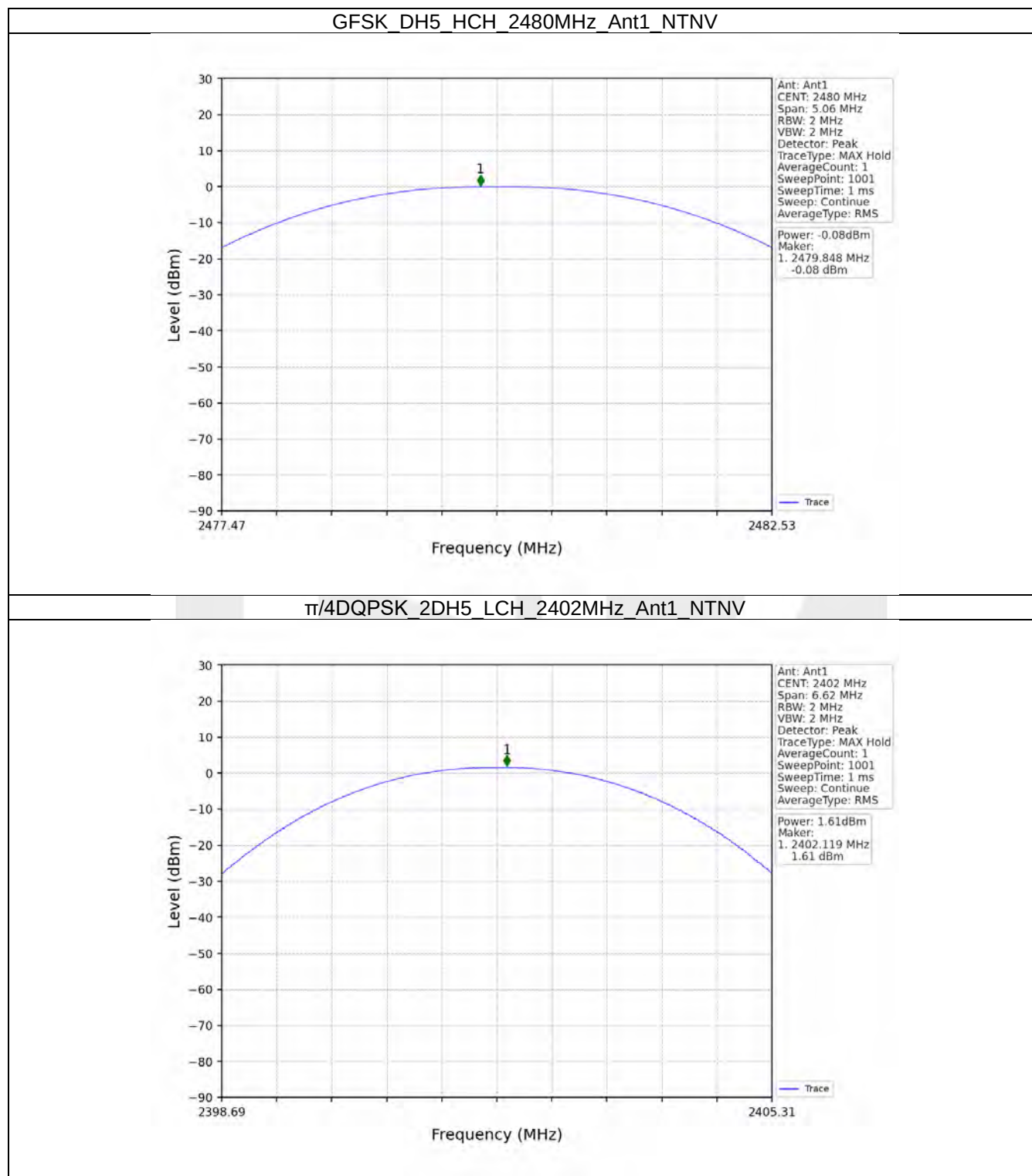
3.1.1 Power

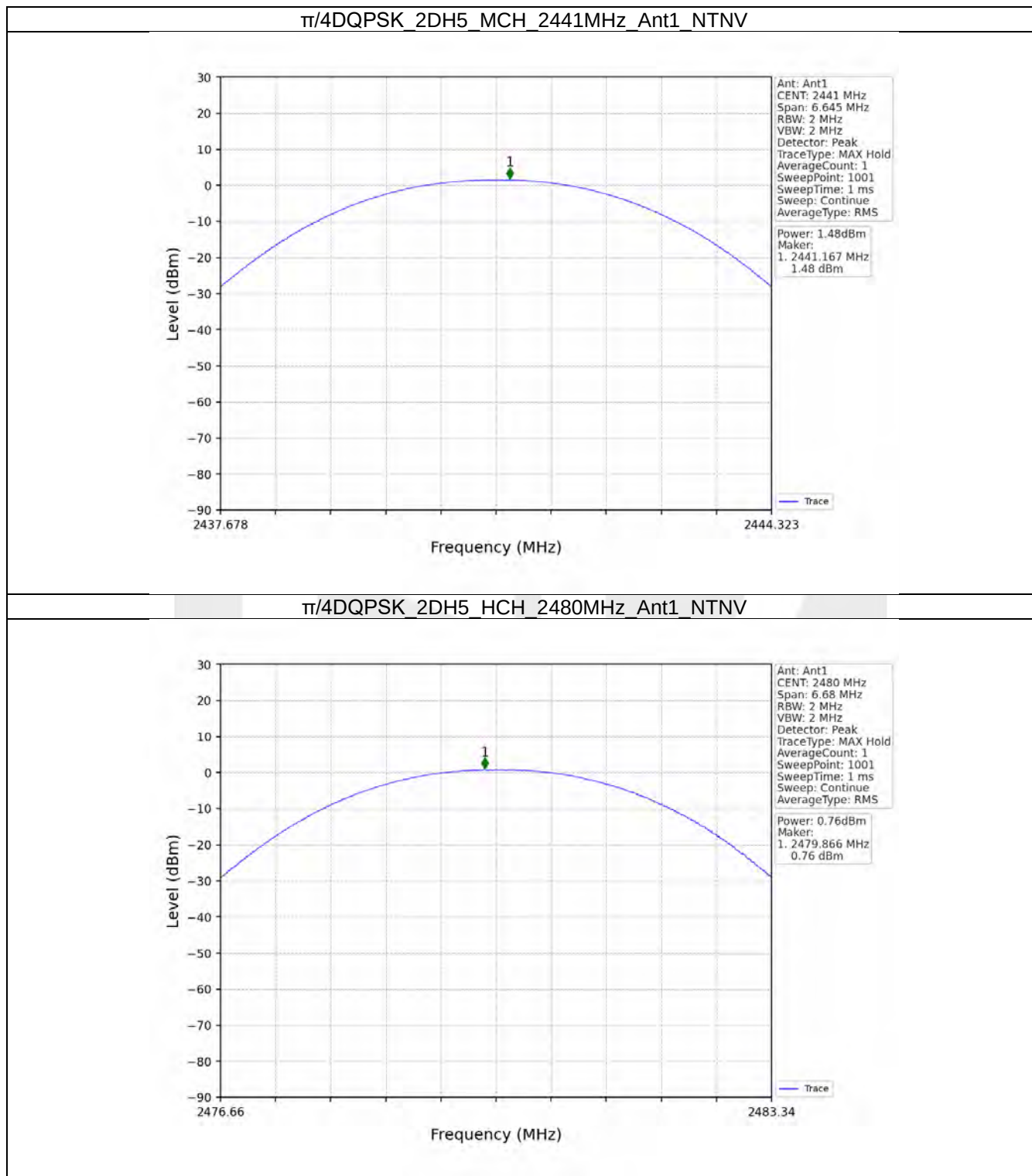
Mode	TX Type	Frequency (MHz)	Packet Type	Maximum Peak Conducted Output Power (dBm)		Verdict
				ANT1	Limit	
GFSK	SISO	2402	DH5	-1.21	≤ 30	Pass
		2441	DH5	-1.71	≤ 30	Pass
		2480	DH5	-2.10	≤ 30	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	0.74	≤ 20.97	Pass
		2441	2DH5	0.42	≤ 20.97	Pass
		2480	2DH5	0.07	≤ 20.97	Pass

3.2 Test Graph(Left Ear)

3.2.1 Power

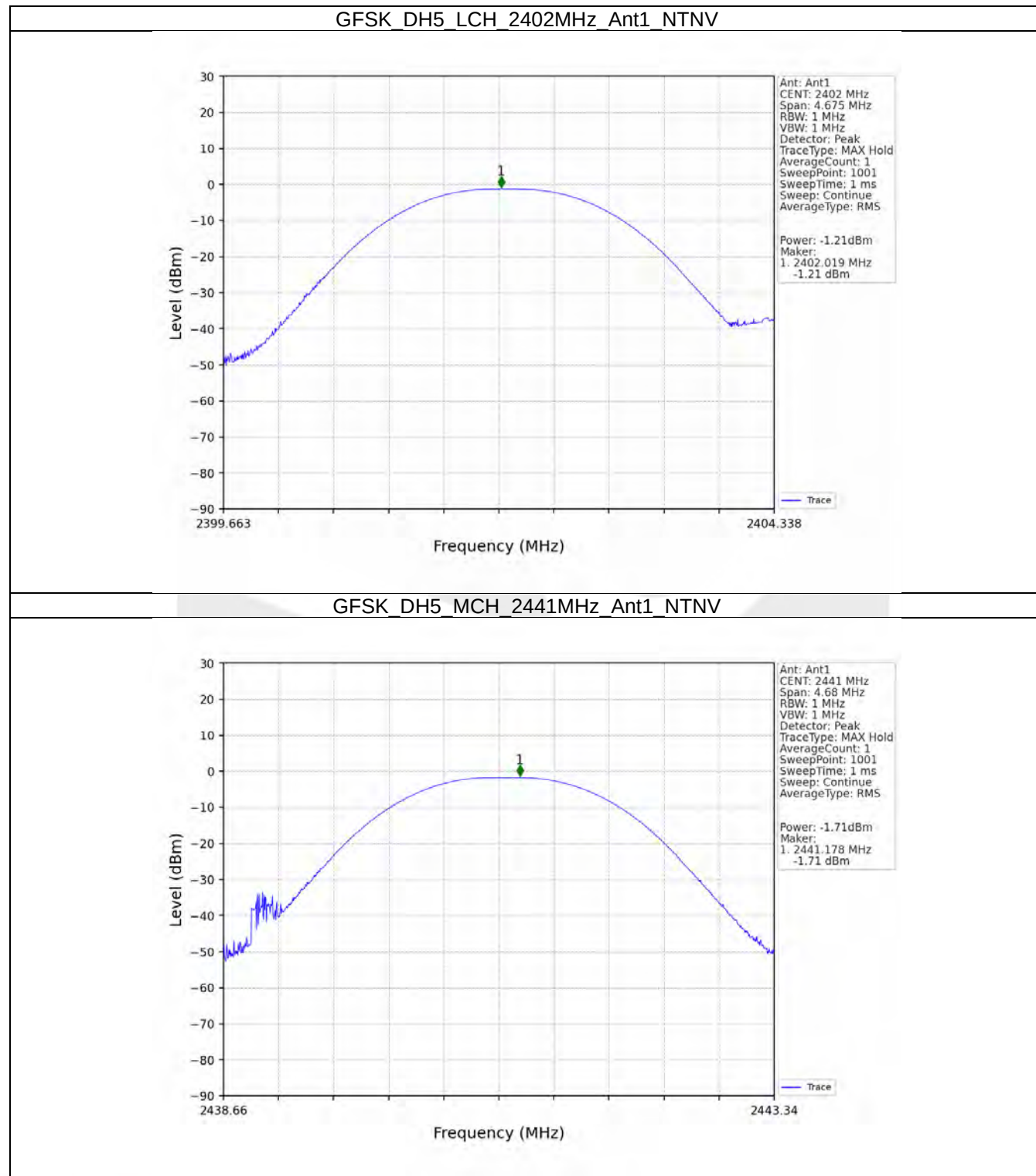


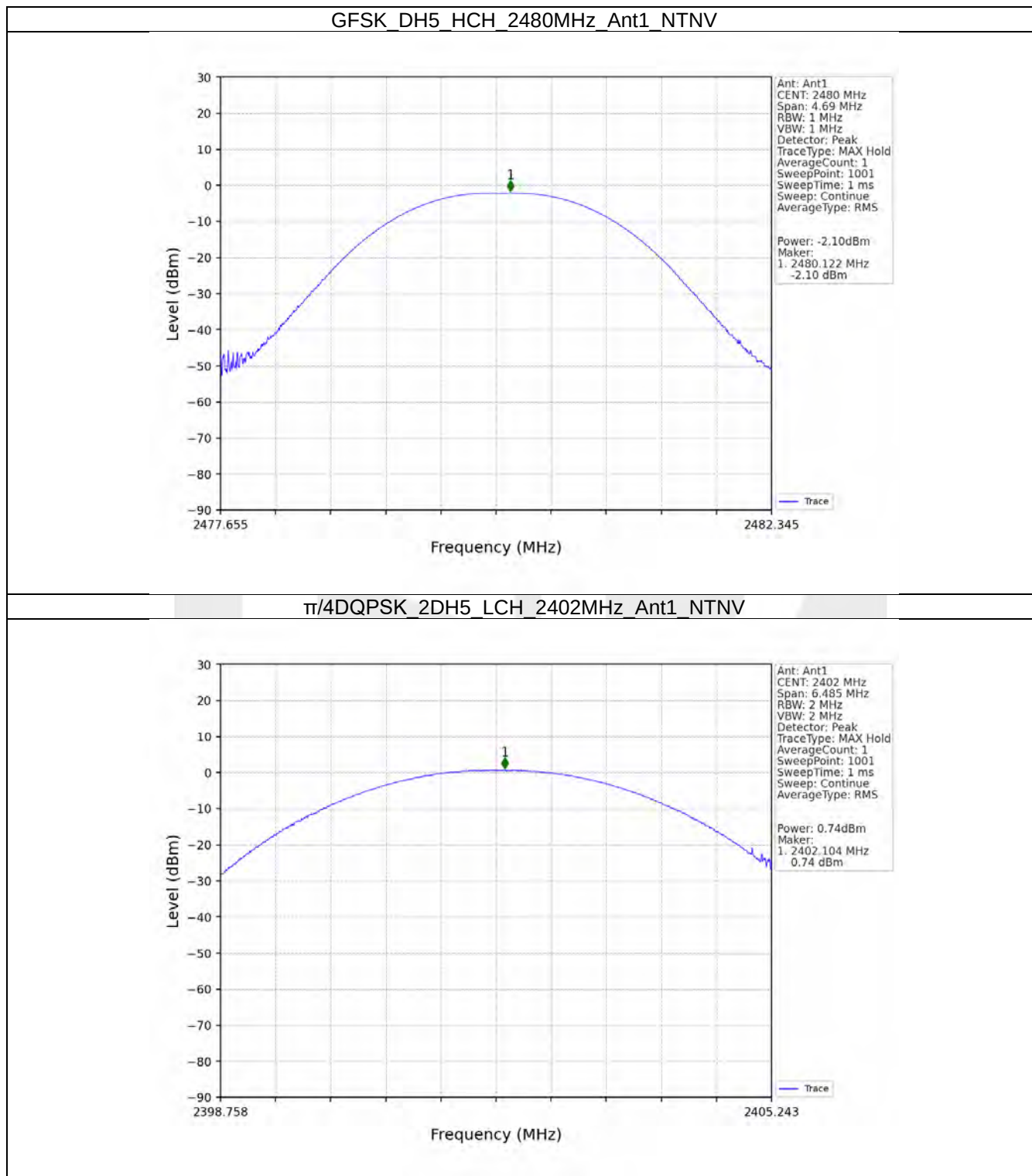




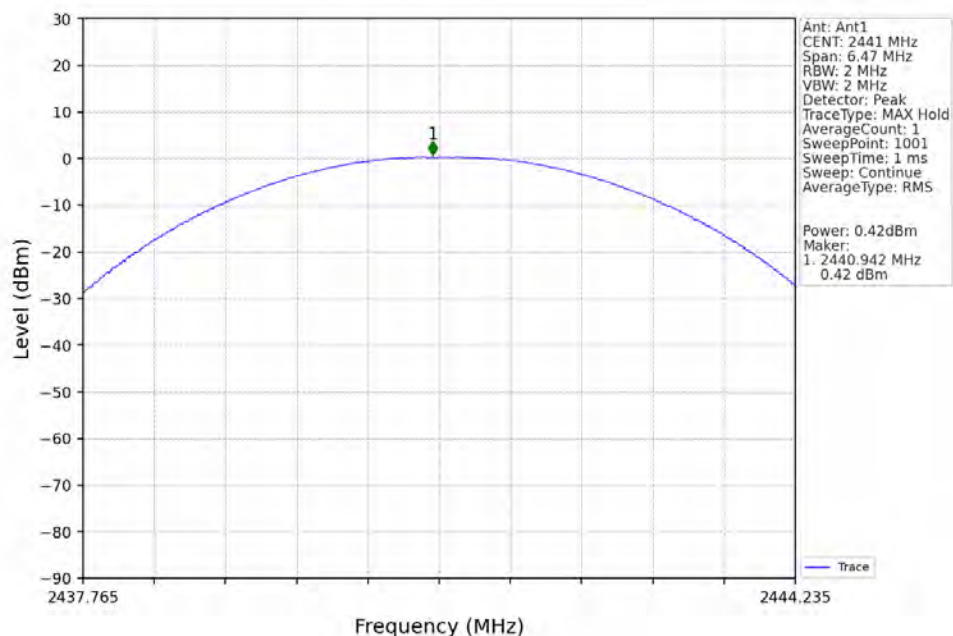
3.2 Test Graph(Right Ear)

3.2.1 Power

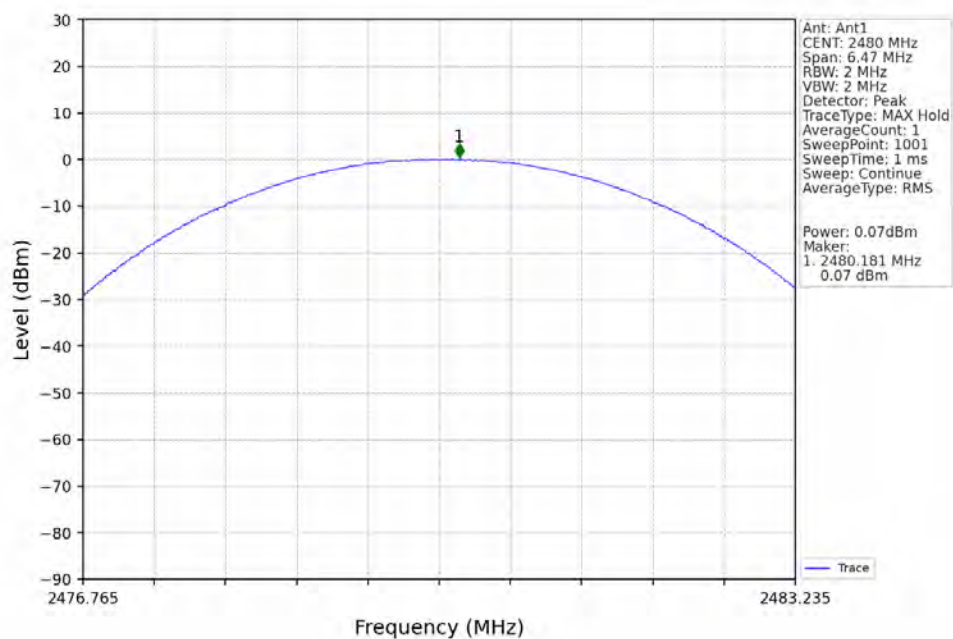




$\pi/4$ DQPSK_2DH5_MCH_2441MHz_Ant1_NTNV



$\pi/4$ DQPSK_2DH5_HCH_2480MHz_Ant1_NTNV



Left Ear

4. Carrier Frequency Separation

4.1 Test Result

4.1.1 Ant1

Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	1.000	1.025	≥ 0.683	Pass
$\pi/4$ DQPSK	SISO	HOPP	2DH5	1.001	1.336	≥ 0.891	Pass

Right Ear

4. Carrier Frequency Separation

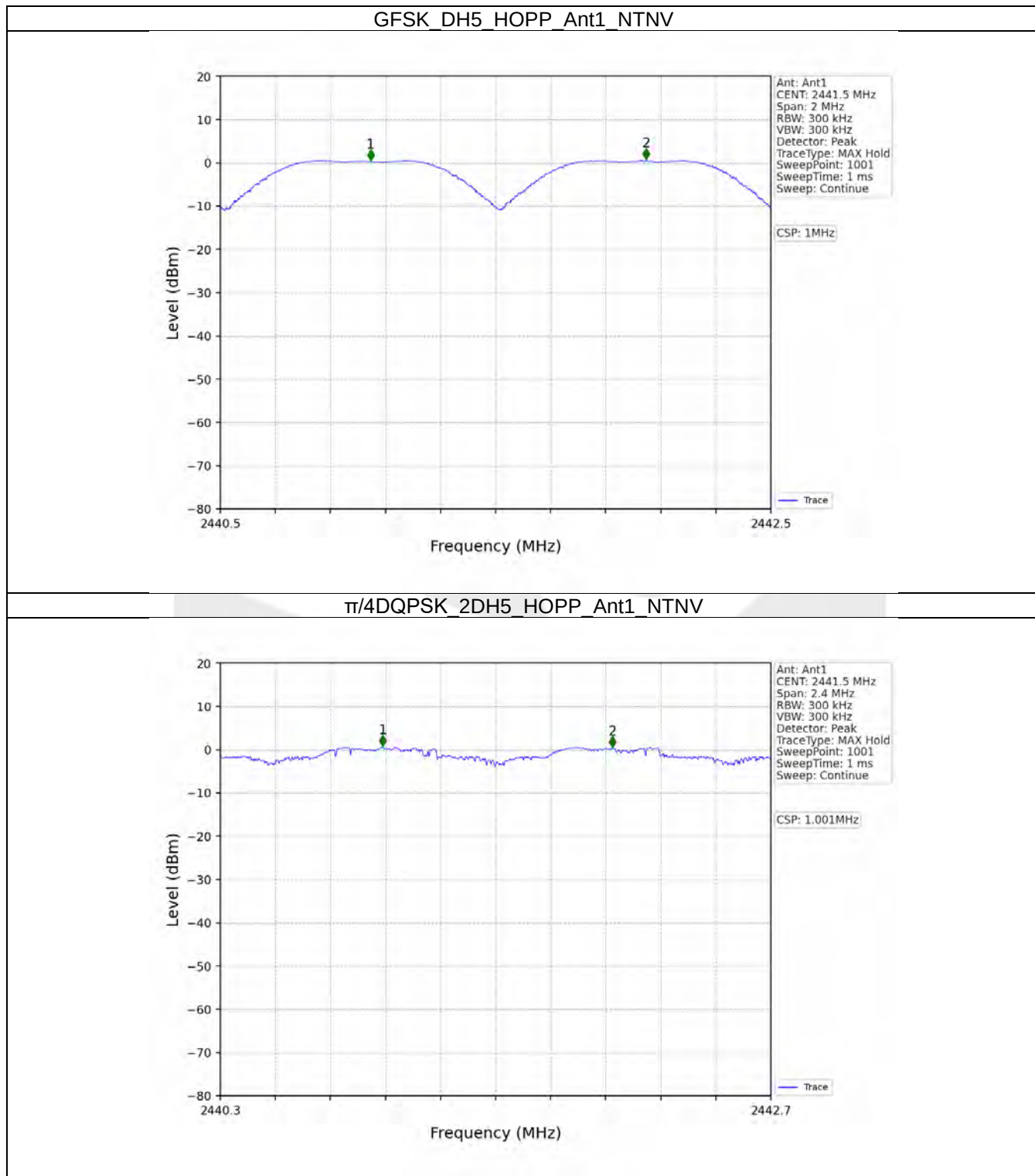
4.1 Test Result

4.1.1 Ant1

Ant1							
Mode	TX Type	Frequency (MHz)	Packet Type	Channel Separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz)	Verdict
GFSK	SISO	HOPP	DH5	1.034	0.938	≥ 0.938	Pass
$\pi/4$ DQPSK	SISO	HOPP	2DH5	1.030	1.297	≥ 0.865	Pass

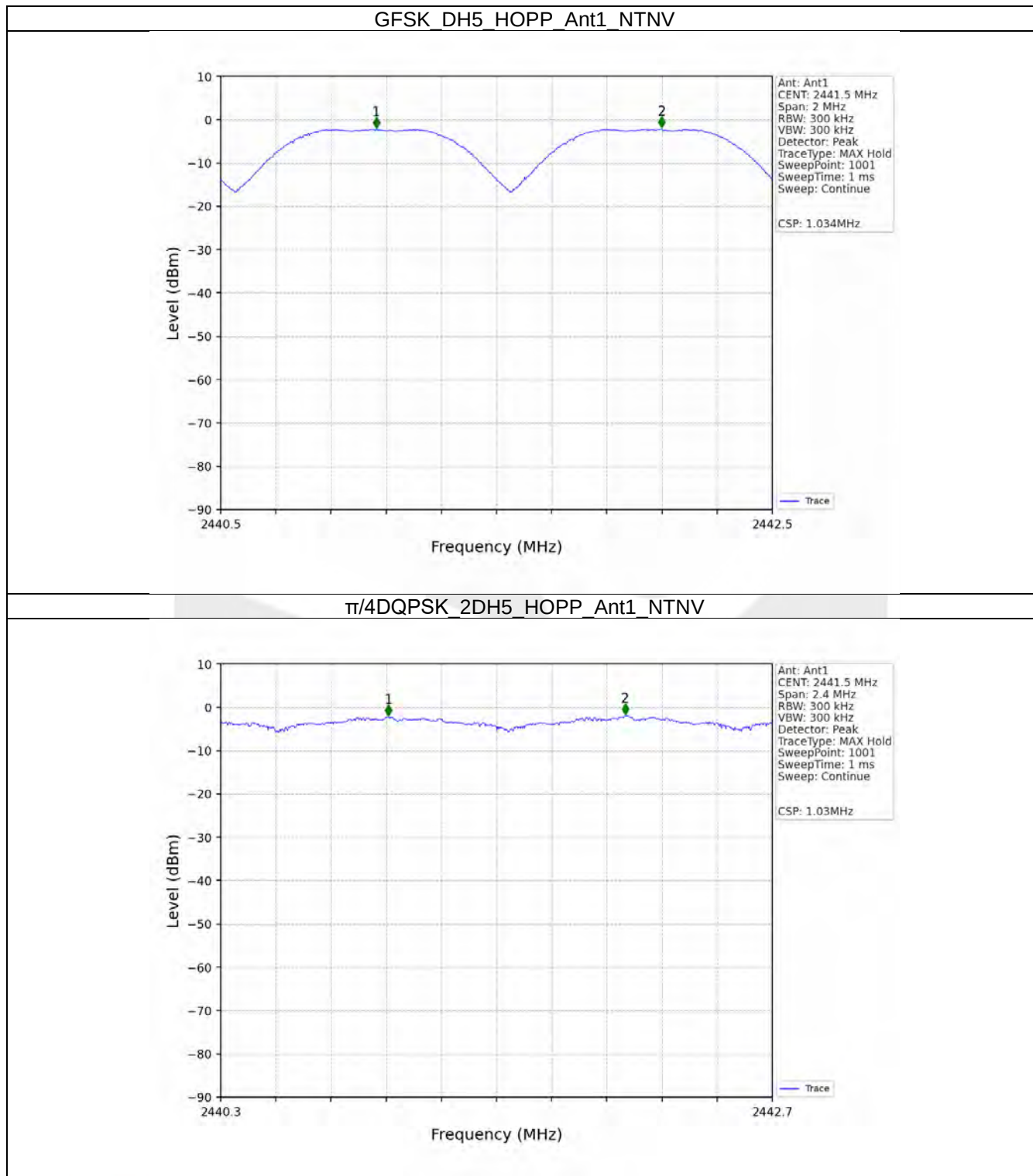
4.2 Test Graph(Left Ear)

4.2.1 Ant1



4.2 Test Graph(Right Ear)

4.2.1 Ant1



Left Ear

5. Number of Hopping Frequencies

5.1 Test Result

5.1.1 HoppNum

Mode	TX Type	Frequency (MHz)	Packet Type	Num of Hopping Frequencies		Verdict
				ANT1	Limit	
GFSK	SISO	HOPP	DH5	79	≥ 15	Pass
$\pi/4$ DQPSK	SISO	HOPP	2DH5	79	≥ 15	Pass

