

Appendix A

RF Test Data for BT V4.0(BDR/EDR) (Conducted Measurement)

Product Name: Vibration Speaker

Trade Mark: Adin

Test Model: BTBOX

Environmental Conditions

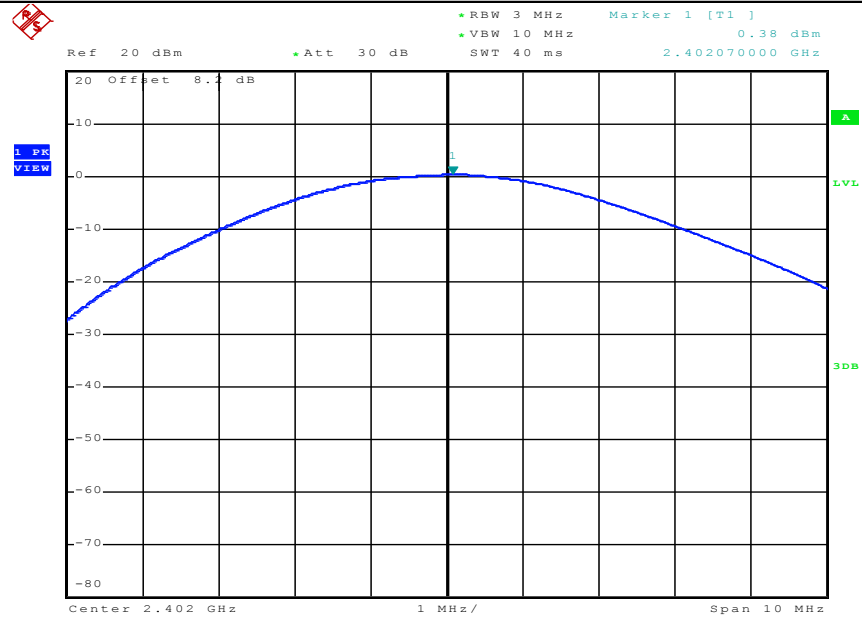
Temperature:	23.4 ° C
Relative Humidity:	53.5%
ATM Pressure:	100.0 kPa
Test Engineer:	David Luo
Supervised by:	Wang.Chuang

A.1 Maximum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.380	30	PASS
	MCH	3.090	30	PASS
	HCH	3.550	30	PASS
$\pi/4$ DQPSK	LCH	-2.130	21	PASS
	MCH	1.600	21	PASS
	HCH	2.450	21	PASS
8DPSK	LCH	-1.790	21	PASS
	MCH	1.930	21	PASS
	HCH	2.730	21	PASS

