

Appendix A

RF Test Data for BT V4.1(BDR/EDR) (Conducted Measurement)

Product Name: DP50-2

Trade Mark: 

Test Model: X300 PRO4

Environmental Conditions

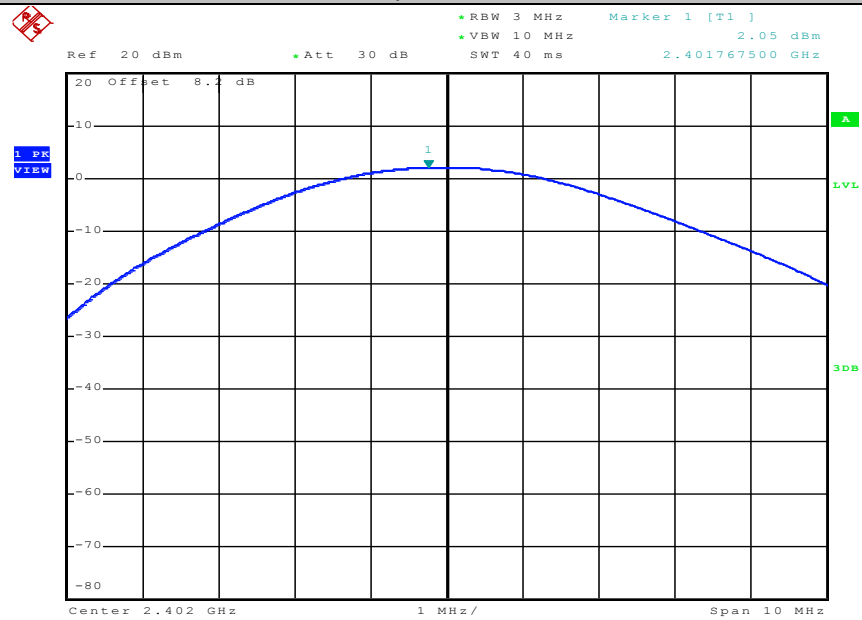
Temperature:	24.1 ° C
Relative Humidity:	53.2 %
ATM Pressure:	100.0 kPa
Test Engineer:	SCENT HU
Supervised by:	Wang.Chuang

A.1 Maximum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.050	21	PASS
	MCH	1.660	21	PASS
	HCH	0.470	21	PASS
$\pi/4$ DQPSK	LCH	2.050	21	PASS
	MCH	1.630	21	PASS
	HCH	0.440	21	PASS
8DPSK	LCH	2.020	21	PASS
	MCH	1.570	21	PASS
	HCH	0.410	21	PASS

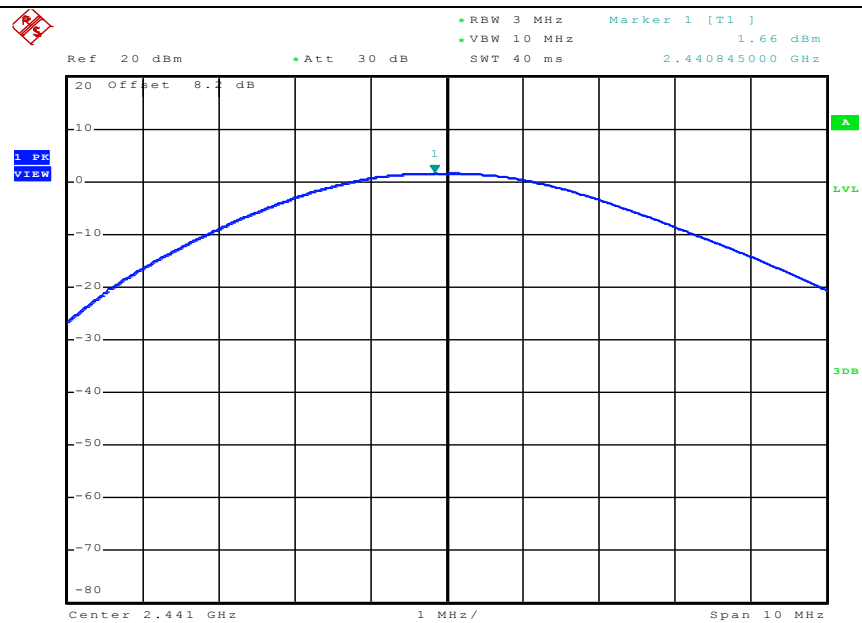
Test Graphs

GFSK/LCH



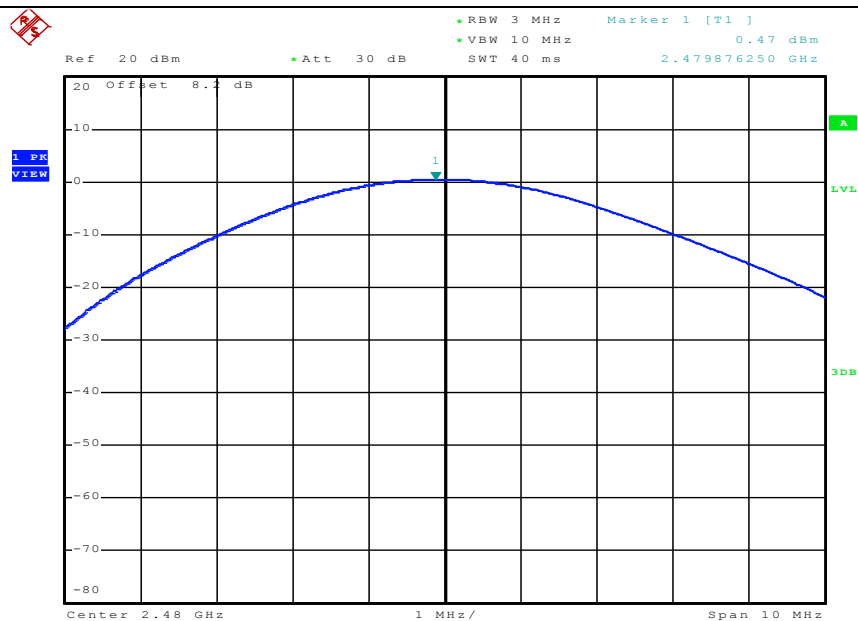
Date: 5.AUG.2019 23:07:10

GFSK/MCH

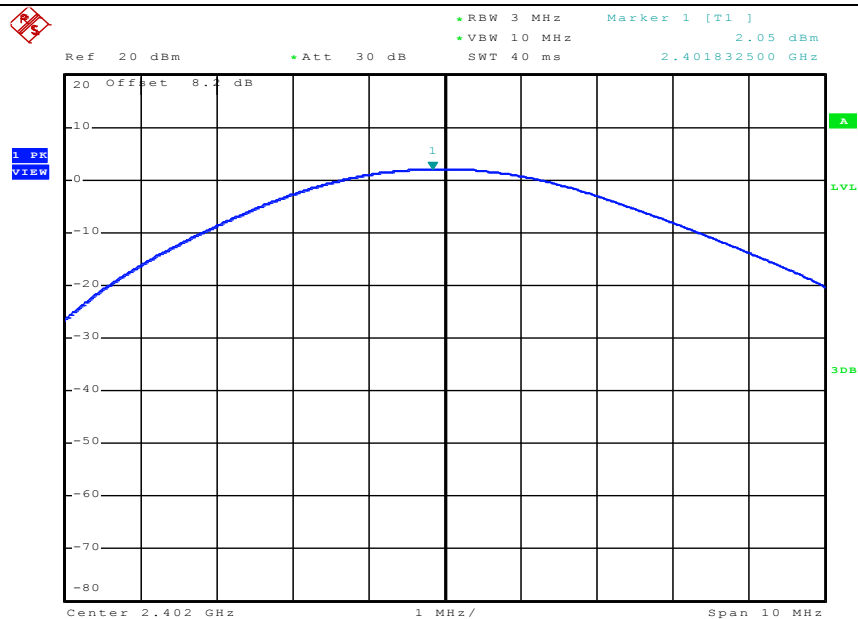


Date: 5.AUG.2019 23:10:33

GFSK/HCH

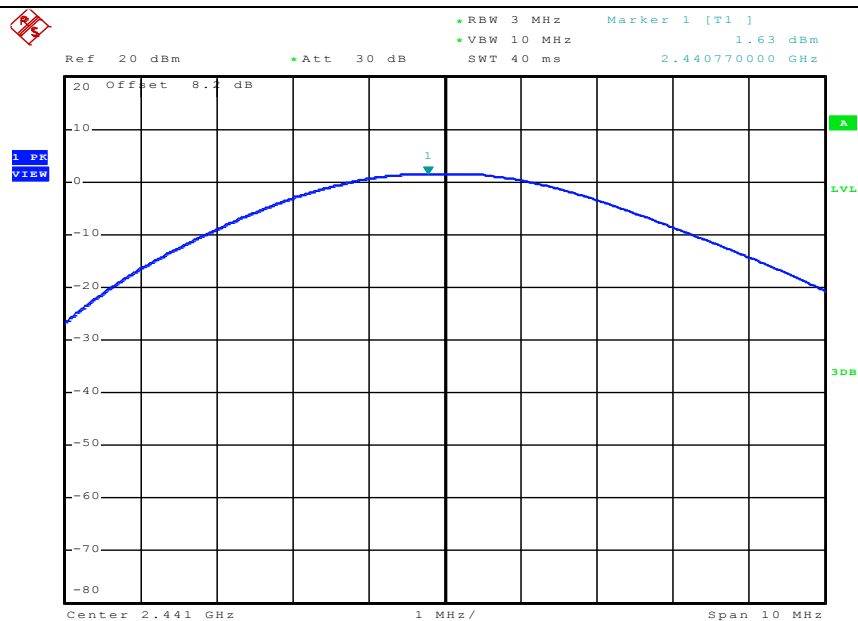


Date: 5.AUG.2019 23:12:25

 $\pi/4$ DQPSK/LCH

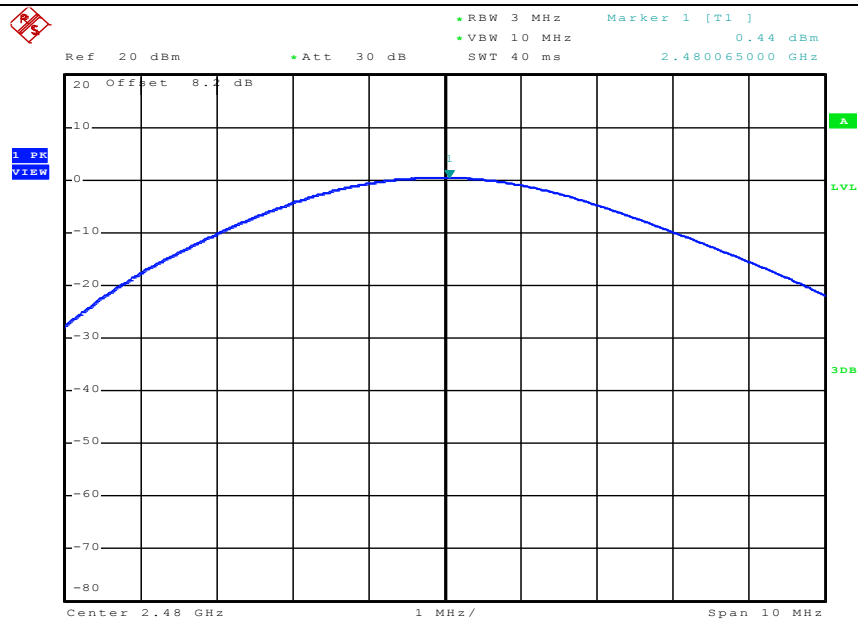
Date: 5.AUG.2019 23:15:37

$\pi/4$ DQPSK/MCH



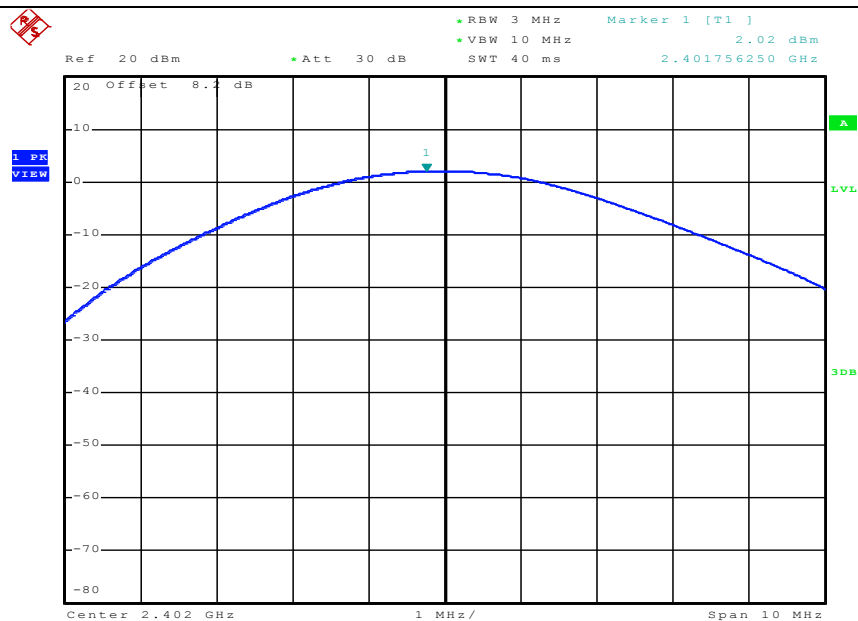
Date: 5.AUG.2019 23:18:35

$\pi/4$ DQPSK/HCH



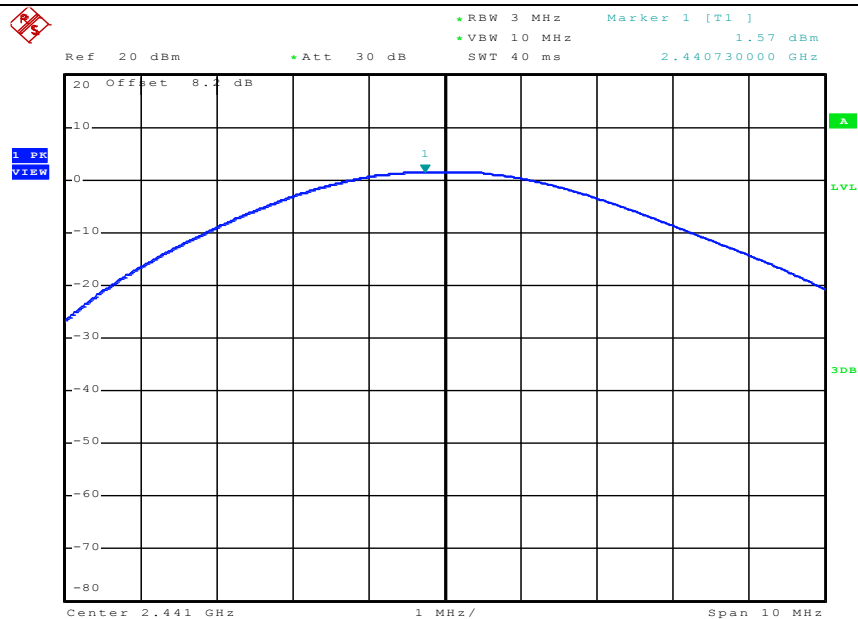
Date: 5.AUG.2019 23:20:30

8DPSK/LCH



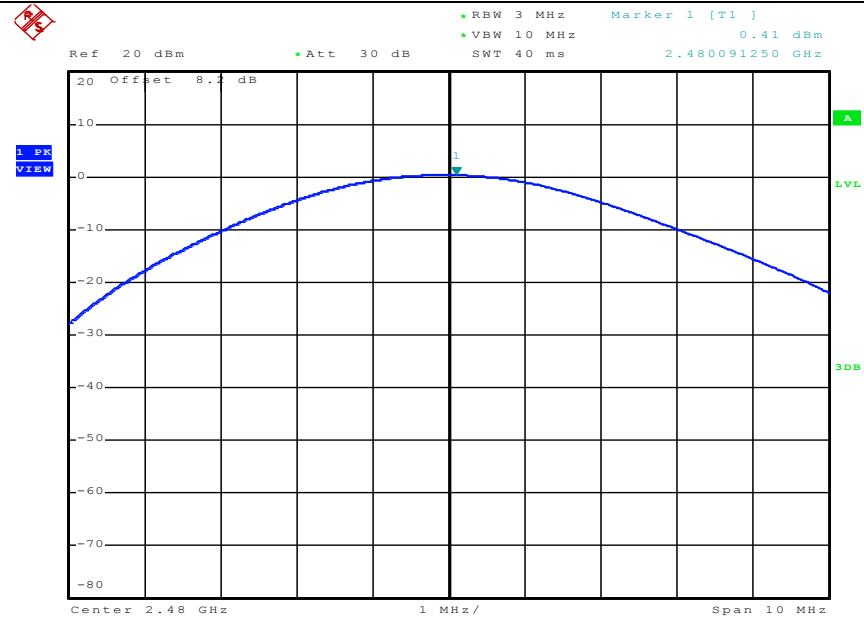
Date: 5.AUG.2019 23:24:16

8DPSK/MCH



Date: 5.AUG.2019 23:30:01

8DPSK/HCH

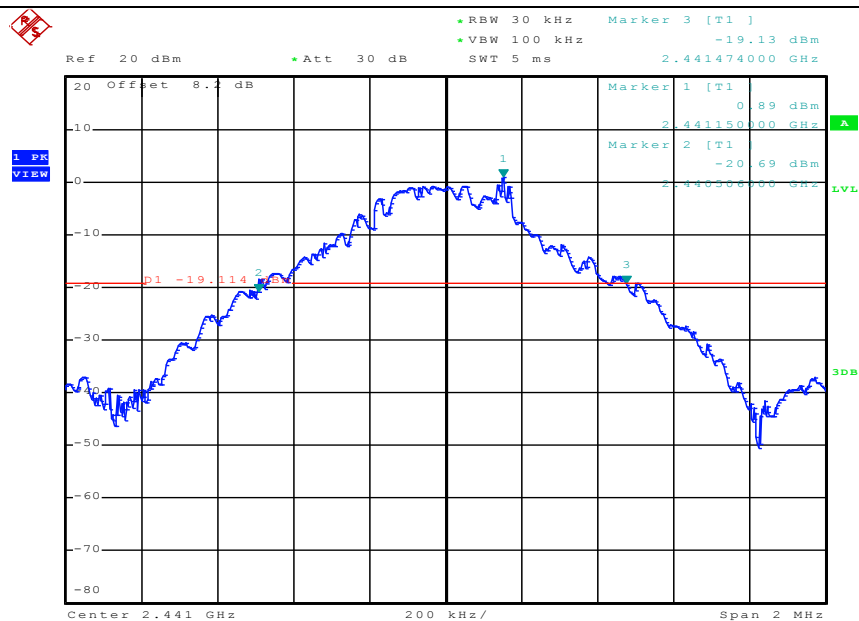


Date: 5.AUG.2019 23:31:51

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.970	Not Specified	PASS
	MCH	0.968	Not Specified	PASS
	HCH	0.970	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.064	Not Specified	PASS
	MCH	1.060	Not Specified	PASS
	HCH	1.070	Not Specified	PASS
8DPSK	LCH	1.002	Not Specified	PASS
	MCH	0.986	Not Specified	PASS
	HCH	0.994	Not Specified	PASS