Right Ear

5. Number of Hopping Frequencies

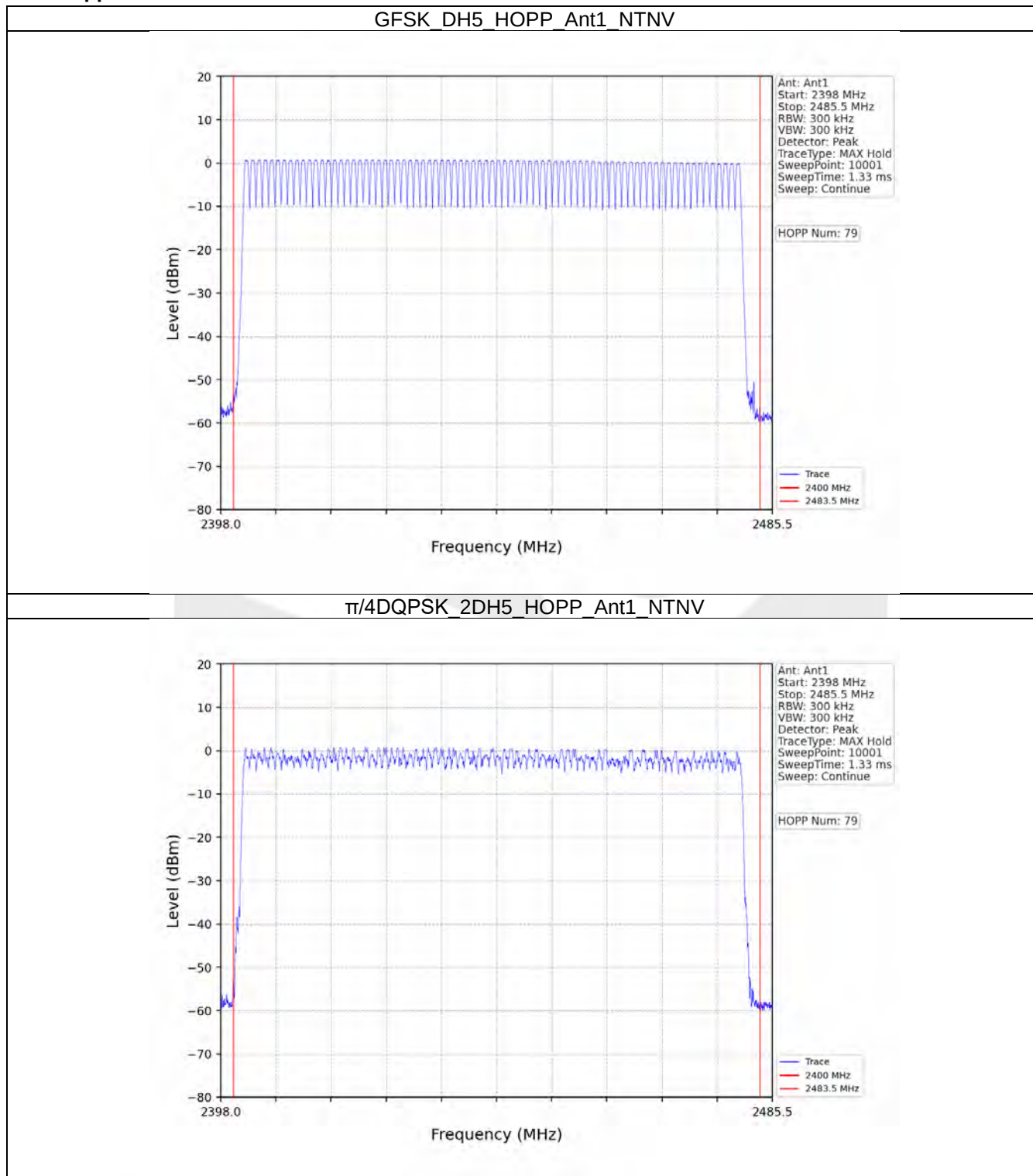
5.1 Test Result

5.1.1 HoppNum

Mode	TX Type	Frequency (MHz)	Packet Type	Num of Hopping Frequencies		Verdict
				ANT1	Limit	
GFSK	SISO	HOPP	DH5	79	≥ 15	Pass
$\pi/4$ DQPSK	SISO	HOPP	2DH5	79	≥ 15	Pass

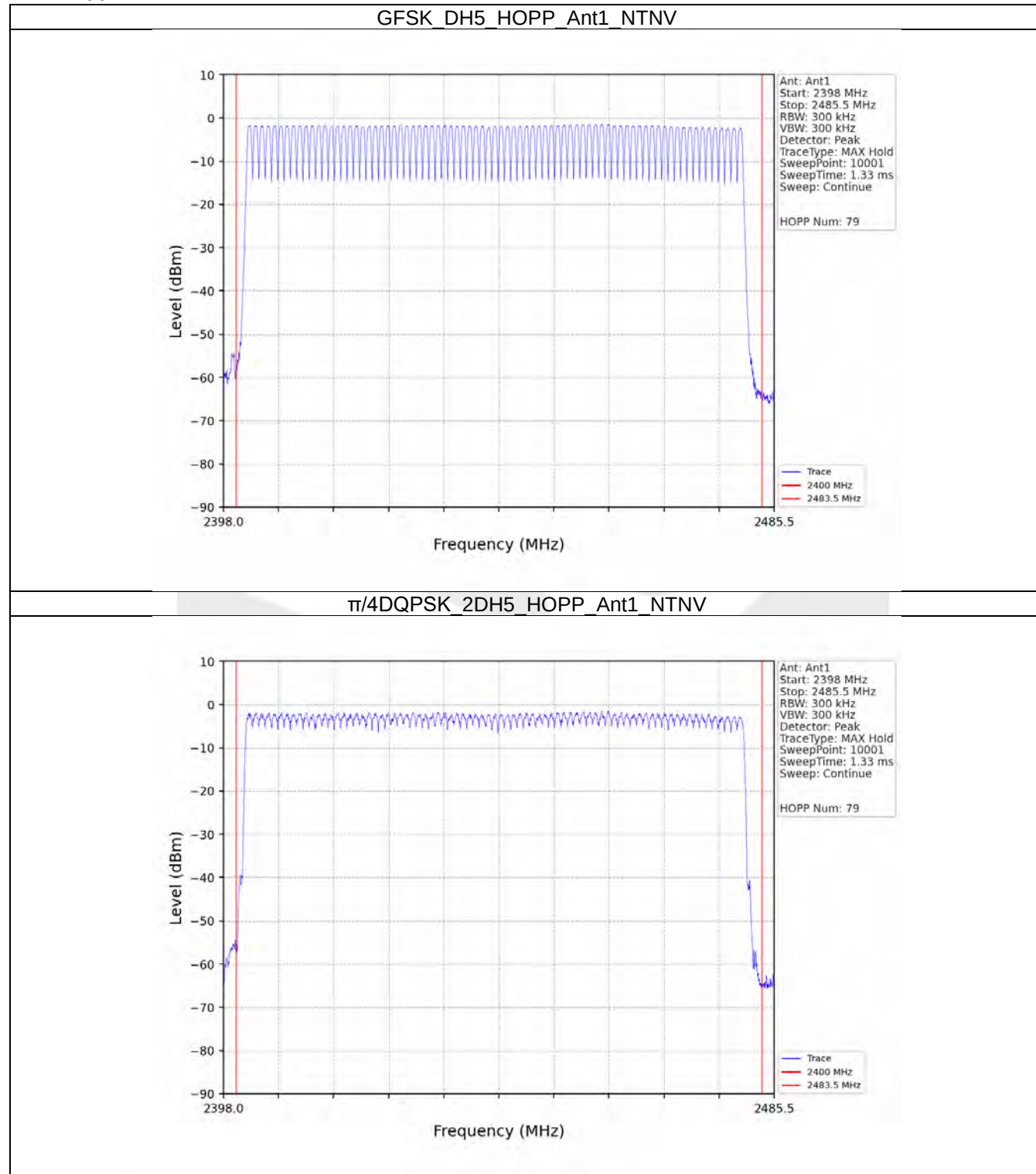
5.2 Test Graph(Left Ear)

5.2.1 HoppNum



5.2 Test Graph(Right Ear)

5.2.1 HoppNum



Left Ear

6. Time of Occupancy (Dwell Time)

6.1 Test Result

6.1.1 Ant1

Ant1									
Mode	Tx Type	Frequency (MHz)	Packet Type	Duration of Single Pulse (ms)	Observation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limit (ms)	Verdict
GFSK	SISO	HOPP	DH1	0.388	31.600	319	123.772	<=400	Pass
			DH3	1.650	31.600	159	262.350	<=400	Pass
			DH5	2.896	31.600	104	301.184	<=400	Pass
$\pi/4$ DQPSK	SISO	HOPP	2DH1	0.396	31.600	319	126.324	<=400	Pass
			2DH3	1.654	31.600	159	262.986	<=400	Pass
			2DH5	2.904	31.600	105	304.920	<=400	Pass

Right Ear

6. Time of Occupancy (Dwell Time)

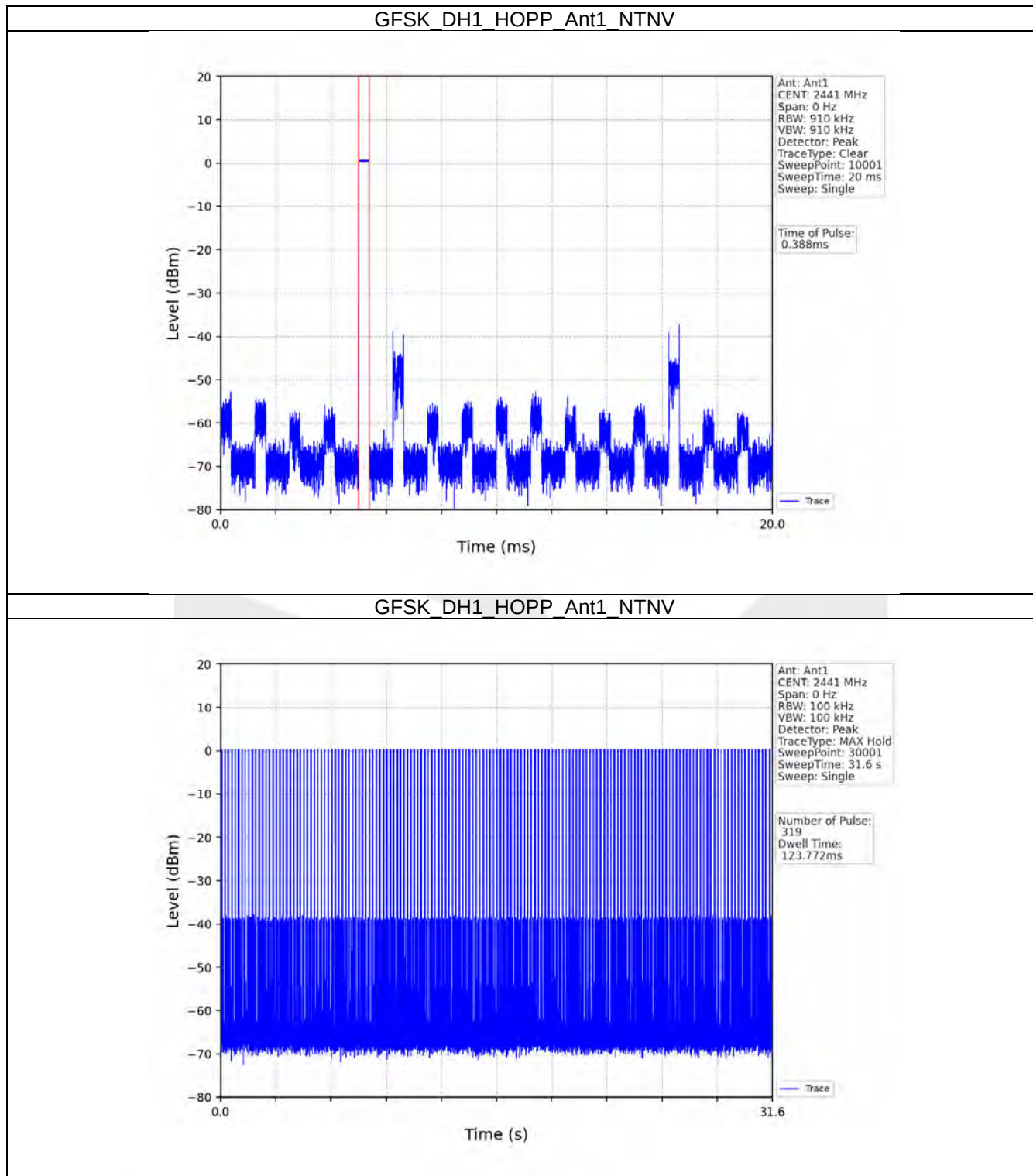
6.1 Test Result

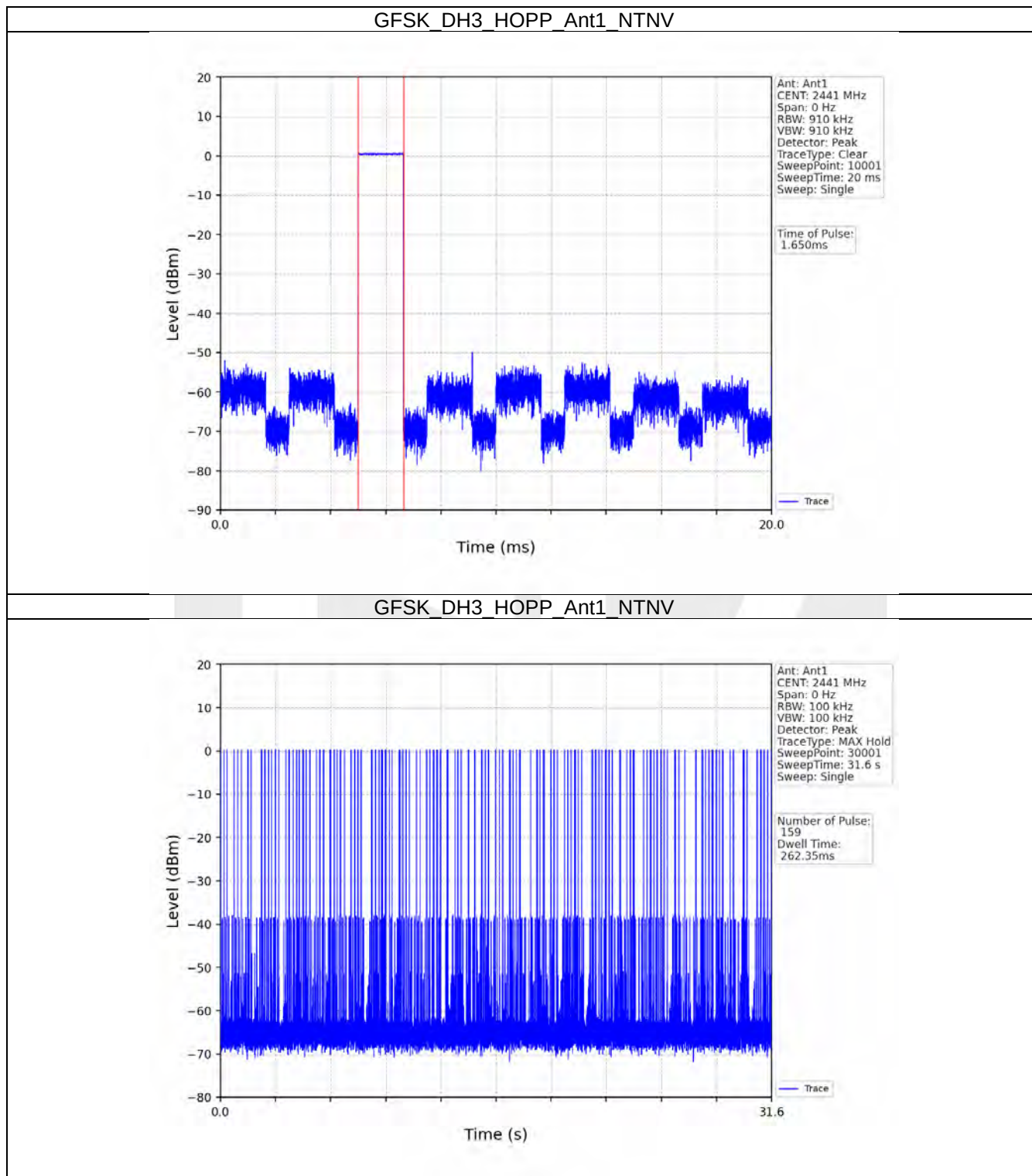
6.1.1 Ant1

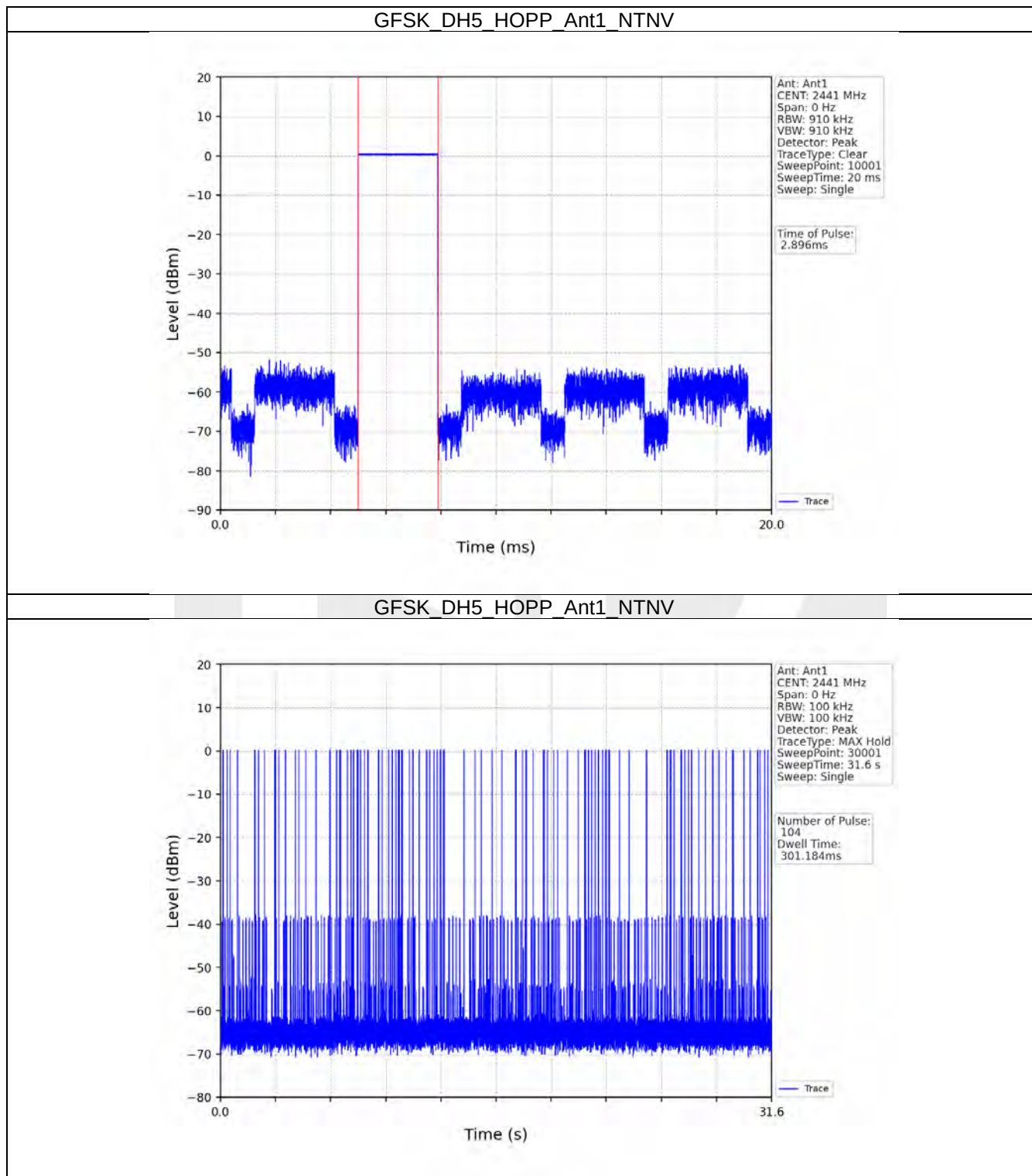
Ant1									
Mode	Tx Type	Frequency (MHz)	Packet Type	Duration of Single Pulse (ms)	Observation Period (s)	Num of Pulse in Observation Period	Dwell Time (ms)	Limit (ms)	Verdict
GFSK	SISO	HOPP	DH1	0.384	31.600	320	122.880	<=400	Pass
			DH3	1.640	31.600	155	254.200	<=400	Pass
			DH5	2.888	31.600	101	291.688	<=400	Pass
$\pi/4$ DQPSK	SISO	HOPP	2DH1	0.394	31.600	320	126.080	<=400	Pass
			2DH3	1.650	31.600	152	250.800	<=400	Pass
			2DH5	2.898	31.600	105	304.290	<=400	Pass

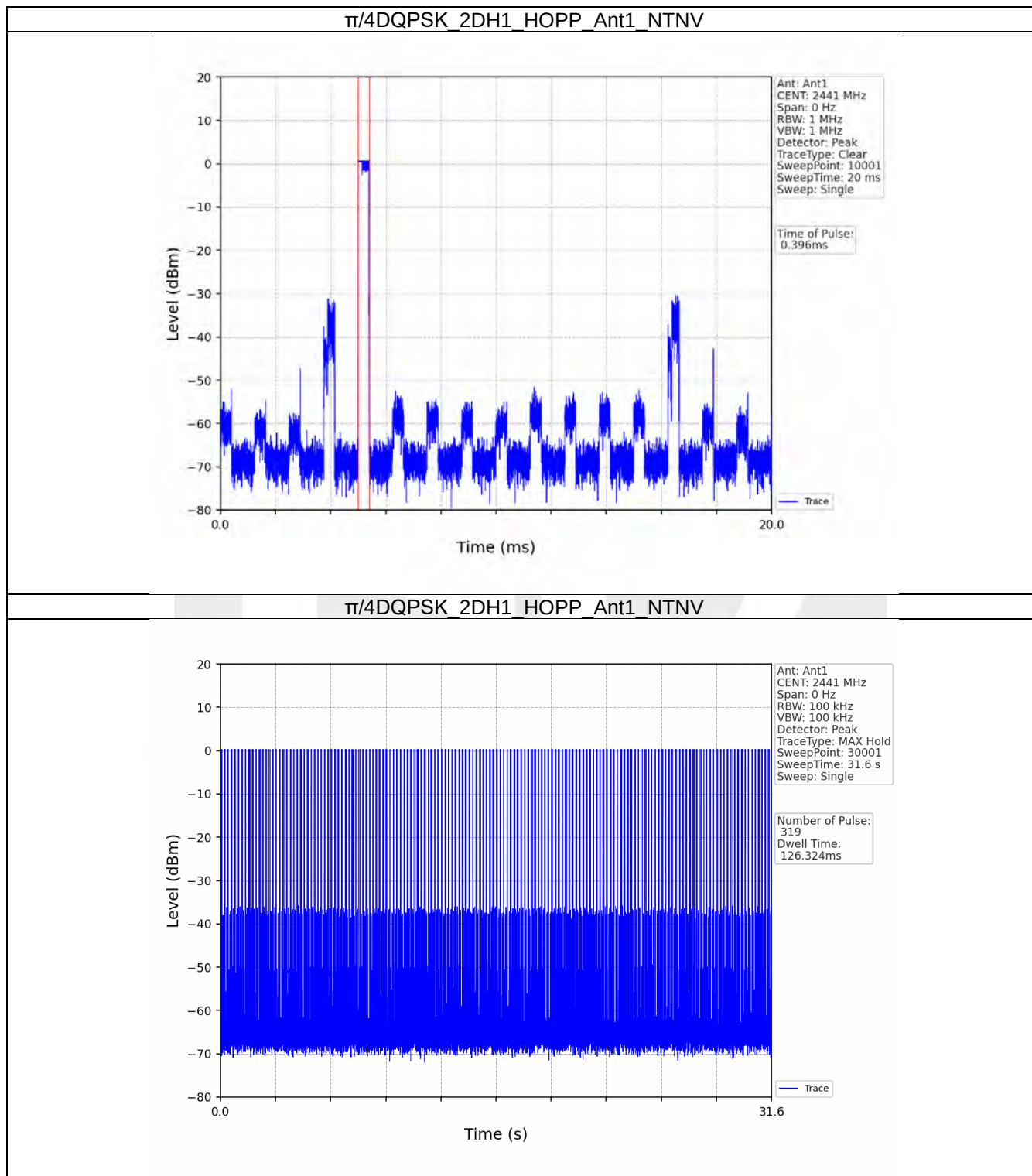
6.2 Test Graph(Left Ear)

