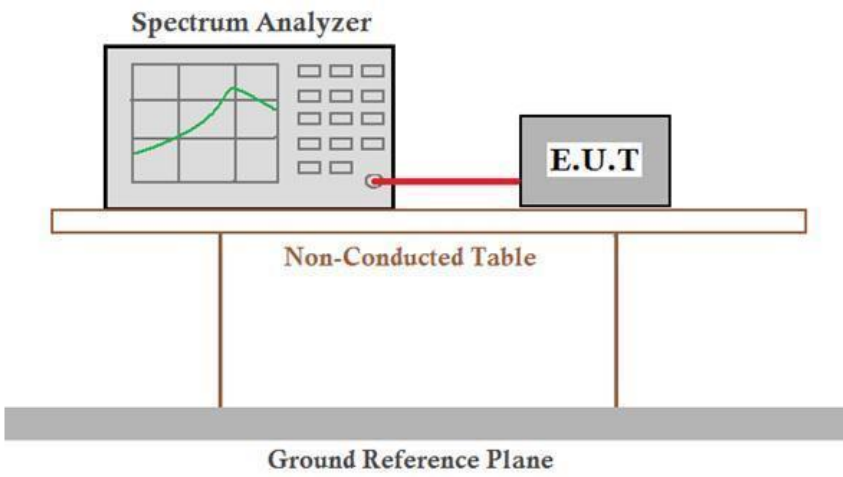


5.4 20dB Occupy Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Test Setup:	 <p>Remark: Offset=Cable loss+ attenuation factor.</p>
Limit:	NA
Exploratory Test Mode:	Non-hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass

Measurement Data

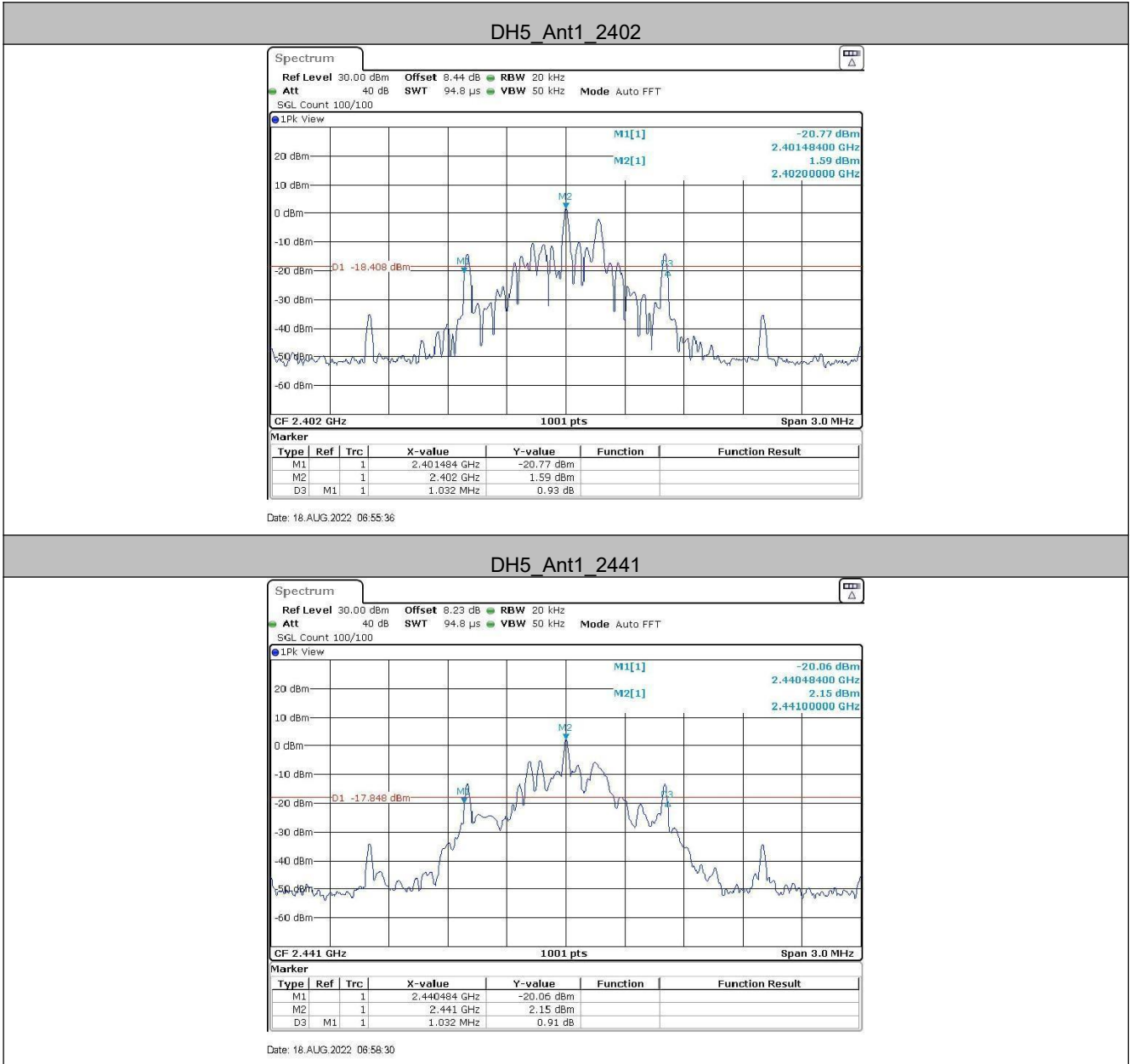
Ant1:

Test channel	20dB Occupy Bandwidth (MHz)		
	GFSK	$\pi/4$ DQPSK	8DPSK
Lowest	1.032	1.347	1.311
Middle	1.032	1.350	1.293
Highest	0.864	1.296	1.275

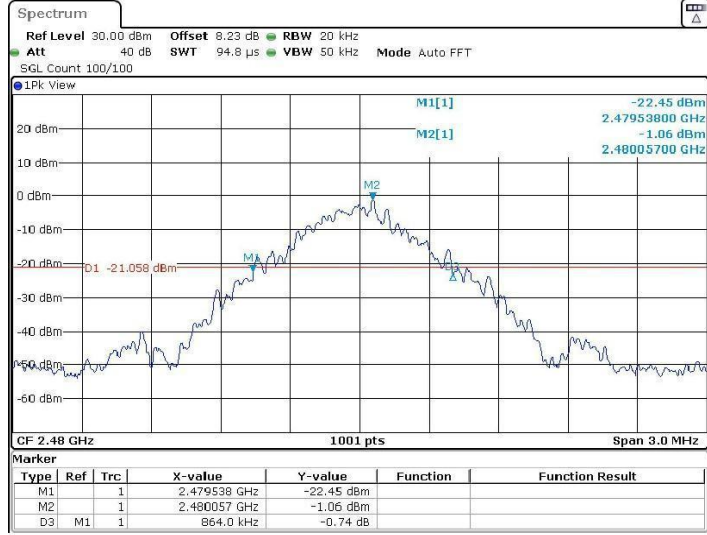
Ant2:

Test channel	20dB Occupy Bandwidth (MHz)		
	GFSK	$\pi/4$ DQPSK	8DPSK
Lowest	0.945	1.302	1.362
Middle	0.936	1.338	1.353
Highest	0.939	1.350	1.221

Test plot as follows:

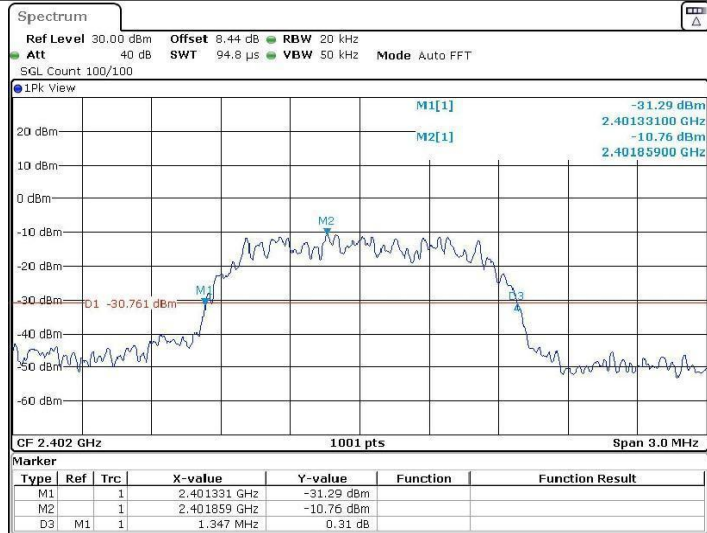


DH5_Ant1_2480



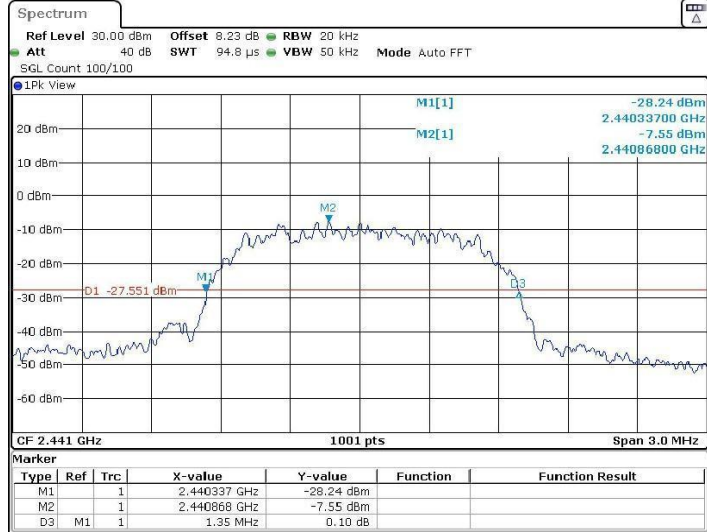
Date: 18.AUG.2022 07:04.40

2DH5_Ant1_2402



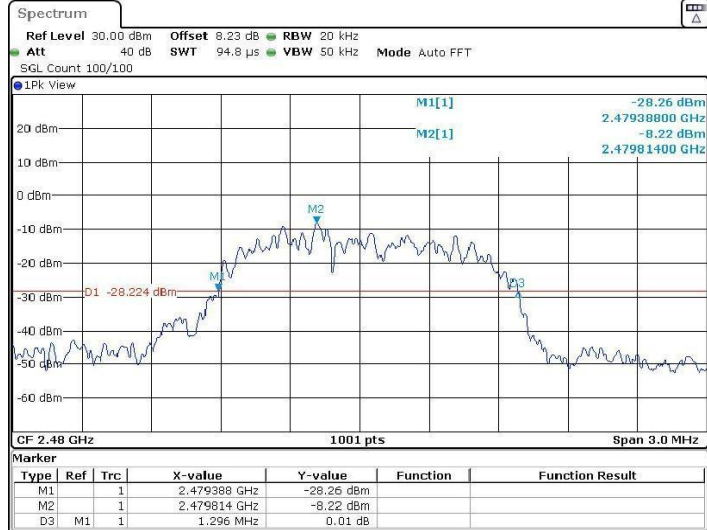
Date: 18.AUG.2022 07:08.01

2DH5_Ant1_2441



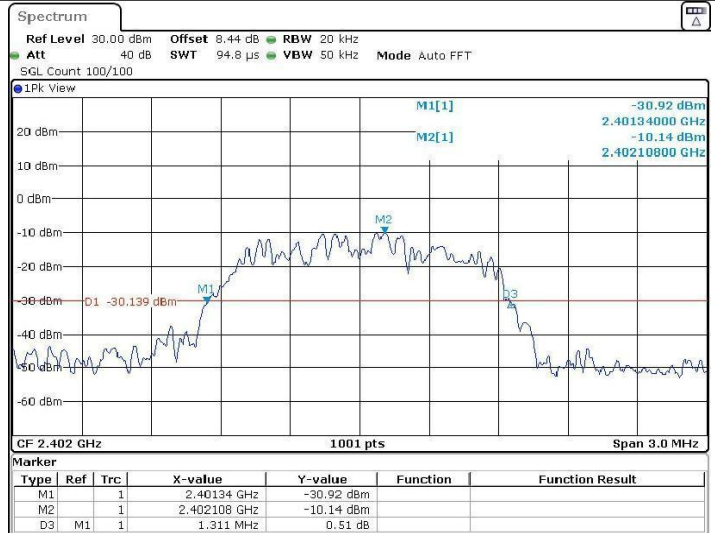
Date: 18.AUG.2022 07:10:50

2DH5_Ant1_2480



Date: 18.AUG.2022 07:12:53

3DH5_Ant1_2402

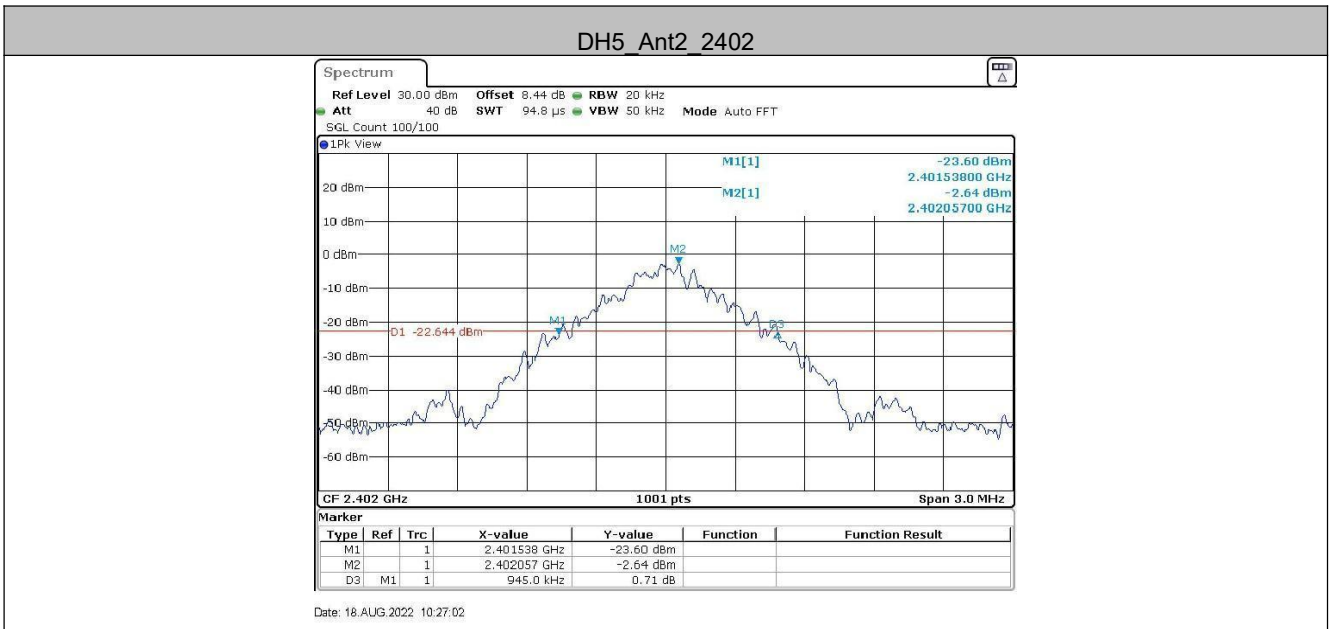
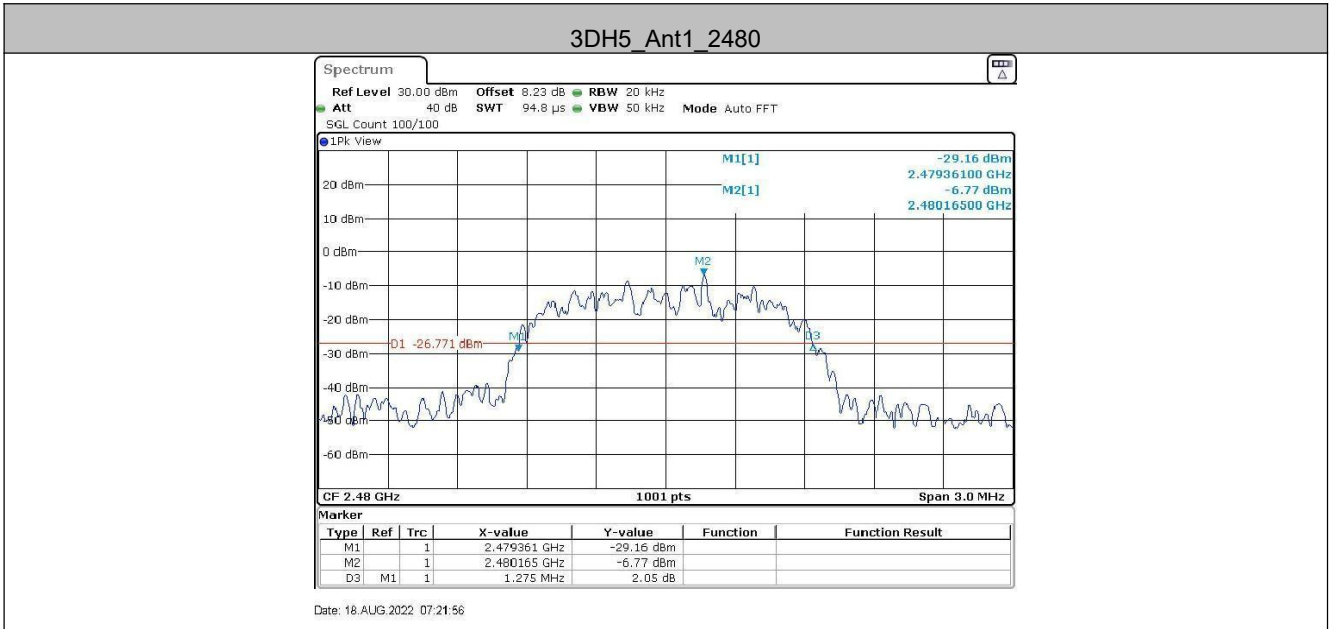