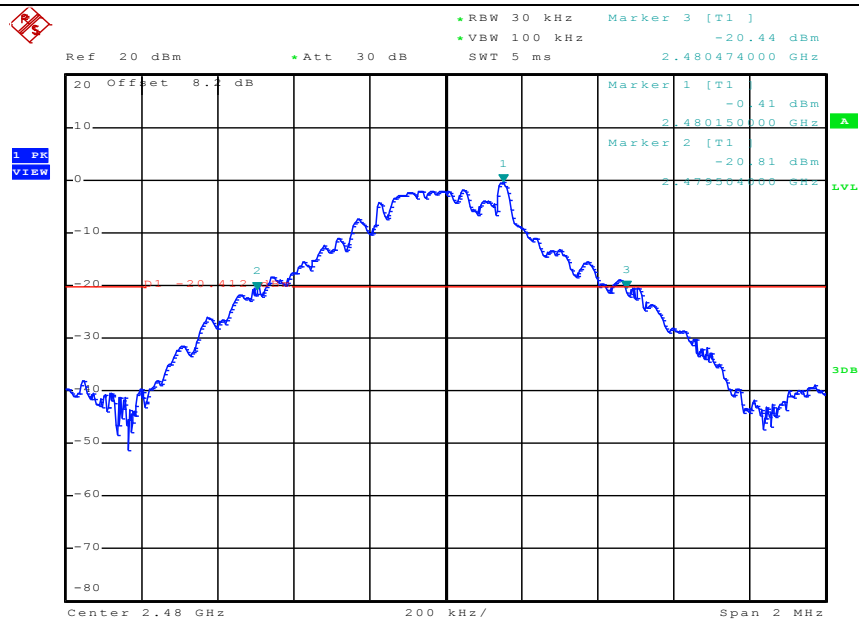


GFSK/MCH

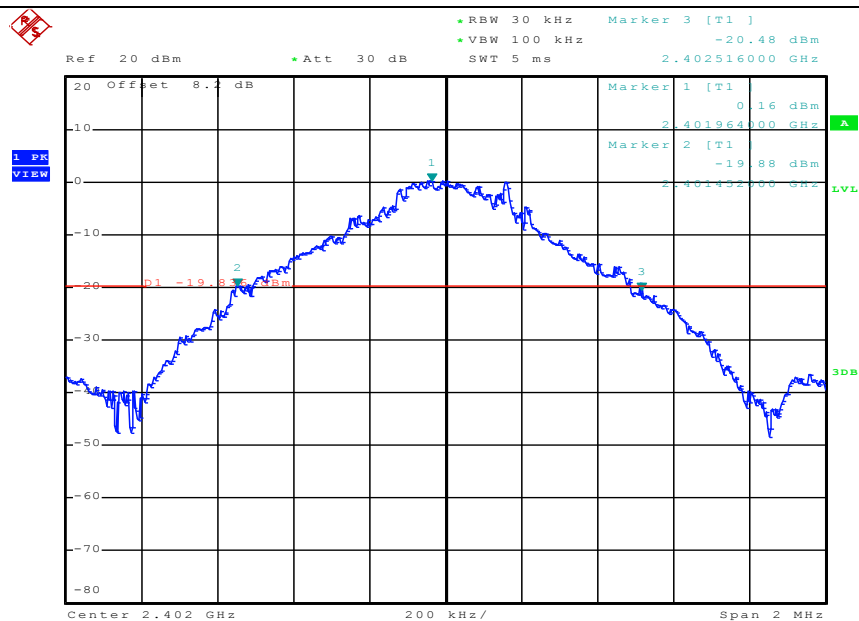


Date: 5.AUG.2019 23:09:56

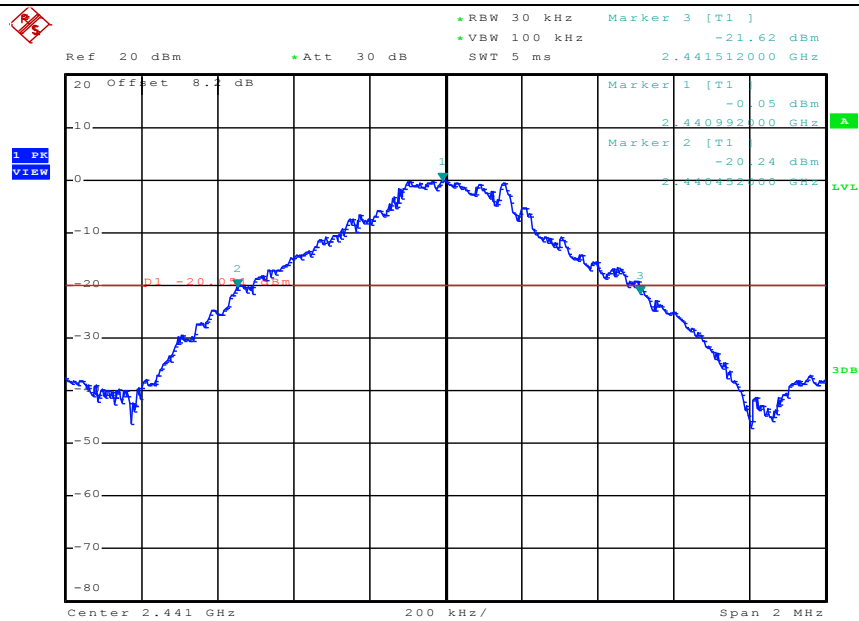
GFSK/HCH



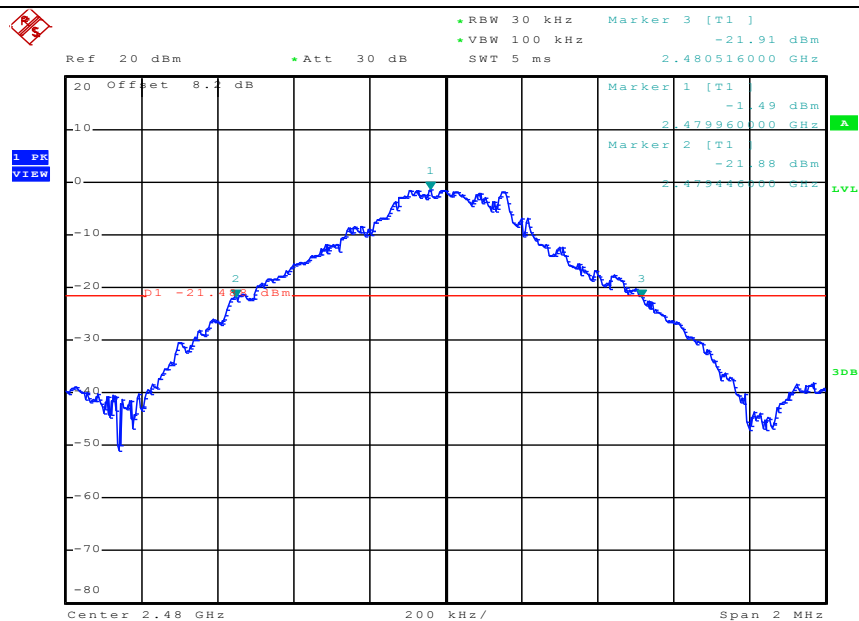
Date: 5.AUG.2019 23:11:49

$\pi/4$ DQPSK/LCH

Date: 5.AUG.2019 23:15:01

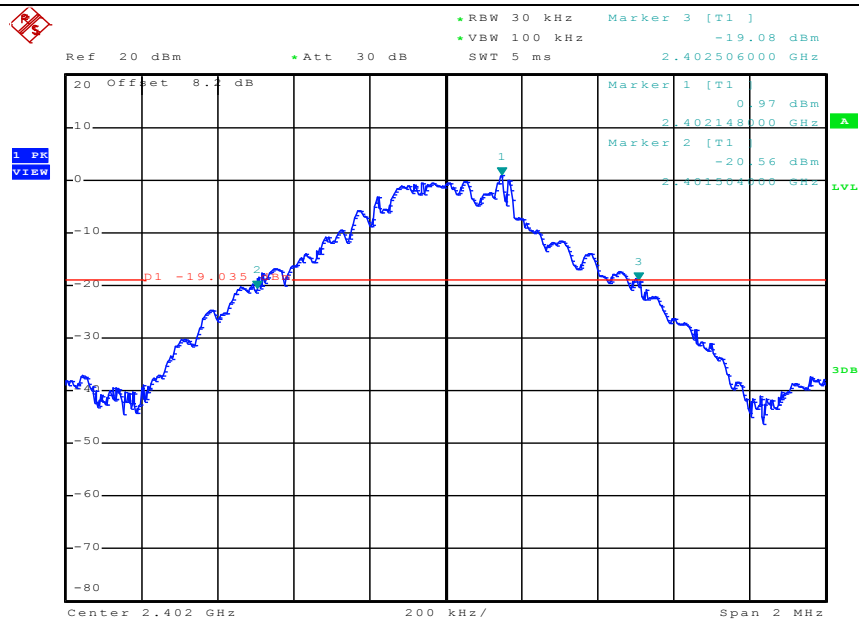
 $\pi/4$ DQPSK/MCH

Date: 5.AUG.2019 23:17:58

$\pi/4$ DQPSK/HCH

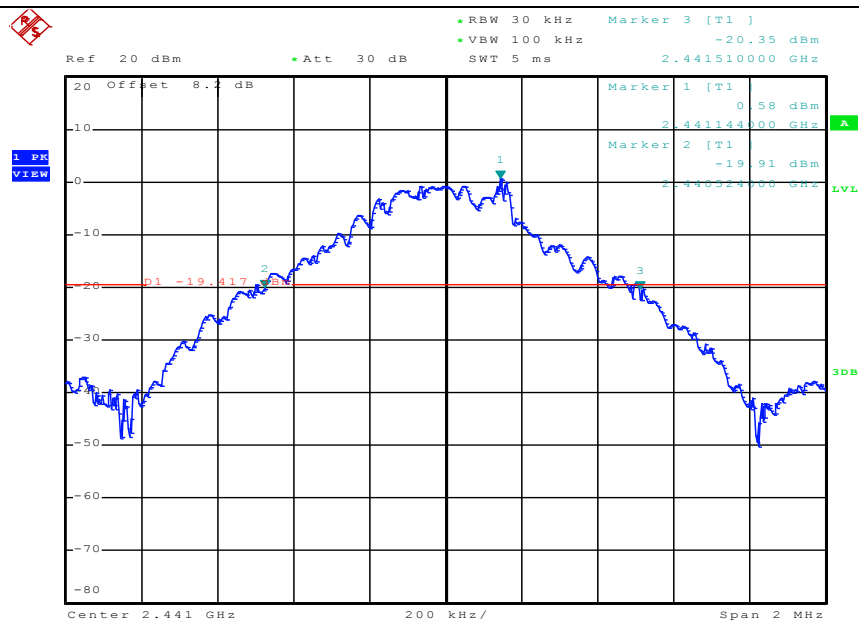
Date: 5.AUG.2019 23:19:53

8DPSK/LCH



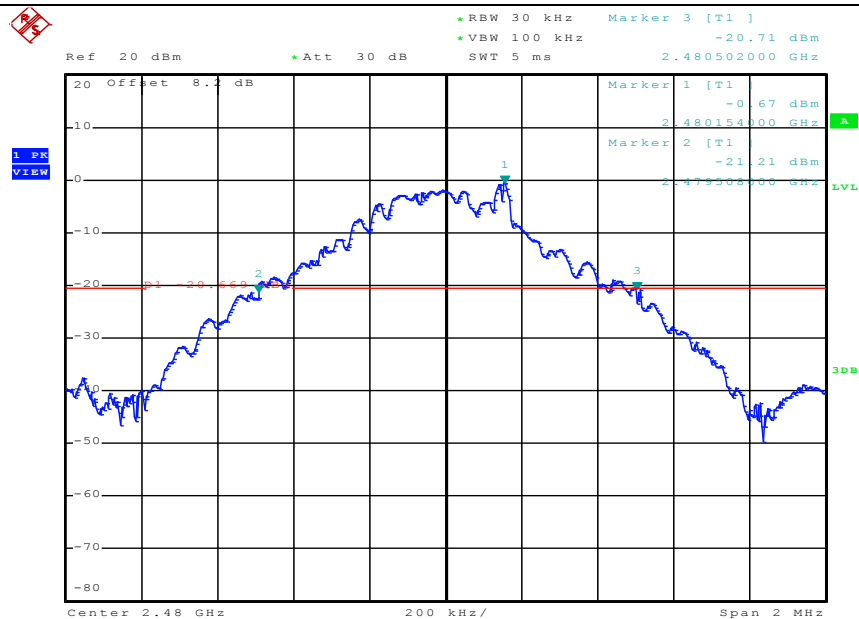
Date: 5.AUG.2019 23:23:39

8DPSK/MCH



Date: 5.AUG.2019 23:29:25

8DPSK/HCH



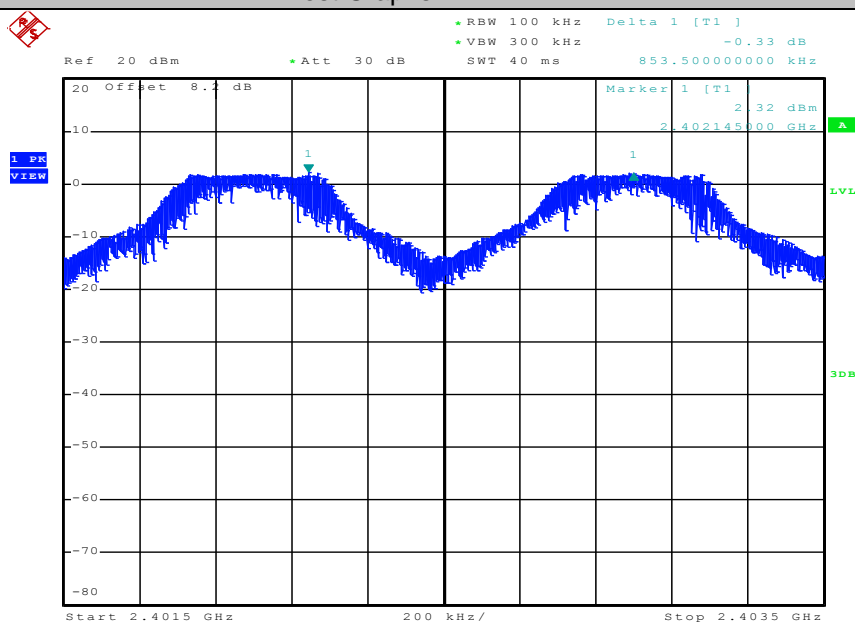
Date: 5.AUG.2019 23:31:14

A.3 Carrier Frequency Separation

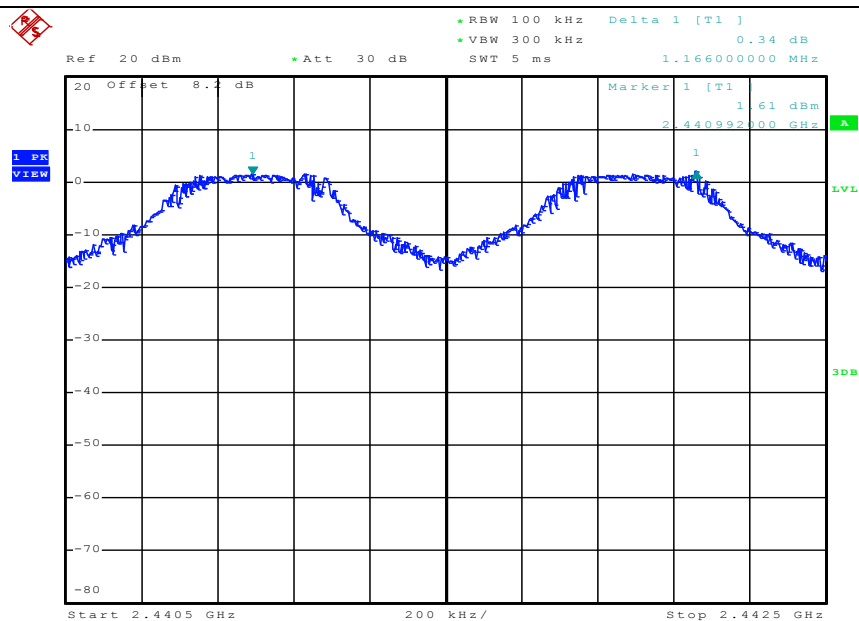
Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.854	0.647	PASS
	MCH	1.166	0.647	PASS
	HCH	0.880	0.647	PASS
$\pi/4$ DQPSK	LCH	0.832	0.713	PASS
	MCH	0.870	0.713	PASS
	HCH	1.030	0.713	PASS
8DPSK	LCH	0.996	0.668	PASS
	MCH	0.720	0.668	PASS
	HCH	1.116	0.668	PASS