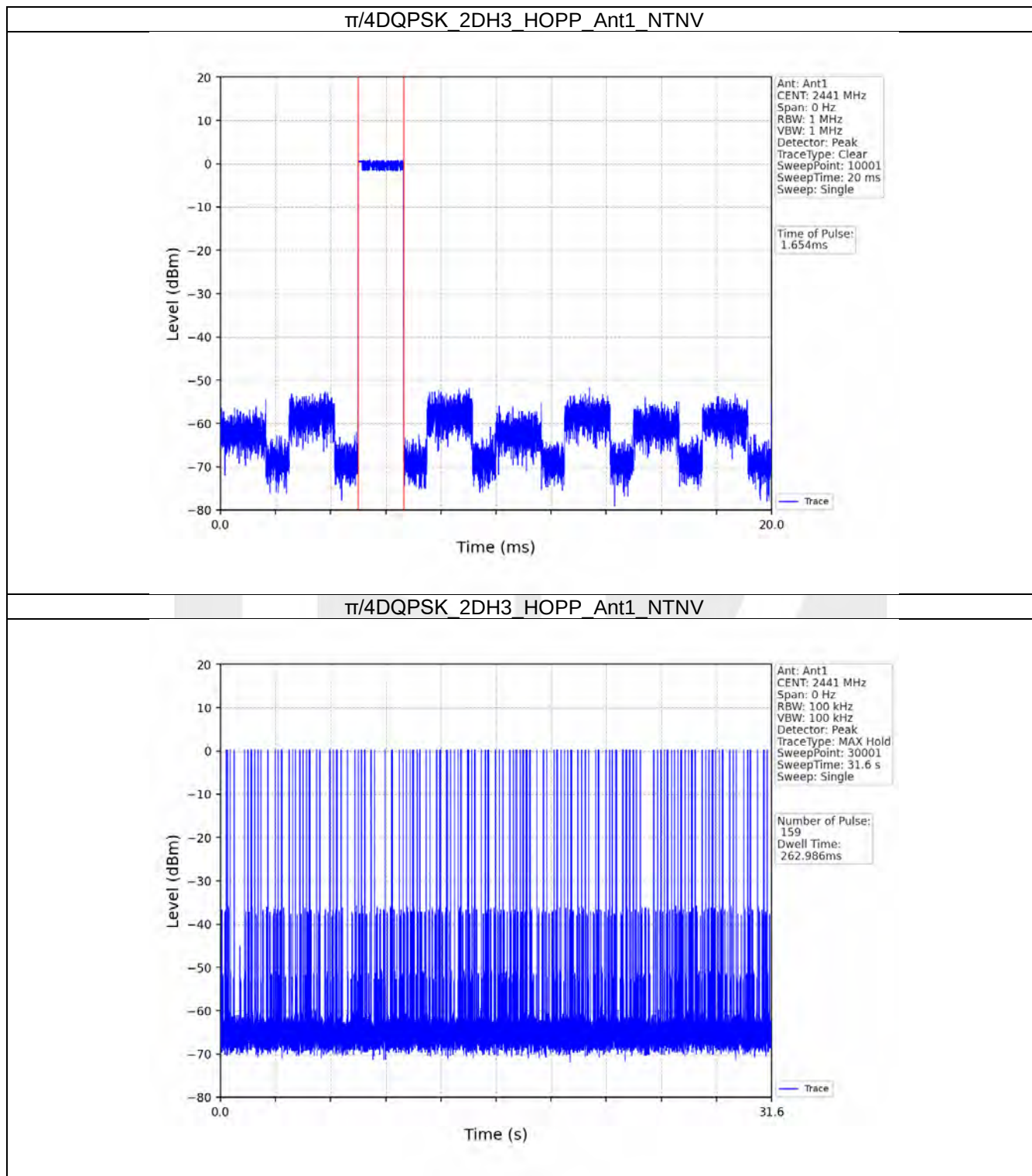
6.2.1 Ant1

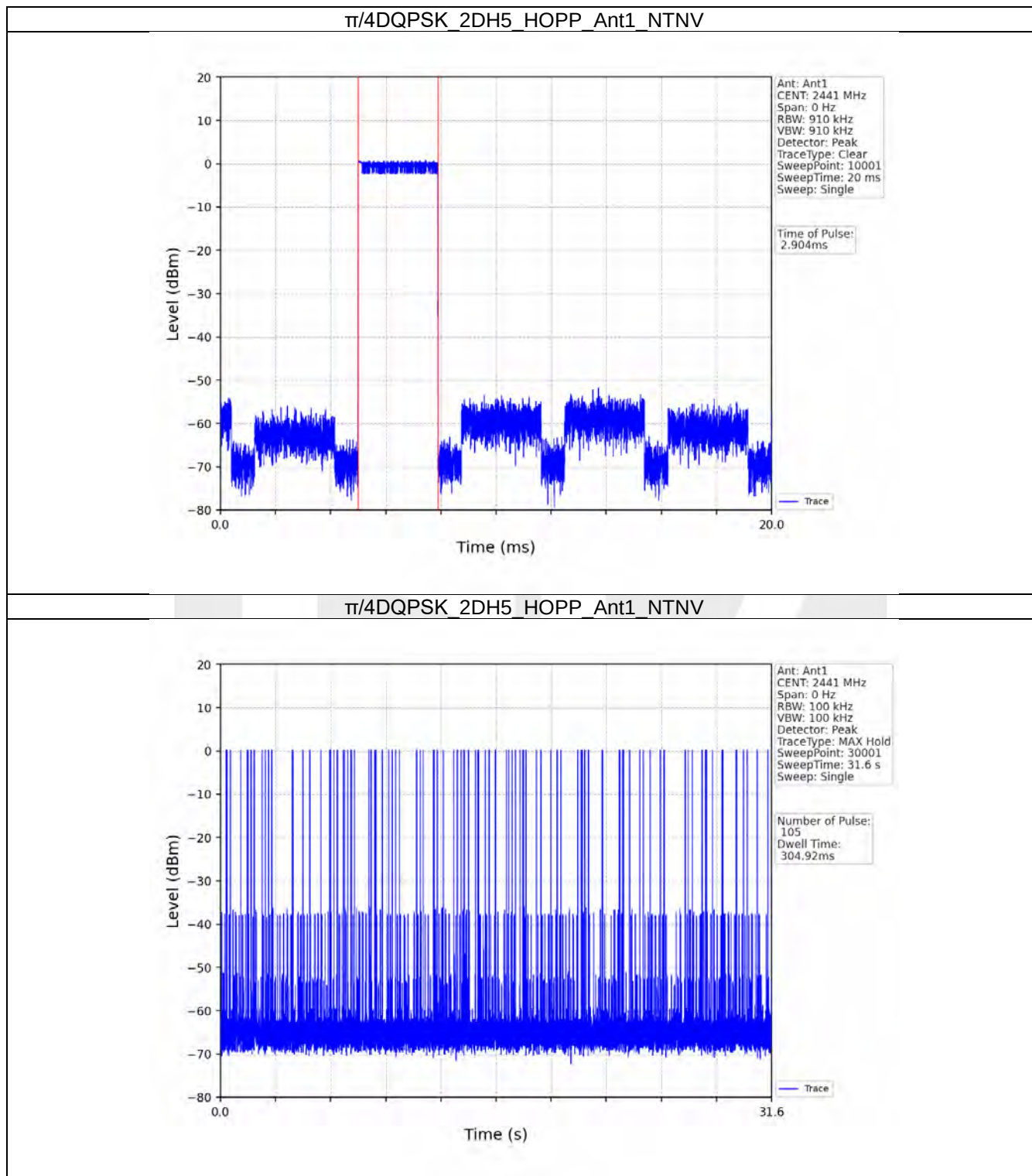






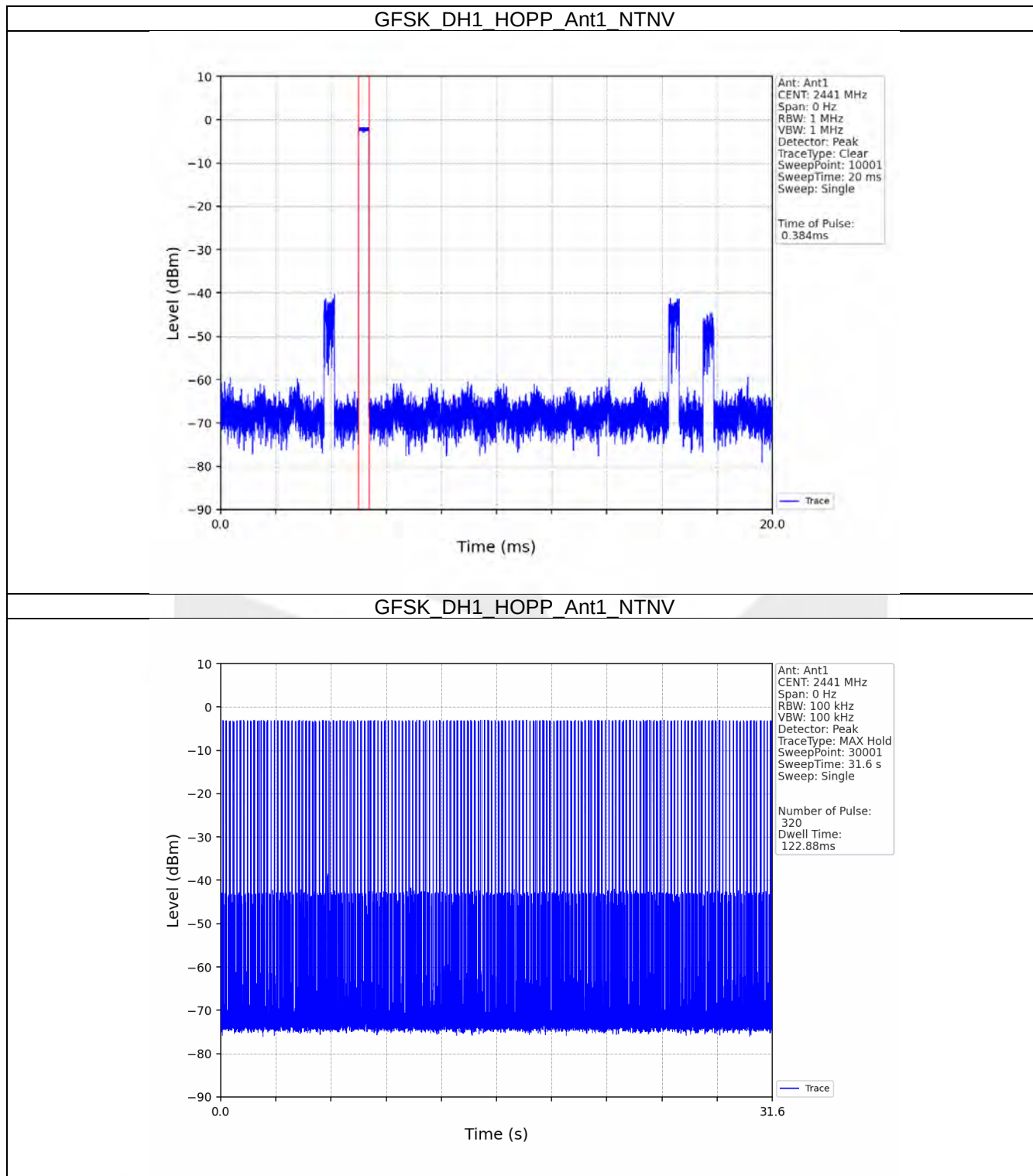


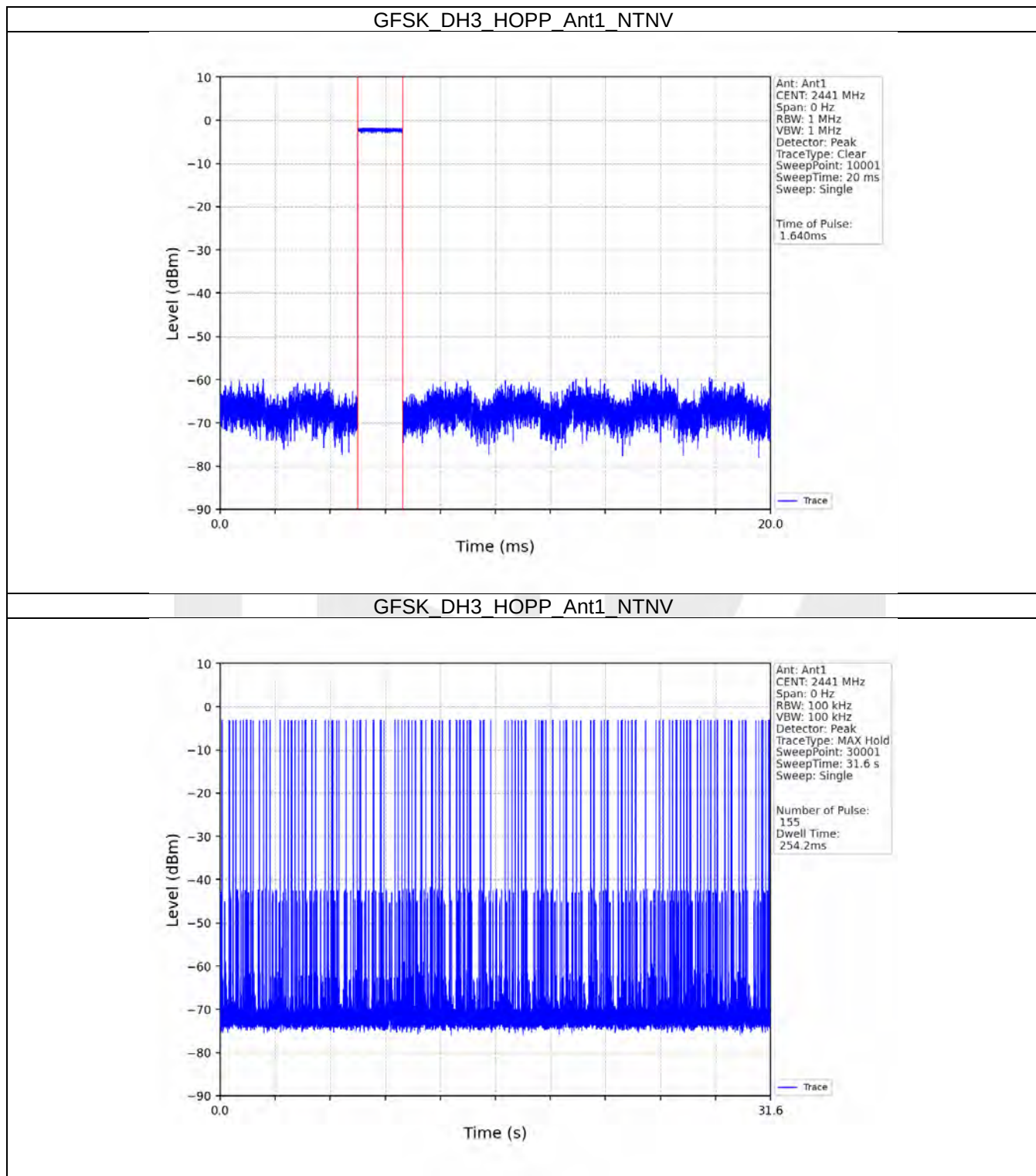


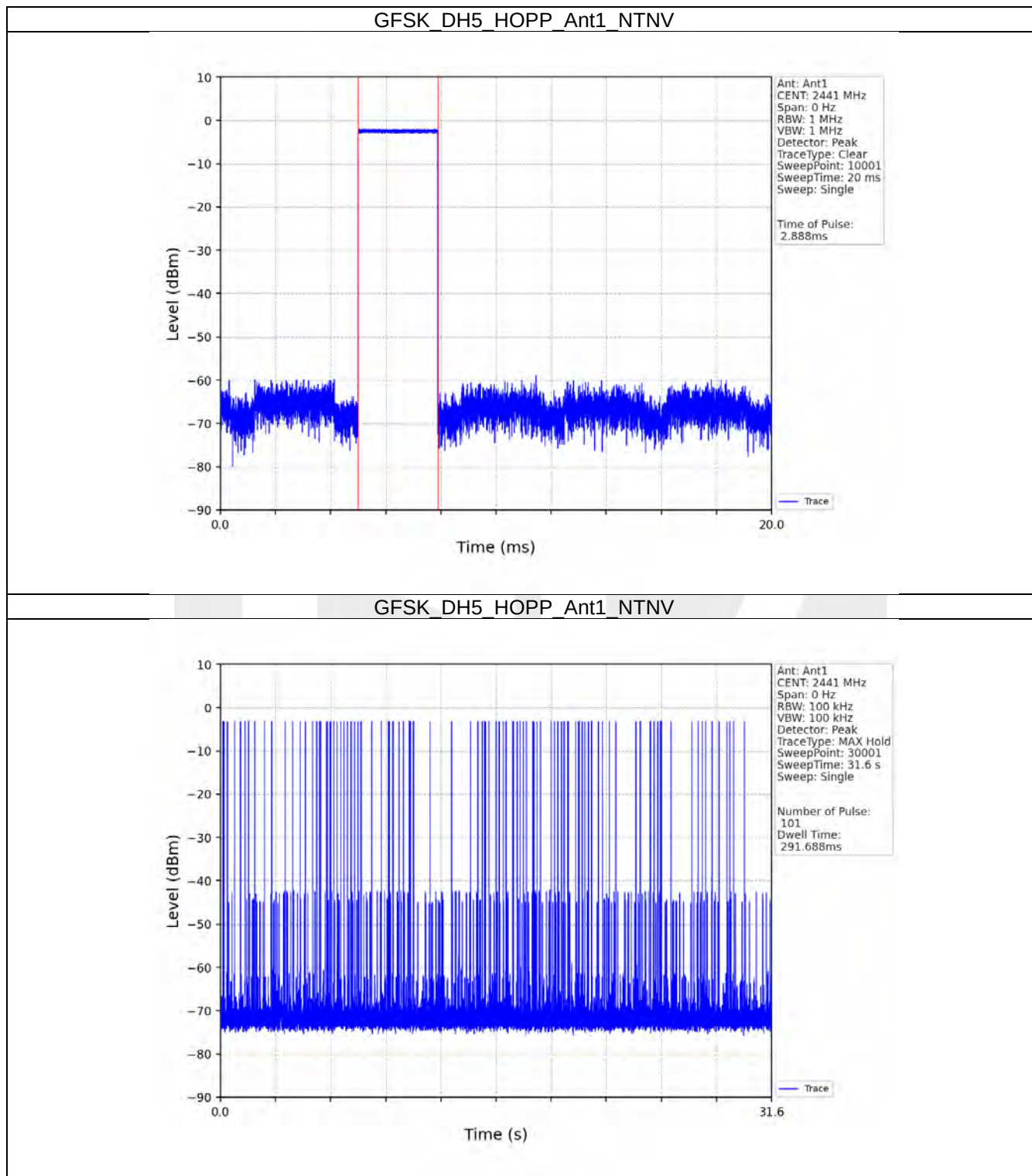


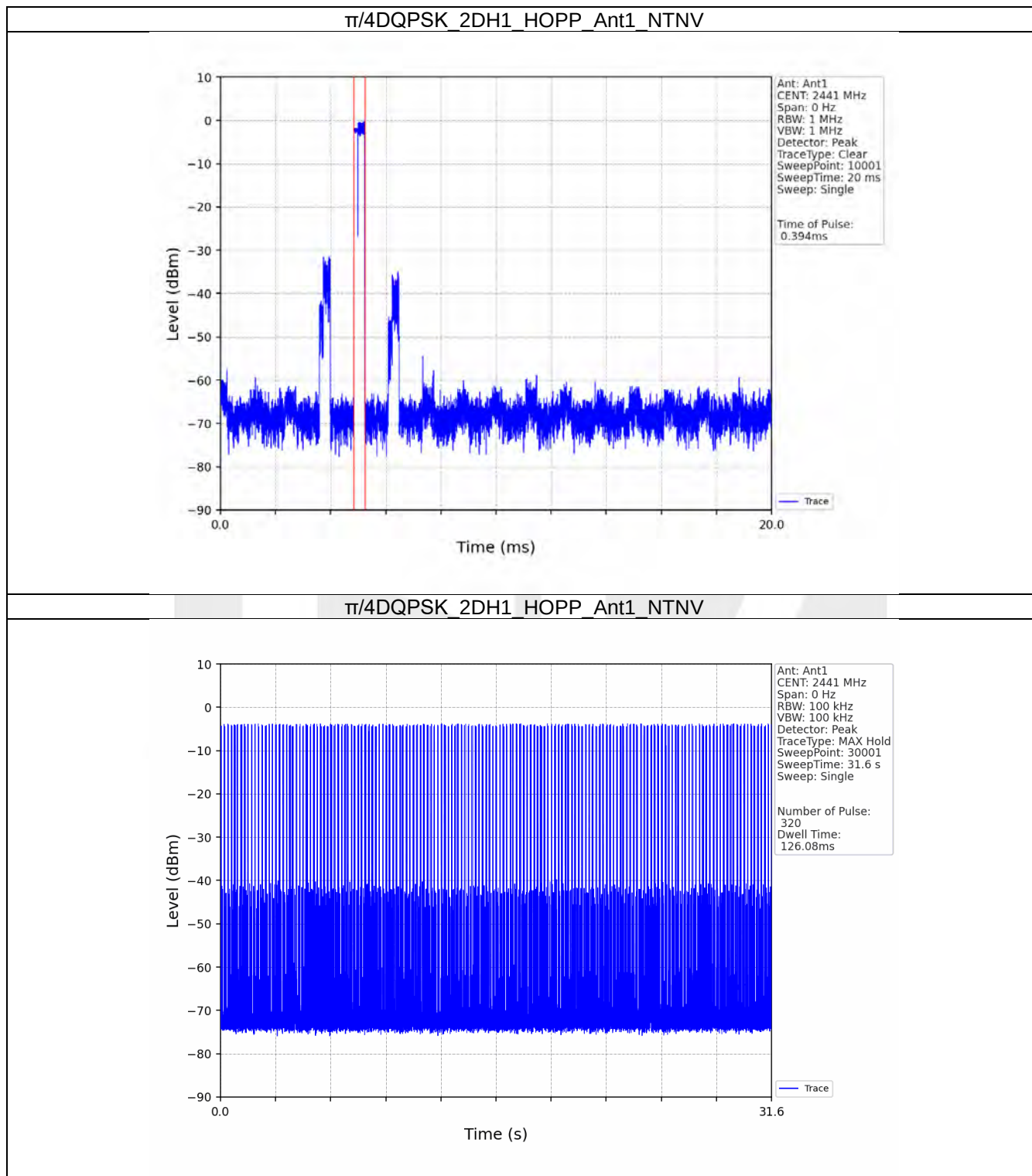
6.2 Test Graph(Right Ear)

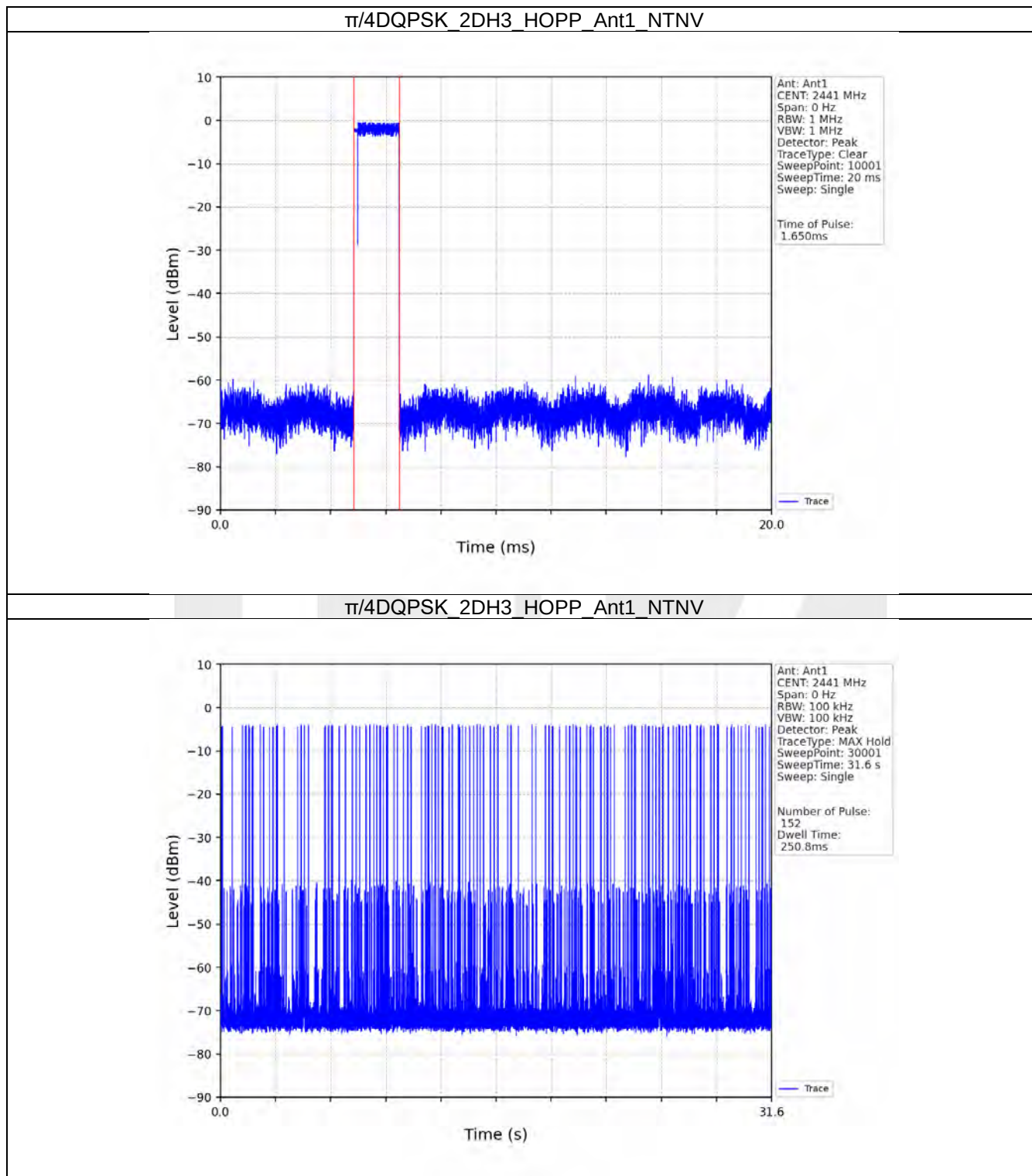
6.2.1 Ant1

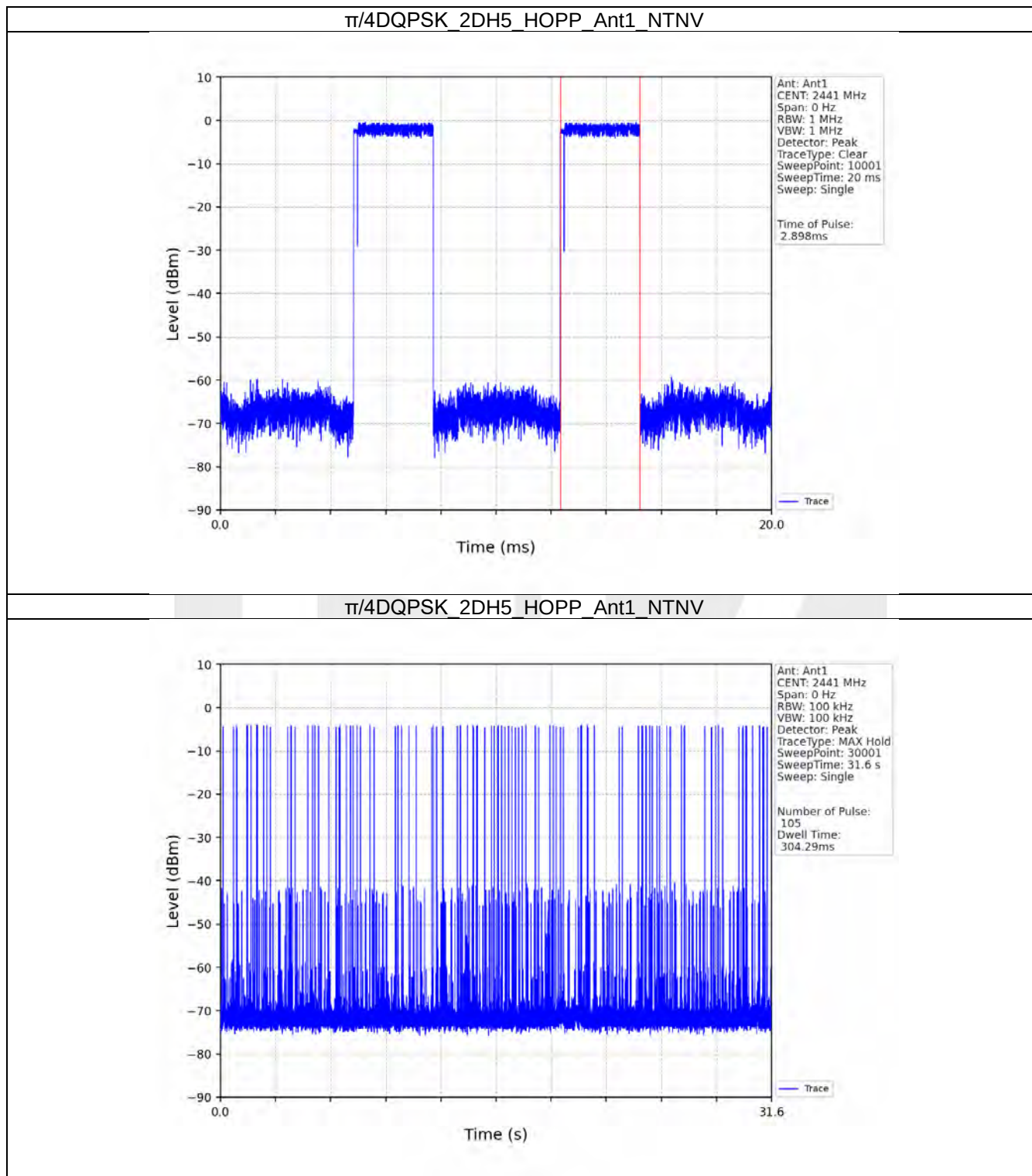












Left Ear

7. Unwanted Emissions In Non-restricted Frequency Bands

7.1 Test Result

7.1.1 Ref

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	0.54
		2441	DH5	1	0.42
		2480	DH5	1	-0.33
		HOPP	DH5	1	0.64
					0.64
$\pi/4$ DQPSK	SISO	2402	2DH5	1	0.54
		2441	2DH5	1	0.44
		2480	2DH5	1	-0.28
		HOPP	2DH5	1	0.57
					0.57
					0.57
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.					

7.1.2 CSE

Mode	Tx Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	0.54	-19.46	Pass
		2441	DH5	1	0.42	-19.58	Pass
		2480	DH5	1	-0.33	-20.33	Pass
		HOPP	DH5	1	0.64	-19.36	Pass
					0.64	-19.36	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	1	0.54	-19.46	Pass
		2441	2DH5	1	0.44	-19.56	Pass
		2480	2DH5	1	-0.28	-20.28	Pass
		HOPP	2DH5	1	0.57	-19.43	Pass
					0.57	-19.43	Pass
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.							

Right Ear

7. Unwanted Emissions In Non-restricted Frequency Bands

7.1 Test Result

7.1.1 Ref

Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)
GFSK	SISO	2402	DH5	1	-1.52
		2441	DH5	1	-2.34
		2480	DH5	1	-2.77
		HOPP	DH5	1	-1.50
					-1.50
$\pi/4$ DQPSK	SISO	2402	2DH5	1	-1.96
		2441	2DH5	1	-2.18
		2480	2DH5	1	-2.75
		HOPP	2DH5	1	-1.86
					-1.86

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

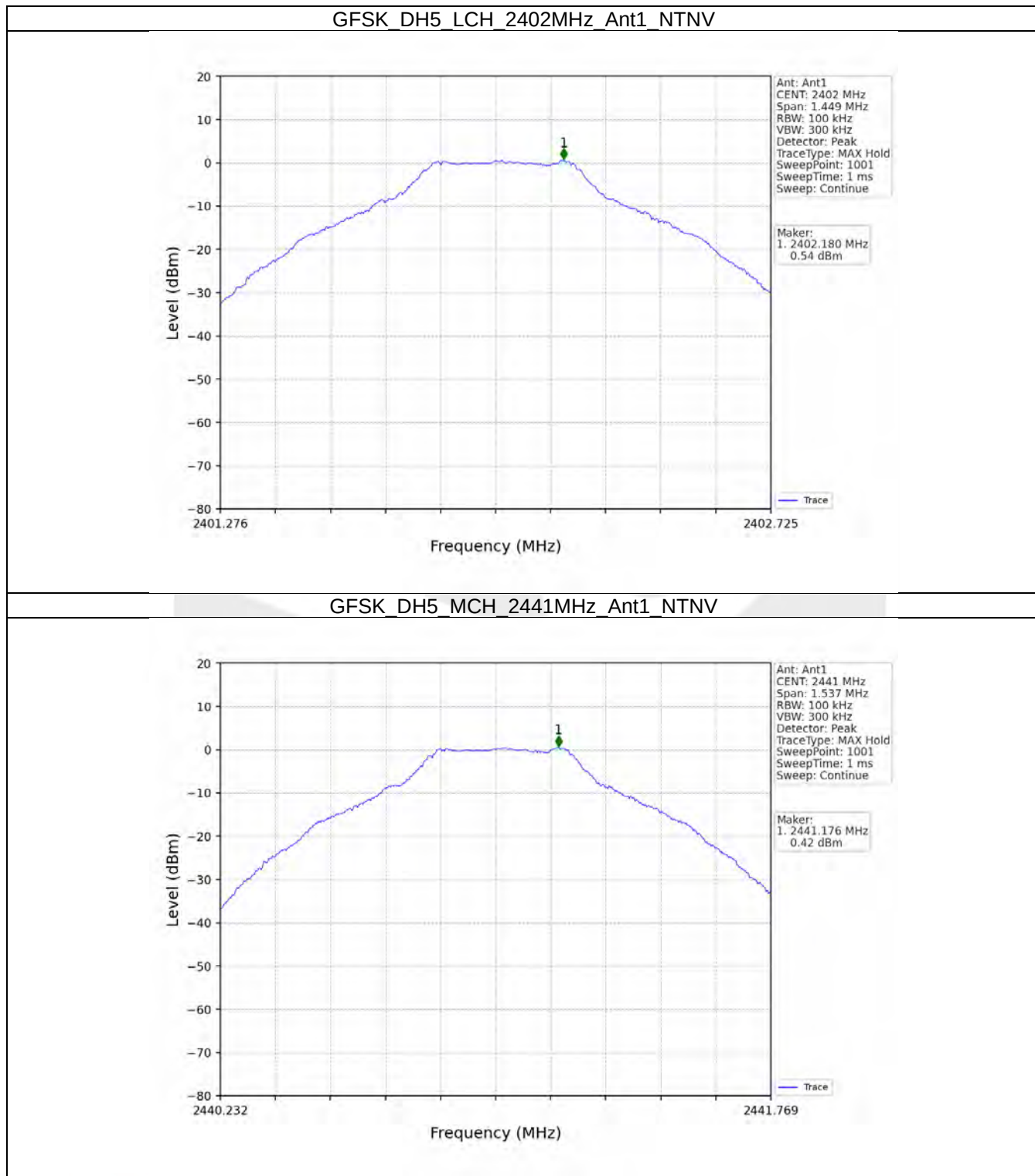
7.1.2 CSE

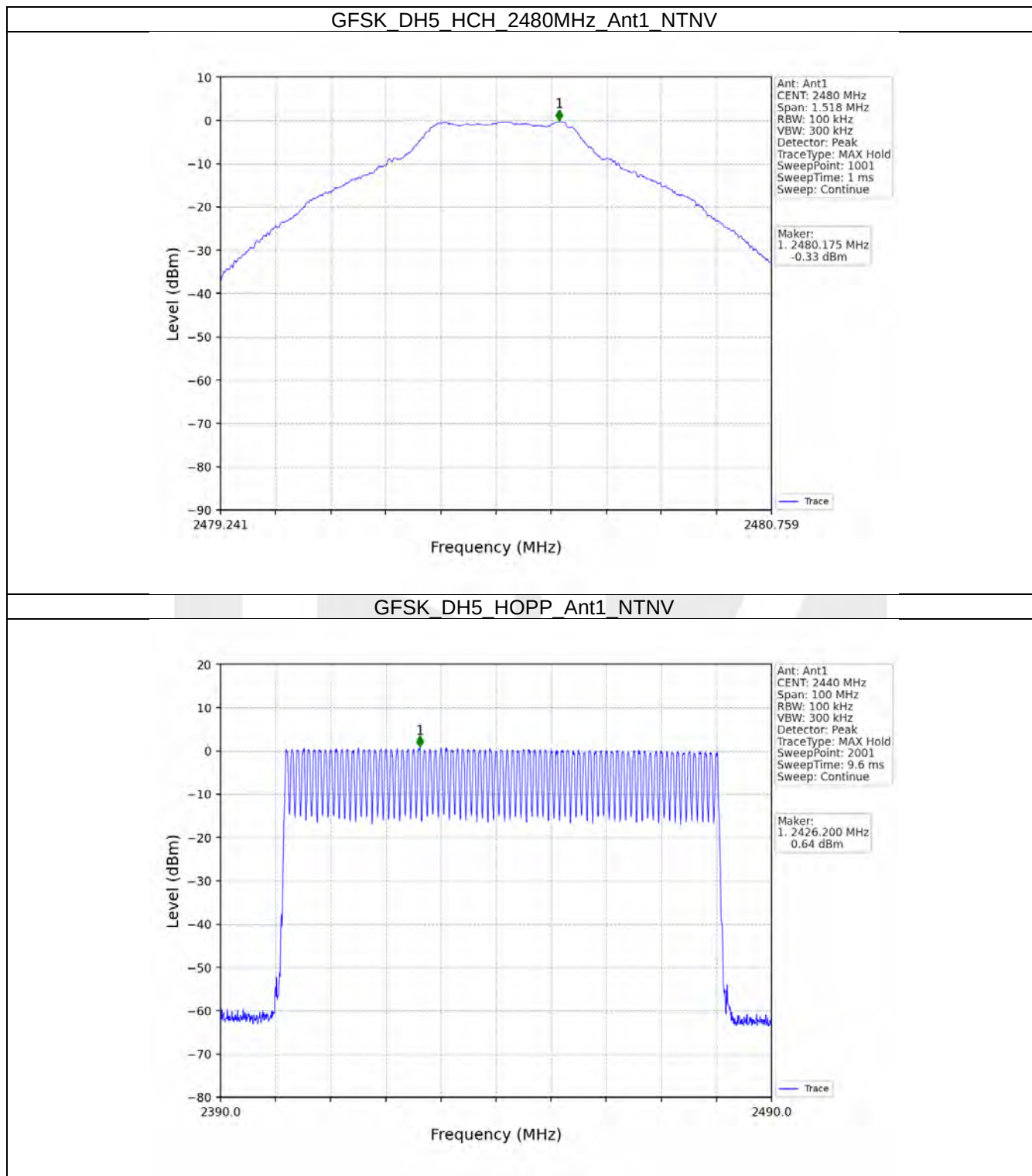
Mode	TX Type	Frequency (MHz)	Packet Type	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
GFSK	SISO	2402	DH5	1	-1.52	-21.52	Pass
		2441	DH5	1	-2.34	-22.34	Pass
		2480	DH5	1	-2.77	-22.77	Pass
		HOPP	DH5	1	-1.50	-21.50	Pass
					-1.50	-21.50	Pass
$\pi/4$ DQPSK	SISO	2402	2DH5	1	-1.96	-21.96	Pass
		2441	2DH5	1	-2.18	-22.18	Pass
		2480	2DH5	1	-2.75	-22.75	Pass
		HOPP	2DH5	1	-1.86	-21.86	Pass
					-1.86	-21.86	Pass