Date: 18.AUG.2022 07:15:56

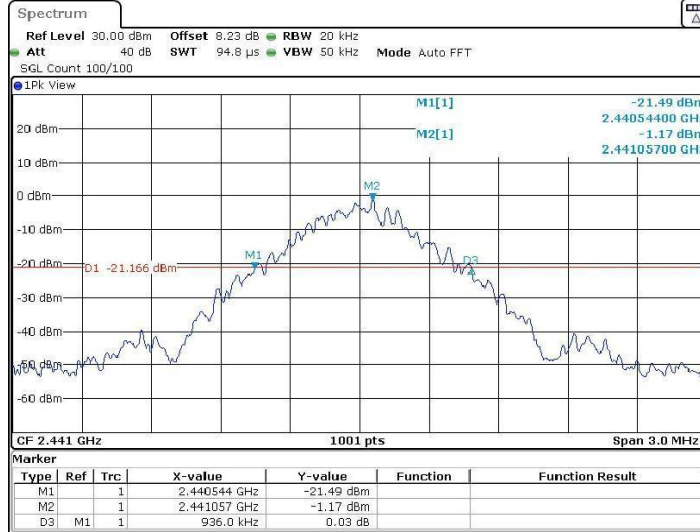
3DH5_Ant1_2441



Date: 18.AUG.2022 07:19:47

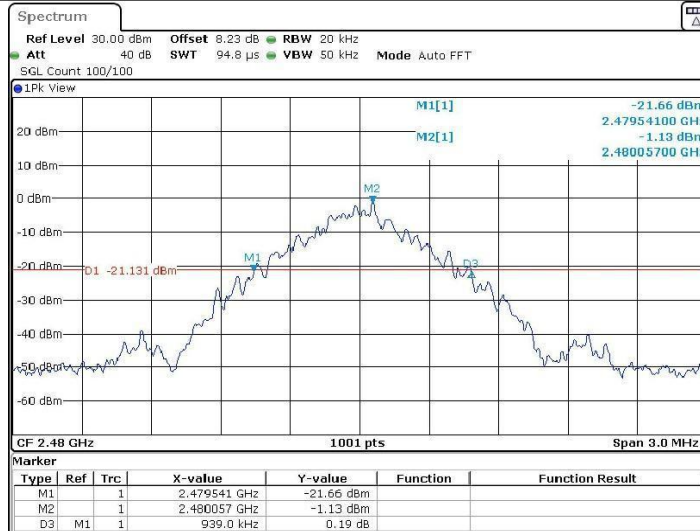


DH5_Ant2_2441



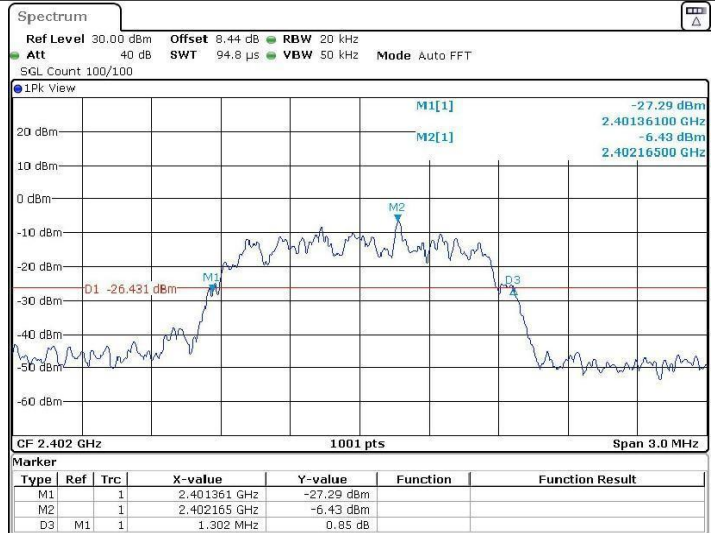
Date: 18.AUG.2022 10:30:47

DH5_Ant2_2480



Date: 18.AUG.2022 10:32:08

2DH5_Ant2_2402



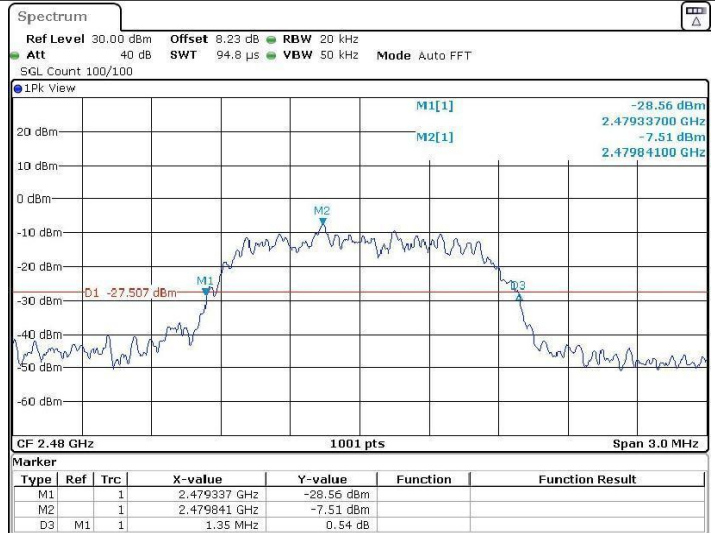
Date: 18.AUG.2022 10:35:02

2DH5_Ant2_2441



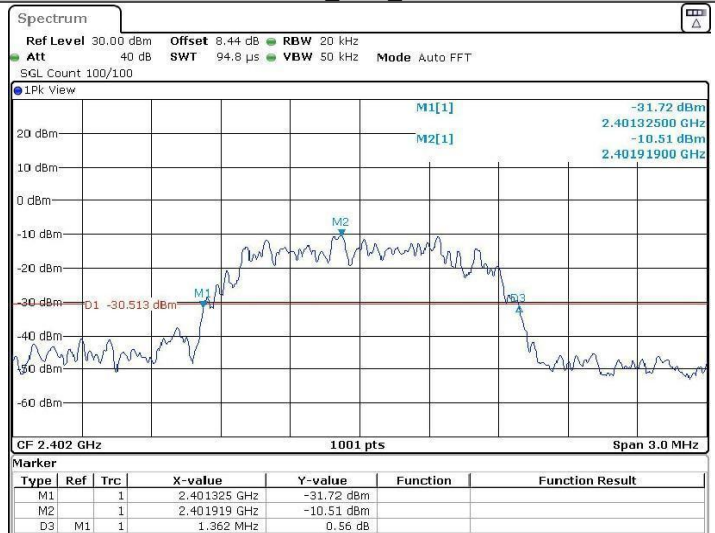
Date: 18.AUG.2022 10:37:30

2DH5_Ant2_2480



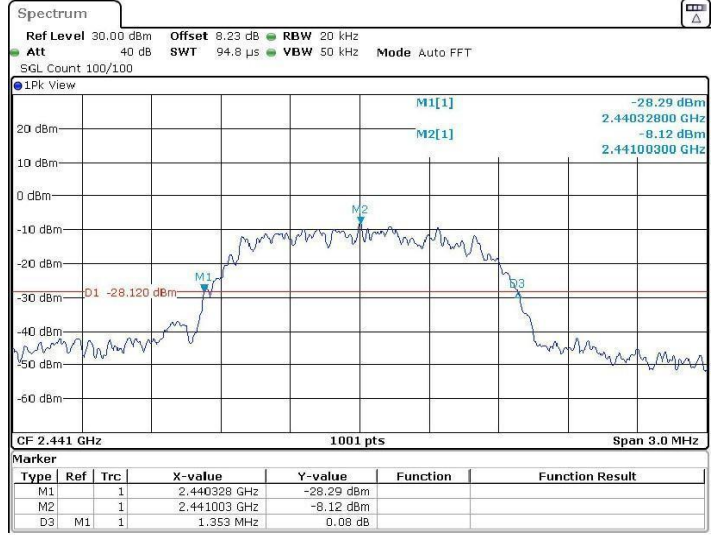
Date: 18.AUG.2022 10:40:29

3DH5_Ant2_2402



Date: 18.AUG.2022 10:43:19

3DH5_Ant2_2441



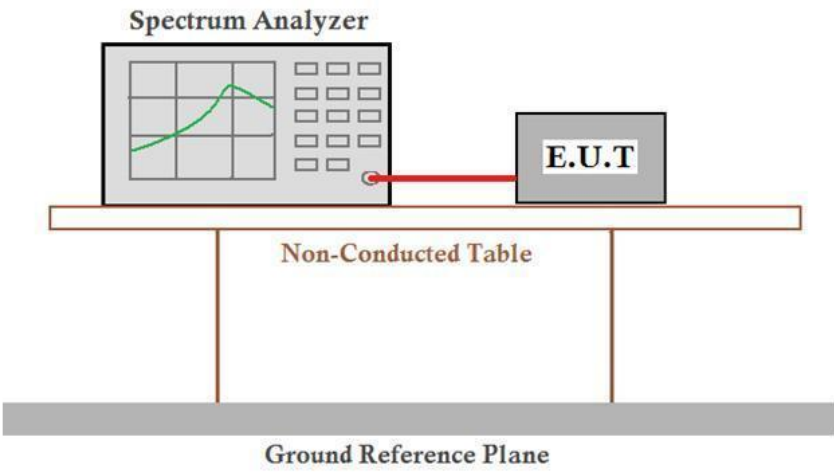
Date: 18.AUG.2022 10:46:30

3DH5_Ant2_2480