Test Graphs

GFSK/LCH

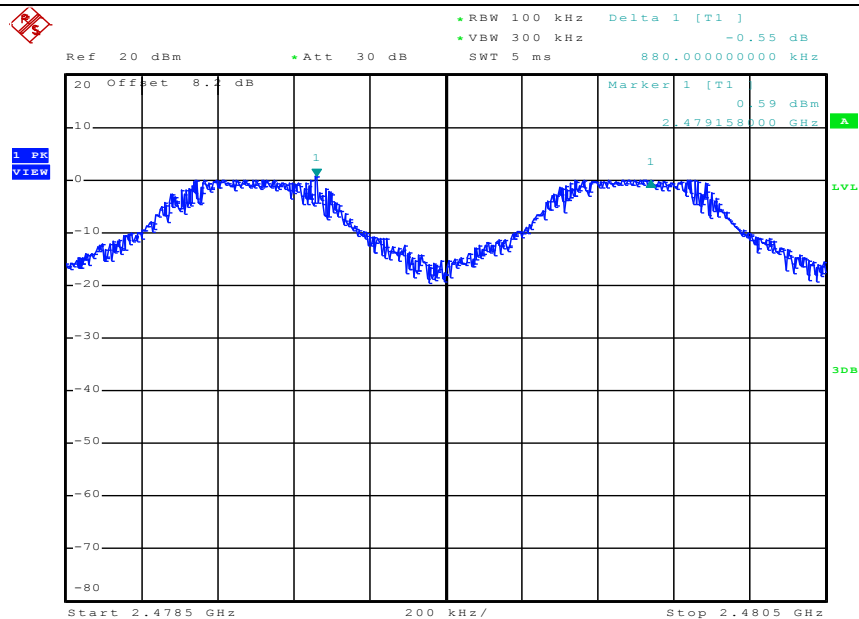


GFSK/MCH

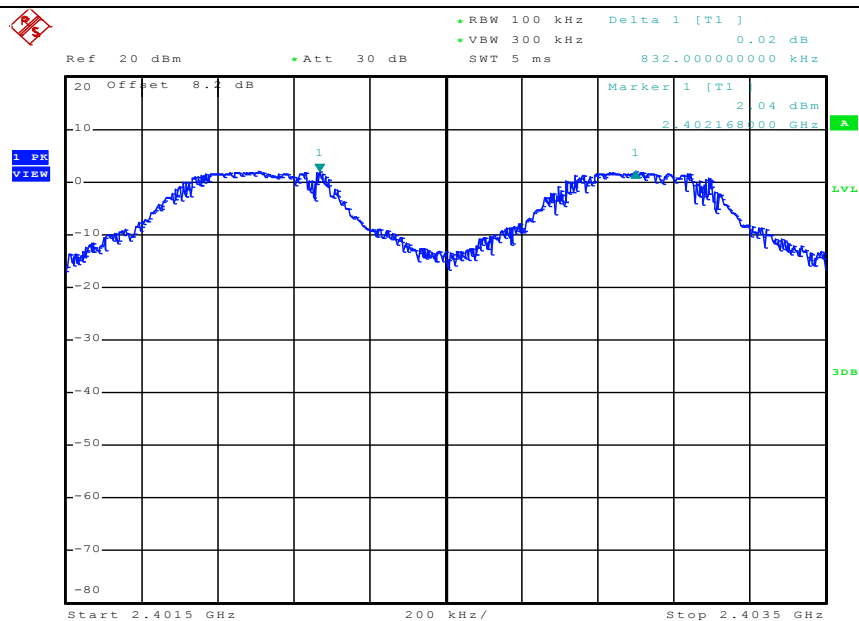


Date: 5.AUG.2019 23:40:16

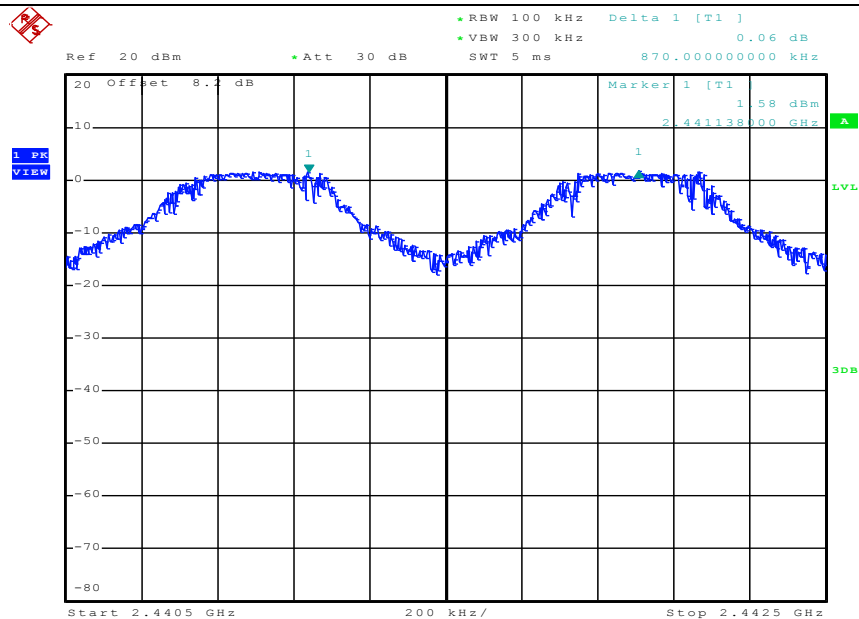
GFSK/HCH



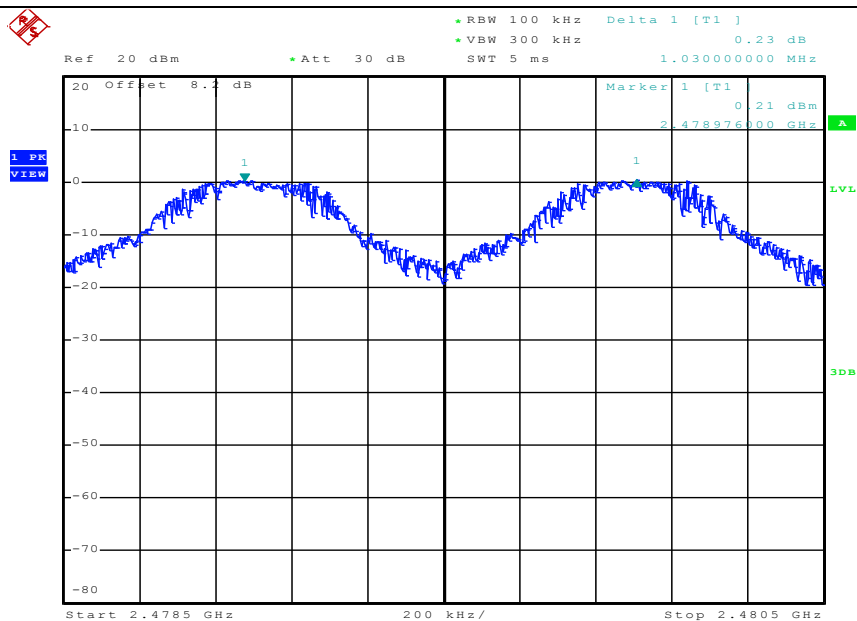
Date: 5.AUG.2019 23:40:54

$\pi/4$ DQPSK/LCH

Date: 5.AUG.2019 23:45:57

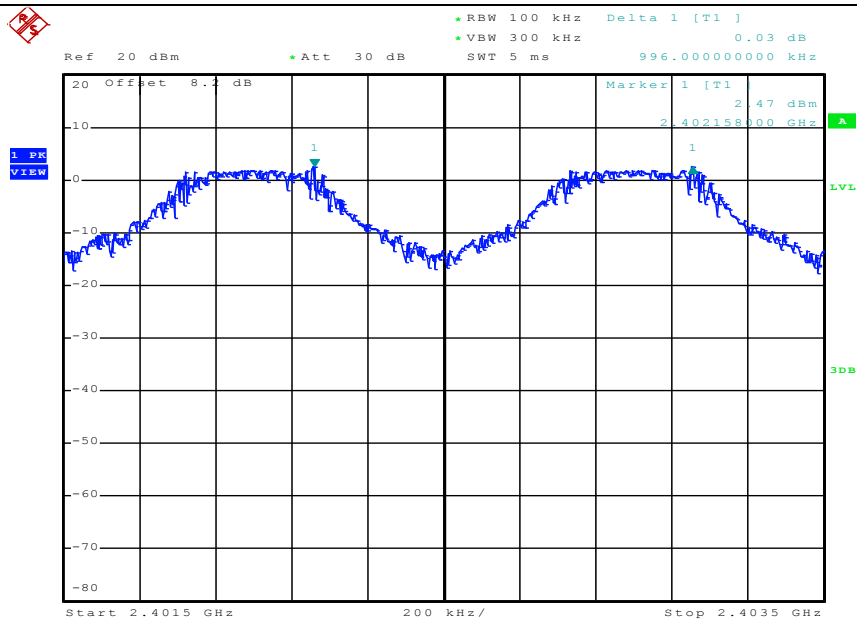
 $\pi/4$ DQPSK/MCH

Date: 5.AUG.2019 23:48:04

$\pi/4$ DQPSK/HCH

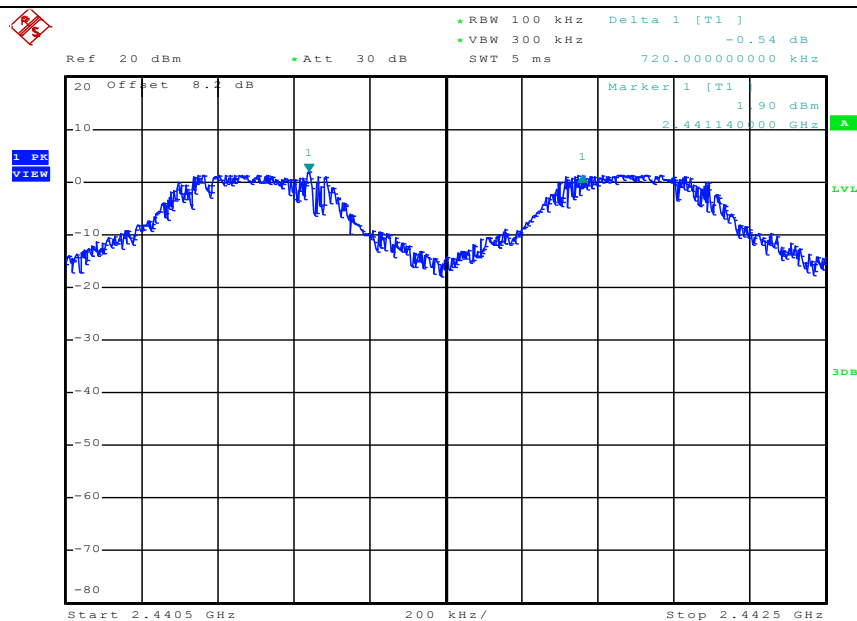
Date: 5.AUG.2019 23:48:44

8DPSK/LCH



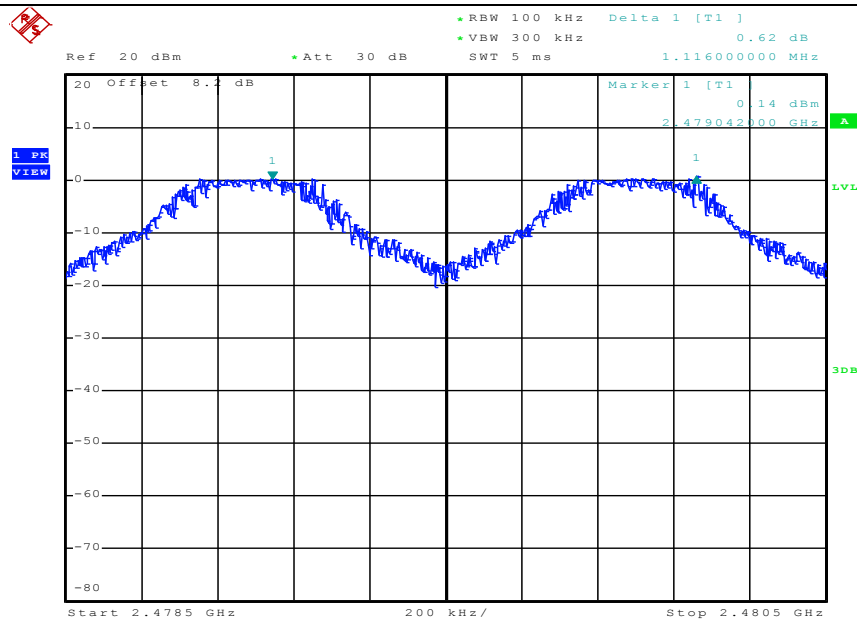
Date: 5.AUG.2019 23:53:47

8DPSK/MCH



Date: 5.AUG.2019 23:56:39

8DPSK/HCH



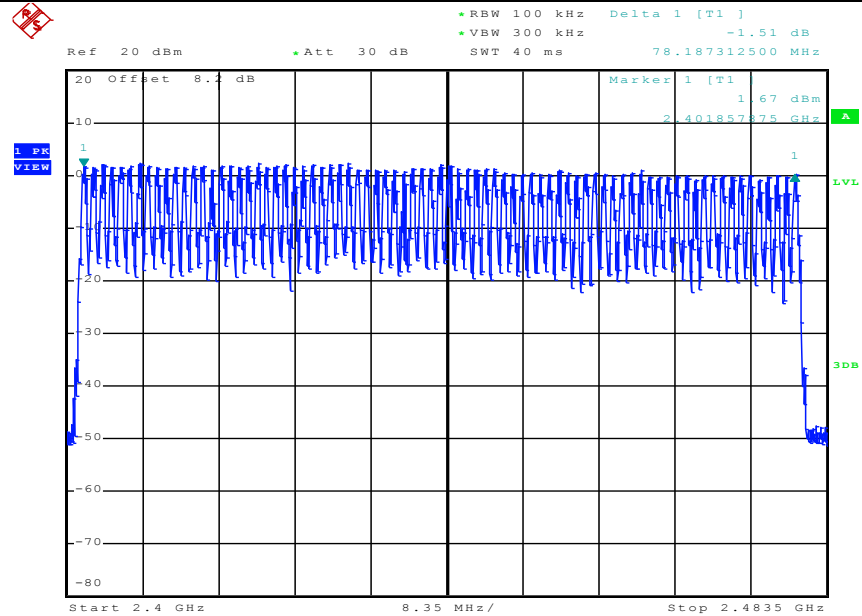
Date: 5.AUG.2019 23:57:19

A.4 Hopping Channel Number

Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

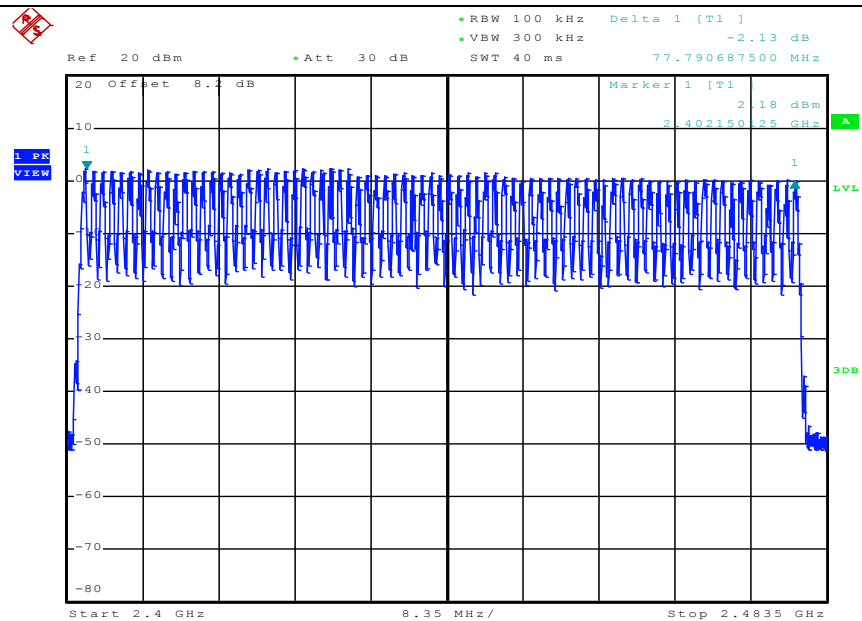
Test Graphs

GFSK/Hop



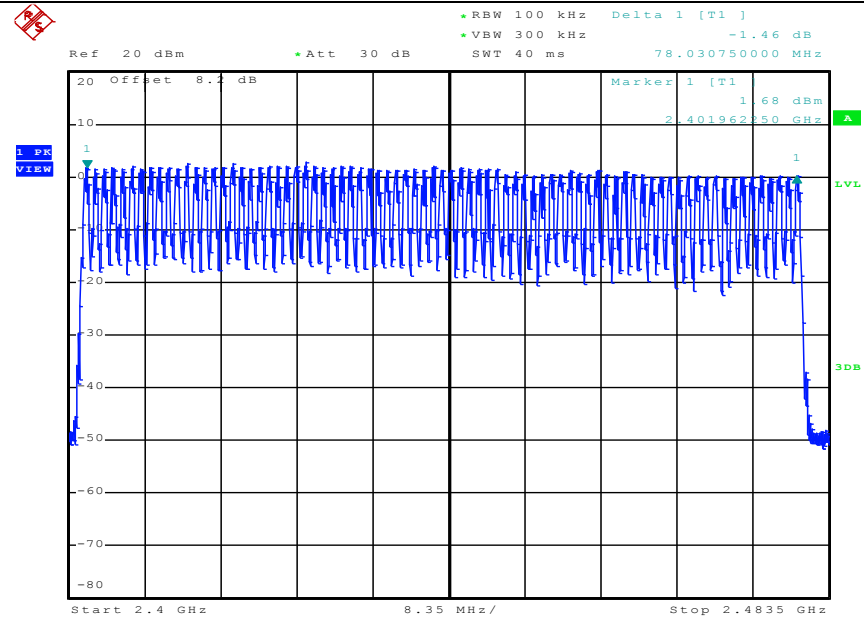
Date: 5.AUG.2019 23:44:34

$\pi/4$ DQPSK/Hop



Date: 5.AUG.2019 23:52:04

8DPSK/Hop



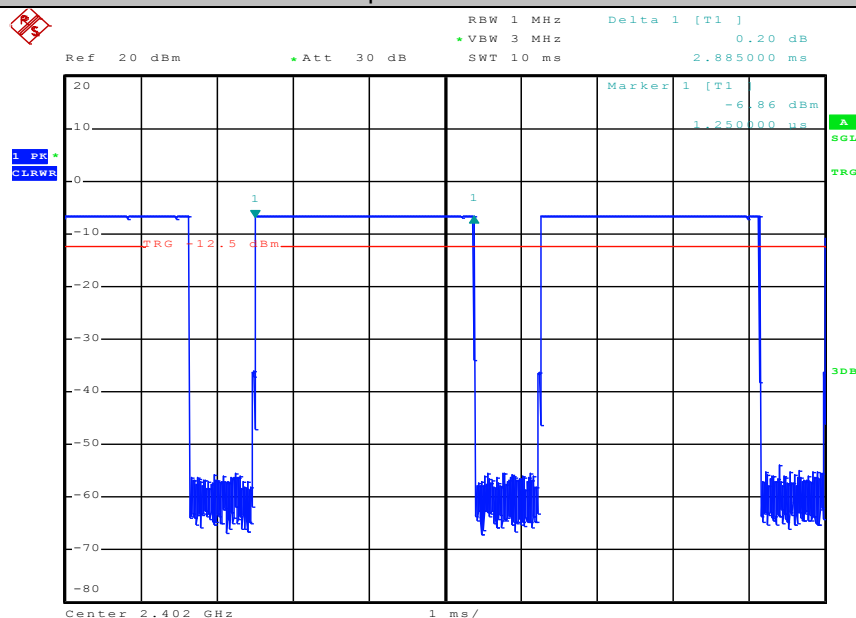
Date: 6.AUG.2019 00:01:17

A.5 Dwell Time

Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.89	106.7	0.308	0.4	PASS
	DH5	MCH	2.89	106.7	0.308	0.4	PASS
	DH5	HCH	2.89	106.7	0.308	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.89	106.7	0.308	0.4	PASS
	2DH5	MCH	2.89	106.7	0.308	0.4	PASS
	2DH5	HCH	2.89	106.7	0.308	0.4	PASS
8DPSK	3DH5	LCH	2.89	106.7	0.308	0.4	PASS
	3DH5	MCH	2.89	106.7	0.308	0.4	PASS
	3DH5	HCH	2.89	106.7	0.308	0.4	PASS