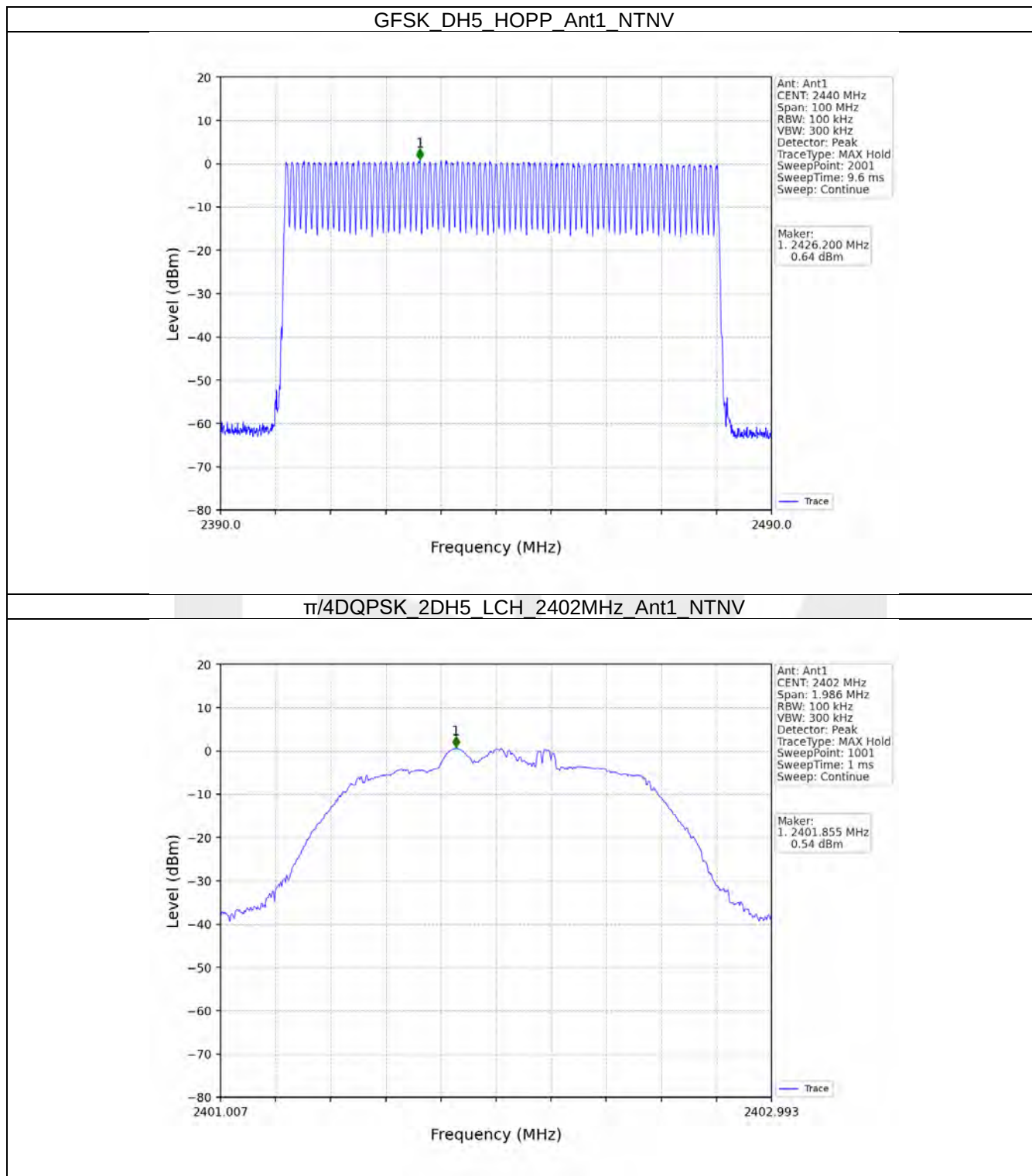
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

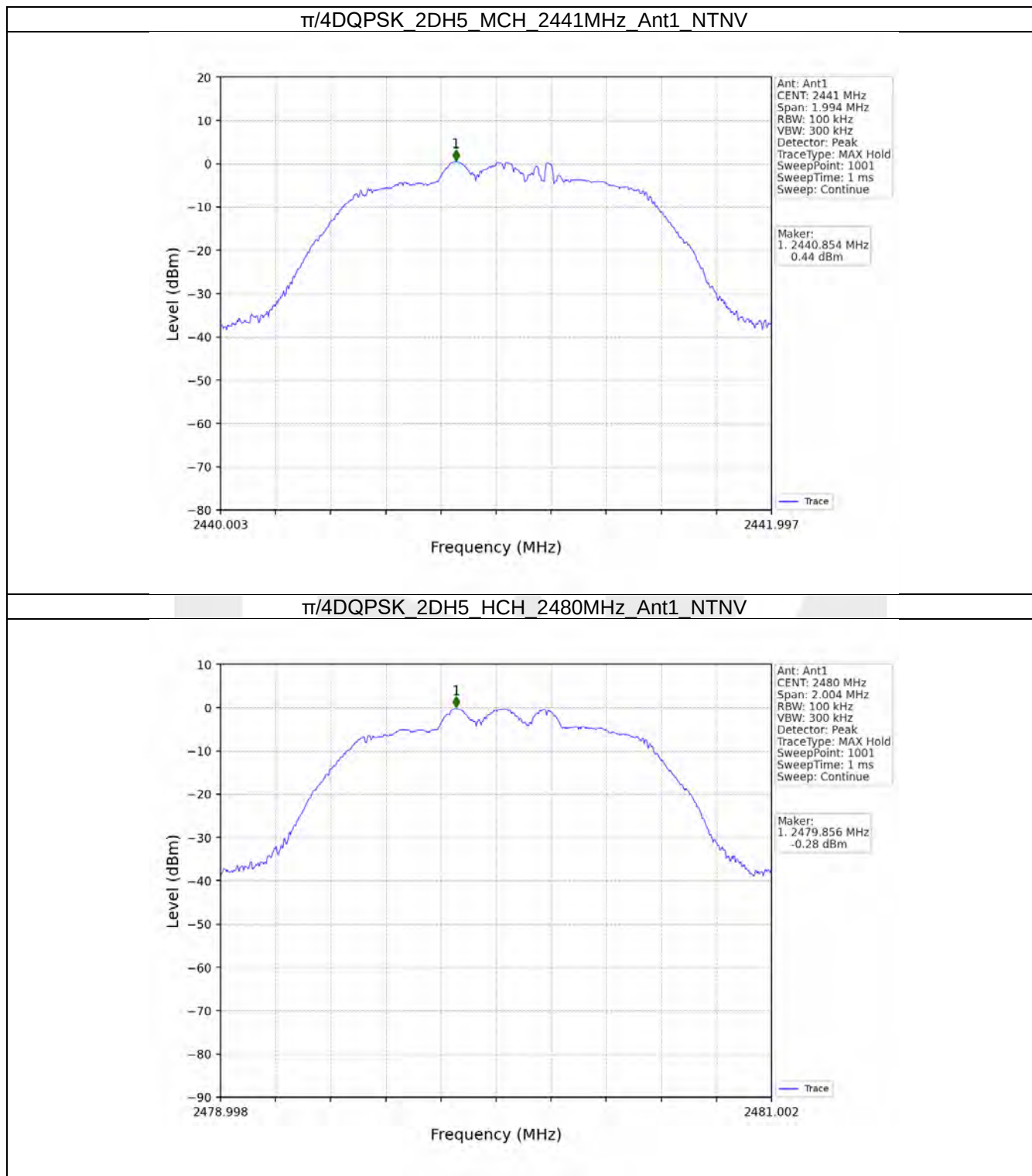
7.2 Test Graph(Left Ear)