Date: 18.AUG.2022 10:48:32

5.5 Carrier Frequencies Separation

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Test Setup:	 <p>Remark: Offset=Cable loss+ attenuation factor.</p>
Limit:	2/3 of the 20dB bandwidth
	Remark: the transmission power is less than 0.125W.
Exploratory Test Mode:	Hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass

Measurement Data

Ant1:

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.867	≥0.688	PASS
2DH5	Ant1	Hop	1.003	≥0.900	PASS
3DH5	Ant1	Hop	1.148	≥0.874	PASS

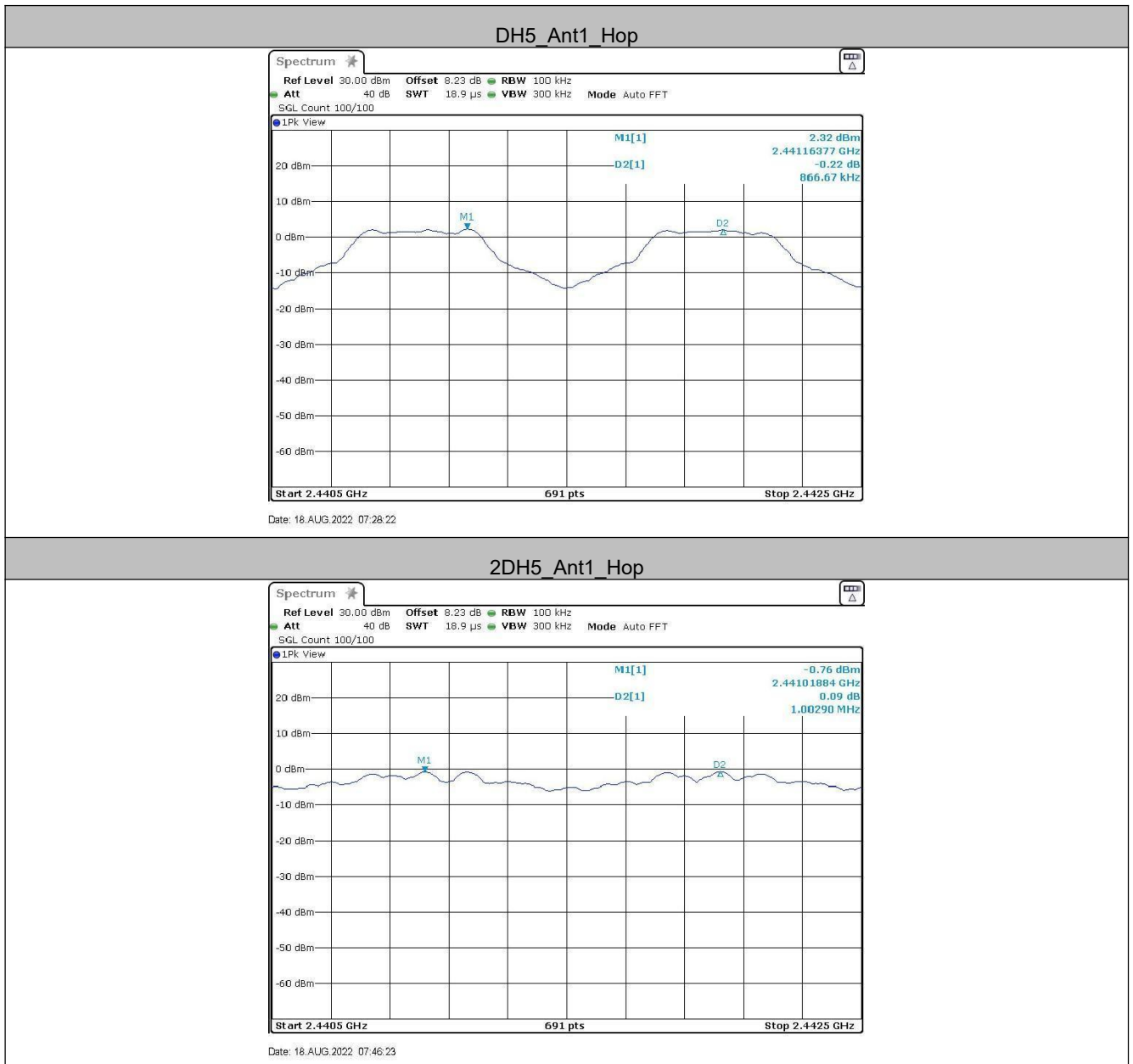
Mode	20dB bandwidth (MHz) (worse case)	Limit (MHz) (Carrier Frequencies Separation)
GFSK	1.032	0.688
$\pi/4$ DQPSK	1.350	0.900
8DPSK	1.311	0.874