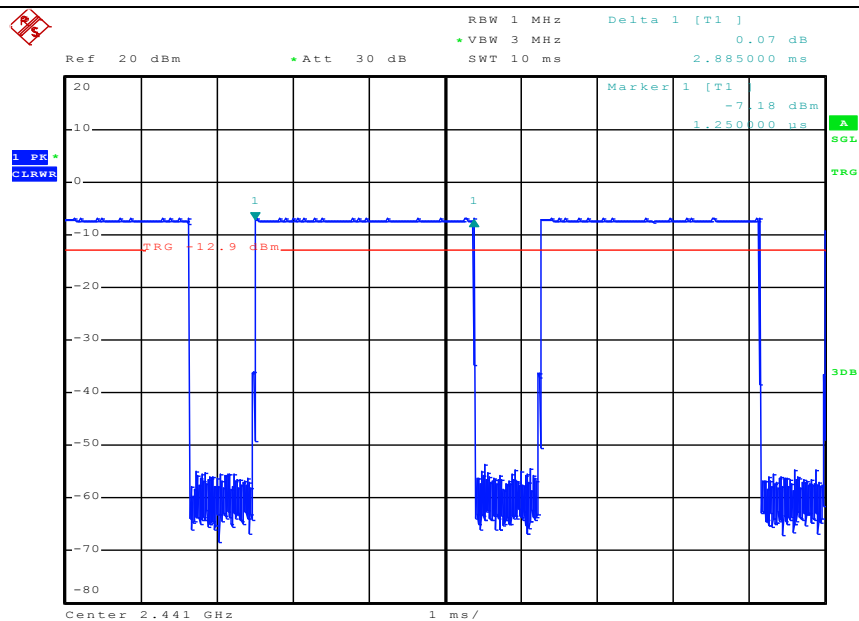
Test Graphs

GFSK_DH5/LCH



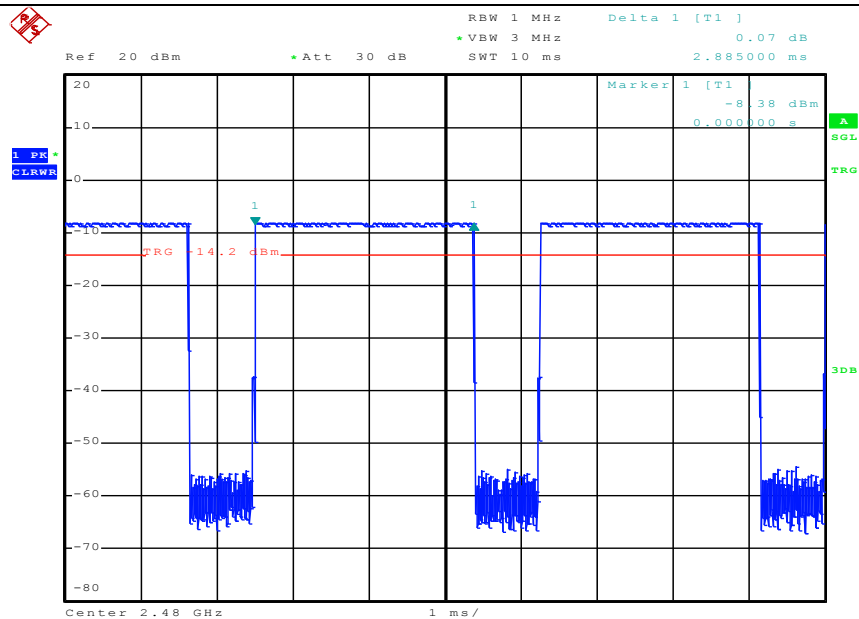
Date: 5.AUG.2019 23:06:55

GFSK_DH5/MCH



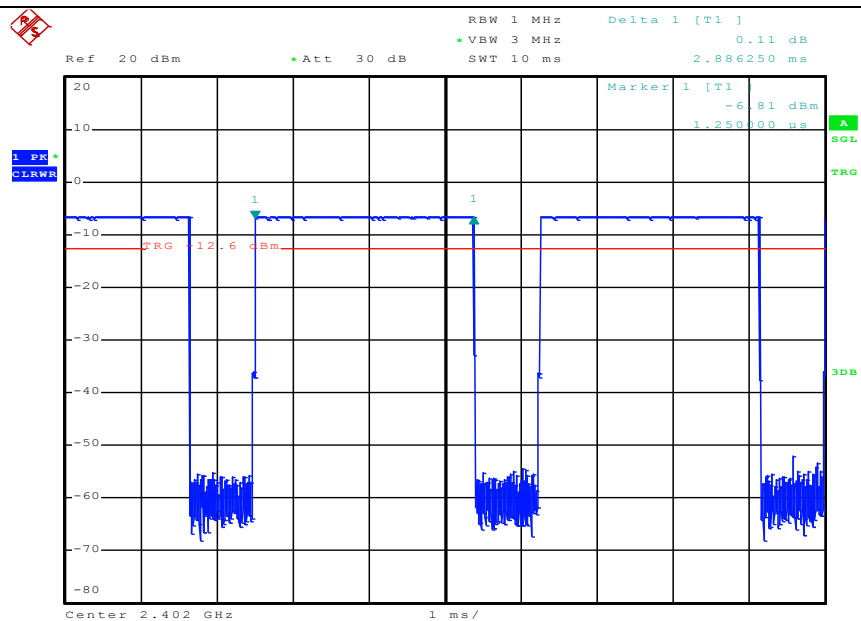
Date: 5.AUG.2019 23:10:18

GFSK_DH5/HCH



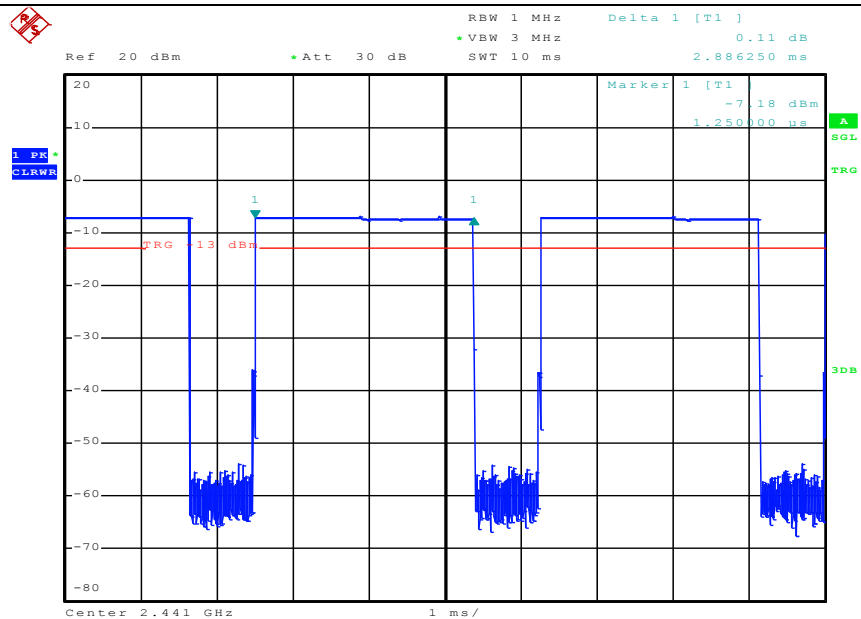
Date: 5.AUG.2019 23:12:10

$\pi/4$ DQPSK
_2DH5/LCH



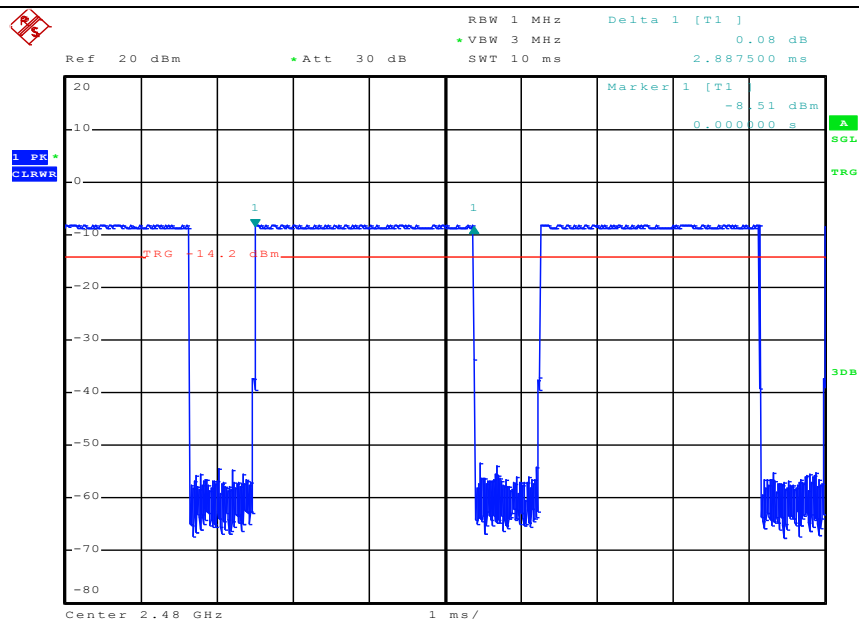
Date: 5.AUG.2019 23:15:22

$\pi/4$ DQPSK
_2DH5/MCH



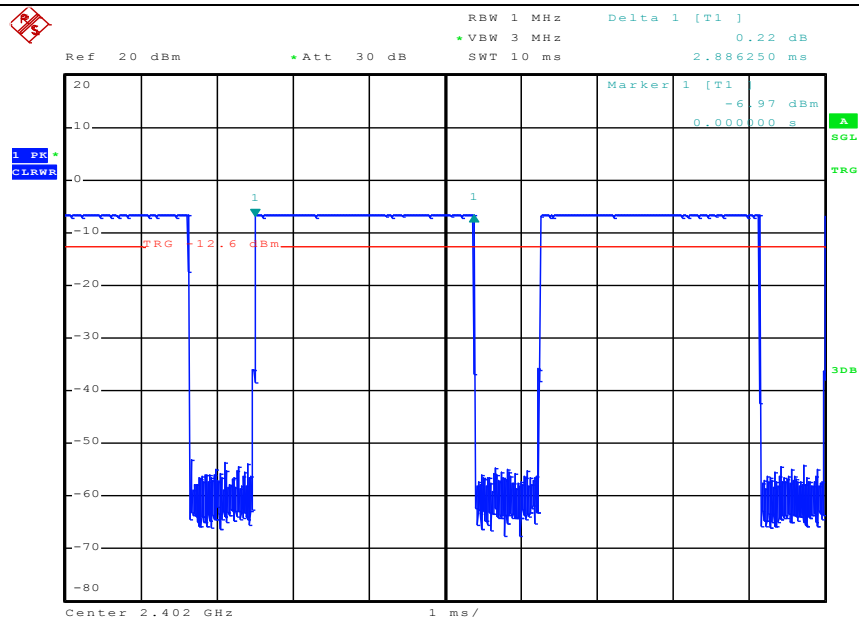
Date: 5.AUG.2019 23:18:20

$\pi/4$ DQPSK
_2DH5/HCH



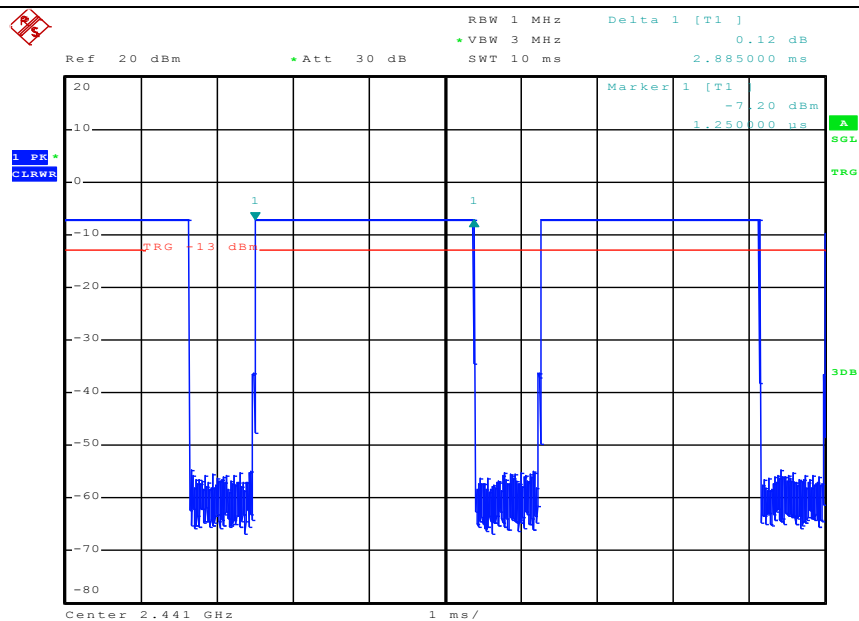
Date: 5.AUG.2019 23:20:15

8DPSK _3DH5/LCH



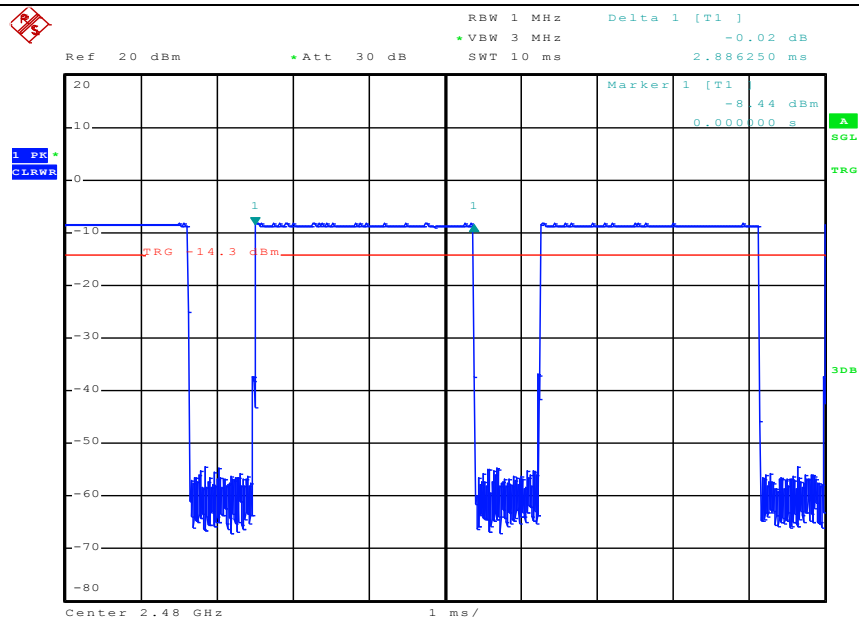
Date: 5.AUG.2019 23:24:01

8DPSK_3DH5/MCH



Date: 5.AUG.2019 23:29:46

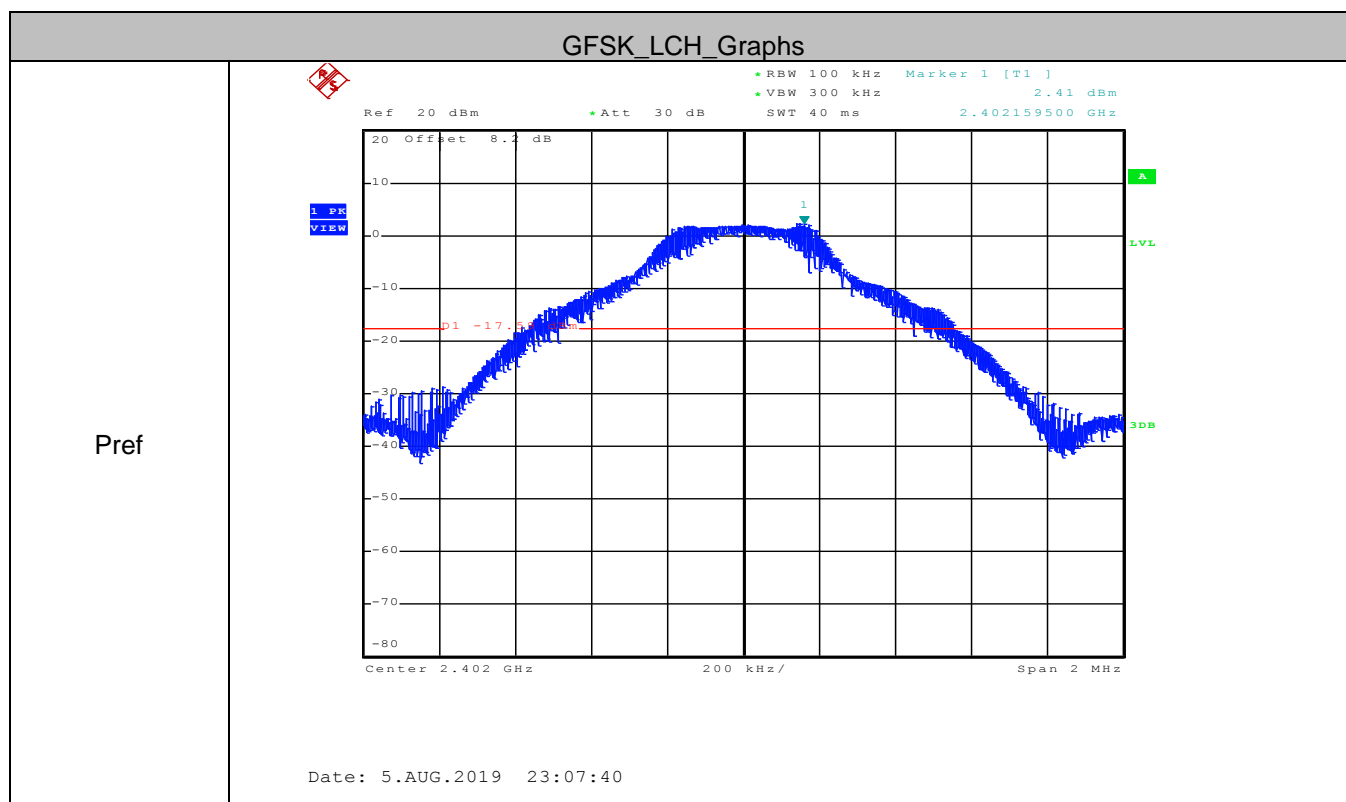
8DPSK_3DH5/HCH



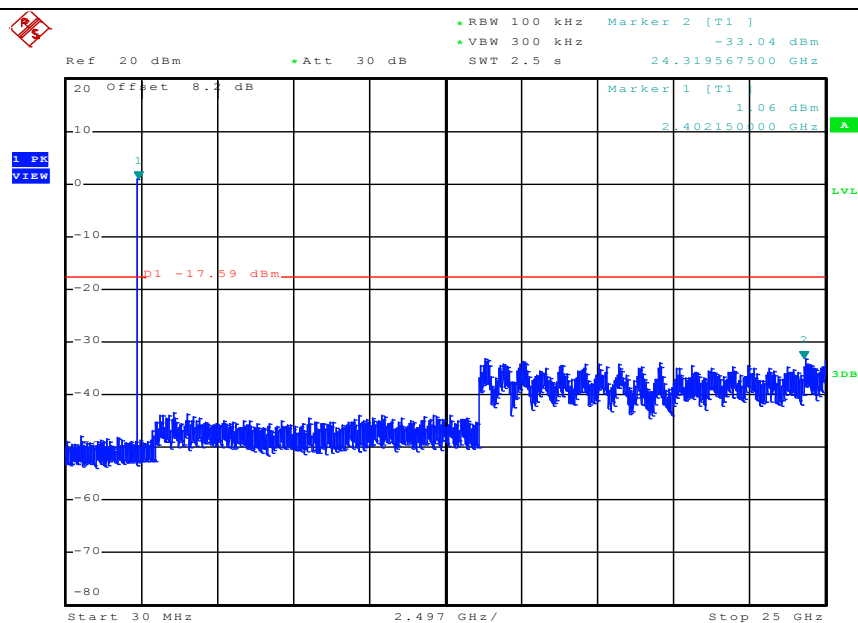
Date: 5.AUG.2019 23:31:36

A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2.41	-33.040	-17.590	PASS
	MCH	1.99	-32.040	-18.010	PASS
	HCH	0.78	-32.390	-19.220	PASS
$\pi/4$ DQPSK	LCH	2.23	-32.710	-17.770	PASS
	MCH	1.8	-31.790	-18.200	PASS
	HCH	0.53	-32.100	-19.470	PASS
8DPSK	LCH	2.31	-32.910	-17.690	PASS
	MCH	1.95	-31.220	-18.050	PASS
	HCH	0.7	-32.090	-19.300	PASS