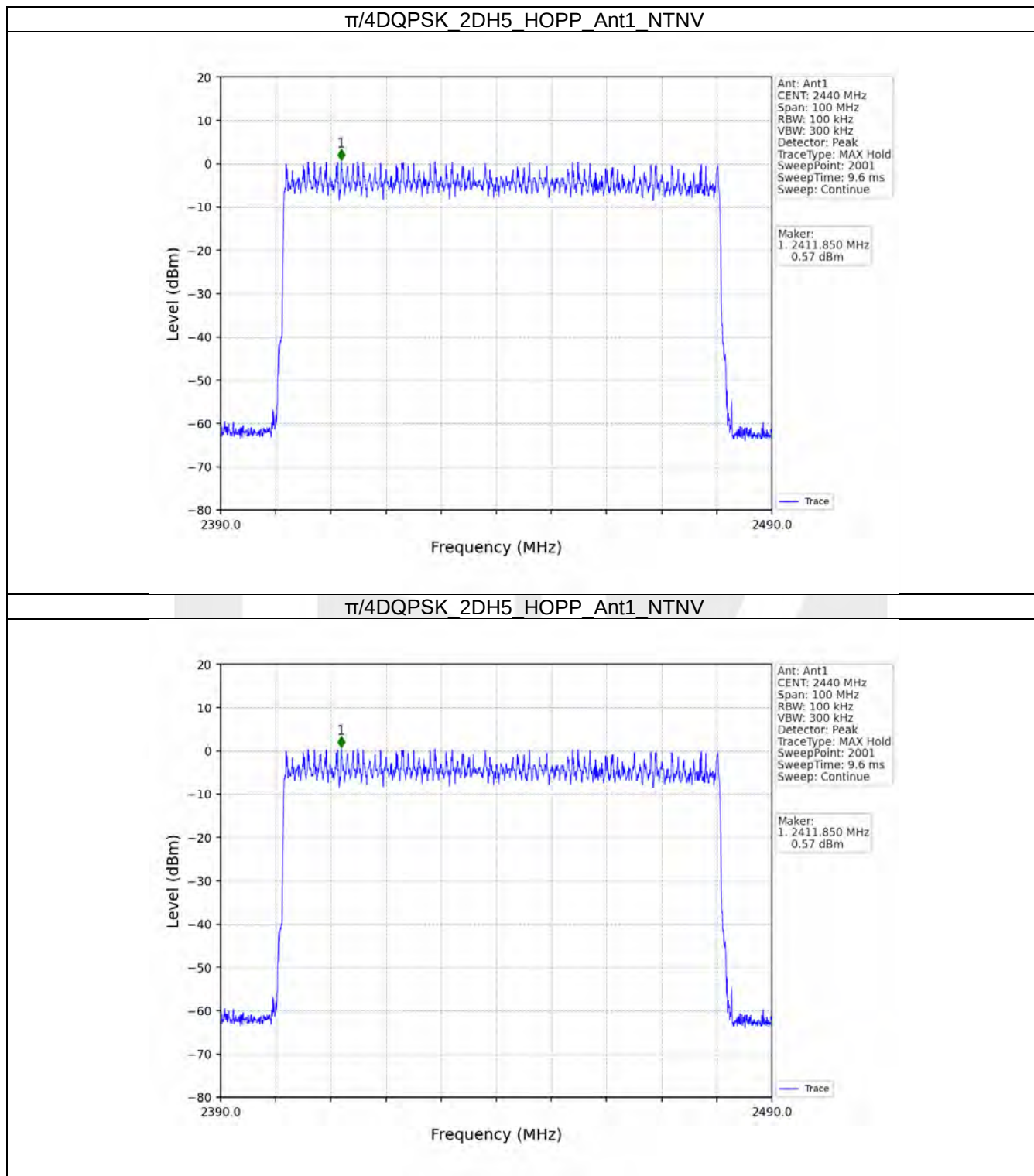
7.2.1 Ref



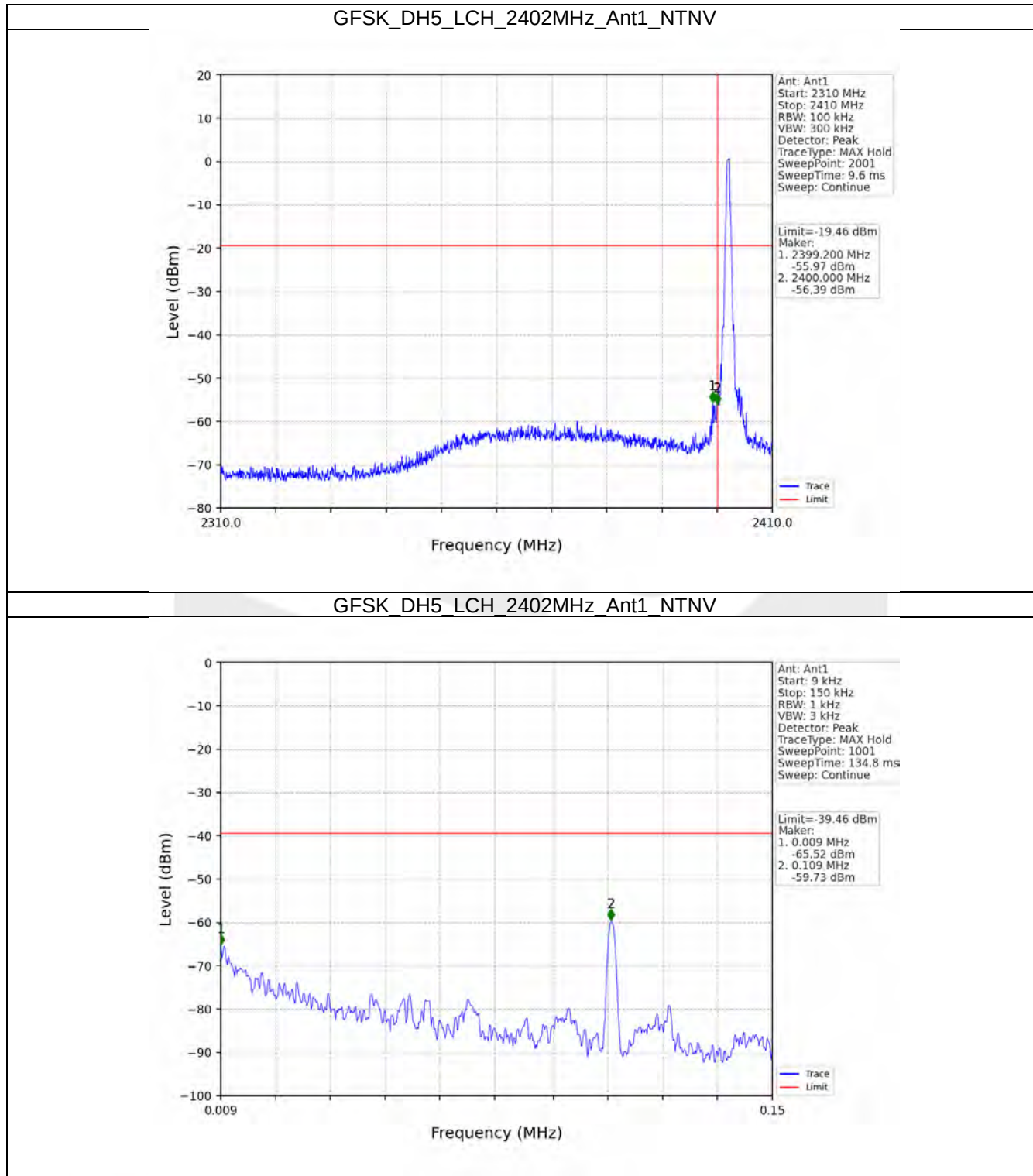




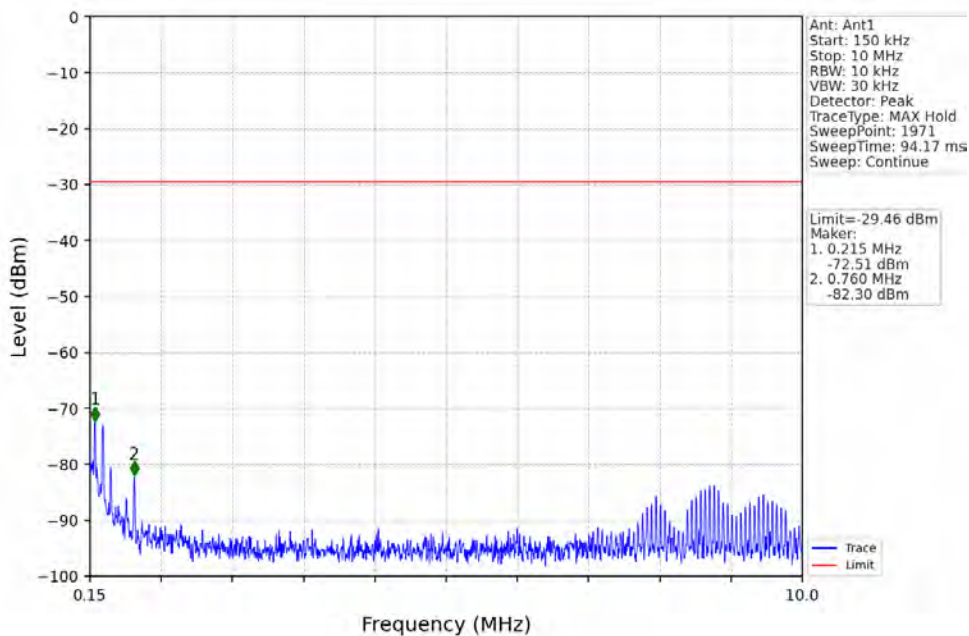




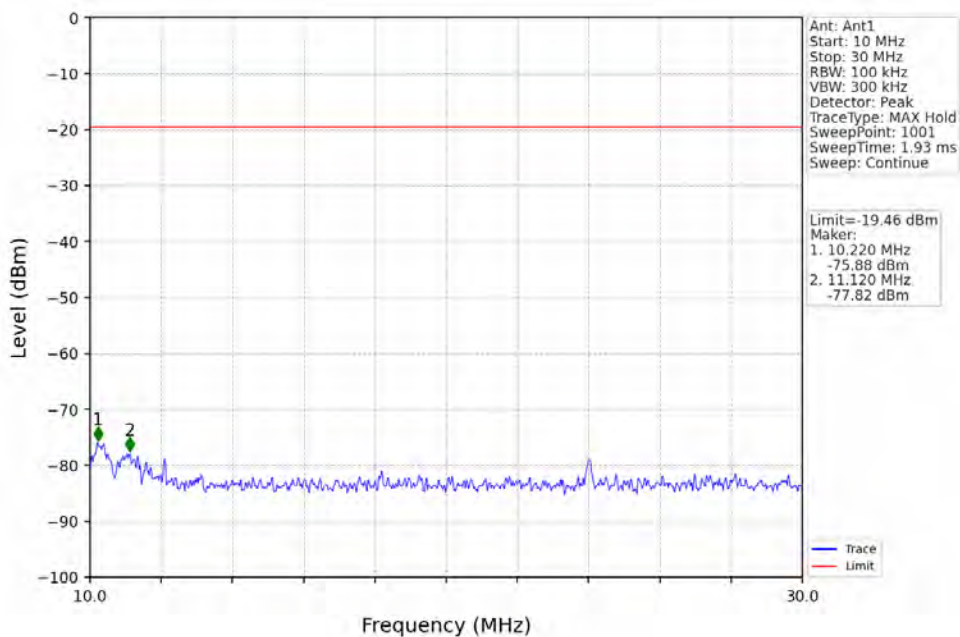
7.2.2 CSE

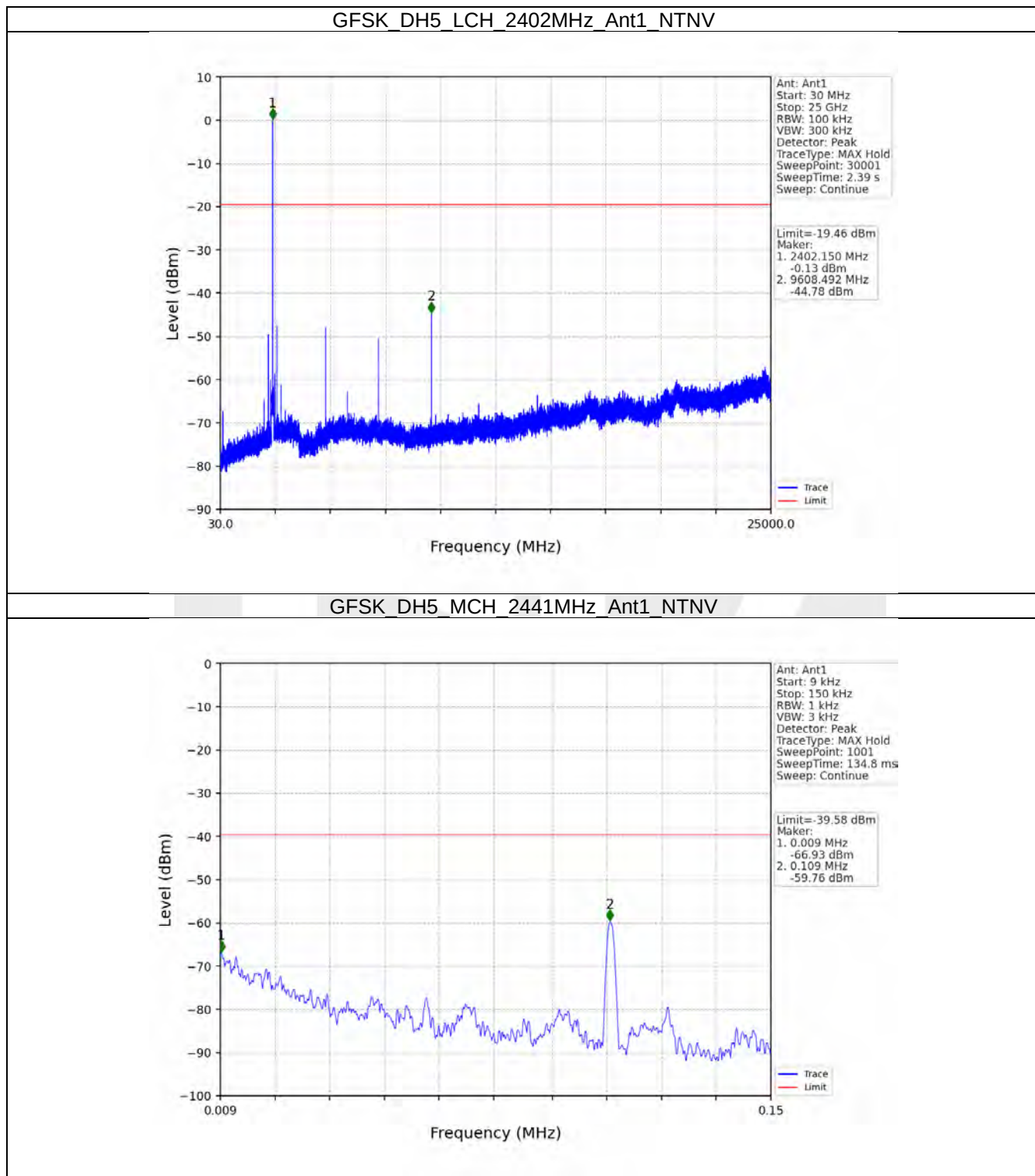


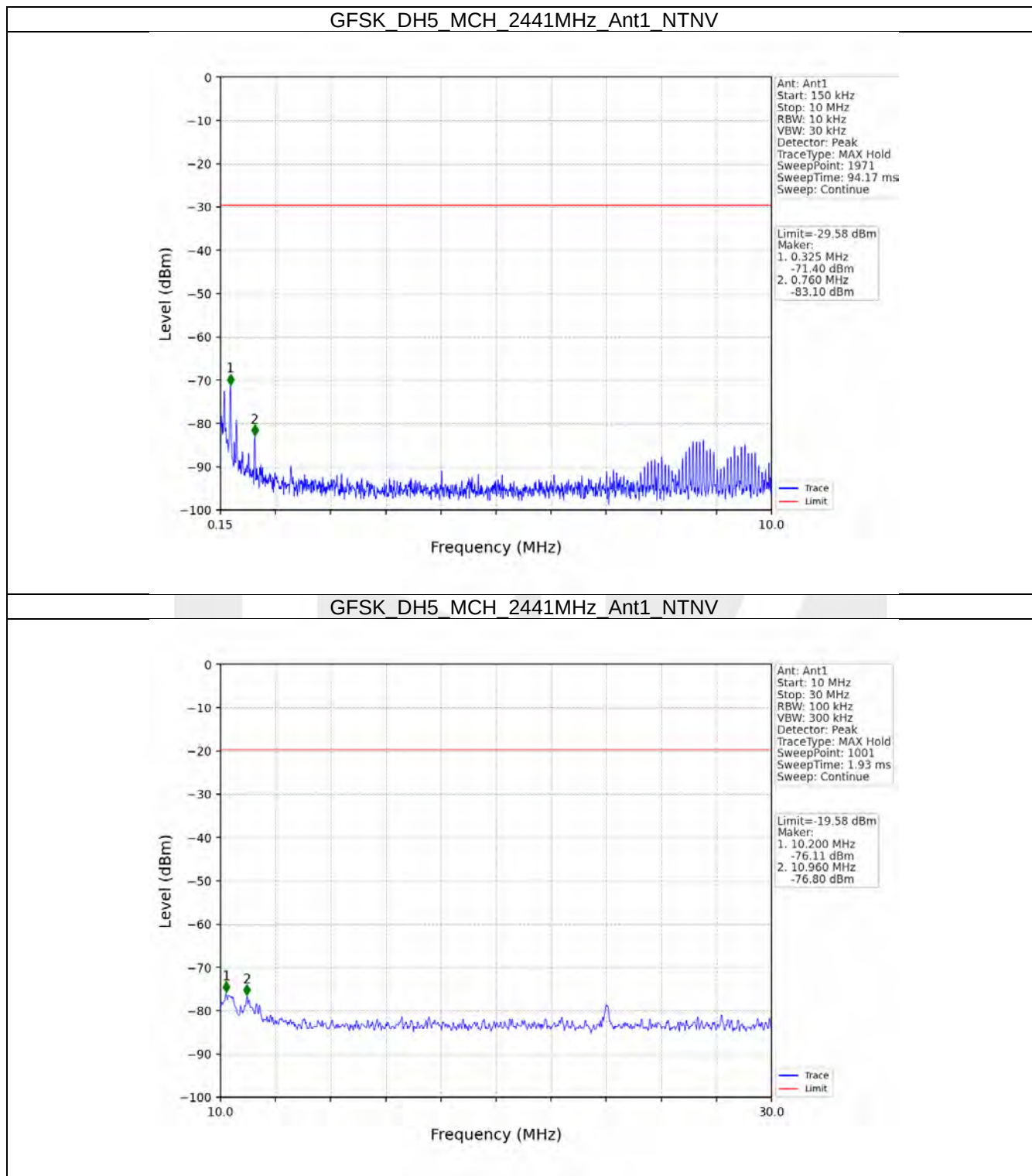
GFSK_DH5_LCH_2402MHz_Ant1_NTNV

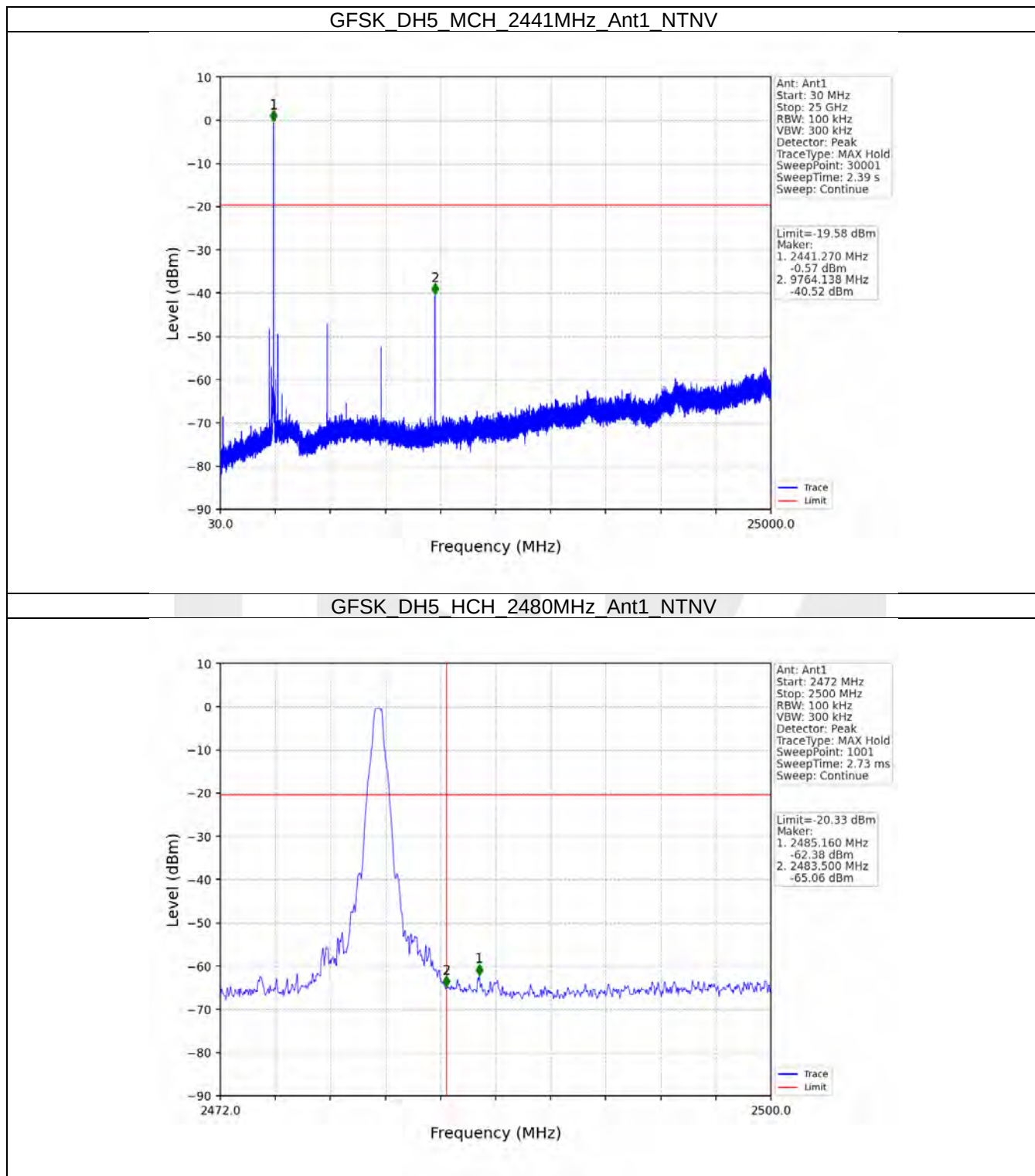


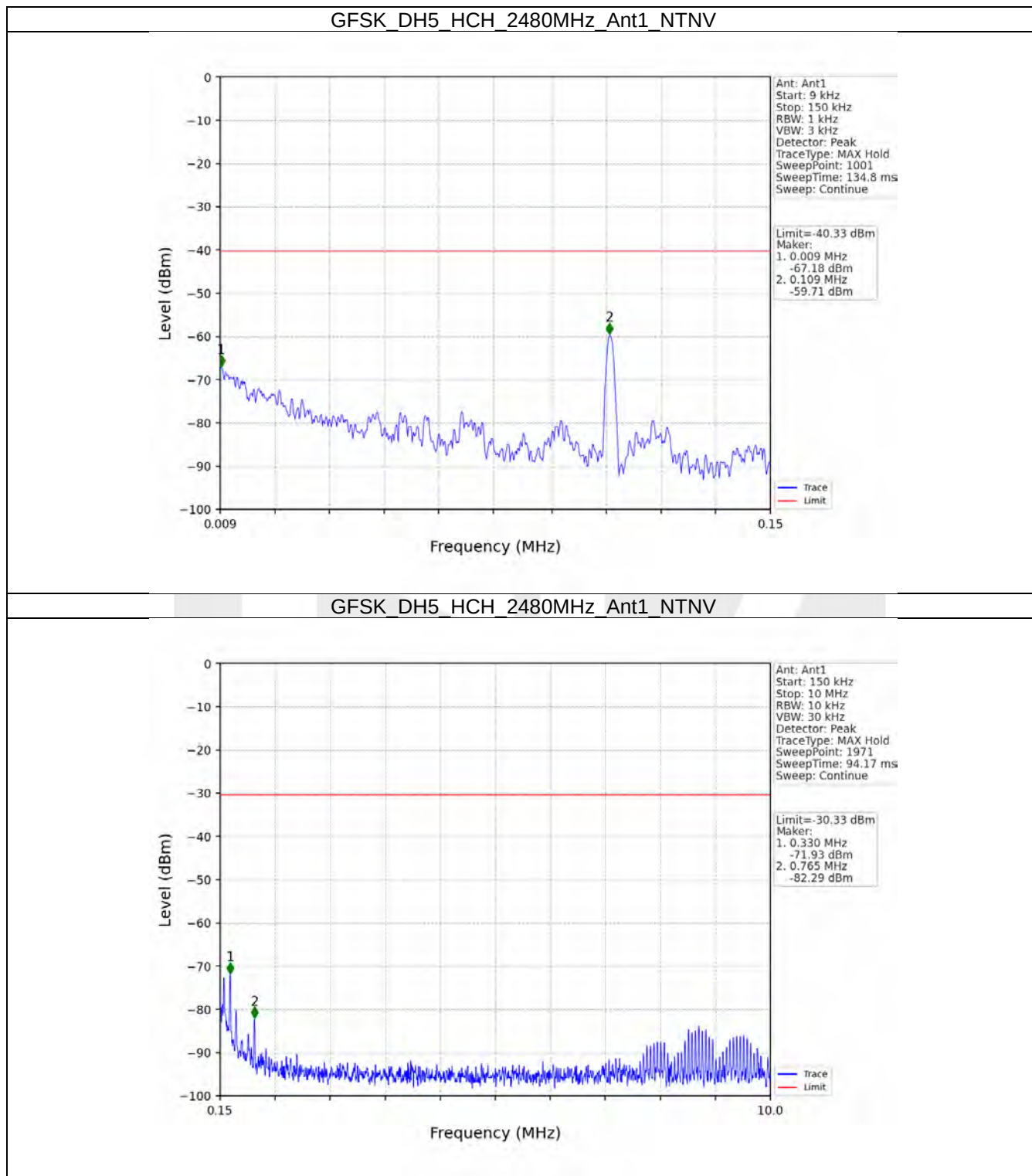
GFSK_DH5_LCH_2402MHz_Ant1_NTNV

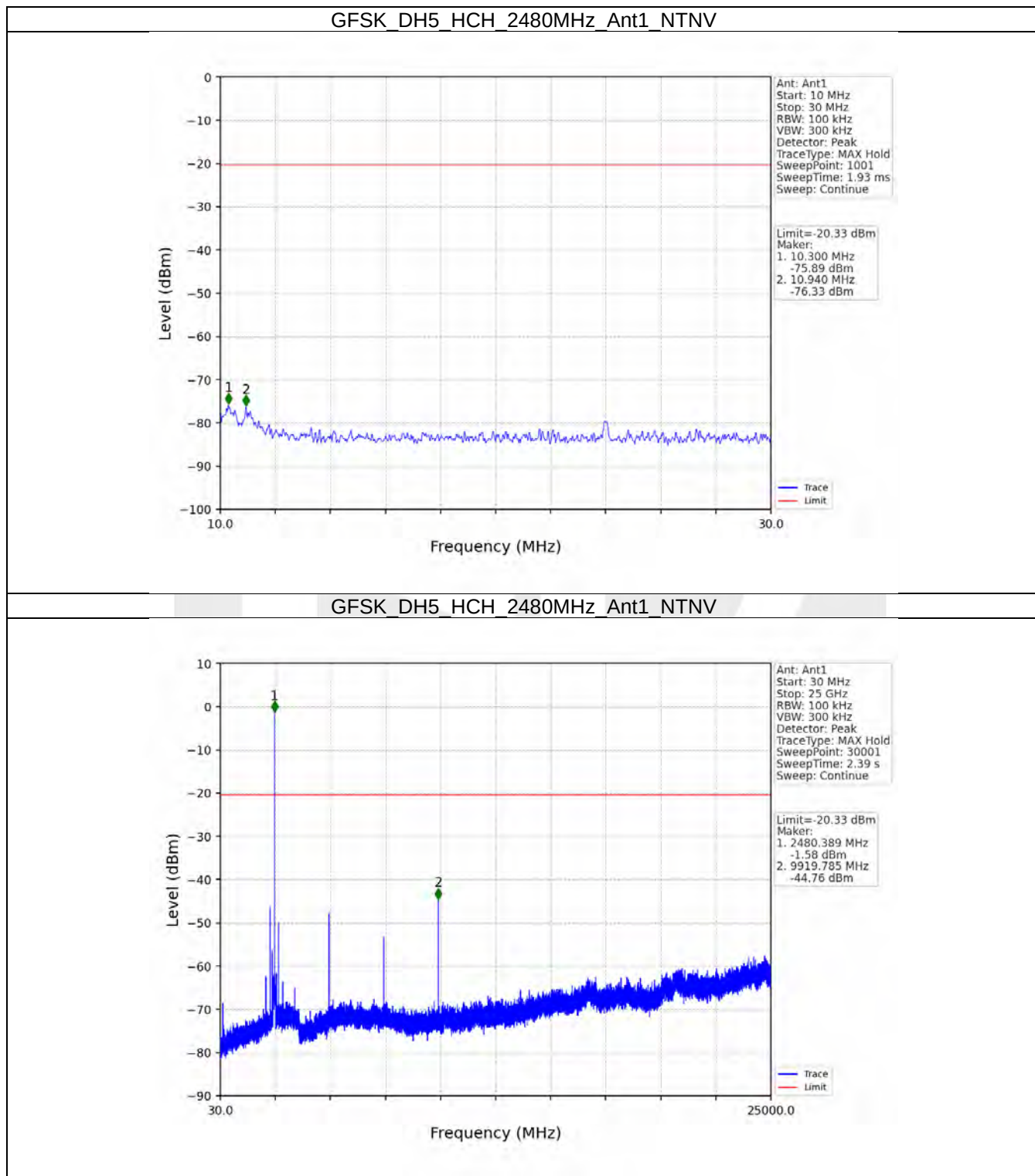


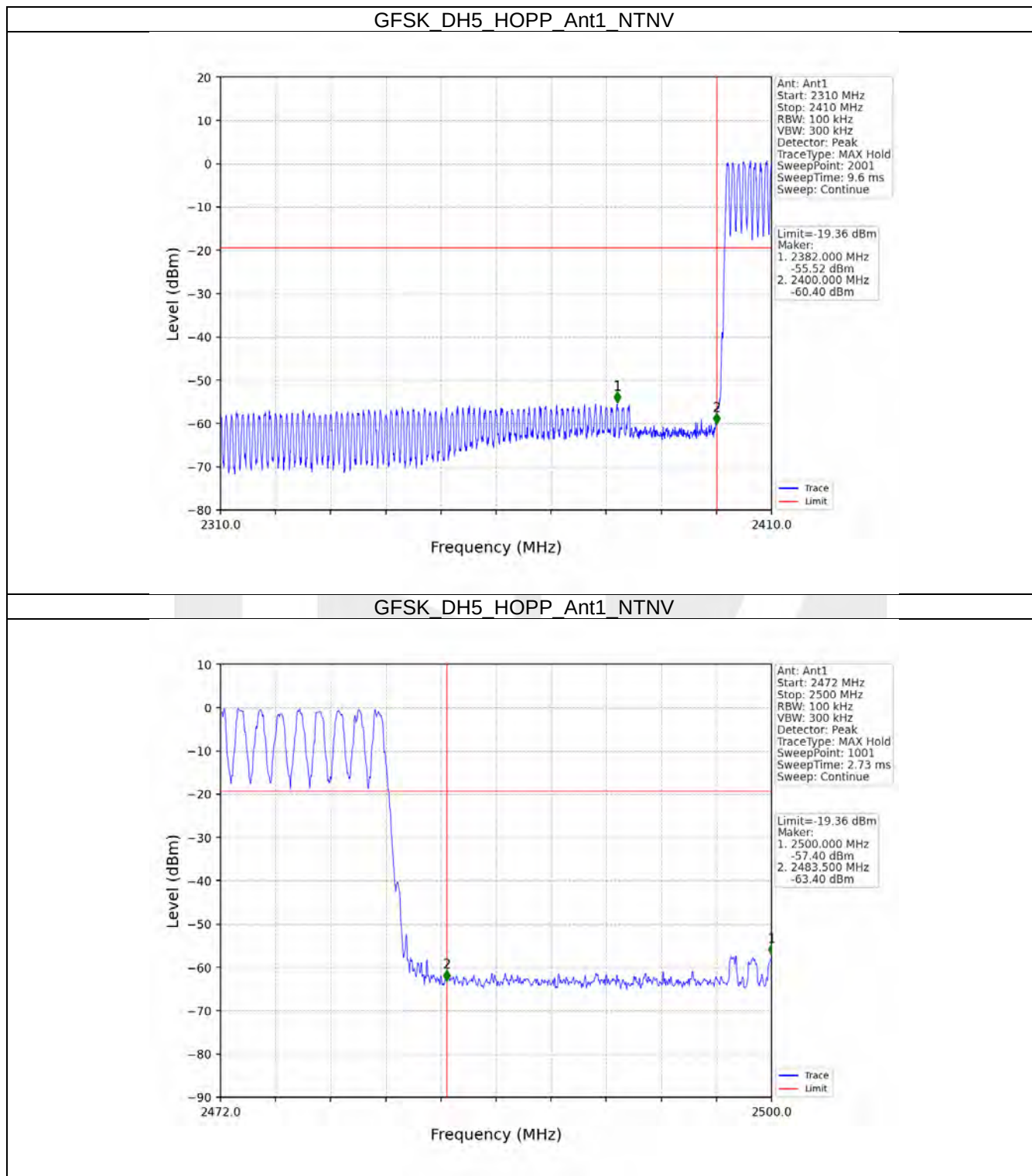