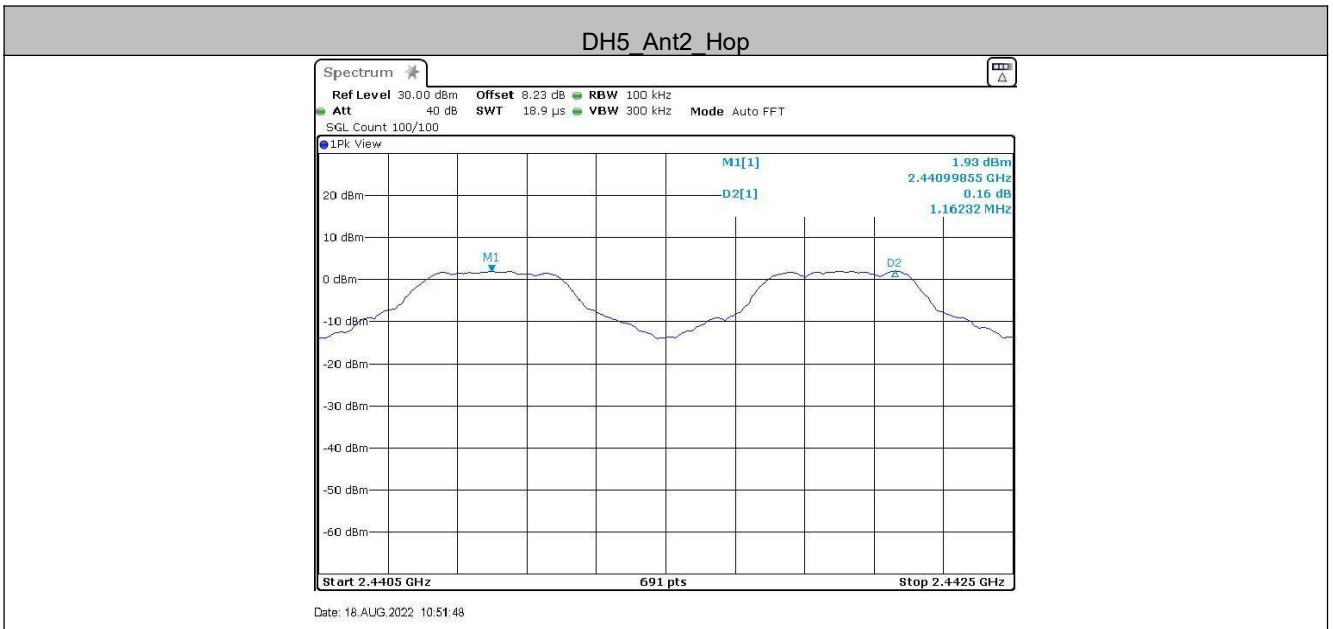
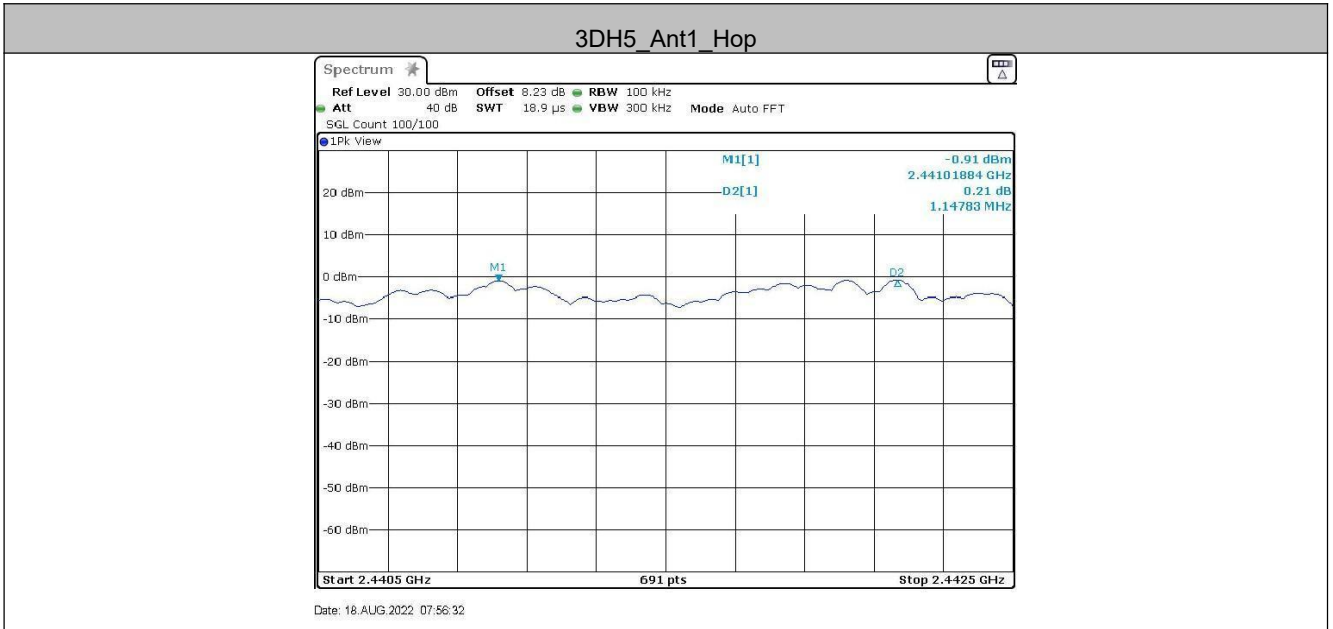
Ant2:

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant2	Hop	1.162	≥0.63	PASS
2DH5	Ant2	Hop	1.006	≥0.900	PASS
3DH5	Ant2	Hop	1.168	≥0.908	PASS

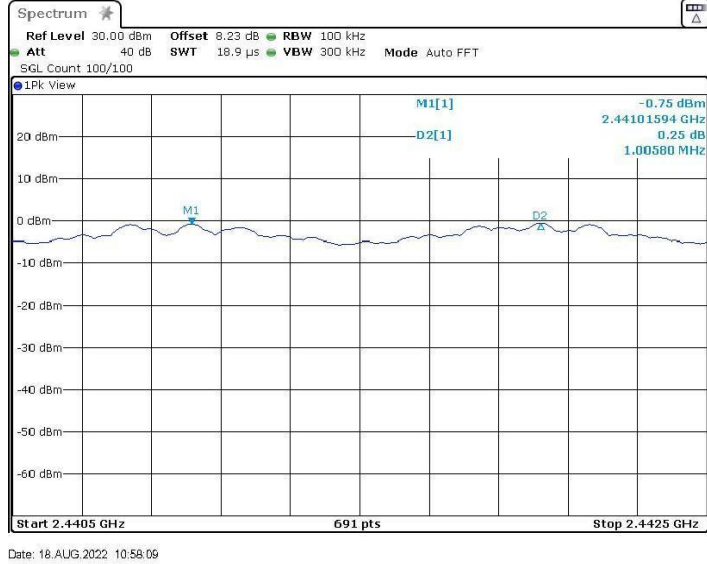
Mode	20dB bandwidth (MHz) (worse case)	Limit (MHz) (Carrier Frequencies Separation)
GFSK	0.945	0.63
$\pi/4$ DQPSK	1.338	0.9
8DPSK	1.362	0.908

Test plot as follows:

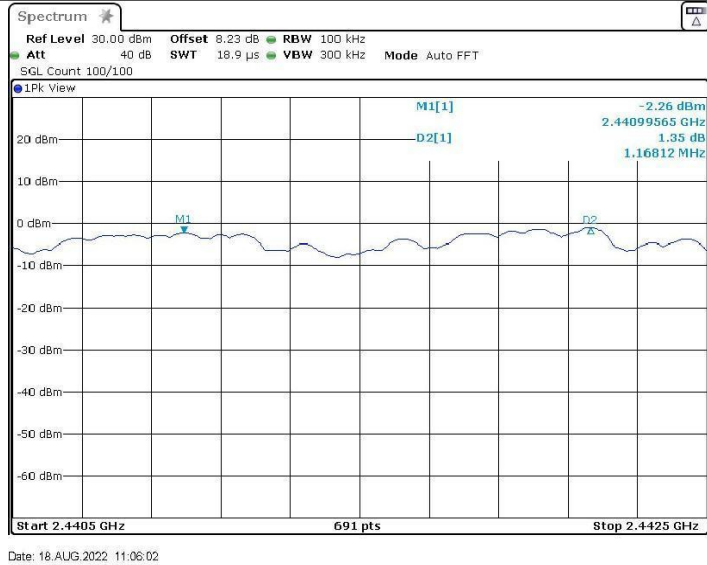




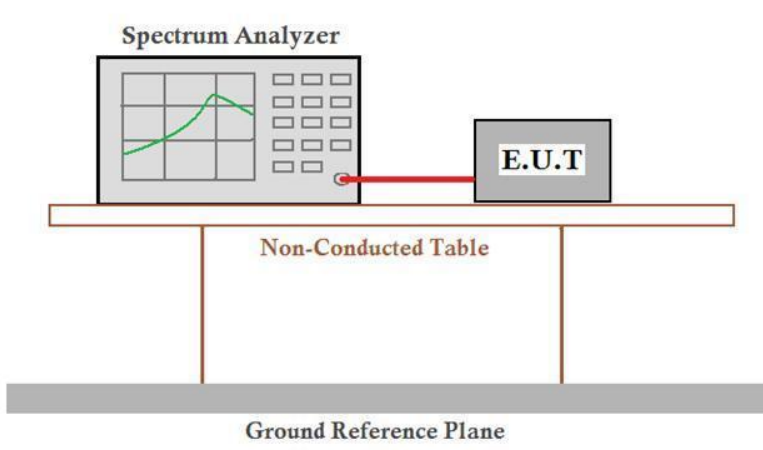
2DH5_Ant2_Hop



3DH5_Ant2_Hop



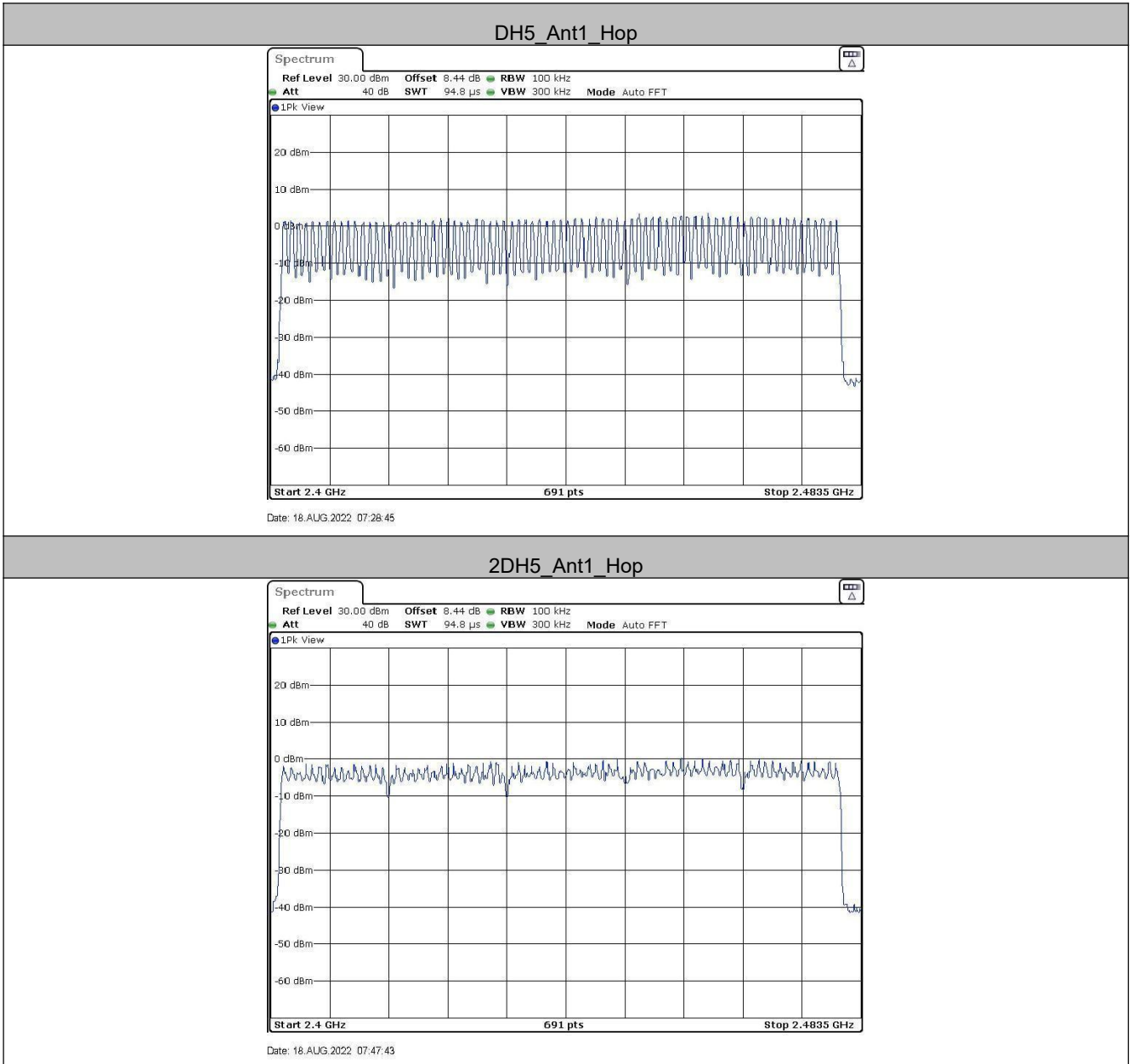
5.6 Hopping Channel Number

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Test Setup:	 <p style="text-align: center;"><i>Remark: Offset=Cable loss+ attenuation factor.</i></p>
Limit:	At least 15 channels
Exploratory Test Mode:	hopping transmitting with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH5 of data type is the worst case of GFSK modulation type, 2-DH5 of data type is the worst case of $\pi/4$ DQPSK modulation type, 3-DH5 of data type is the worst case of 8DPSK modulation type. Only the worst case is recorded in the report.
Test Results:	Pass

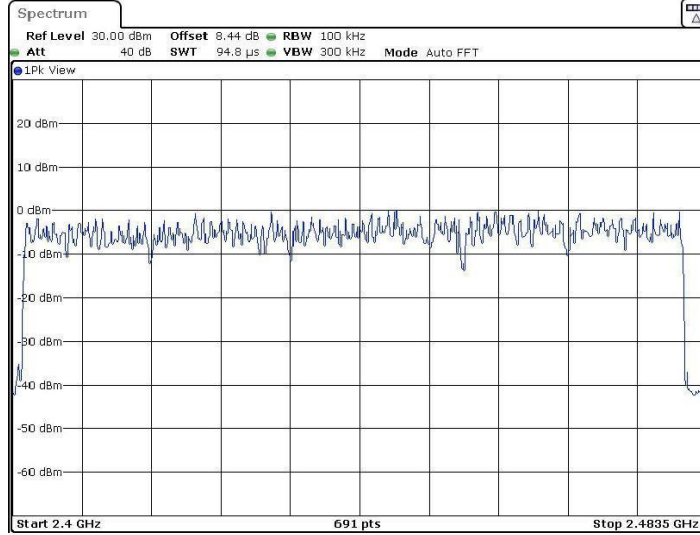
Measurement Data

Mode	Hopping channel numbers	Limit
GFSK	79	≥ 15
$\pi/4$ DQPSK	79	≥ 15
8DPSK	79	≥ 15

Test plot as follows:

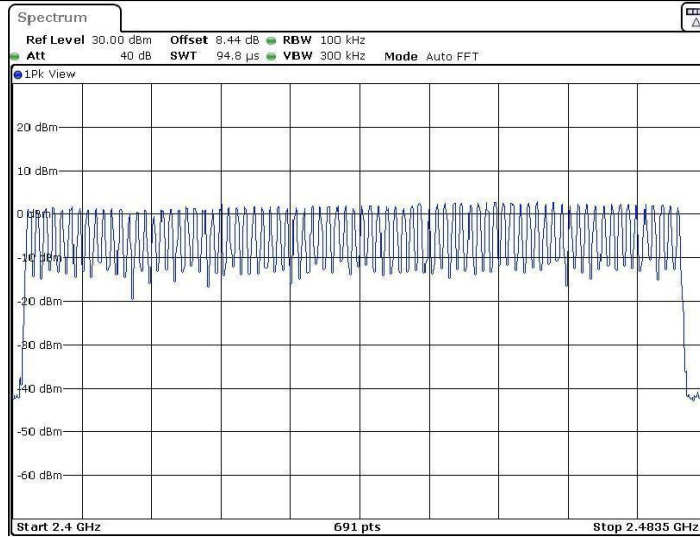


3DH5_Ant1_Hop



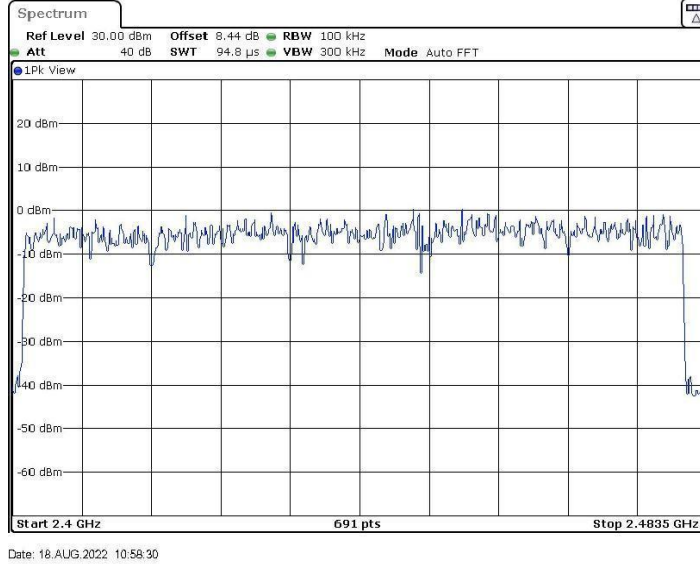
Date: 18.AUG.2022 07:57:04

DH5_Ant2_Hop

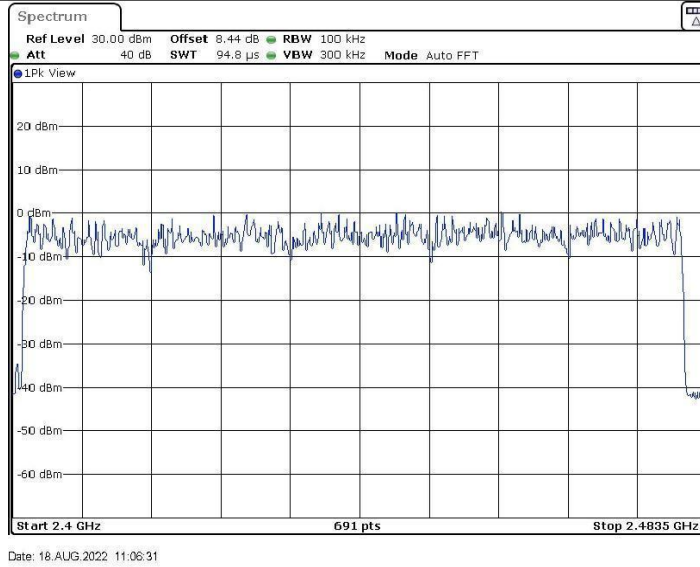


Date: 18.AUG.2022 10:52:06

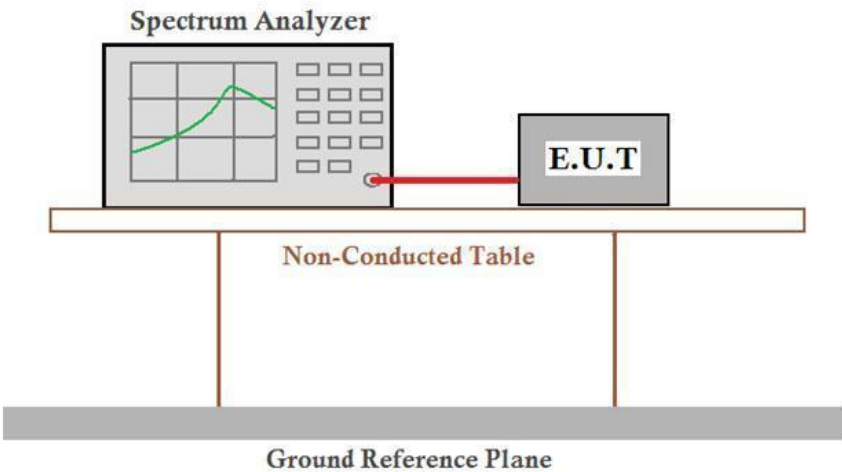
2DH5_Ant2_Hop



3DH5_Ant2_Hop



5.7 Dwell Time

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1)
Test Method:	ANSI C63.10:2013
Test Setup:	 <p style="text-align: center;"><i>Remark: Offset=Cable loss+ attenuation factor.</i></p>
Test Mode:	Hopping transmitting with all kind of modulation and all kind of data type.
Limit:	0.4 Second
Test Results:	Pass

Measurement Data

Ant1:

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.39	320	0.123	≤0.4	PASS
DH3	Ant1	Hop	1.63	160	0.261	≤0.4	PASS
DH5	Ant1	Hop	2.88	130	0.374	≤0.4	PASS
2DH1	Ant1	Hop	0.39	320	0.124	≤0.4	PASS
2DH3	Ant1	Hop	1.63	170	0.278	≤0.4	PASS
2DH5	Ant1	Hop	2.87	130	0.373	≤0.4	PASS
3DH1	Ant1	Hop	0.39	330	0.128	≤0.4	PASS
3DH3	Ant1	Hop	1.63	150	0.245	≤0.4	PASS
3DH5	Ant1	Hop	2.88	110	0.316	≤0.4	PASS

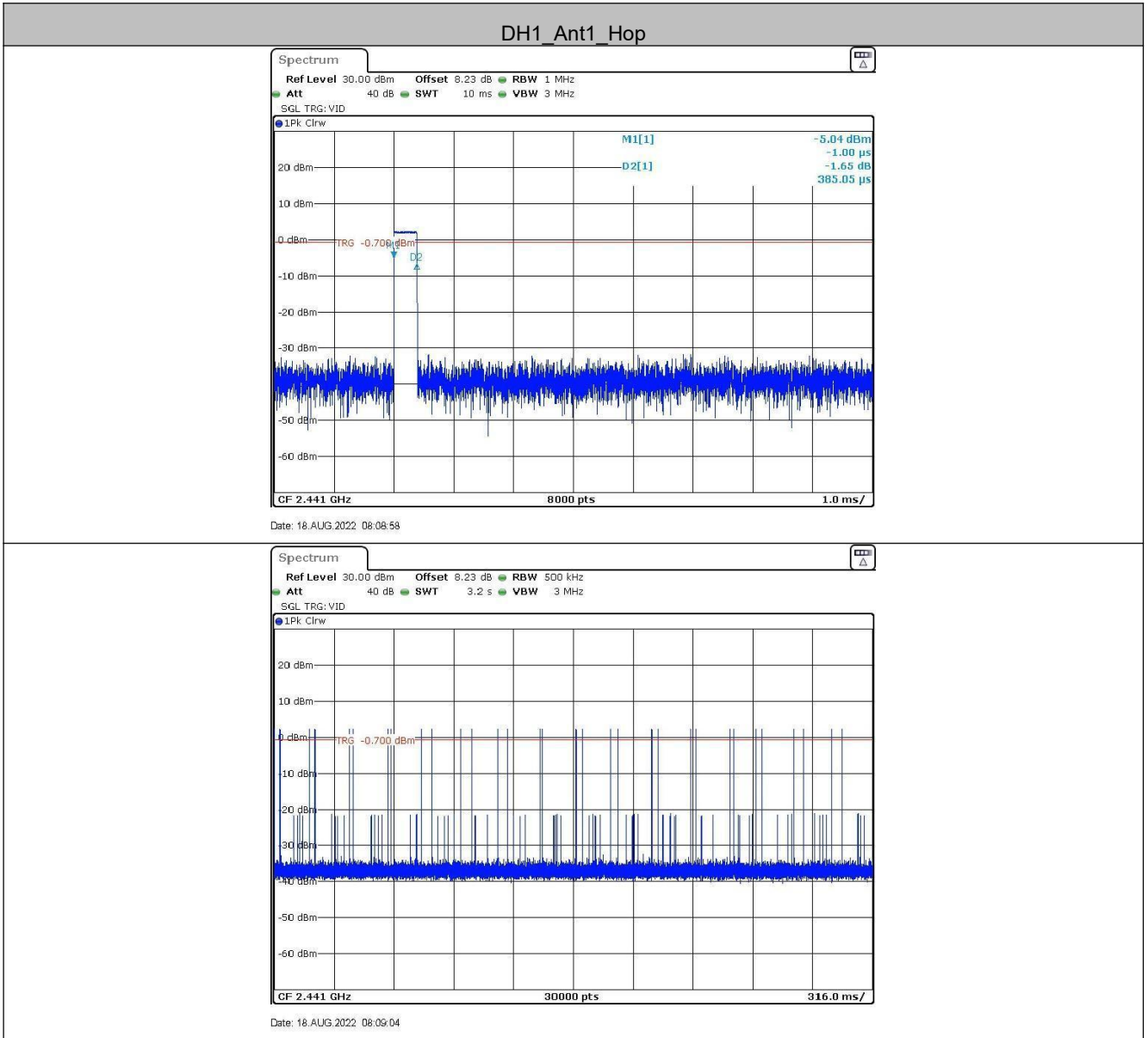
Ant2:

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant2	Hop	0.39	320	0.124	≤0.4	PASS
DH3	Ant2	Hop	1.63	180	0.294	≤0.4	PASS
DH5	Ant2	Hop	2.87	130	0.374	≤0.4	PASS
2DH1	Ant2	Hop	0.39	330	0.128	≤0.4	PASS
2DH3	Ant2	Hop	1.63	120	0.196	≤0.4	PASS
2DH5	Ant2	Hop	2.87	100	0.287	≤0.4	PASS
3DH1	Ant2	Hop	0.39	80	0.031	≤0.4	PASS
3DH3	Ant2	Hop	1.63	100	0.163	≤0.4	PASS
3DH5	Ant2	Hop	2.88	130	0.374	≤0.4	PASS

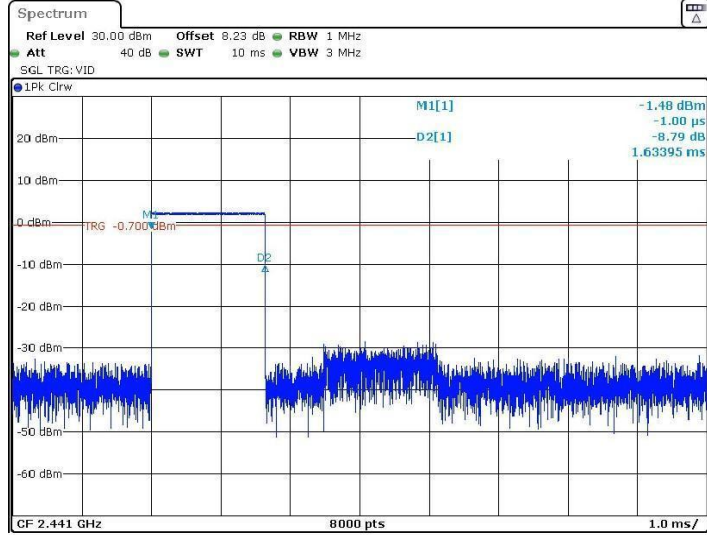
Remark:

The test period: T= 0.4 Second/Channel x 79 Channel = 31.6 s

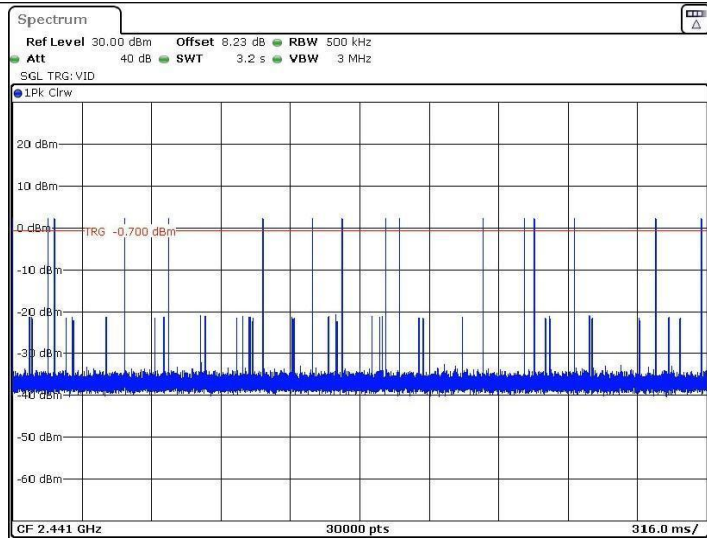
Test plot as follows:



DH3_Ant1_Hop

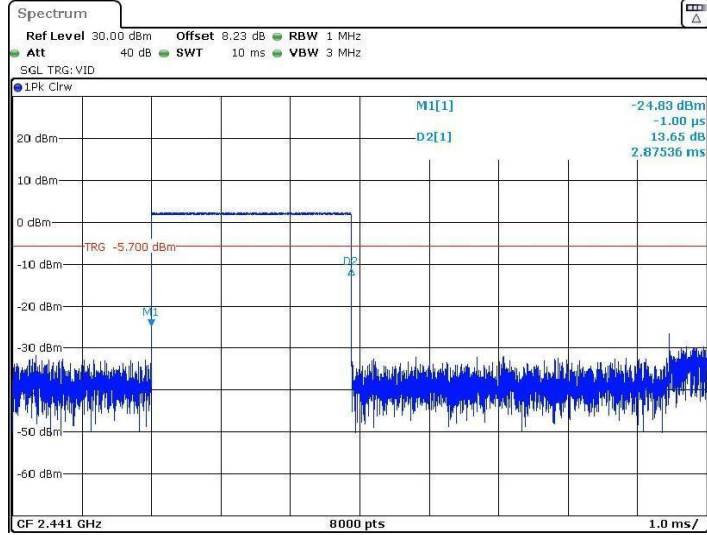


Date: 18.AUG.2022 08:09:35

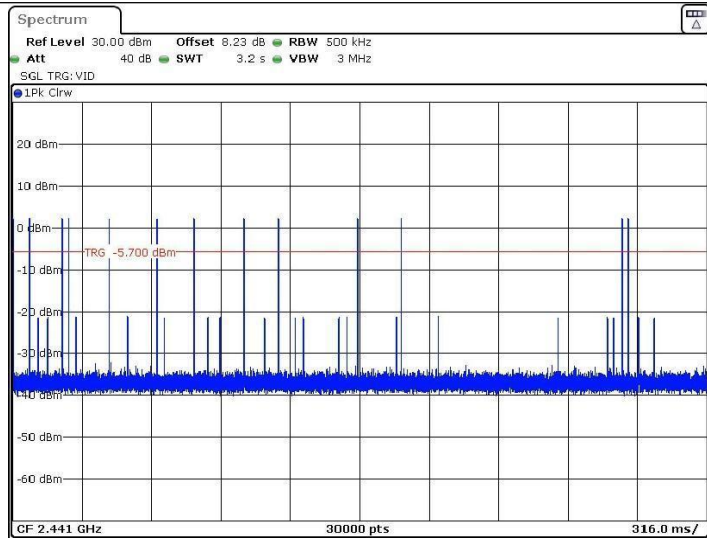


Date: 18.AUG.2022 08:09:41

DH5_Ant1_Hop



Date: 18.AUG.2022 08:08:18



Date: 18.AUG.2022 08:08:24