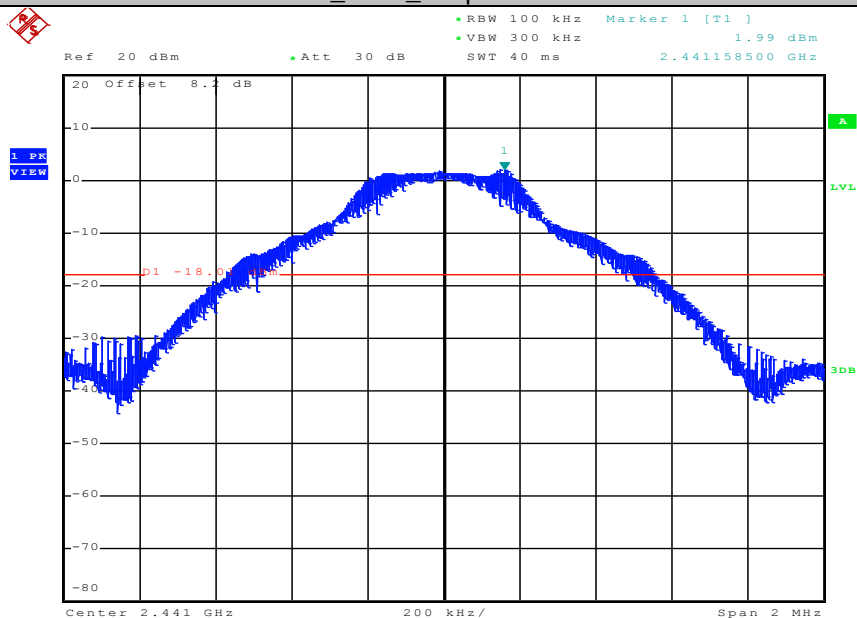
Puw



Date: 5.AUG.2019 23:07:54

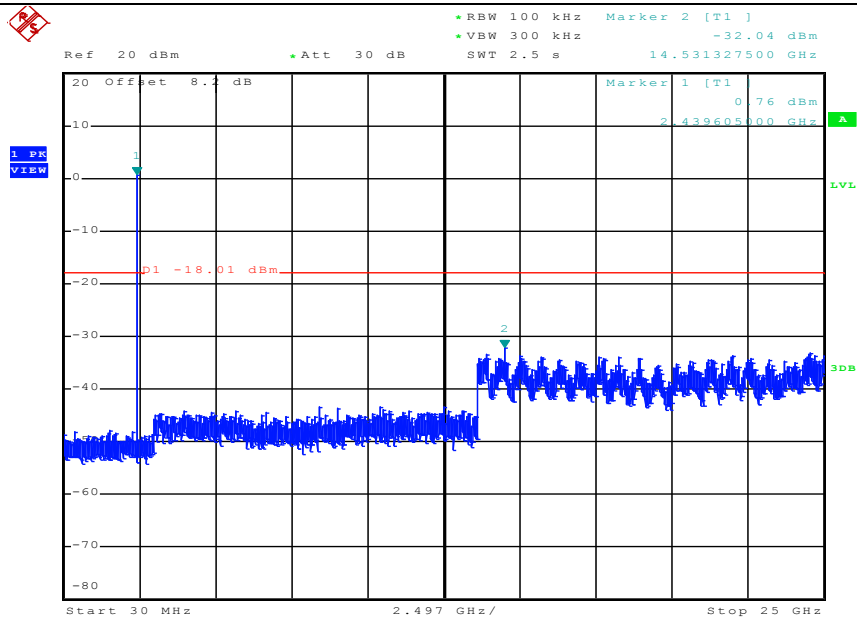
GFSK_MCH_Graphs

Pref



Date: 5.AUG.2019 23:10:46

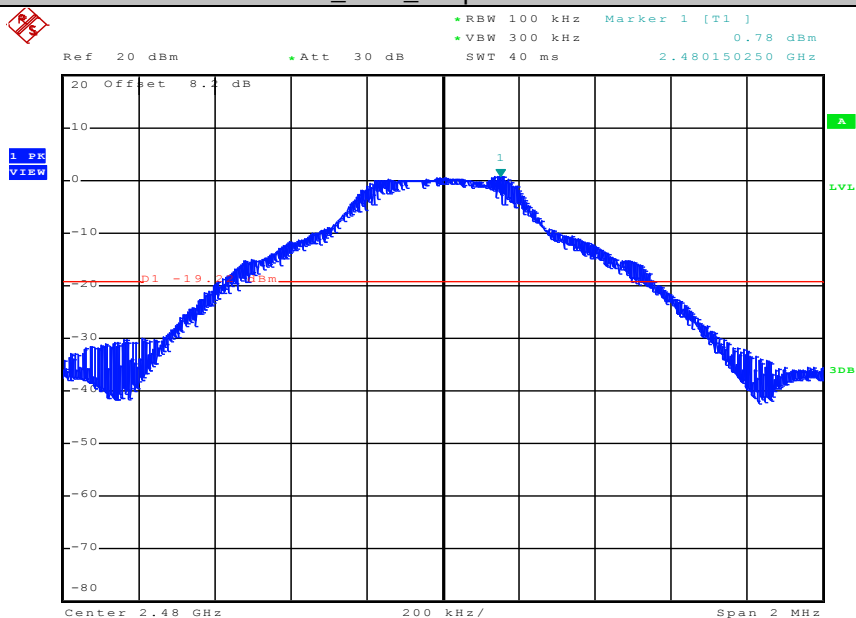
Puw



Date: 5.AUG.2019 23:11:02

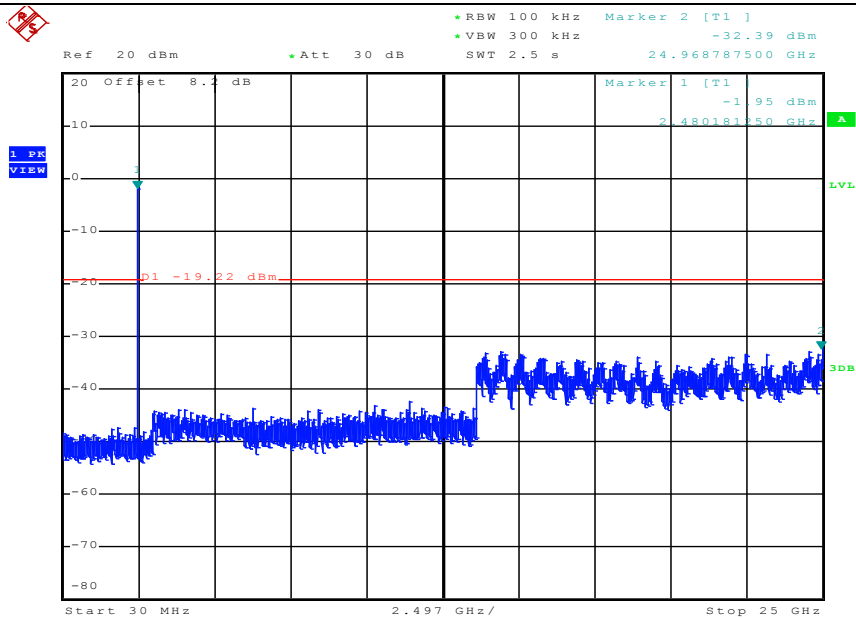
GFSK_HCH_Graphs

Pref



Date: 5.AUG.2019 23:12:58

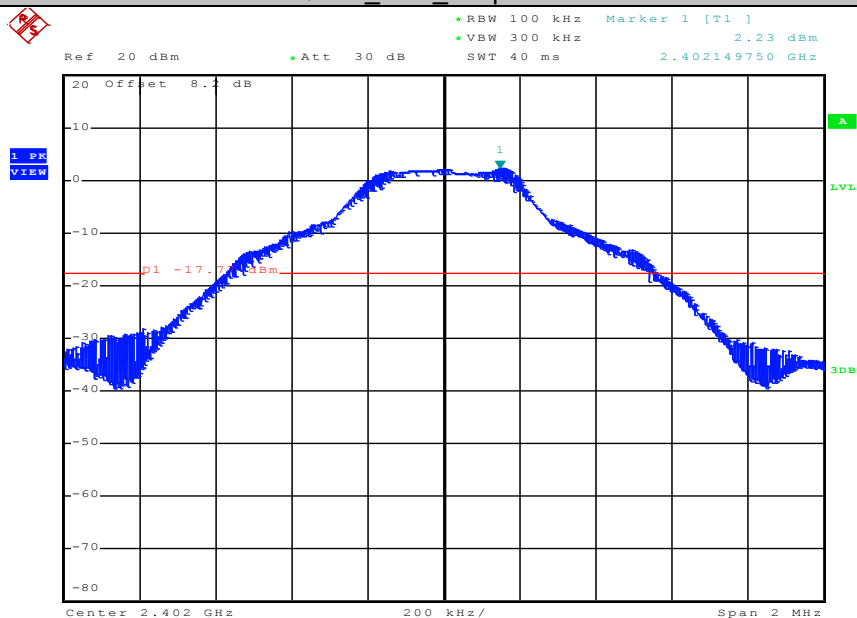
Puw



Date: 5.AUG.2019 23:13:13

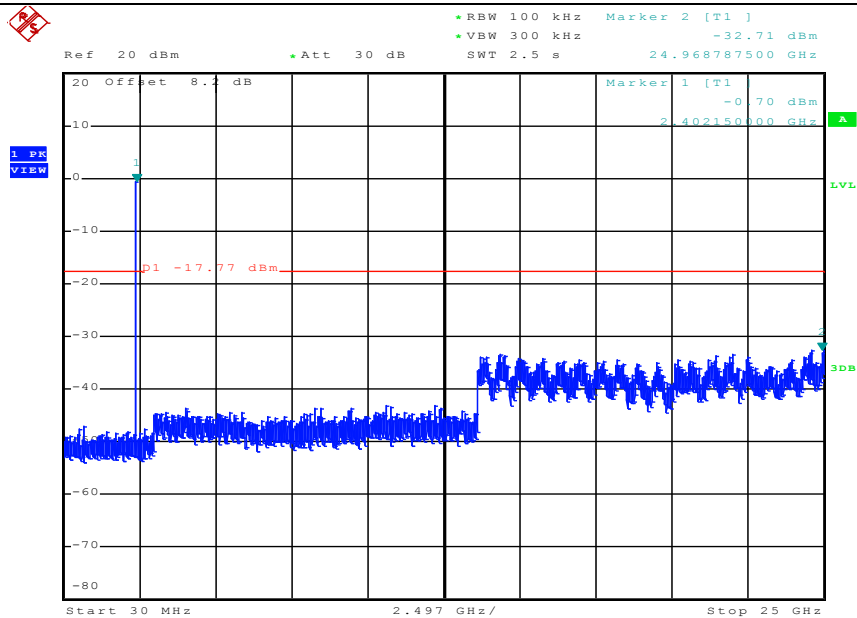
$\pi/4$ DQPSK_LCH_Graphs

Pref



Date: 5.AUG.2019 23:16:17

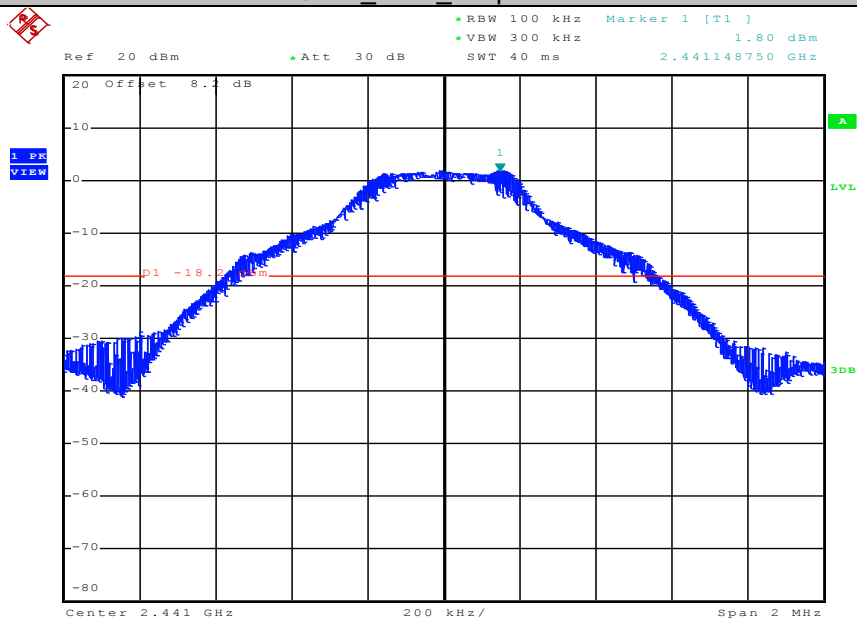
Puw



Date: 5.AUG.2019 23:16:31

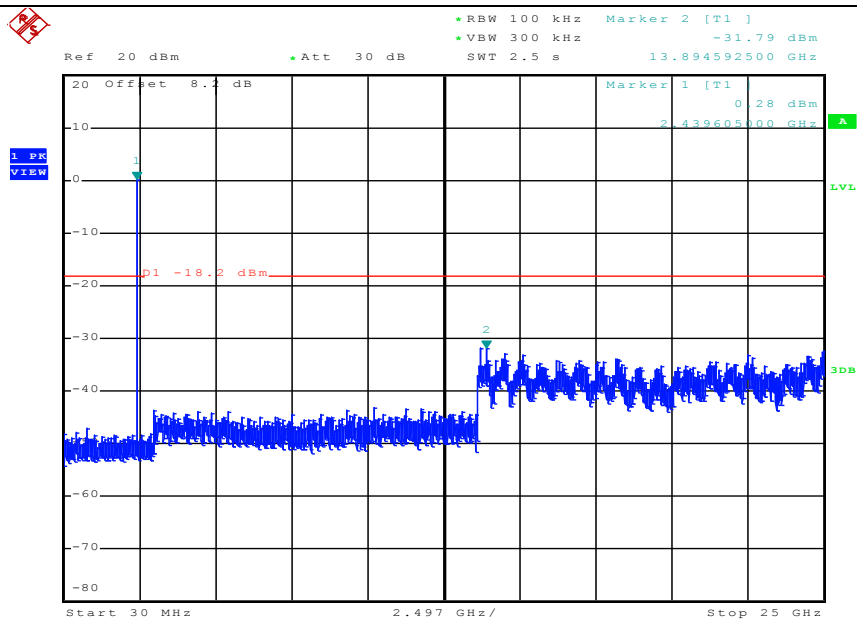
$\pi/4$ DQPSK_MCH_Graphs

Pref



Date: 5.AUG.2019 23:18:51

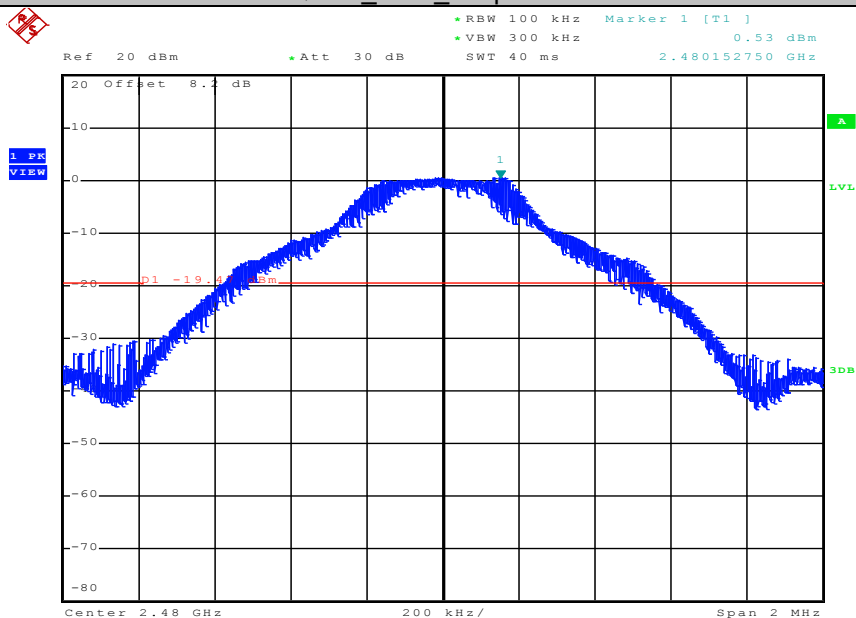
Puw



Date: 5.AUG.2019 23:19:05

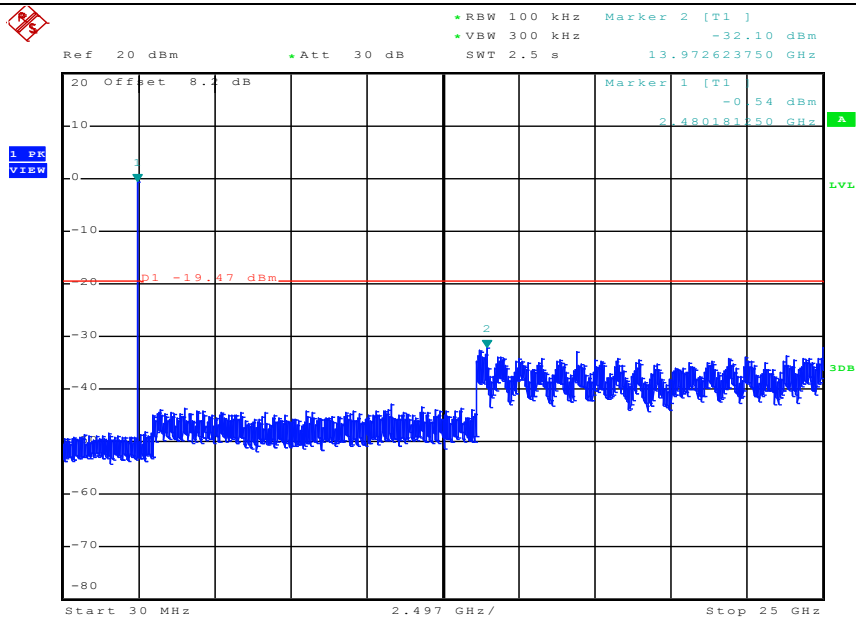
$\pi/4$ DQPSK_HCH_Graphs

Pref



Date: 5.AUG.2019 23:21:01

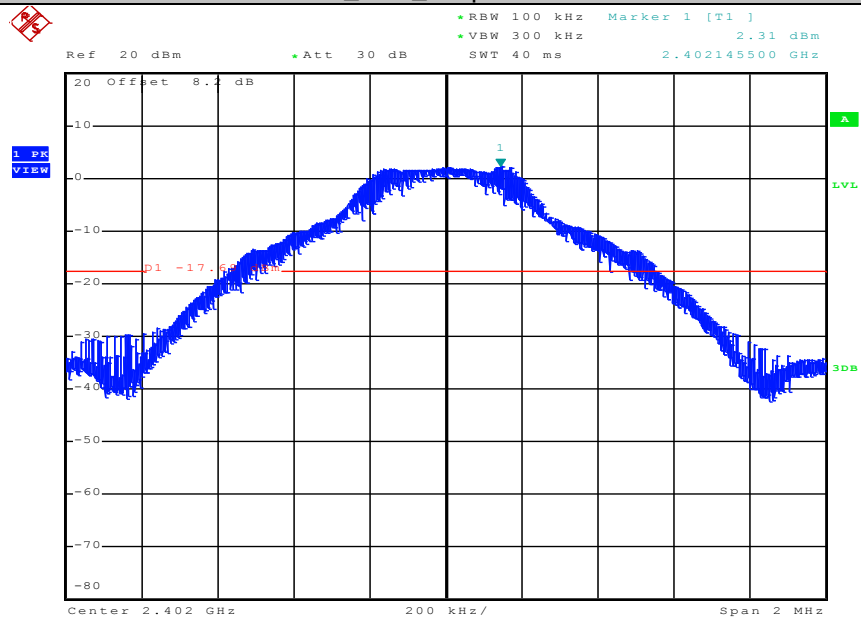
Puw



Date: 5.AUG.2019 23:21:15

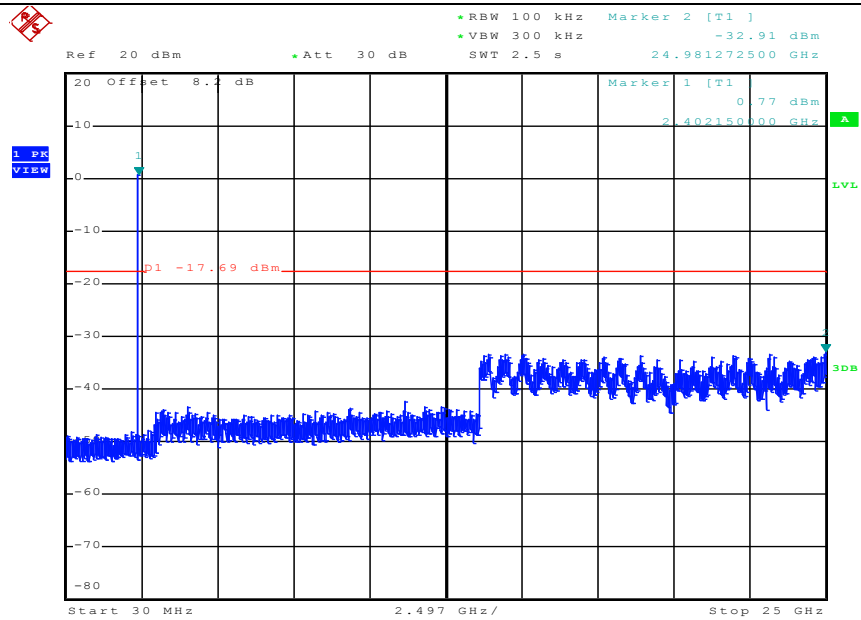