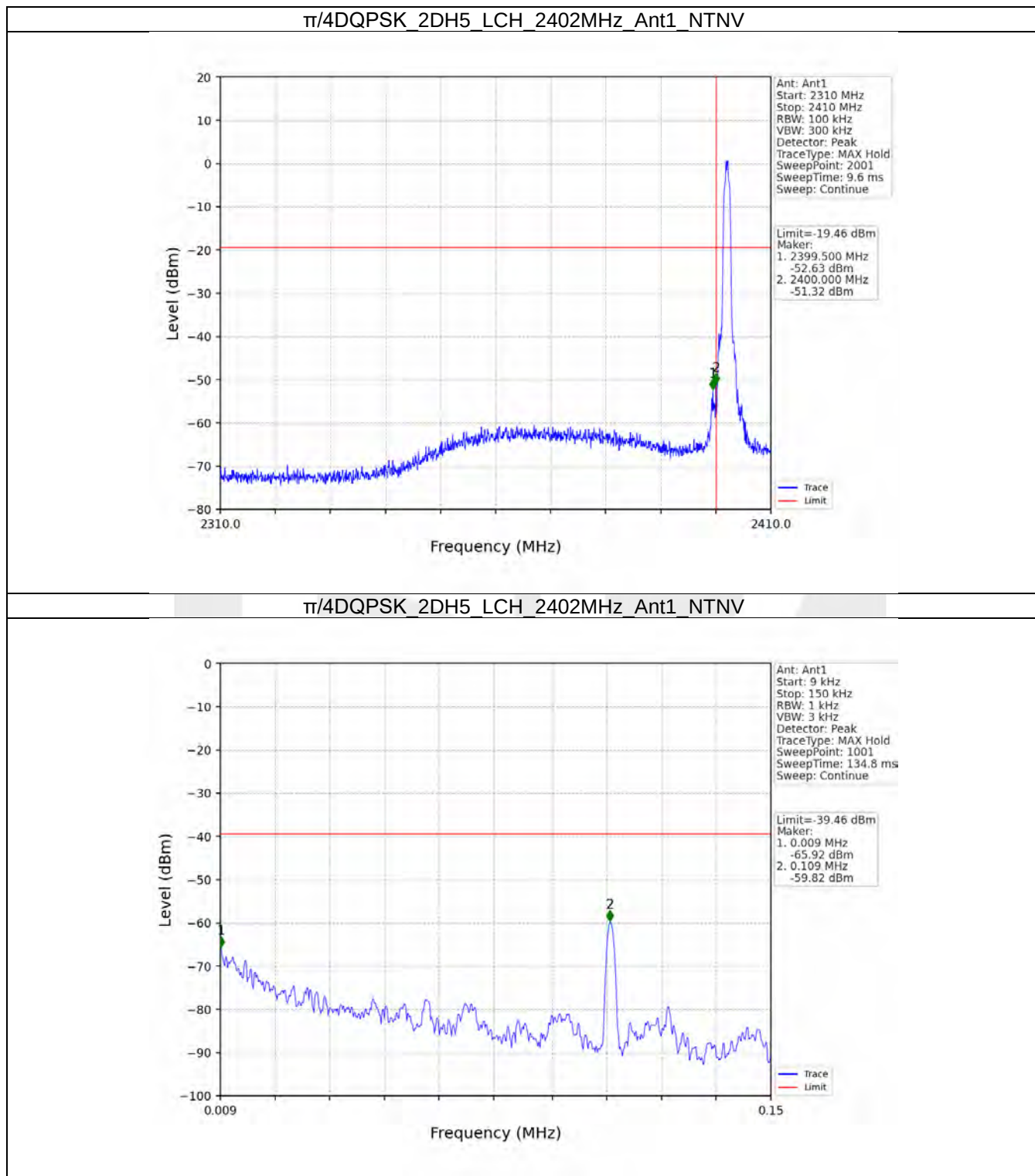


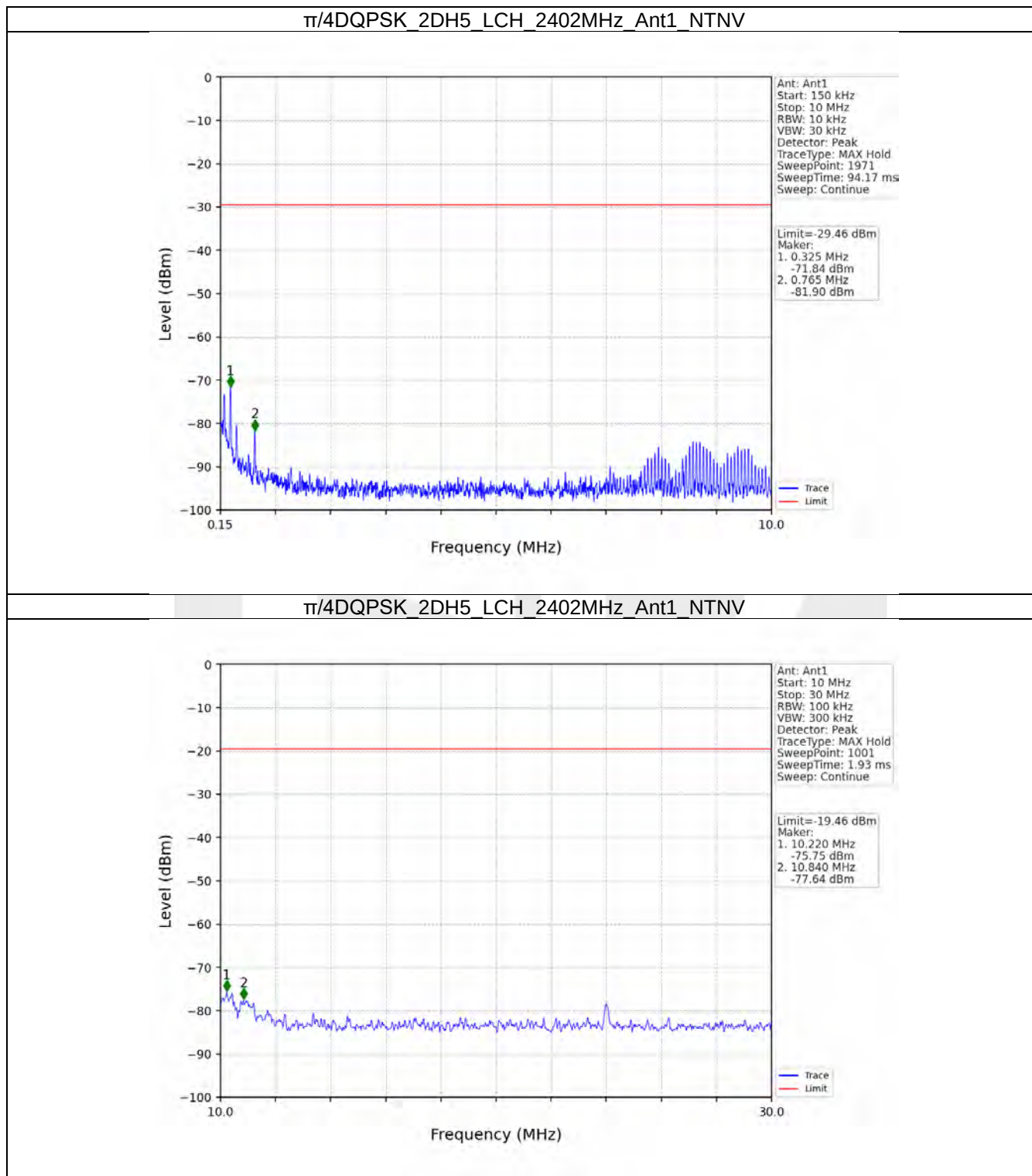


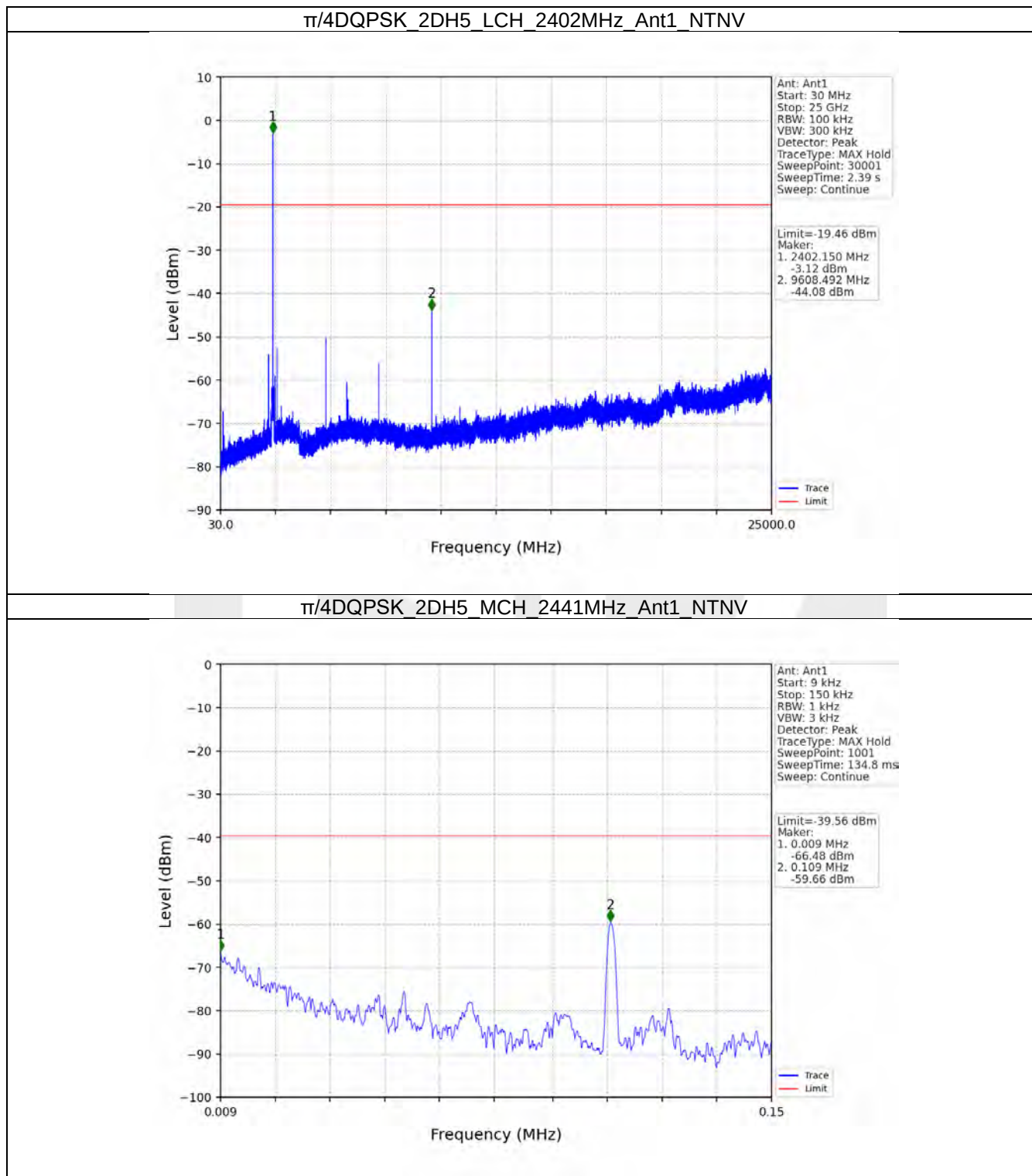


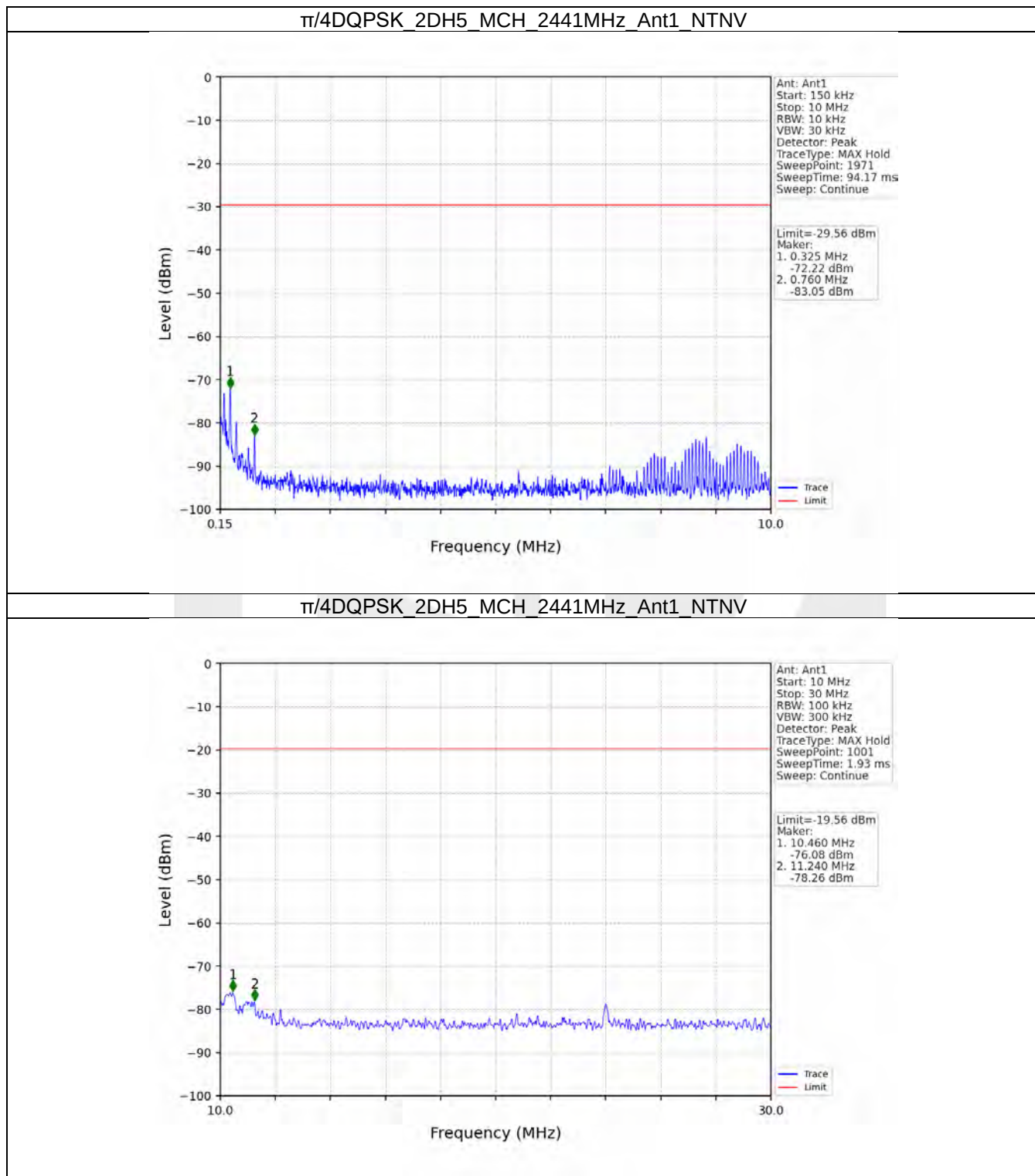


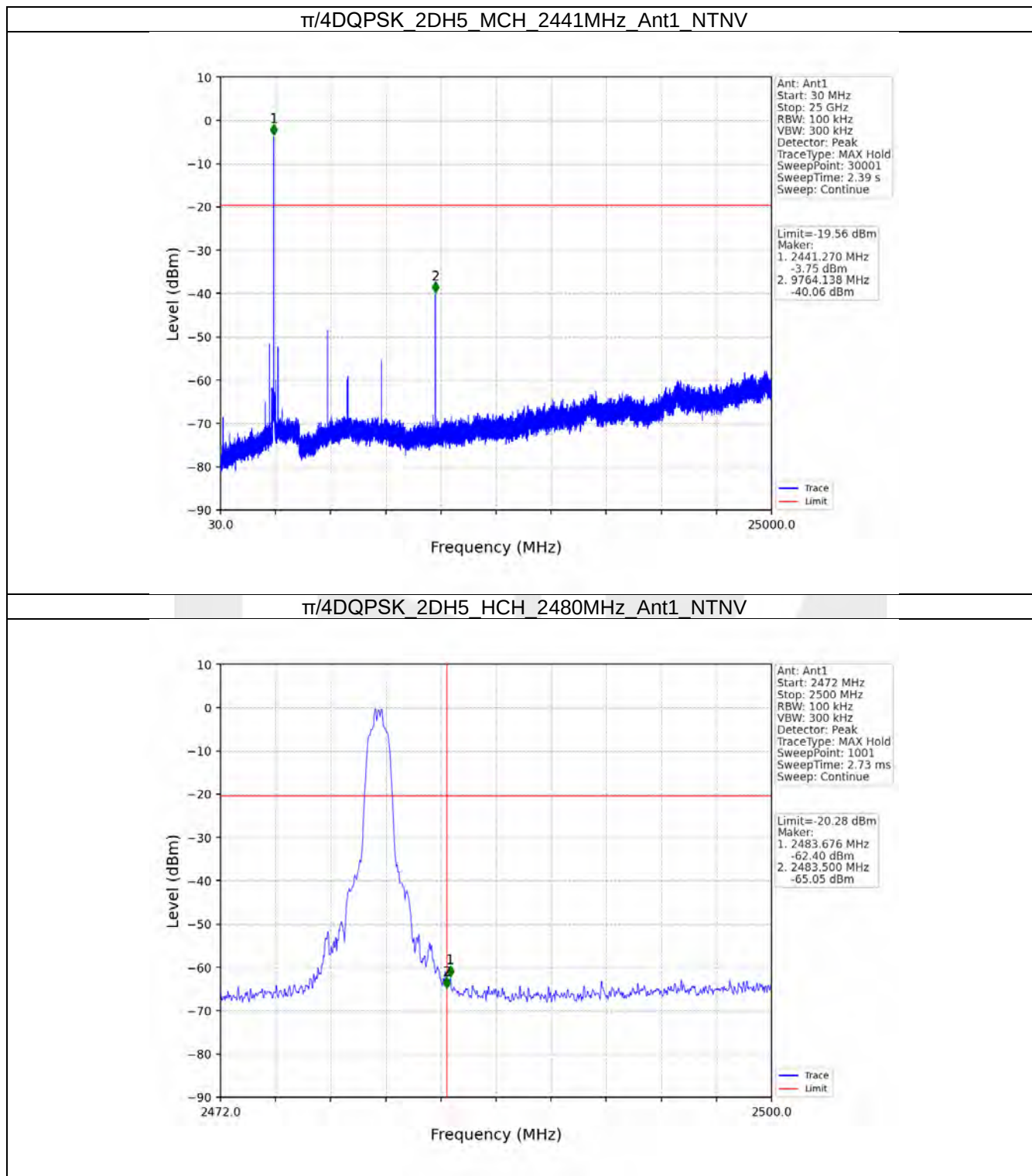


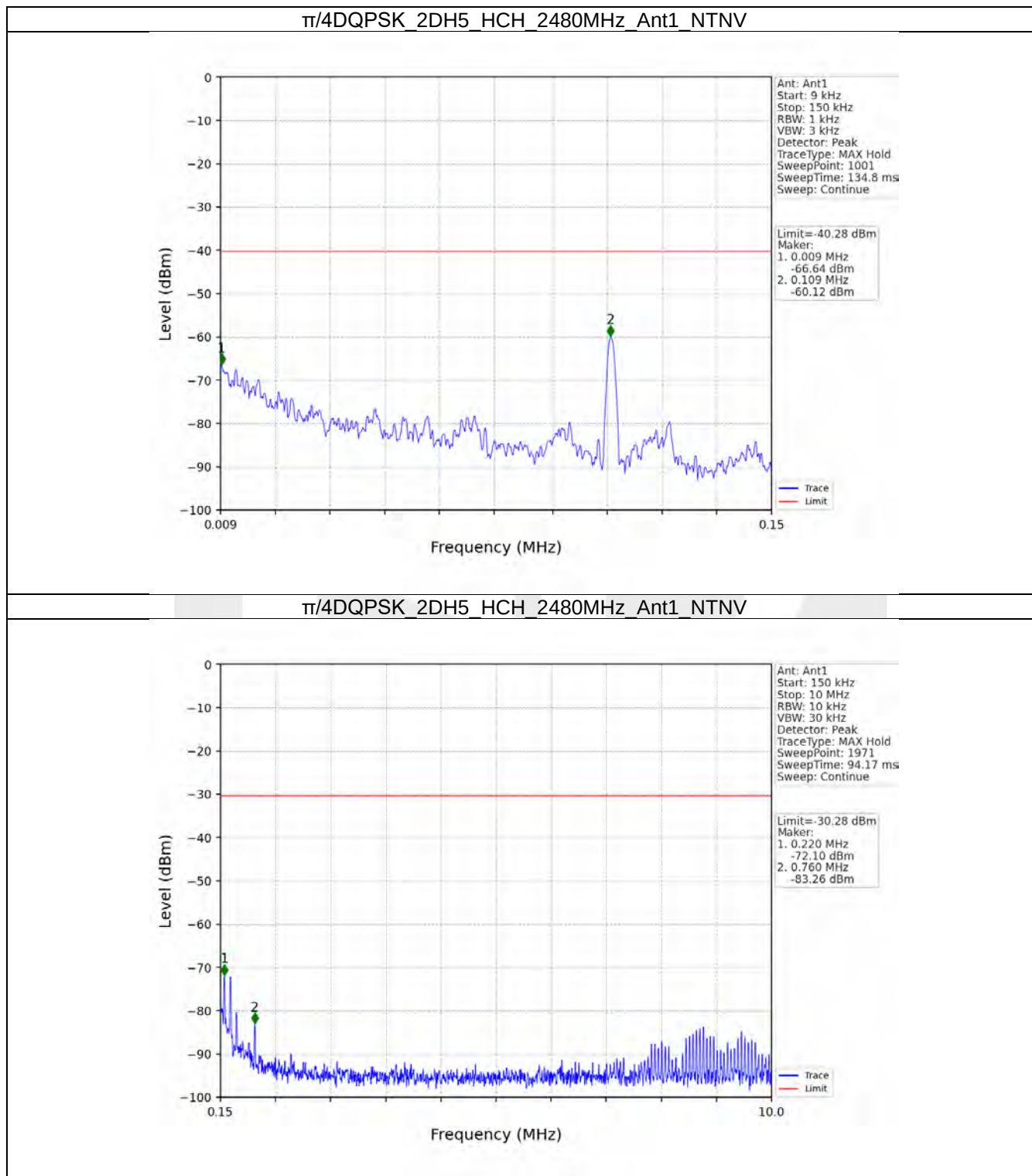


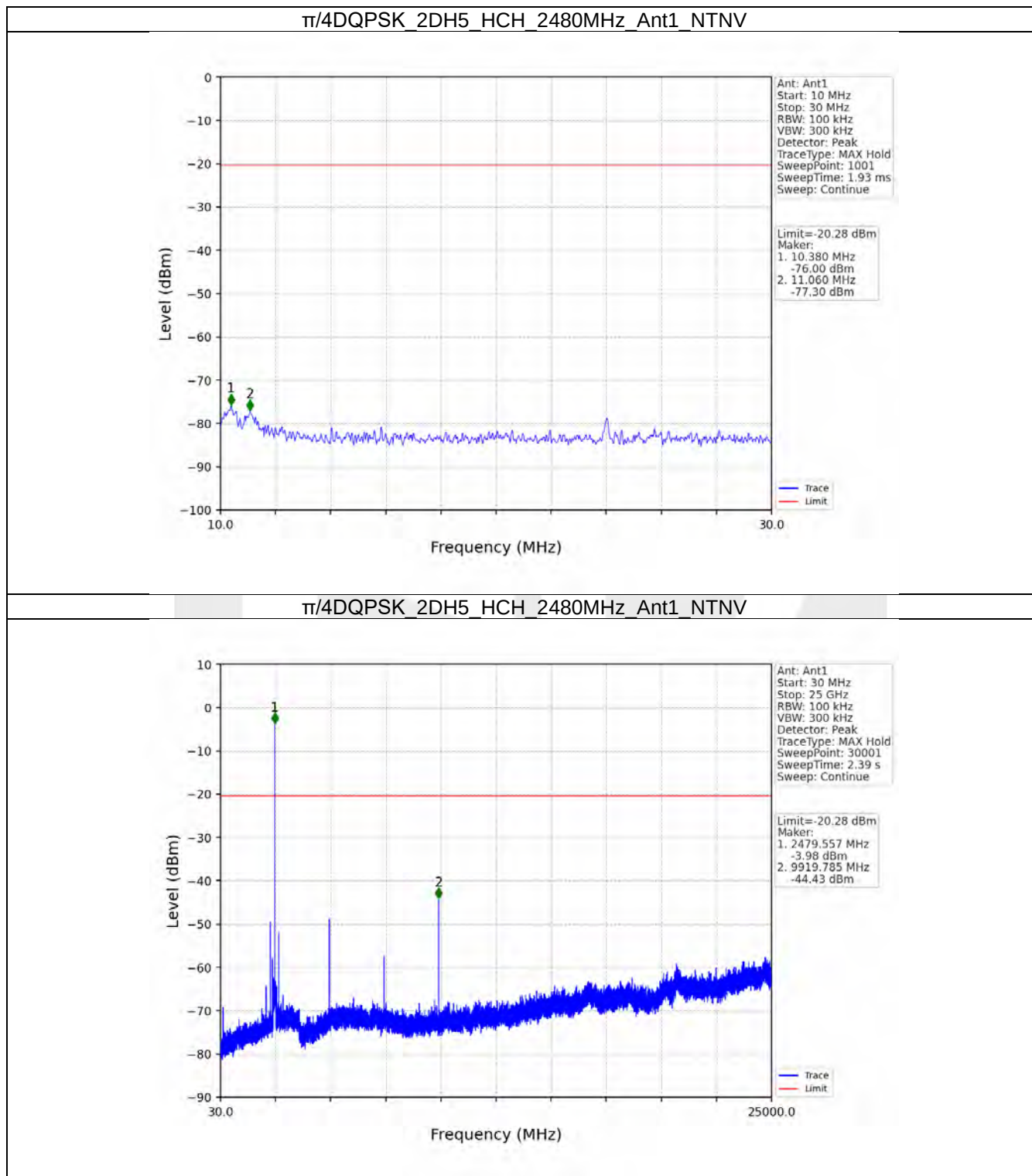


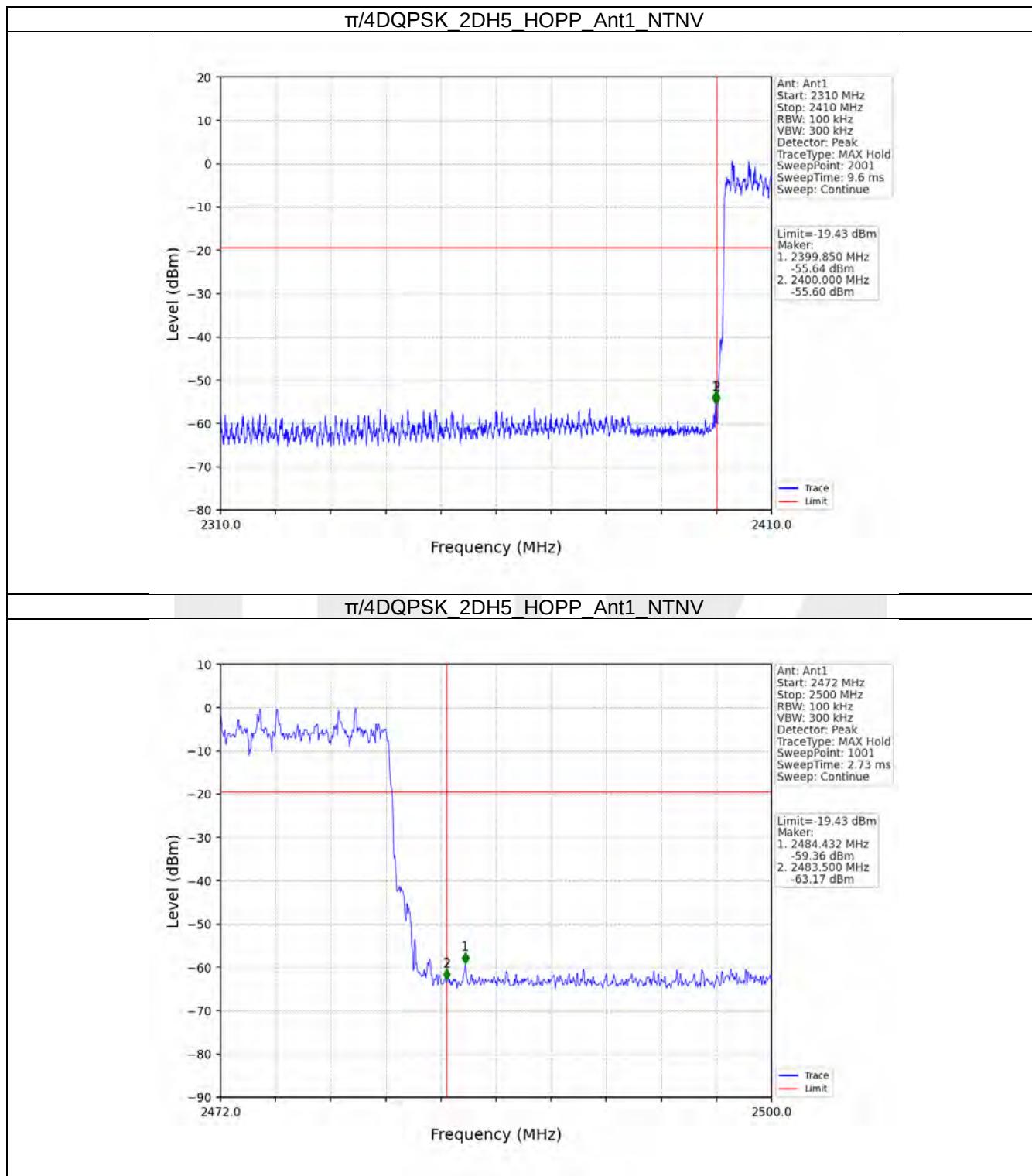






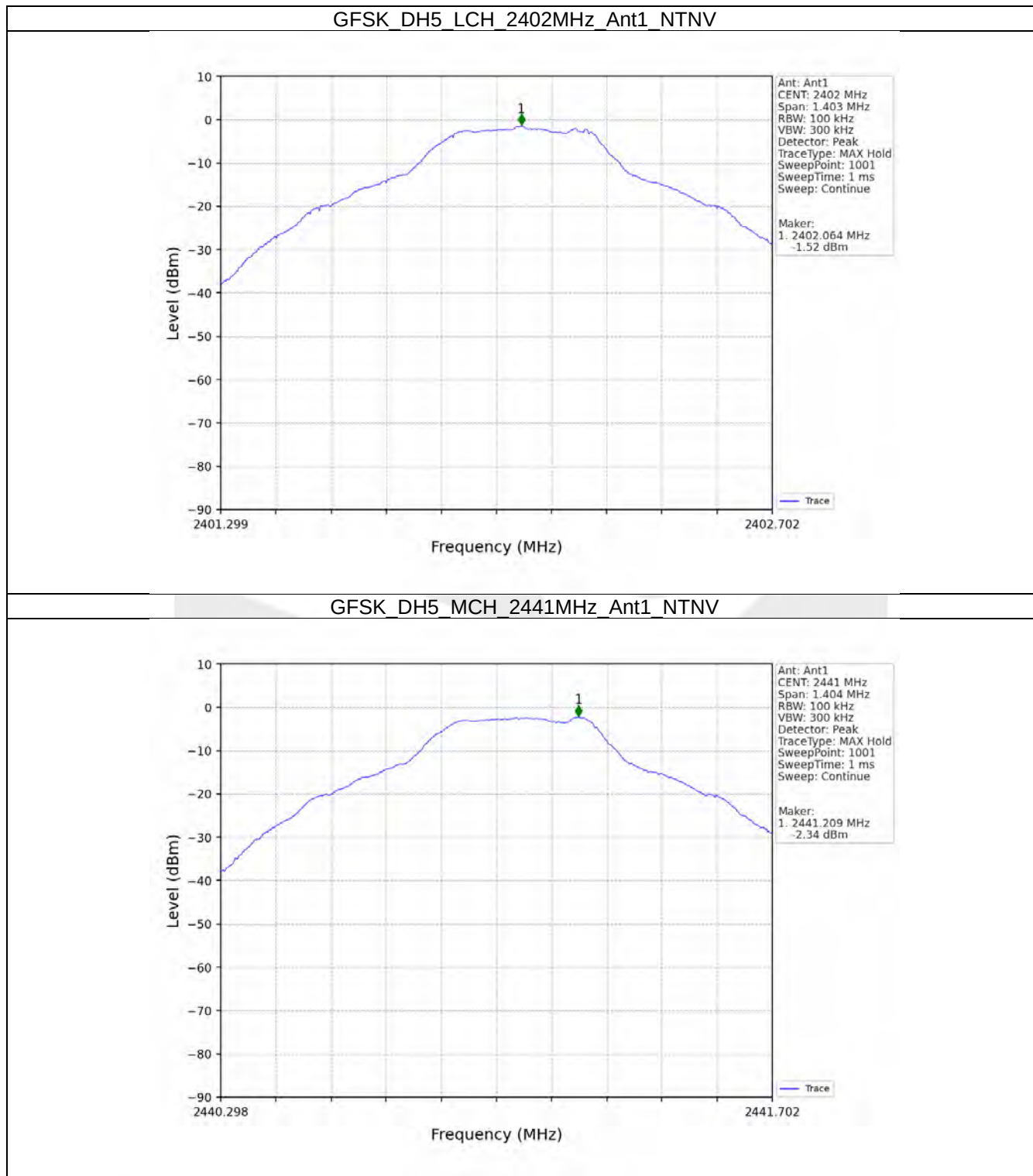


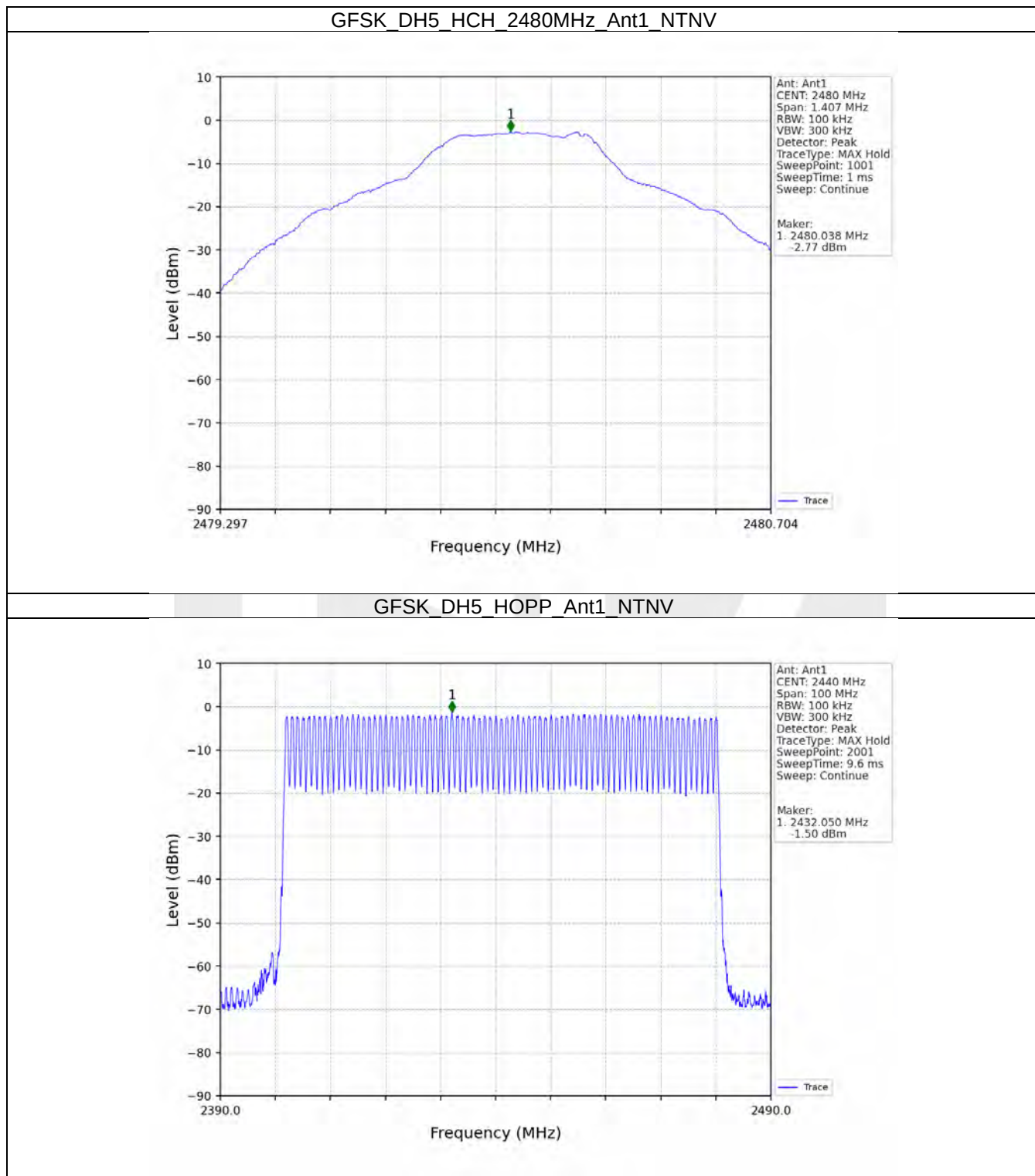


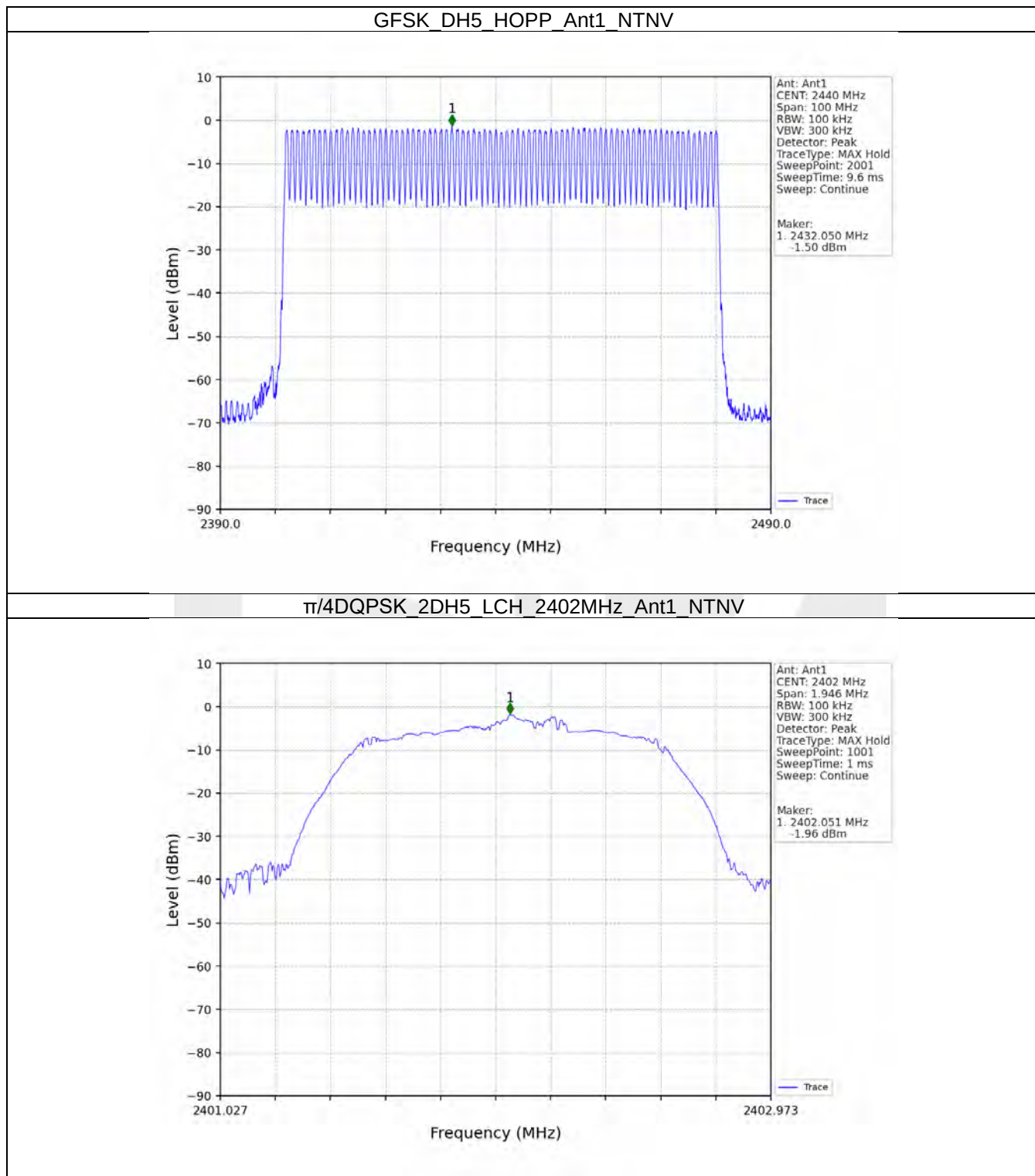


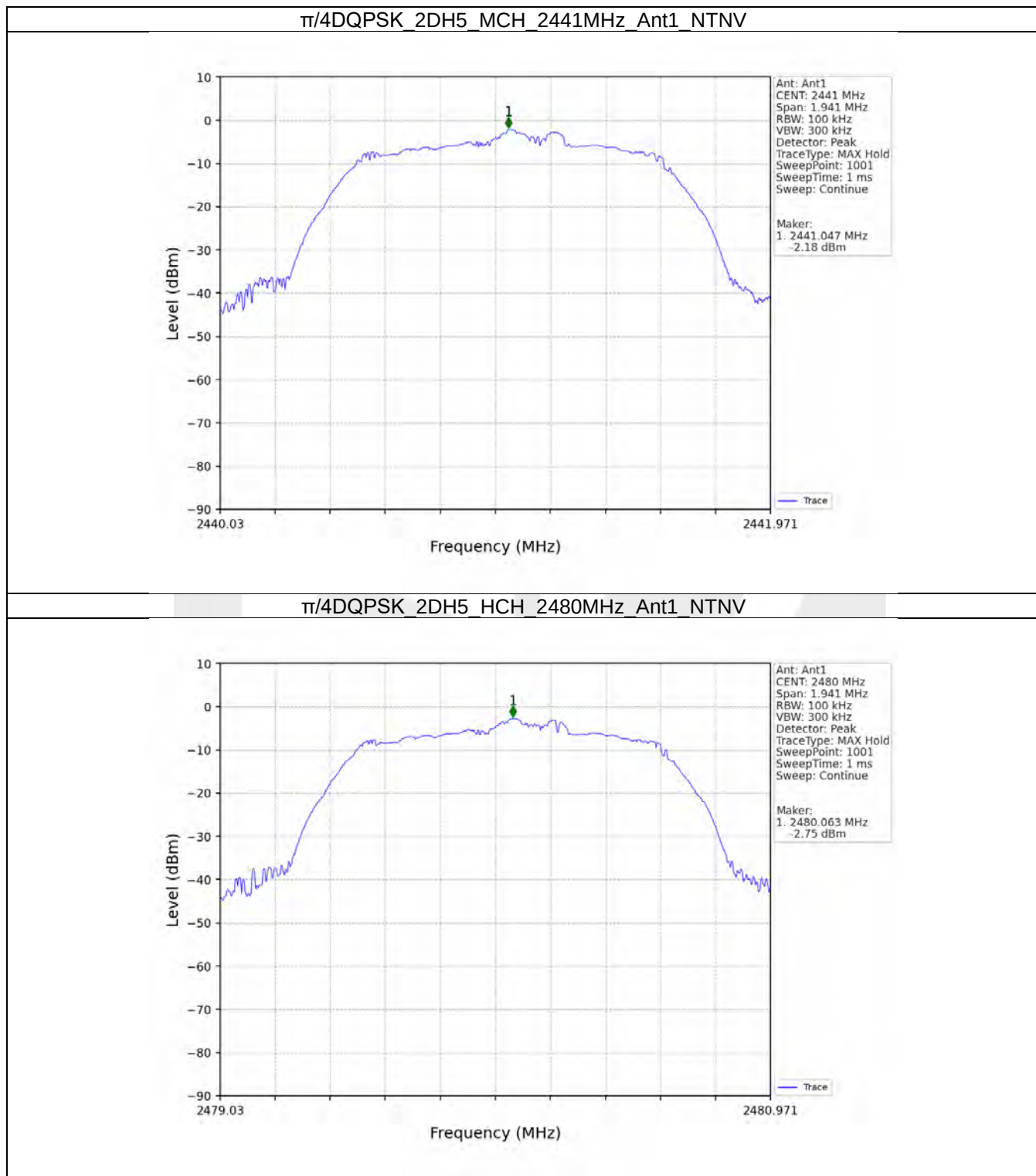
7.2 Test Graph(Right Ear)

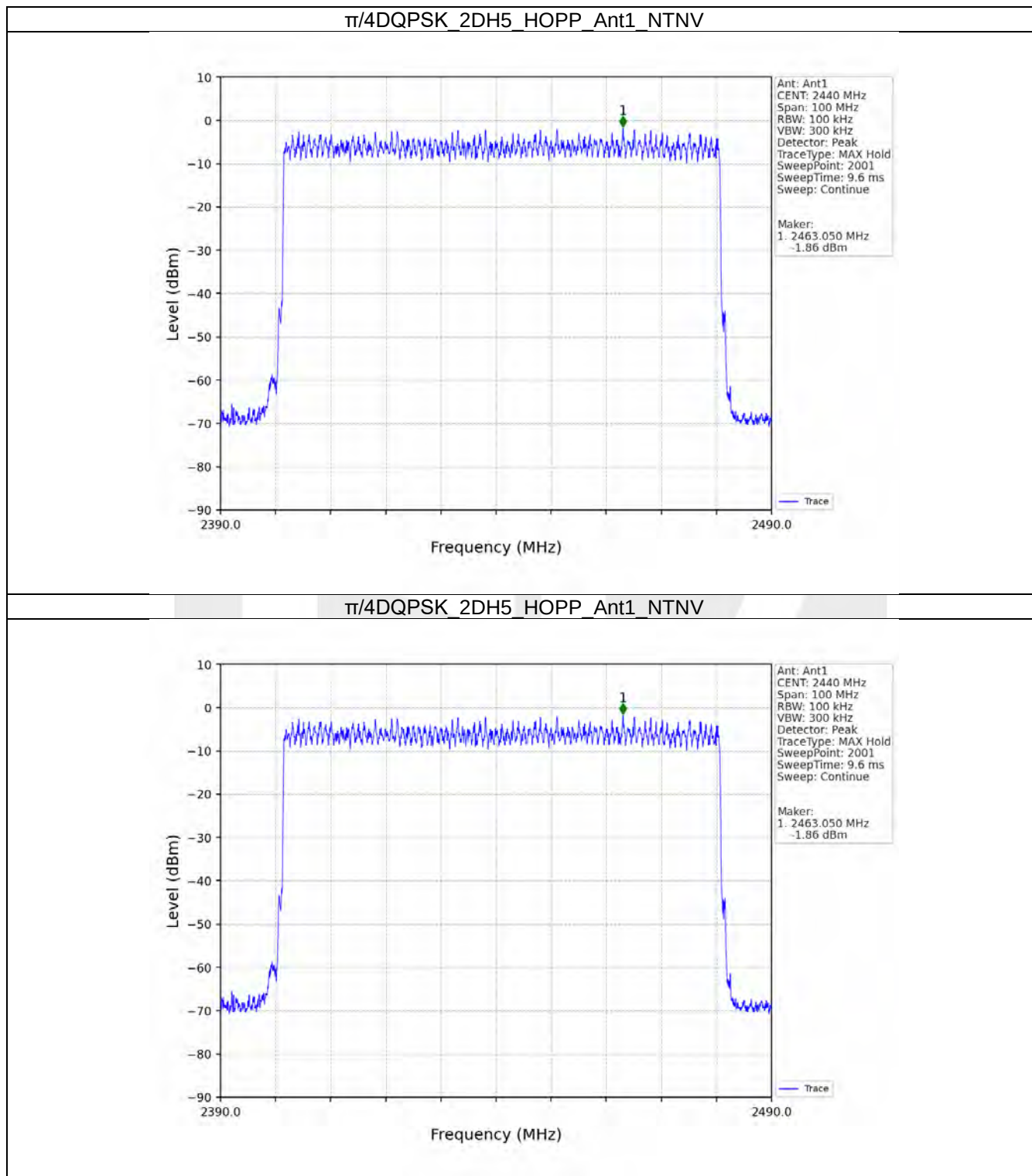
7.2.1 Ref



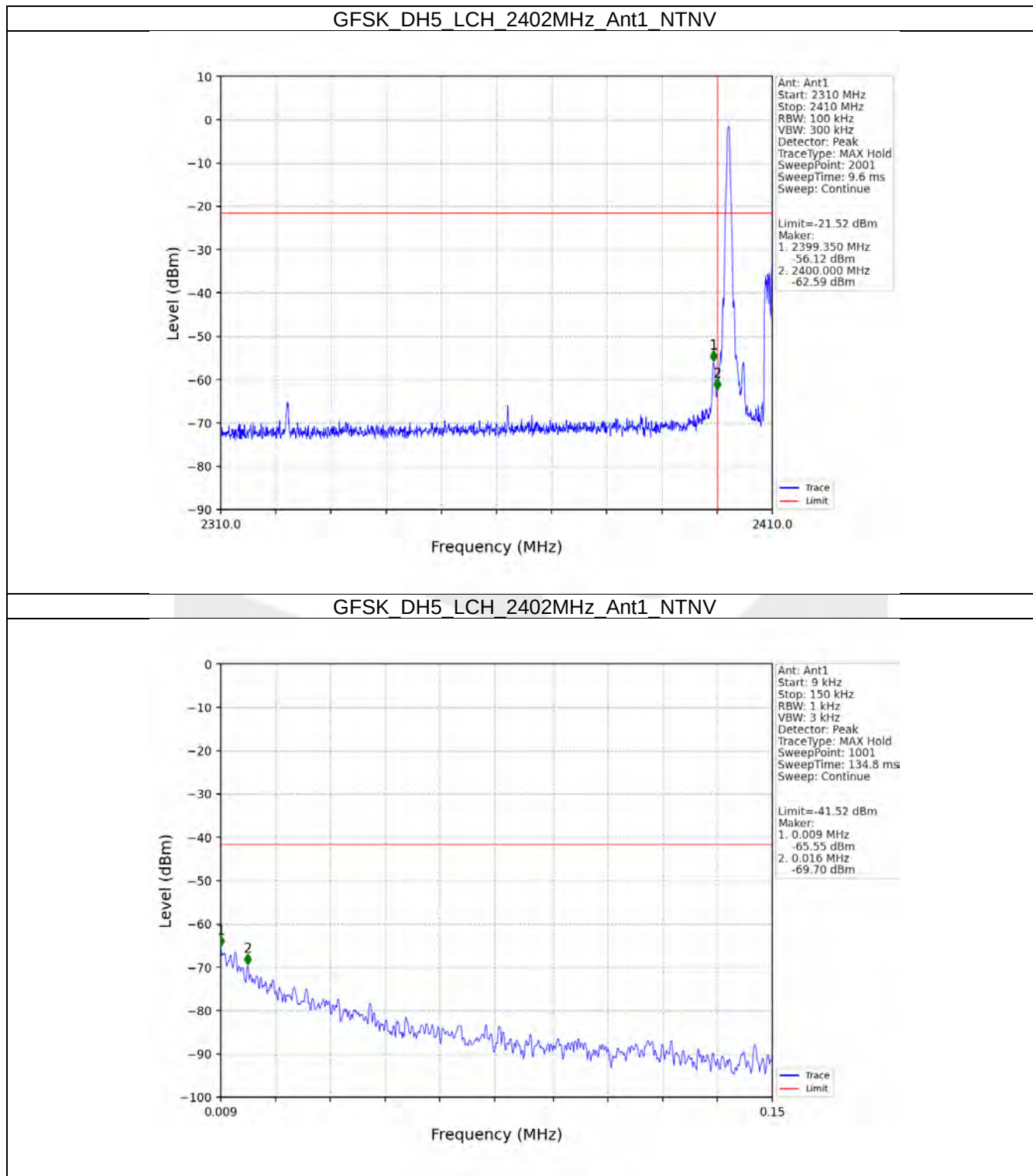


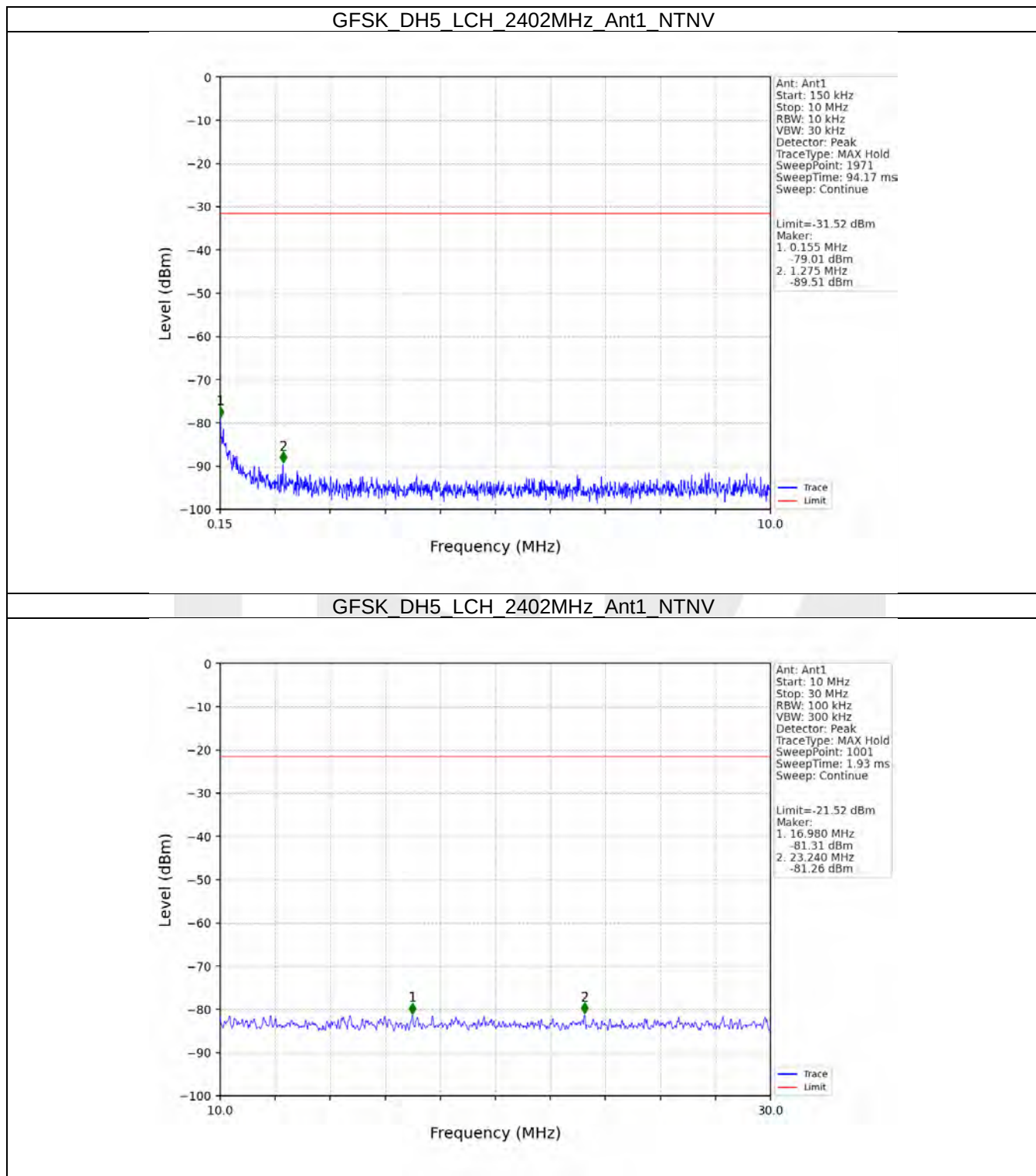




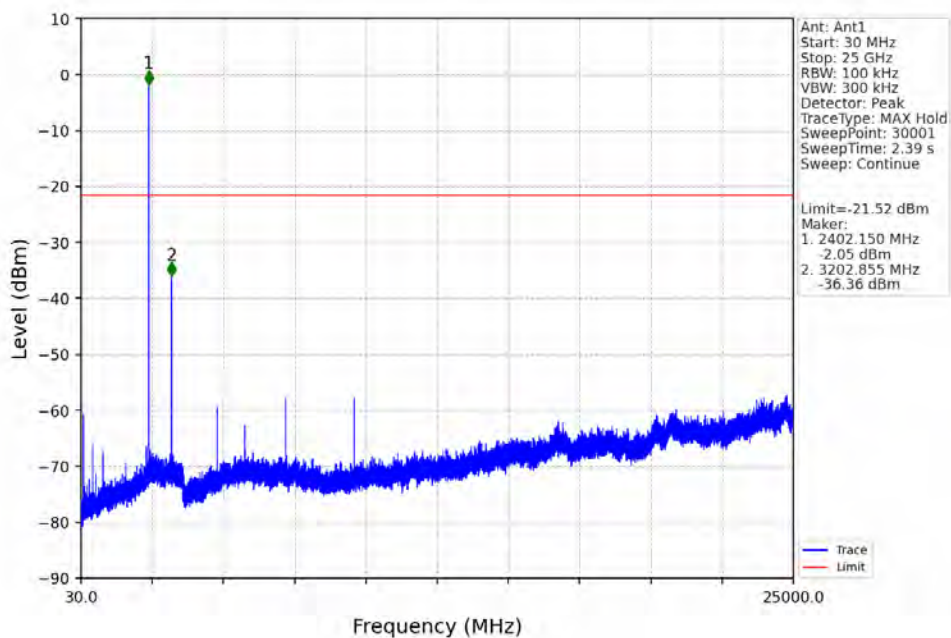


7.2.2 CSE

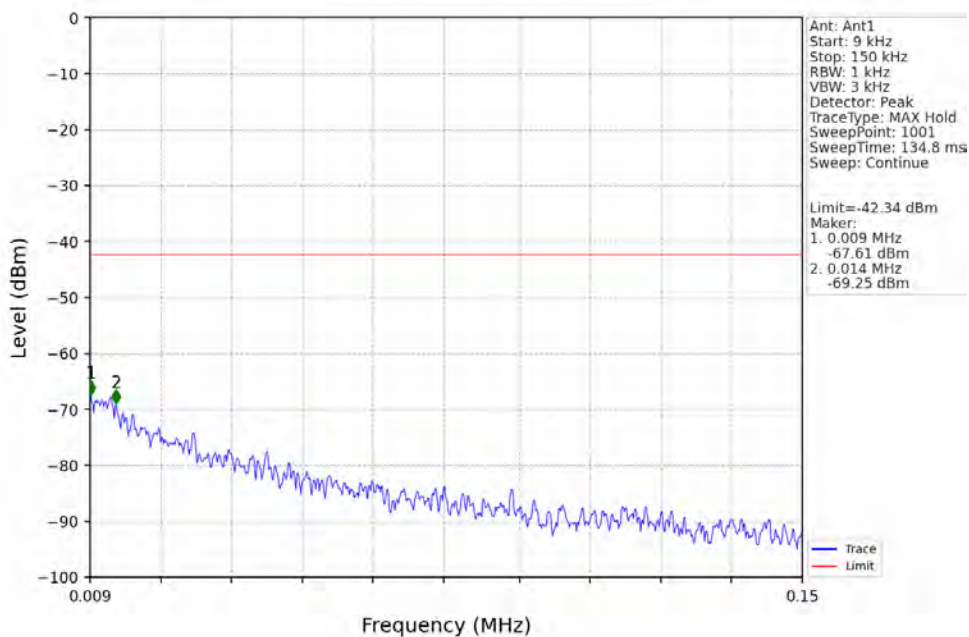


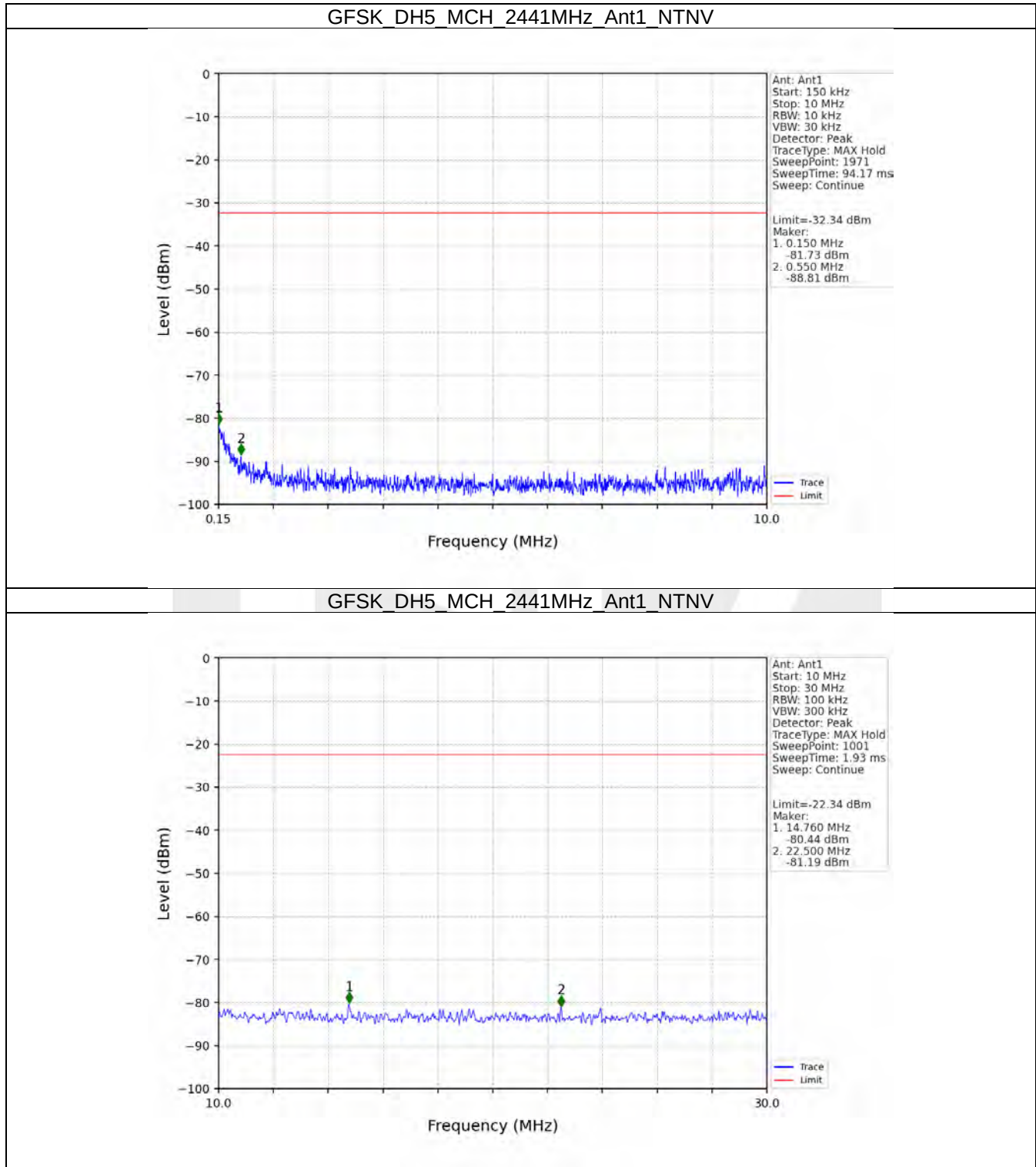


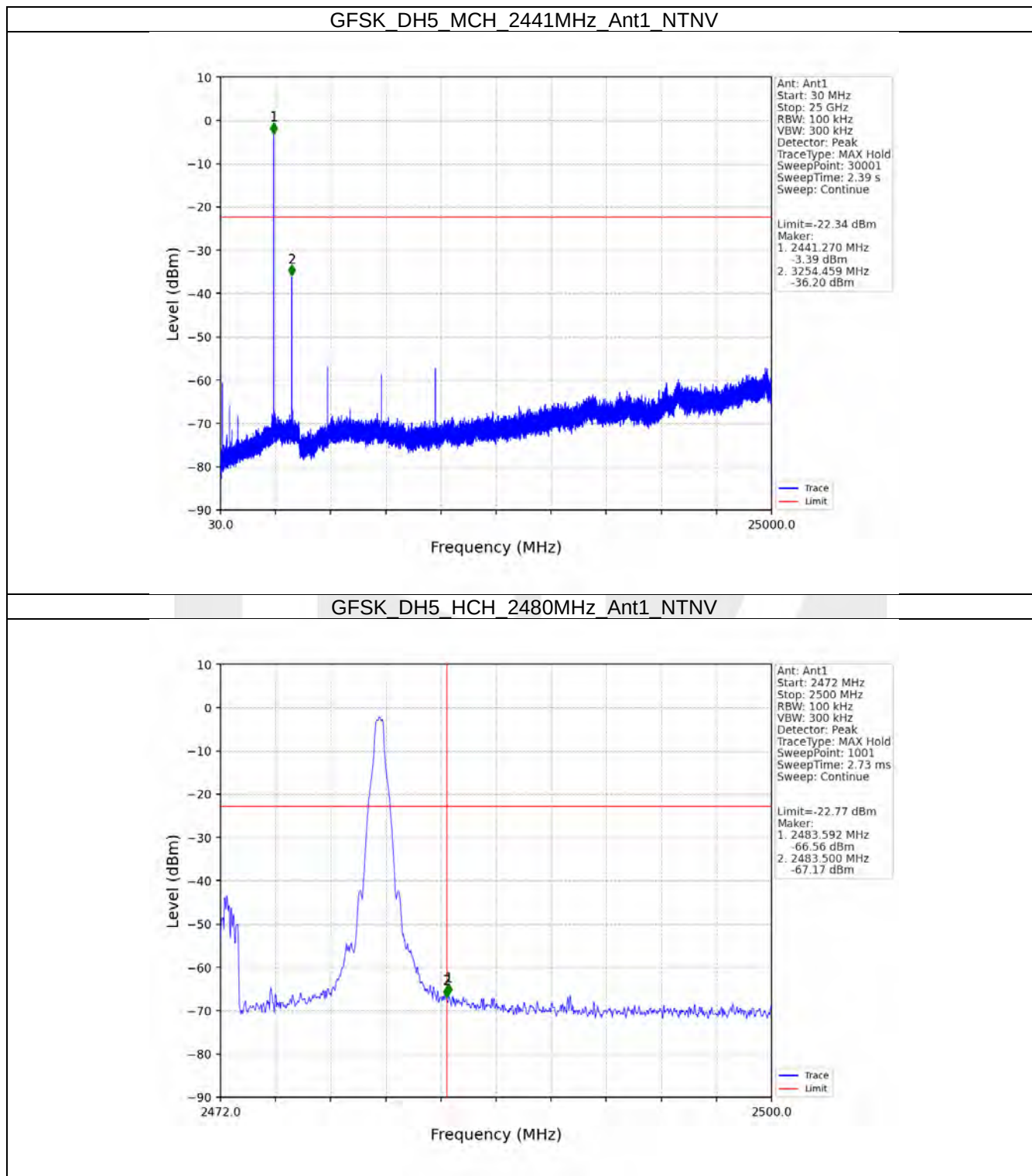
GFSK_DH5_LCH_2402MHz_Ant1_NTNV

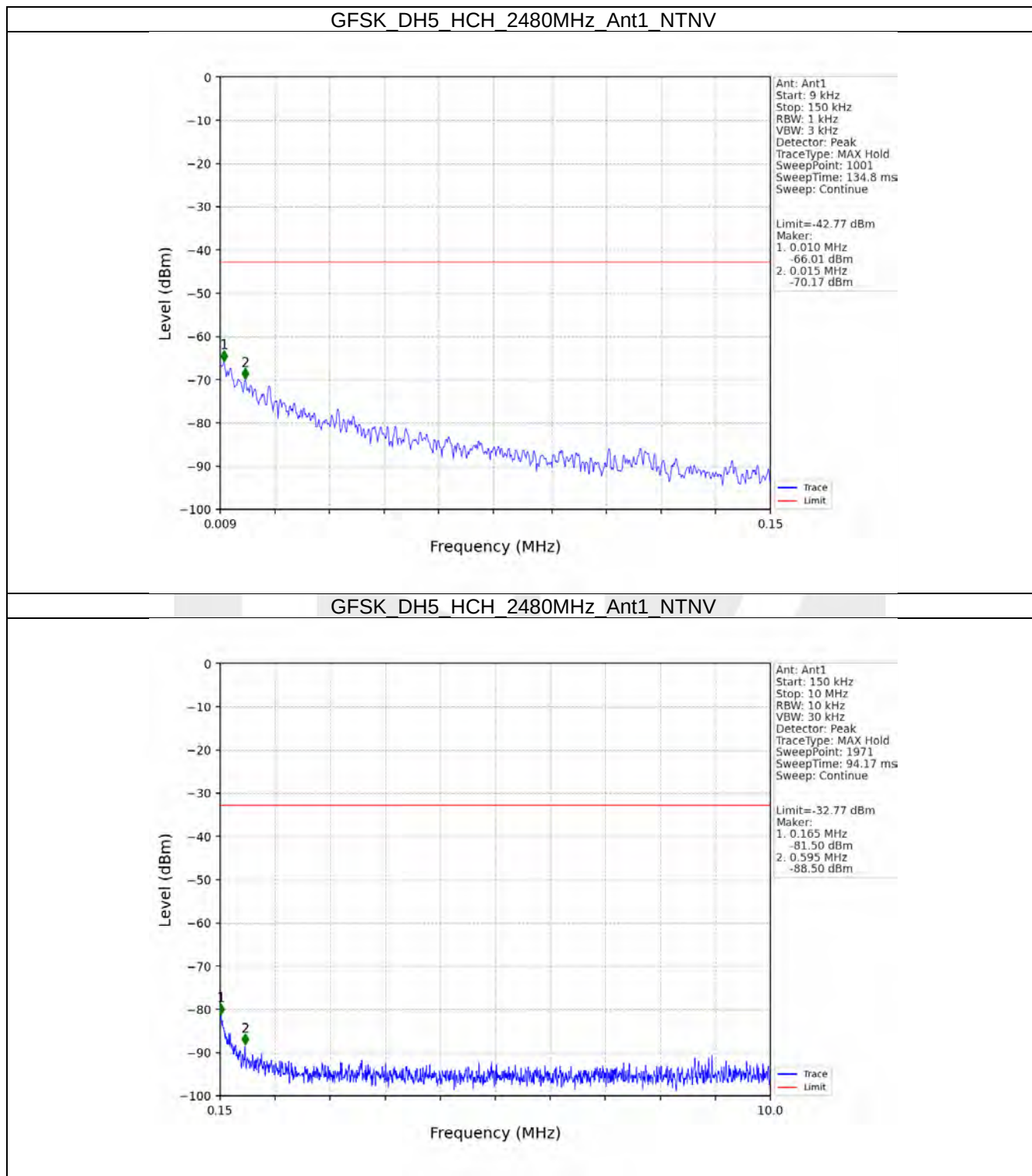


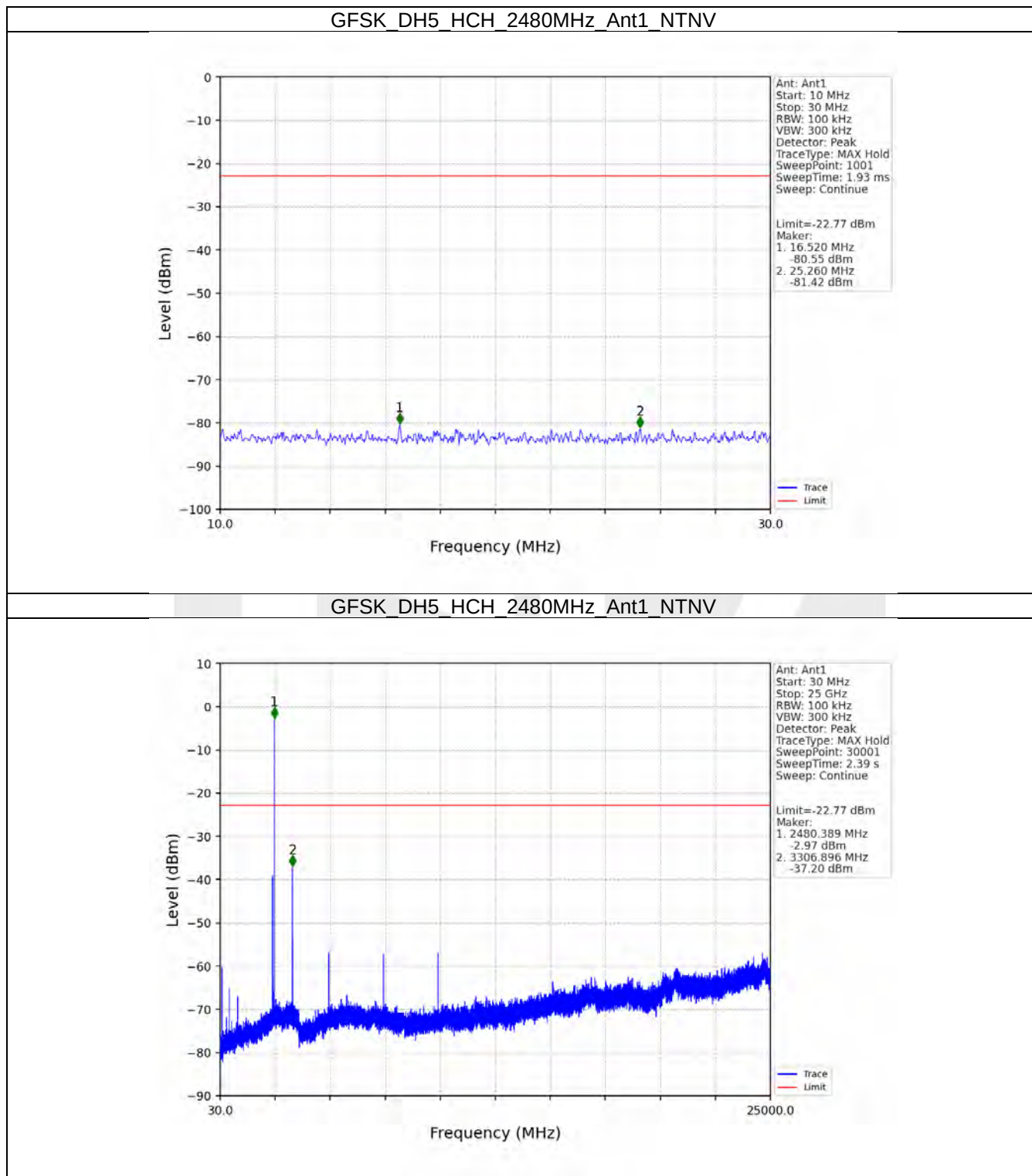
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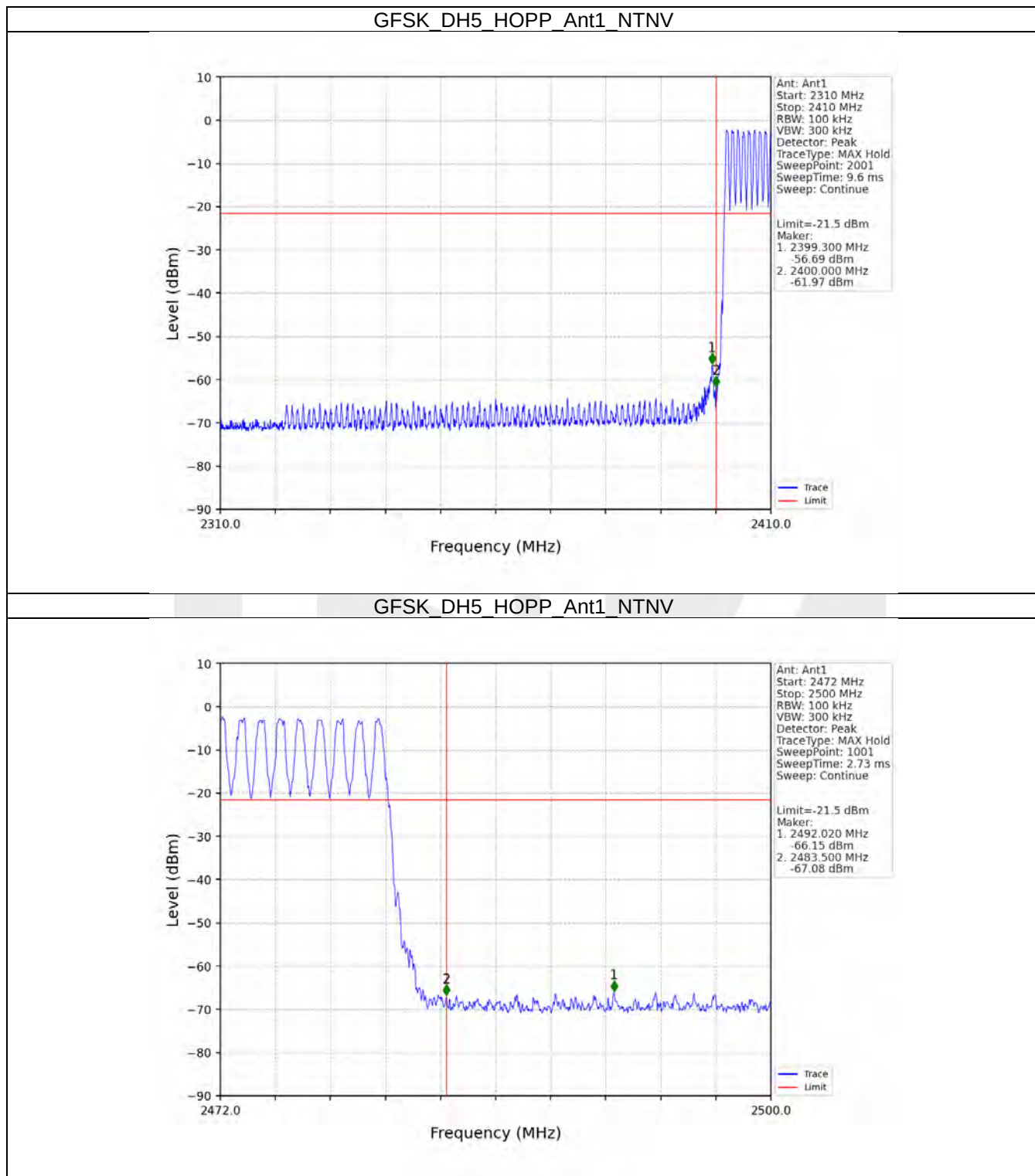