8DPSK_LCH_Graphs

Pref



Date: 5.AUG.2019 23:27:48

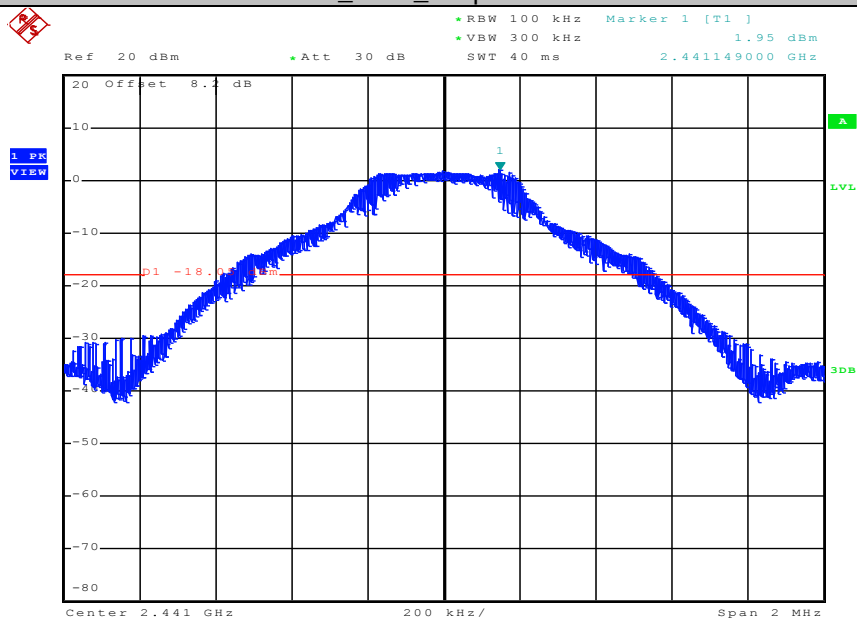
Puw



Date: 5.AUG.2019 23:28:05

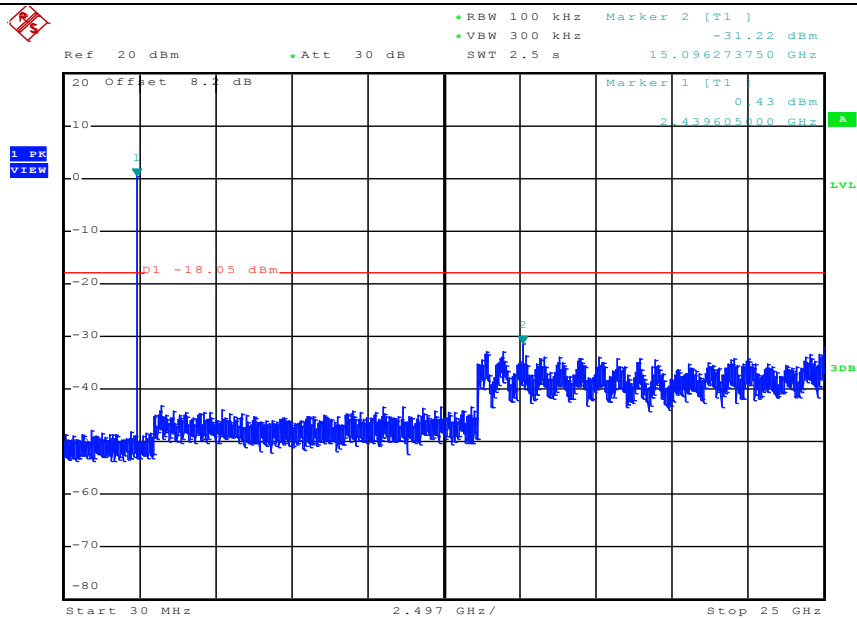
8DPSK_MCH_Graphs

Pref



Date: 5.AUG.2019 23:30:13

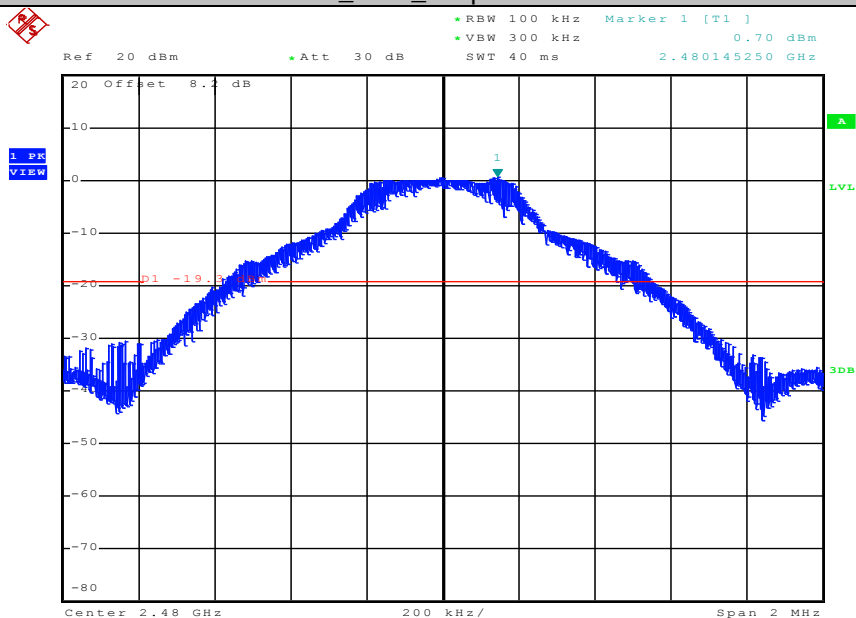
Puw



Date: 5.AUG.2019 23:30:28

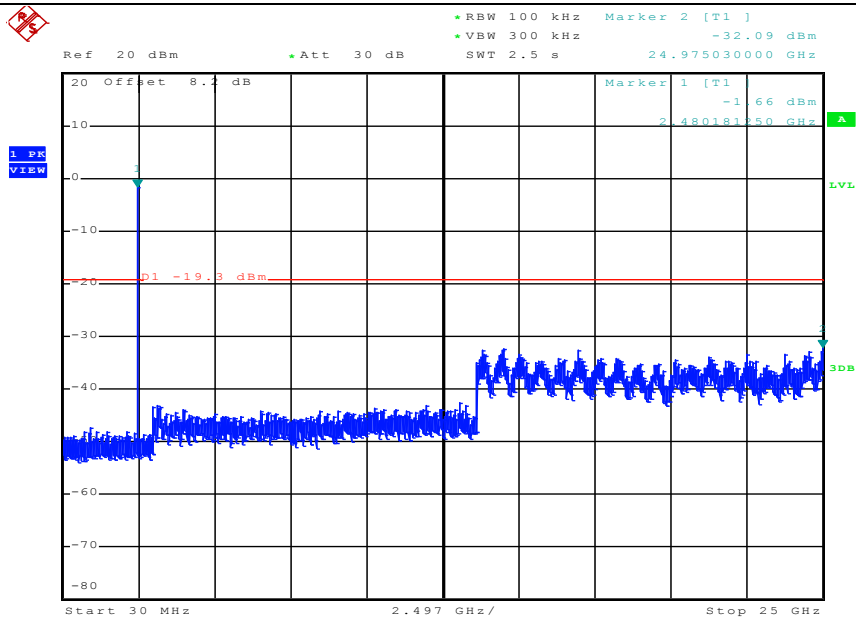
8DPSK_HCH_Graphs

Pref



Date: 5.AUG.2019 23:32:20

Puw



Date: 5.AUG.2019 23:32:37

A.7 Band-edge for RF Conducted Emissions

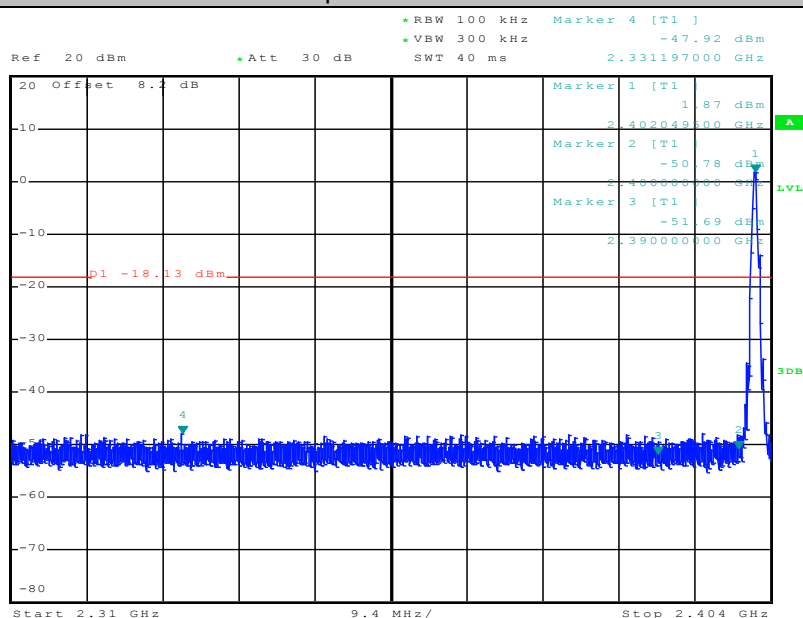
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.870	Off	-47.920	-18.13	PASS
			2.290	On	-46.805	-17.71	PASS
	HCH	2480	0.130	Off	-47.595	-19.87	PASS
			0.880	On	-46.440	-19.12	PASS
$\pi/4$ DQPSK	LCH	2402	1.820	Off	-47.201	-18.18	PASS
			2.220	On	-46.452	-17.78	PASS
	HCH	2480	0.310	Off	-47.231	-19.69	PASS
			0.790	On	-47.071	-19.21	PASS
8DPSK	LCH	2402	2.390	Off	-46.652	-17.61	PASS
			2.410	On	-46.890	-17.59	PASS
	HCH	2480	0.210	Off	-47.092	-19.79	PASS
			1.130	On	-46.853	-18.87	PASS

Test Graphs

GFSK/LCH/No Hop



1 PK
VIEW

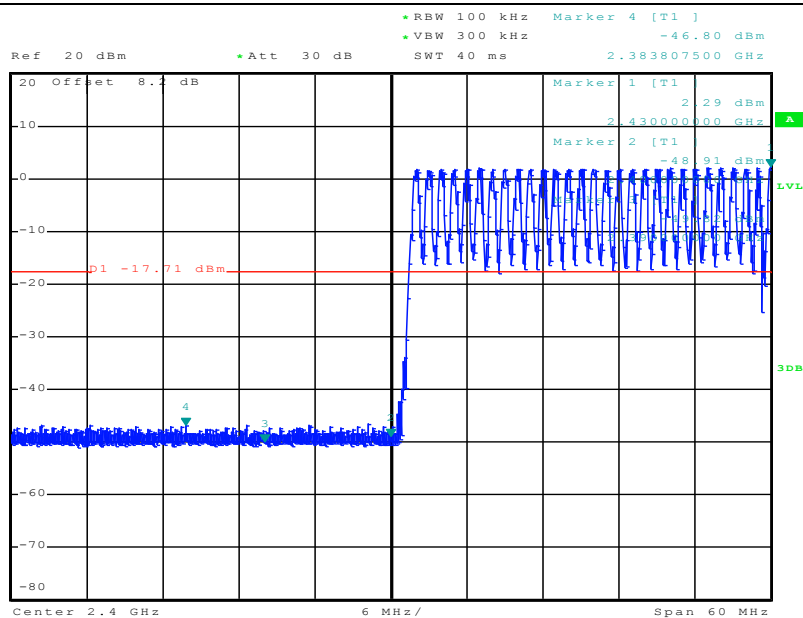


Date: 5.AUG.2019 23:07:27

GFSK/LCH/Hop

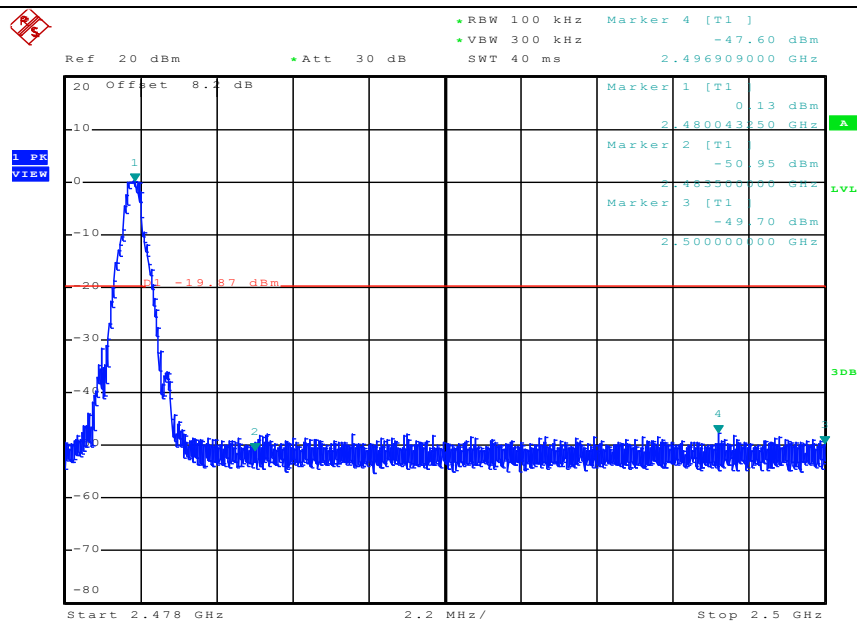


1 PK
VIEW



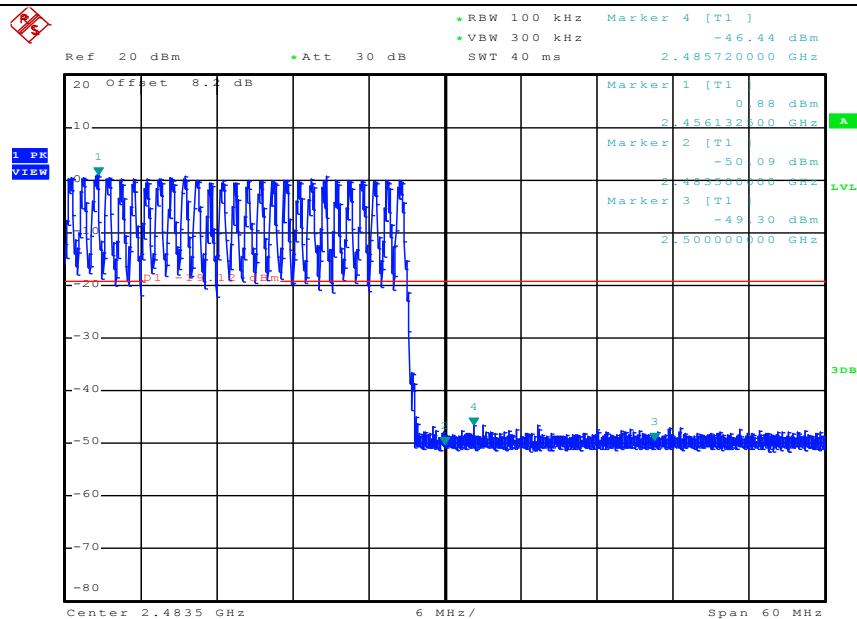
Date: 5.AUG.2019 23:39:23

GFSK/HCH/No Hop



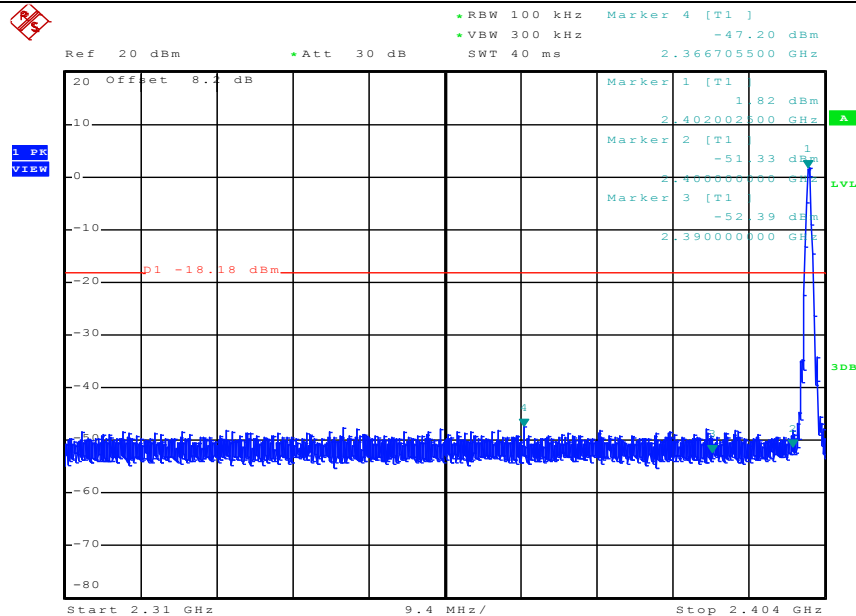
Date: 5.AUG.2019 23:12:42

GFSK/HCH/Hop



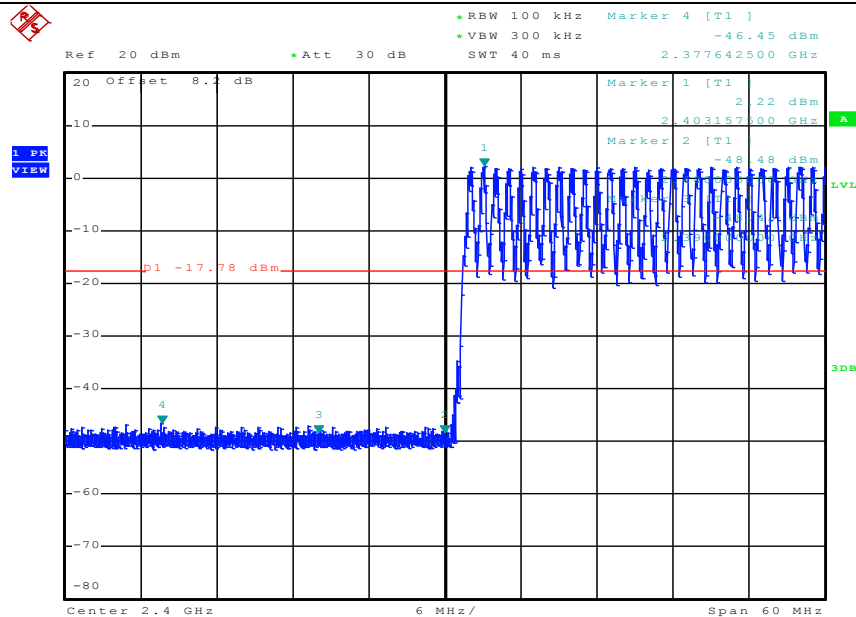
Date: 5.AUG.2019 23:42:42

$\pi/4$ DQPSK/LCH/No
Hop



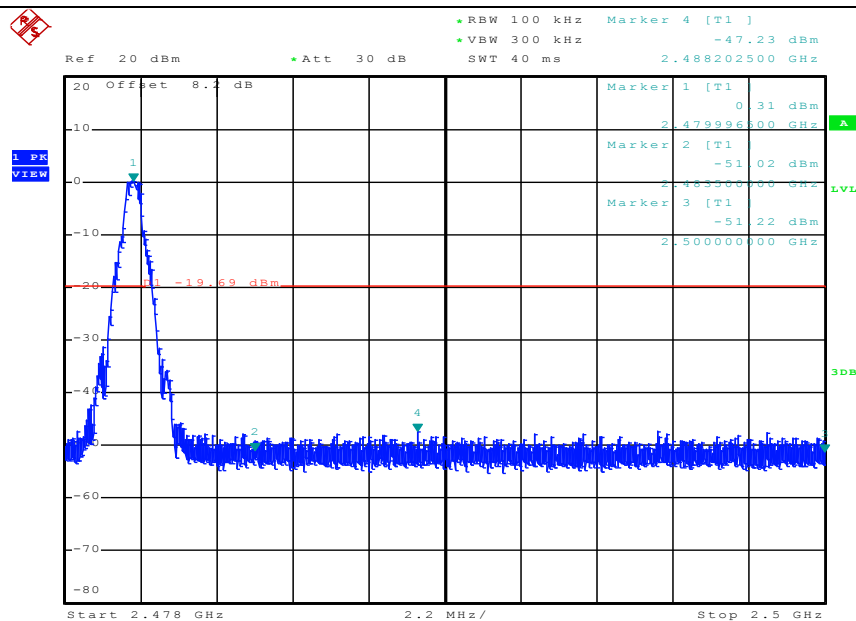
Date: 5.AUG.2019 23:15:54

$\pi/4$ DQPSK/LCH/Hop



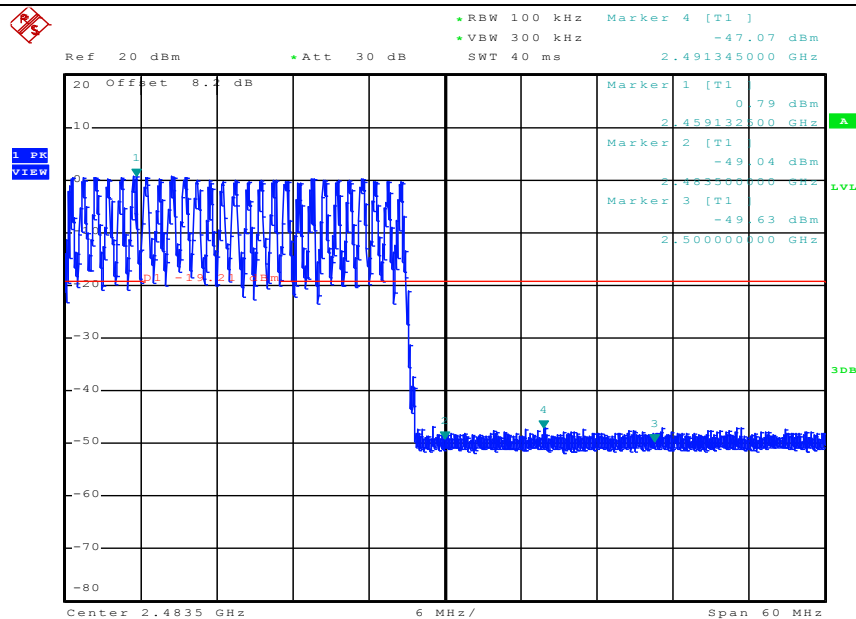
Date: 5.AUG.2019 23:47:20

$\pi/4$ DQPSK/HCH/No
Hop



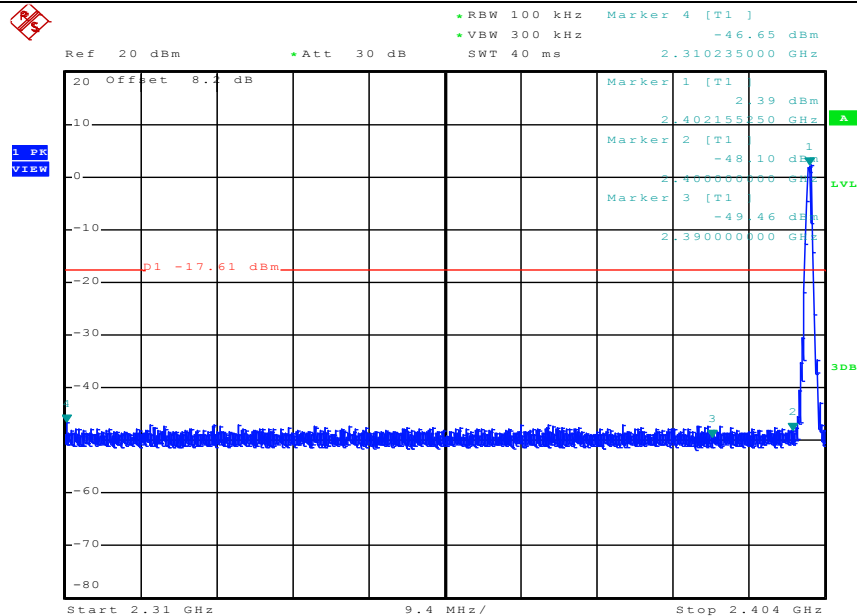
Date: 5.AUG.2019 23:20:46

$\pi/4$ DQPSK/HCH/Hop



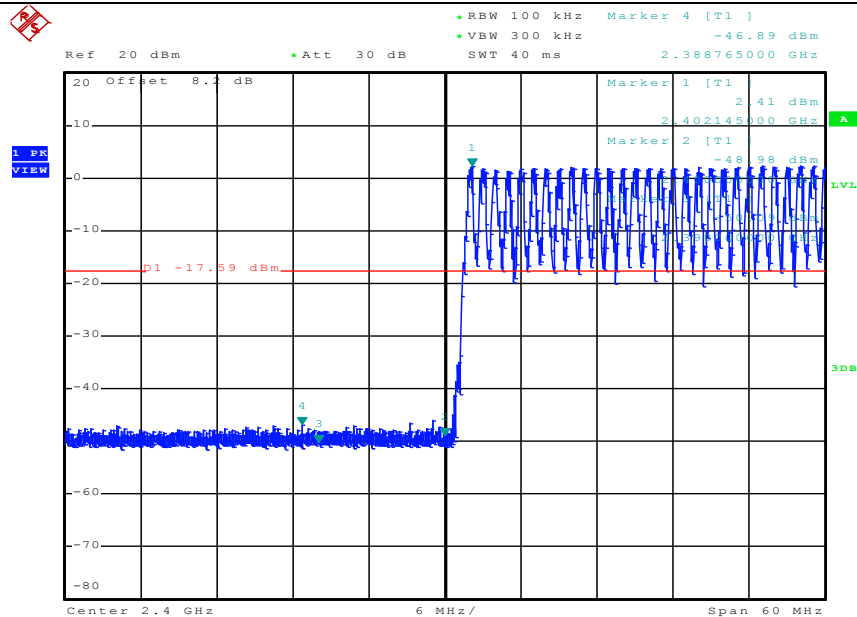
Date: 5.AUG.2019 23:50:12

8DPSK/LCH/No Hop



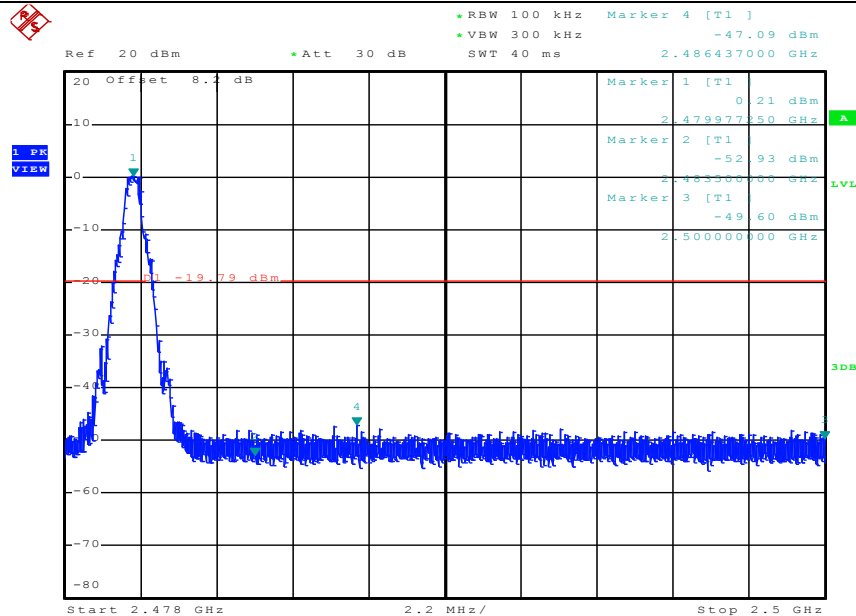
Date: 5.AUG.2019 23:25:55

8DPSK/LCH/Hop



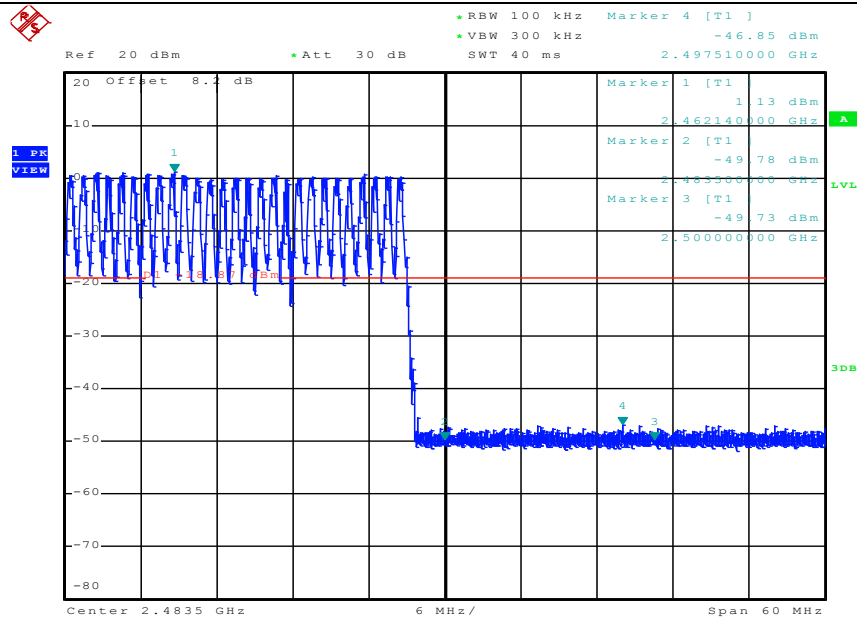
Date: 5.AUG.2019 23:55:56

8DPSK/HCH/No Hop



Date: 5.AUG.2019 23:32:07

8DPSK/HCH/Hop



Date: 5.AUG.2019 23:59:08

A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-47.81	2.0	0	49.45	PEAK	74	PASS
	Off	2310.0	-57.91	2.0	0	39.35	AV	54	PASS
	Off	2390.0	-48.76	2.0	0	48.5	PEAK	74	PASS
	Off	2390.0	-57.63	2.0	0	39.63	AV	54	PASS
	Off	2483.5	-39.16	2.0	0	58.1	PEAK	74	PASS
	Off	2483.5	-42.93	2.0	0	54.33	AV	54	PASS
	Off	2500.0	-47.64	2.0	0	49.62	PEAK	74	PASS
	Off	2500.0	-58.27	2.0	0	38.99	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-48.23	2.0	0	49.03	PEAK	74	PASS
	Off	2310.0	-57.86	2.0	0	39.4	AV	54	PASS
	Off	2390.0	-48.65	2.0	0	48.61	PEAK	74	PASS
	Off	2390.0	-57.66	2.0	0	39.6	AV	54	PASS
	Off	2483.5	-38.95	2.0	0	58.31	PEAK	74	PASS
	Off	2483.5	-42.97	2.0	0	54.29	AV	54	PASS
	Off	2500.0	-47.25	2.0	0	50.01	PEAK	74	PASS
	Off	2500.0	-58.27	2.0	0	38.99	AV	54	PASS
8DPSK	Off	2310.0	-47.94	2.0	0	49.32	PEAK	74	PASS
	Off	2310.0	-57.91	2.0	0	39.35	AV	54	PASS
	Off	2390.0	-48.41	2.0	0	48.85	PEAK	74	PASS
	Off	2390.0	-57.65	2.0	0	39.61	AV	54	PASS
	Off	2483.5	-39.57	2.0	0	57.69	PEAK	74	PASS
	Off	2483.5	-43.01	2.0	0	54.25	AV	54	PASS
	Off	2500.0	-47.96	2.0	0	49.3	PEAK	74	PASS
	Off	2500.0	-58.21	2.0	0	39.05	AV	54	PASS

Note: $E = \text{EIRP} - 20 \log D + 104.8$

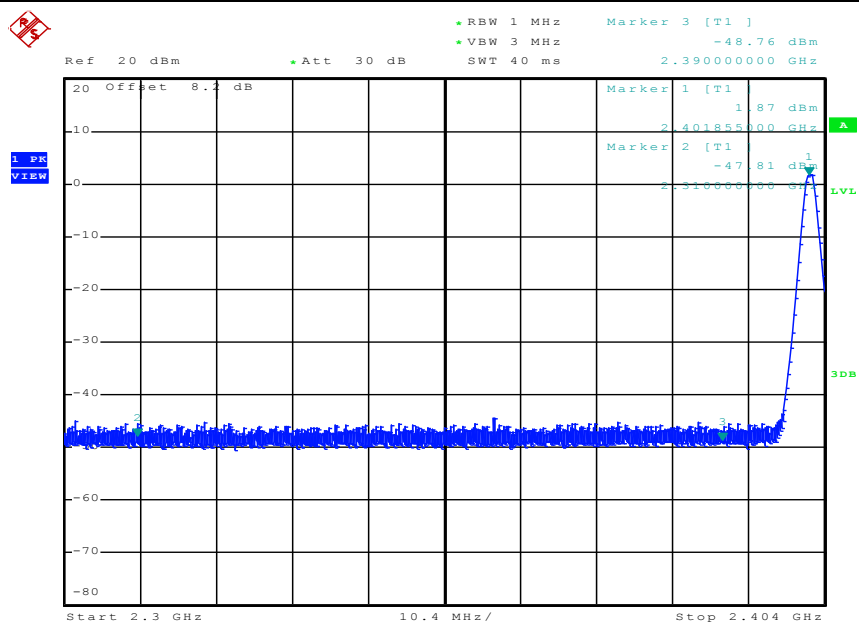
Where:

E = electric field strength in dB μ V/m,

EIRP = equivalent isotropic radiated power in dBm = Power + Gain

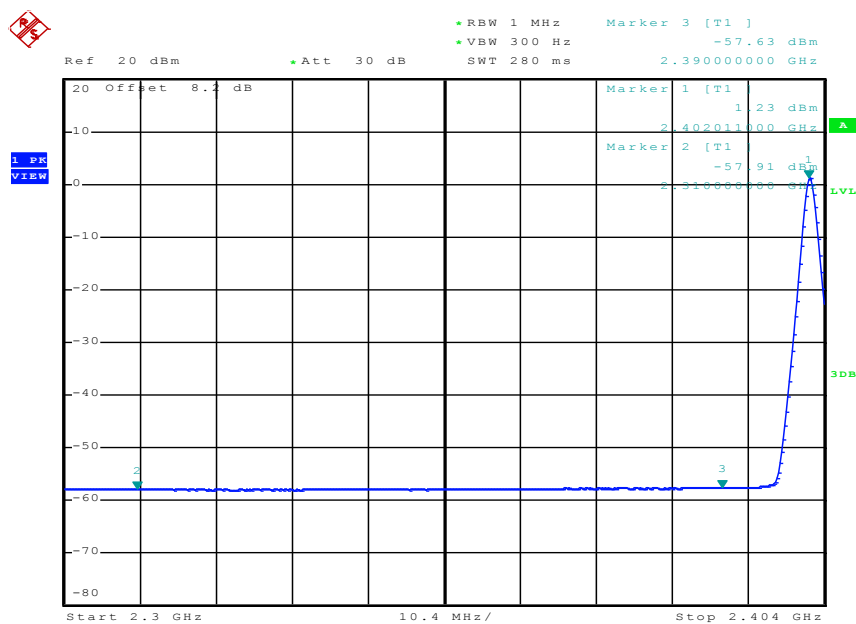
D = specified measurement distance in meters.

Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (Low Channel)



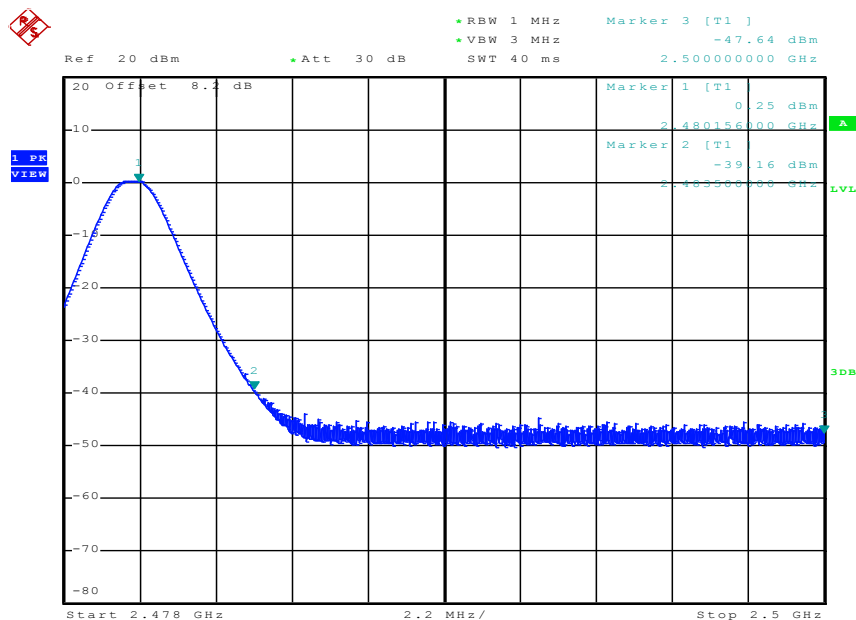
Date: 5.AUG.2019 23:08:13

Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (Low Channel)



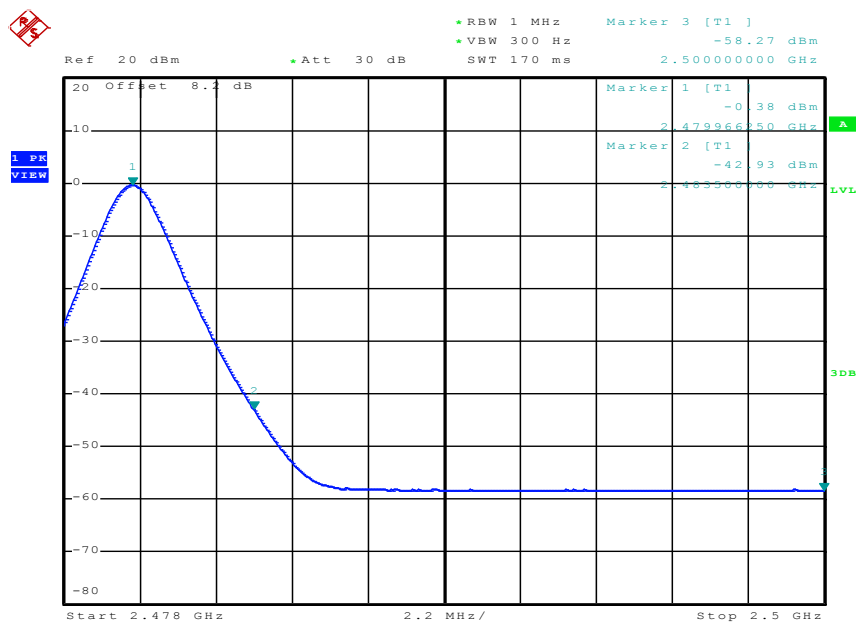
Date: 5.AUG.2019 23:08:27

Restrict-band band-edge measurements_Hopping Off_ GFSK_PEAK (High Channel)



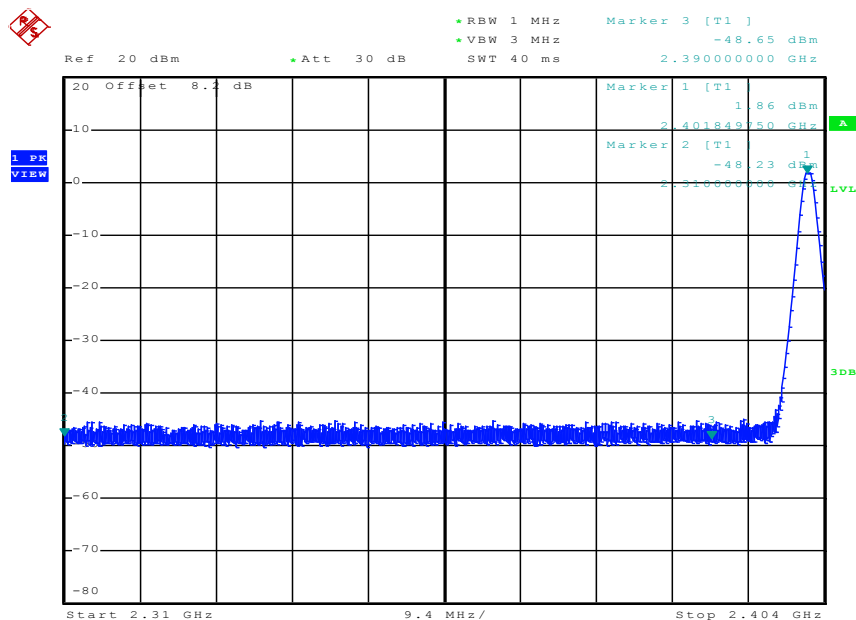
Date: 5.AUG.2019 23:13:32

Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)

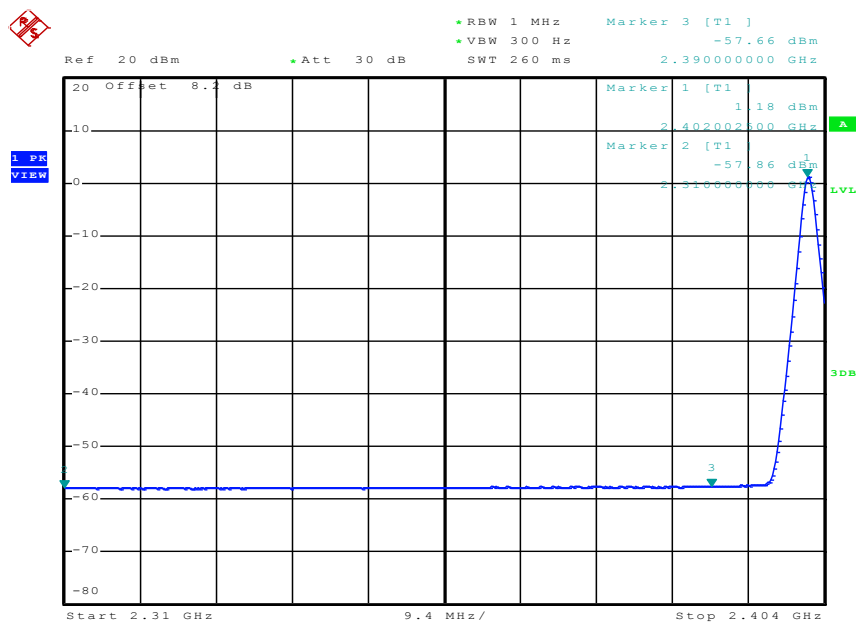


Date: 5.AUG.2019 23:13:45

Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_PEAK (Low Channel)

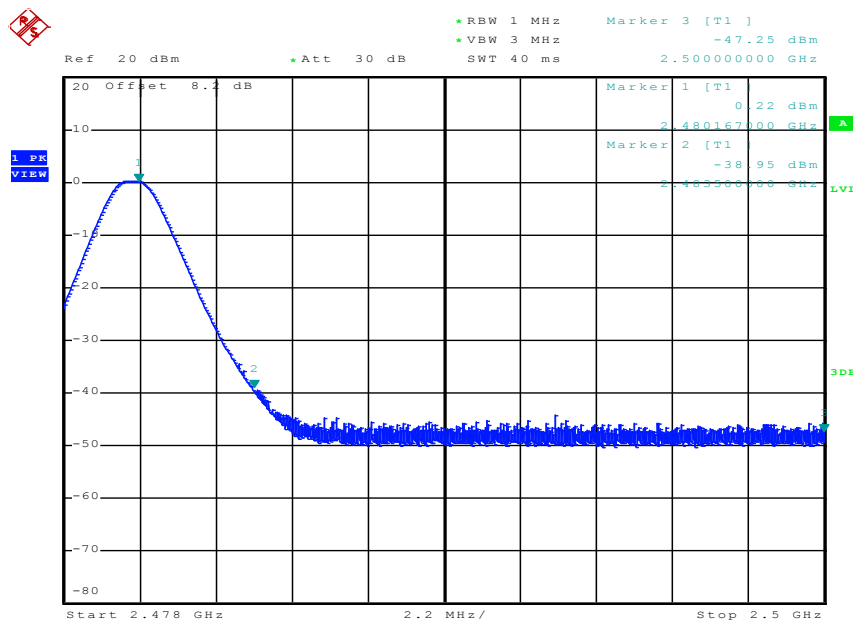


Date: 5.AUG.2019 23:16:50

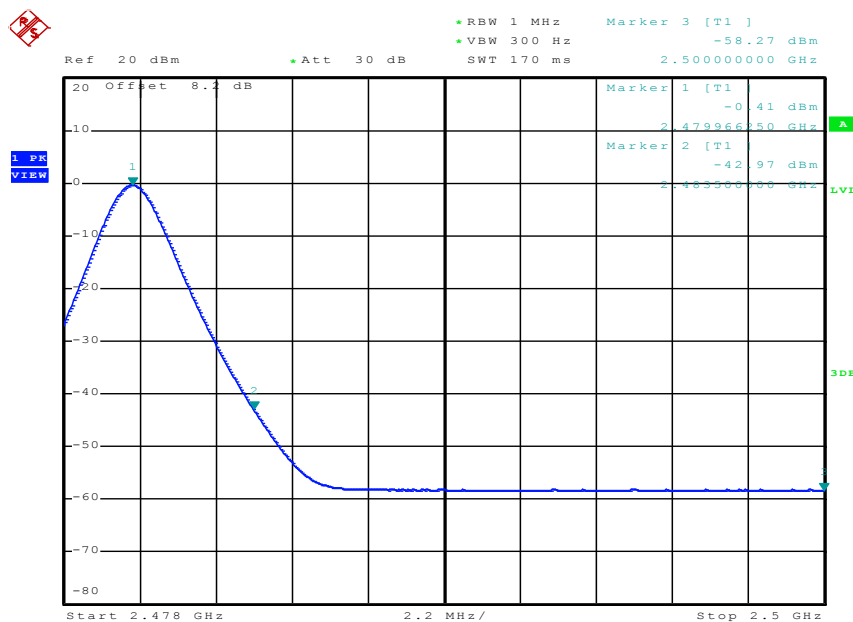
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (Low Channel)

Date: 5.AUG.2019 23:17:04

Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (High Channel)

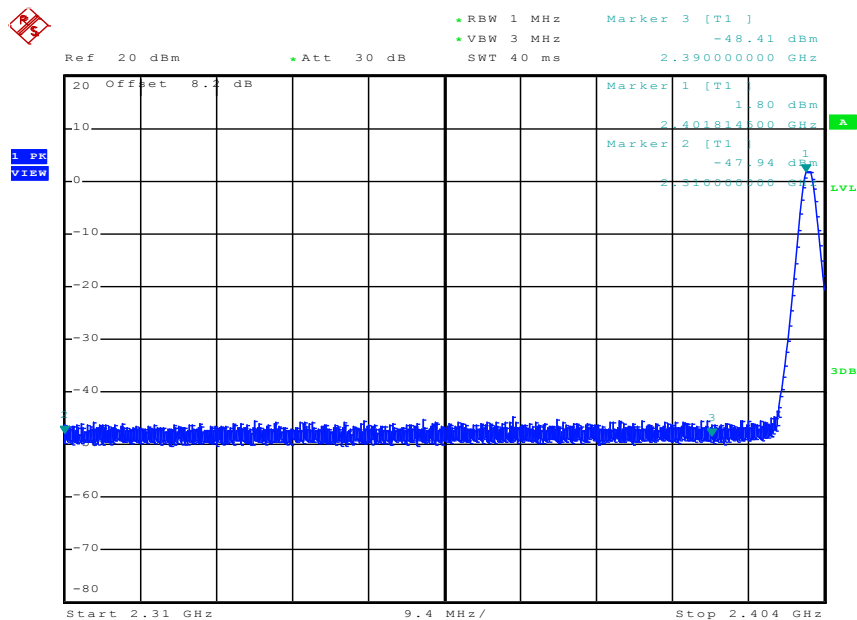


Date: 5.AUG.2019 23:21:34

Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_Average (High Channel)

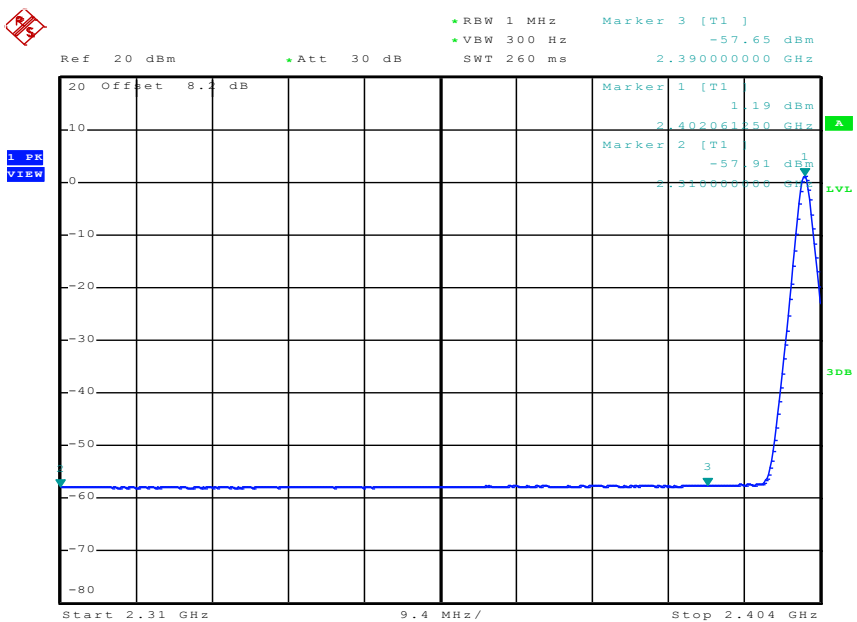
Date: 5.AUG.2019 23:21:48

Restrict-band band-edge measurements_Hopping Off 8DPSK_PEAK (Low Channel)



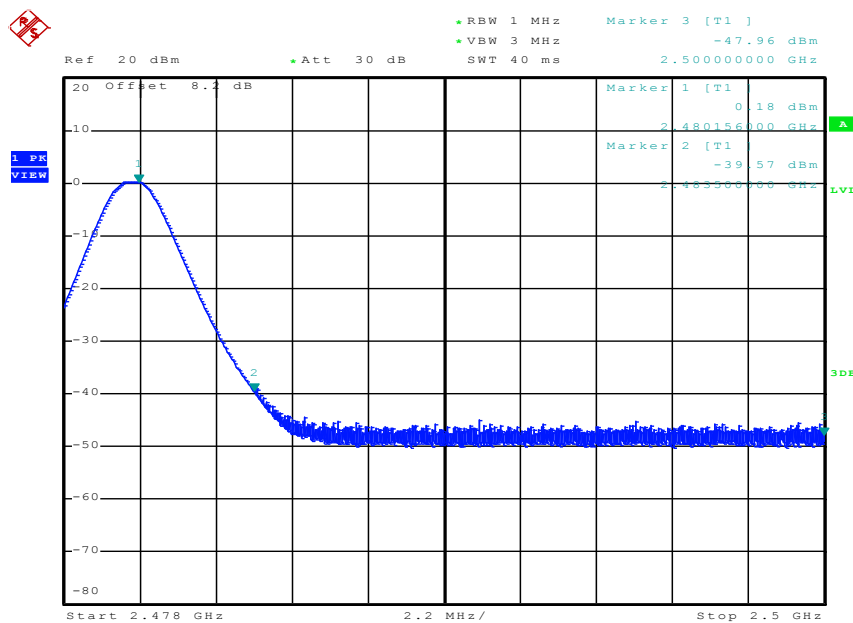
Date: 5.AUG.2019 23:28:24

Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (Low Channel)



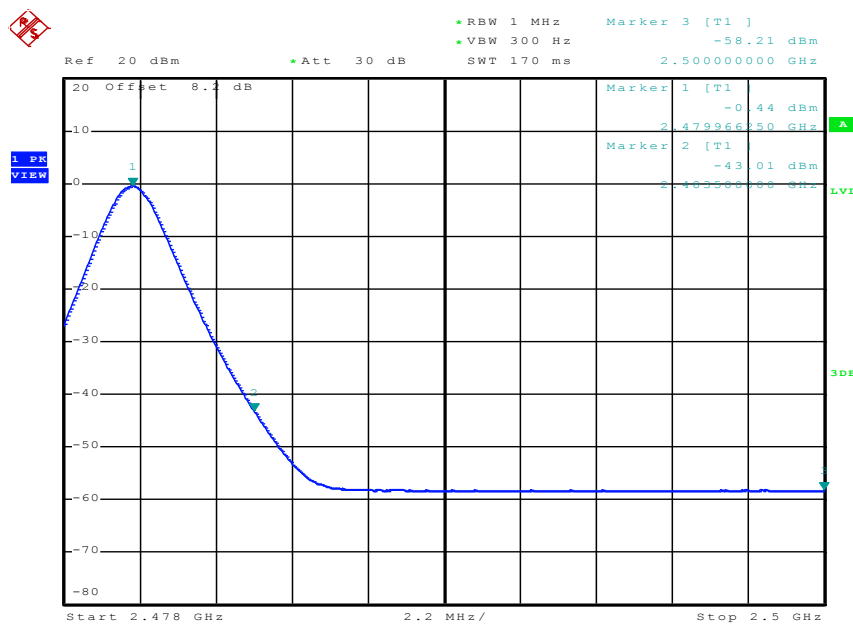
Date: 5.AUG.2019 23:28:37

Restrict-band band-edge measurements_Hopping Off_8DPSK_PEAK (High Channel)



Date: 5.AUG.2019 23:32:56

Restrict-band band-edge measurements_Hopping Off_8DPSK_Average (High Channel)



Date: 5.AUG.2019 23:33:09