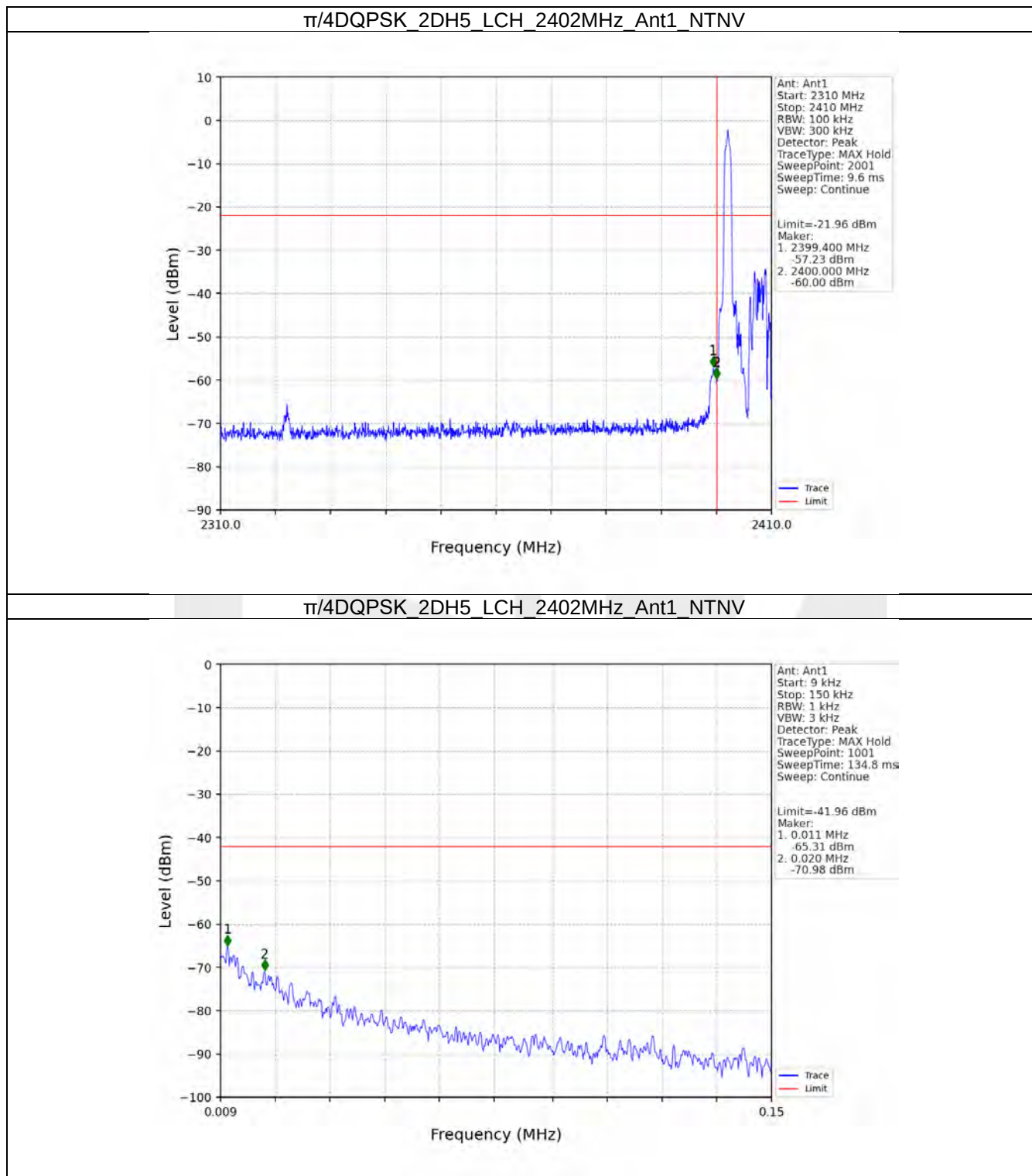


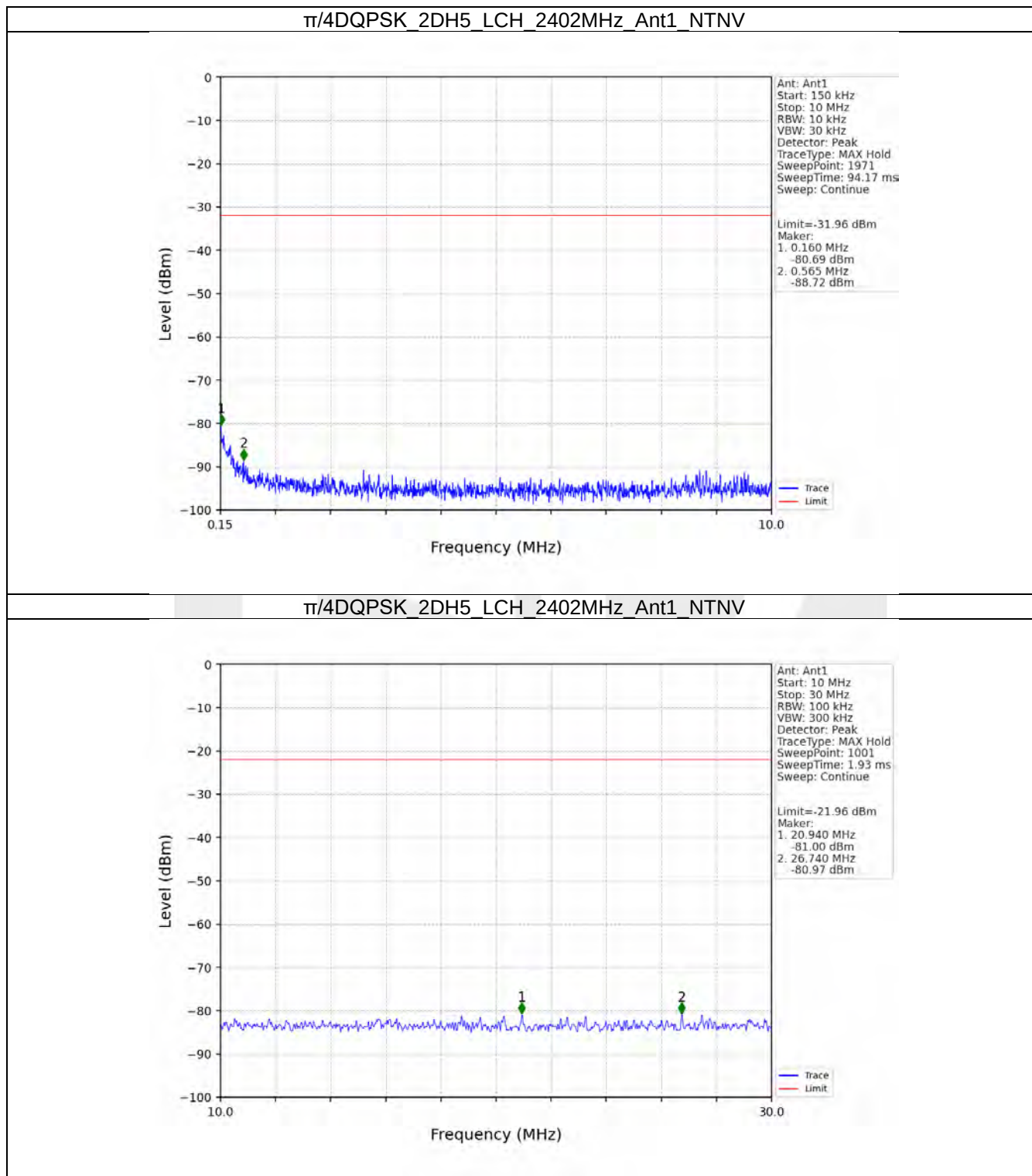


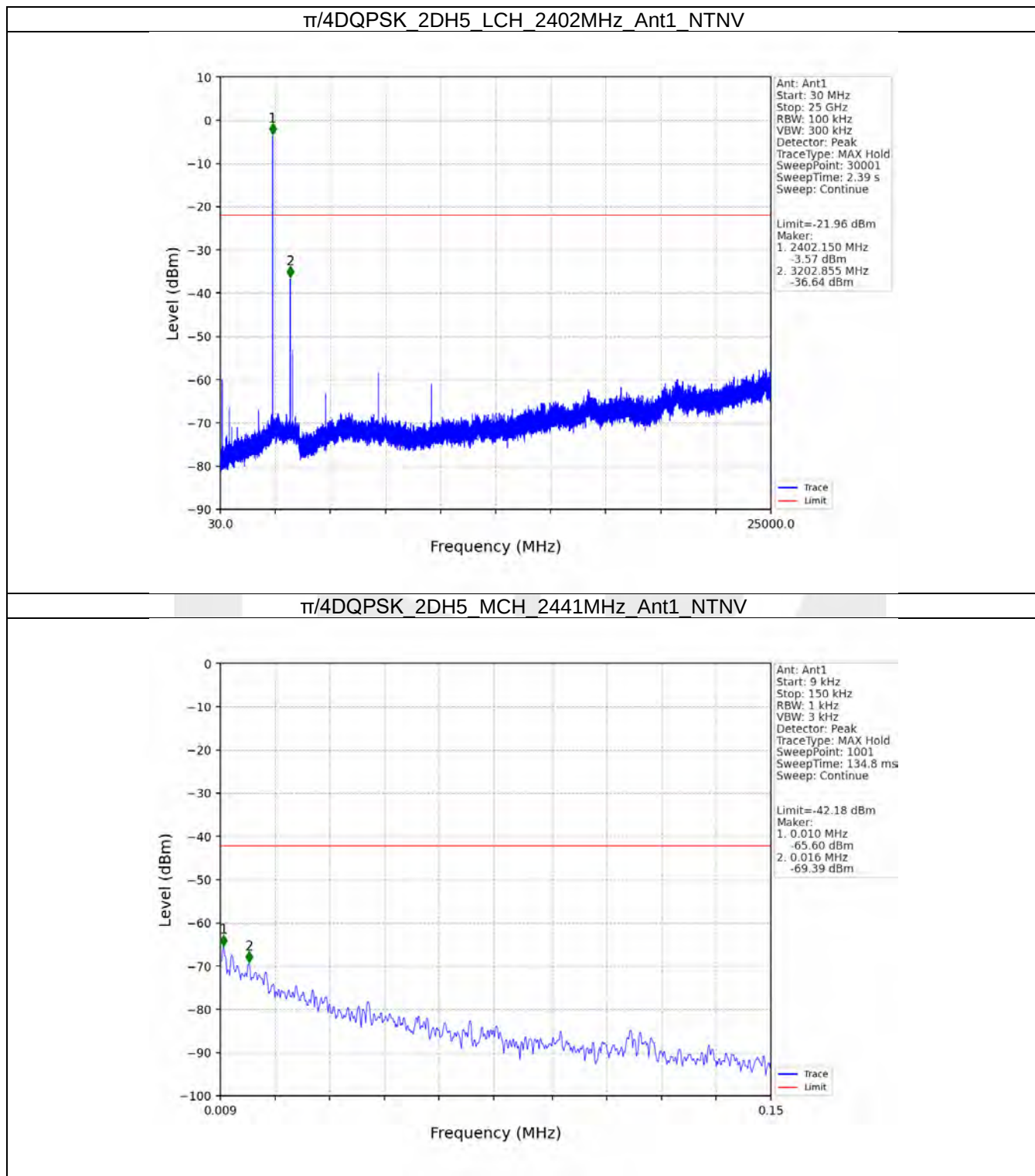


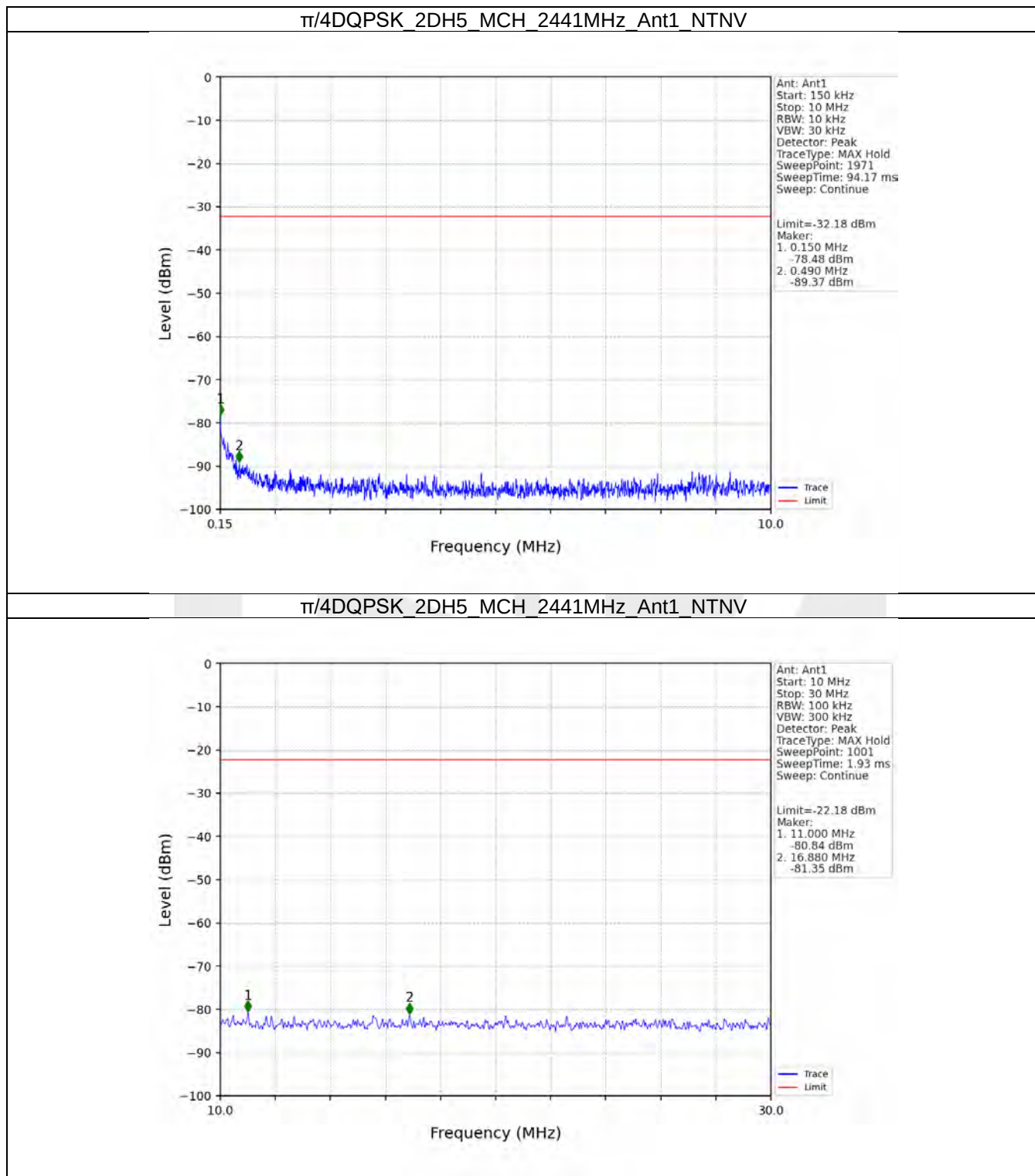


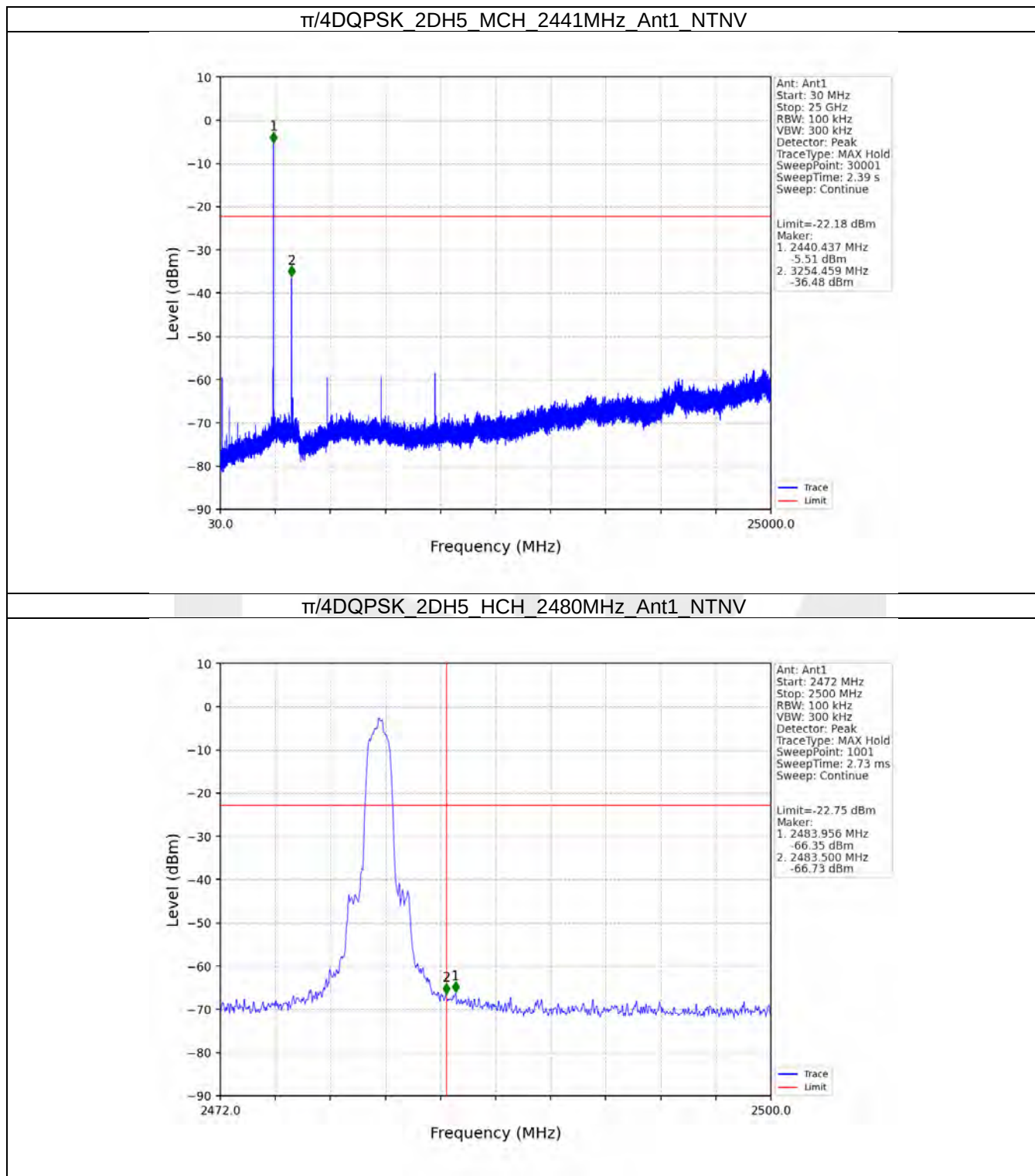


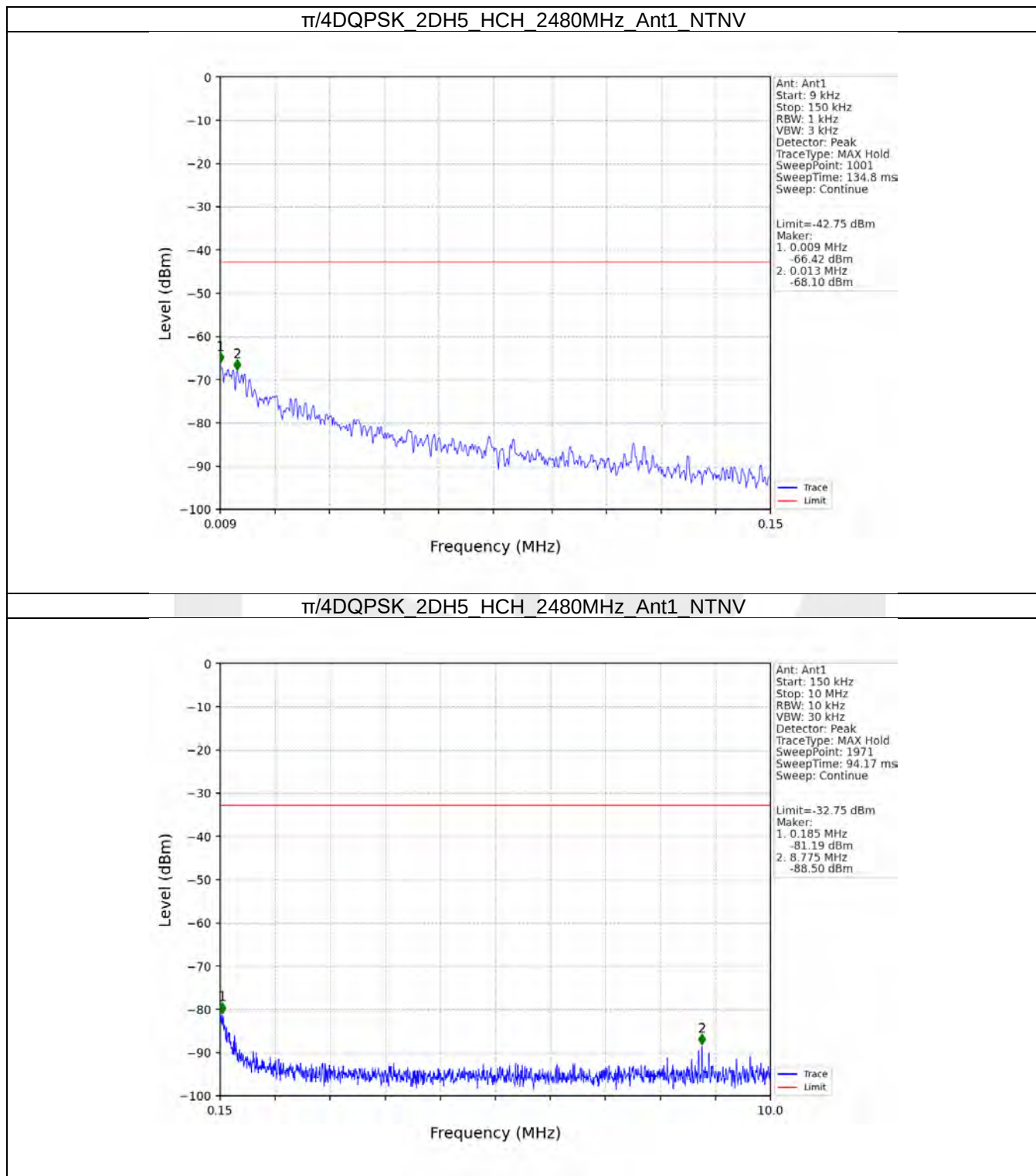


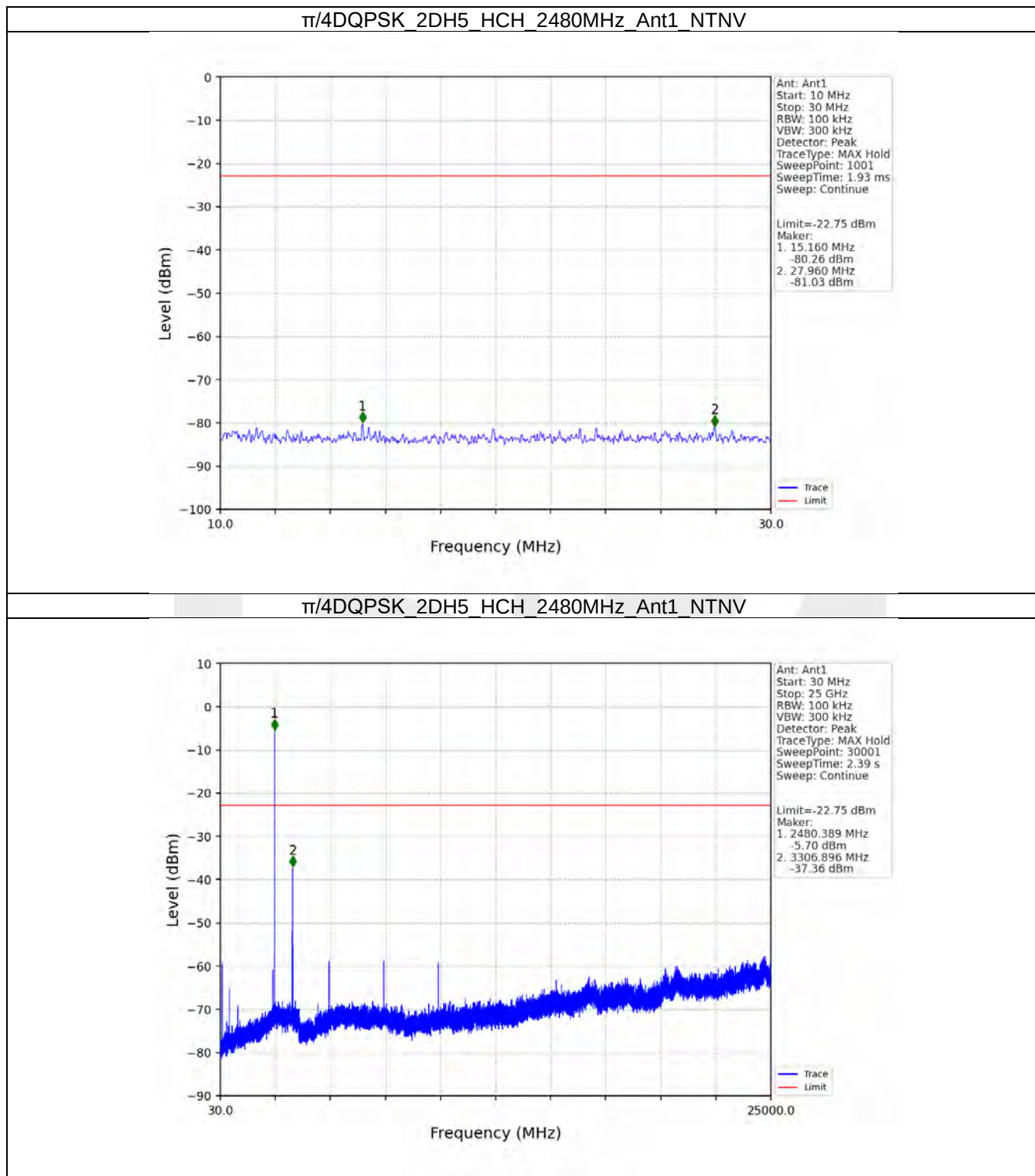


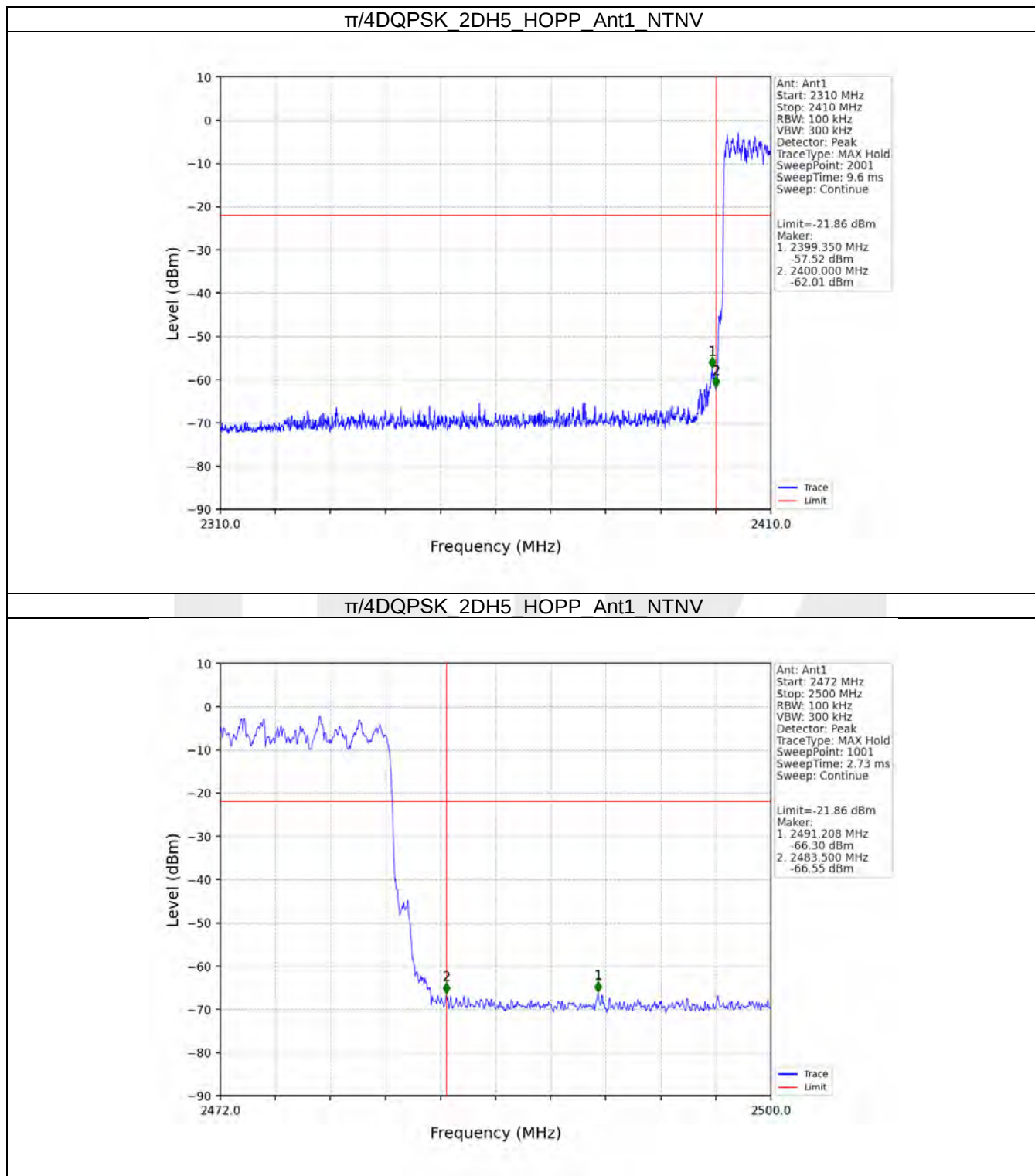












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