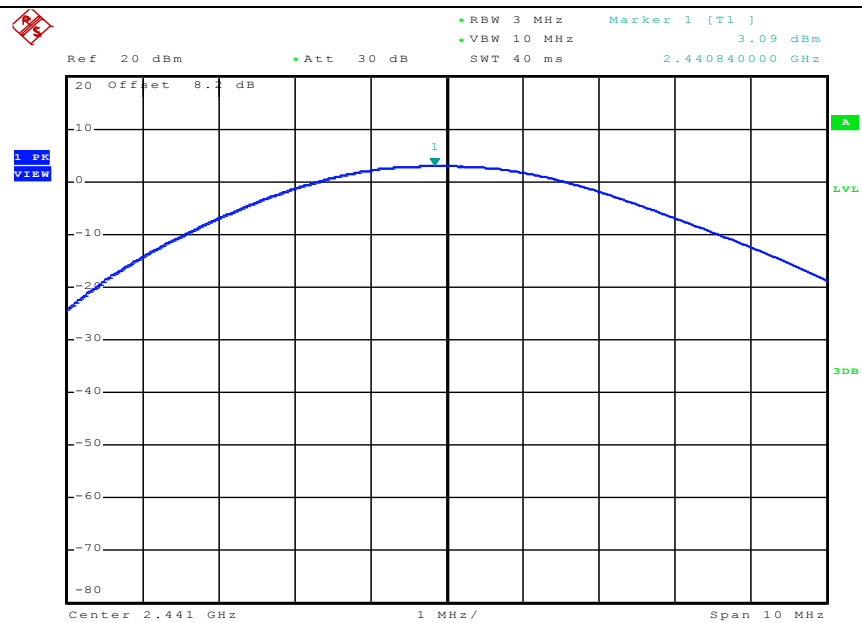
Test Graphs

GFSK/LCH



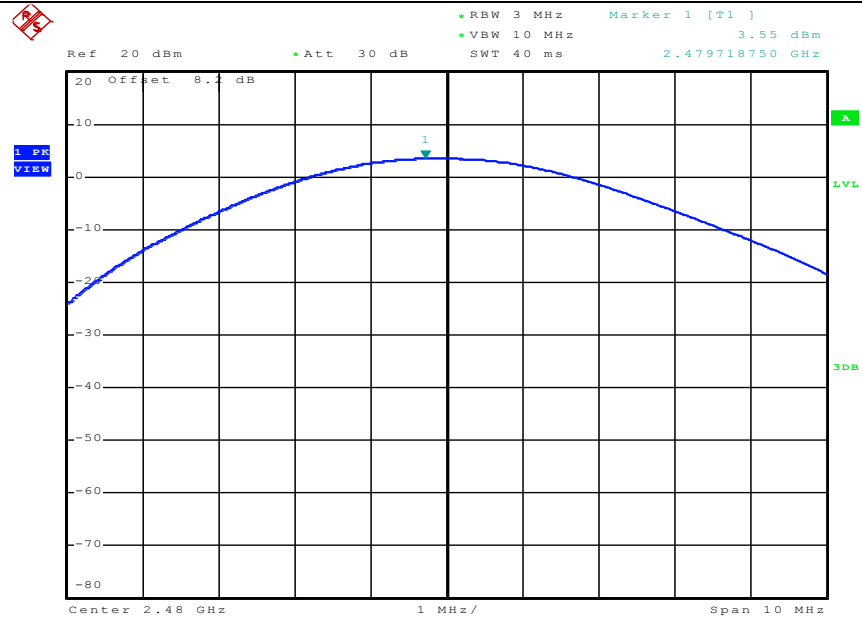
Date: 25.AUG.2019 16:35:18

GFSK/MCH



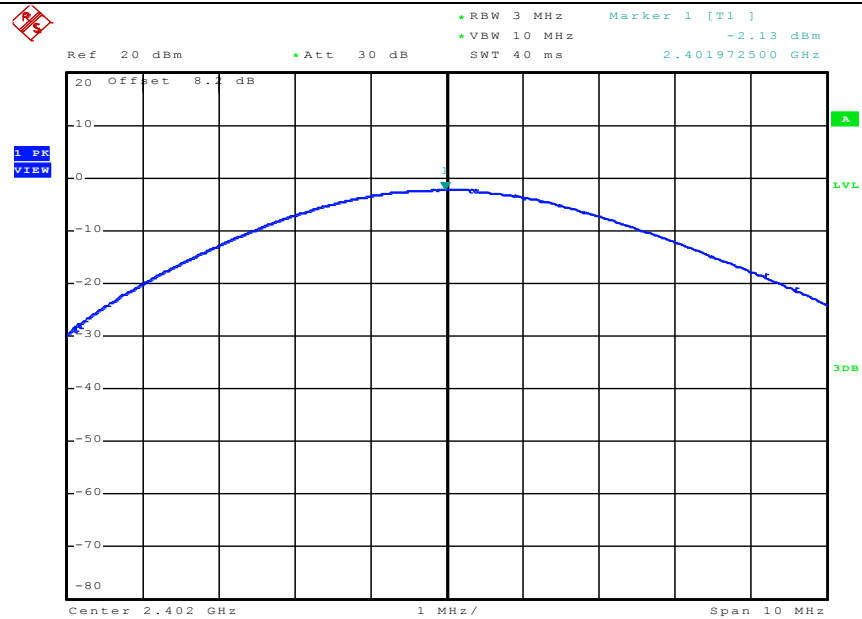
Date: 25.AUG.2019 16:37:47

GFSK/HCH



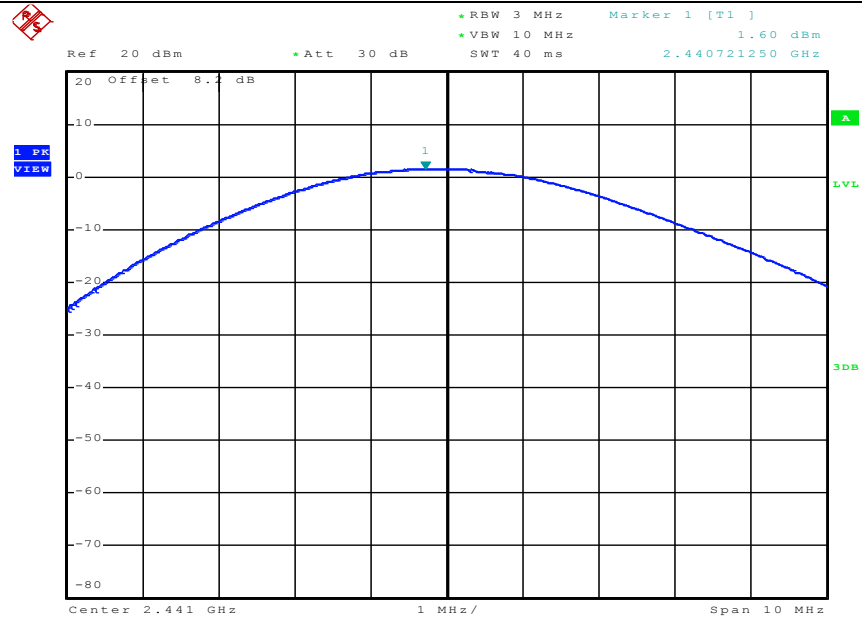
Date: 25.AUG.2019 17:40:26

$\pi/4$ DQPSK/LCH



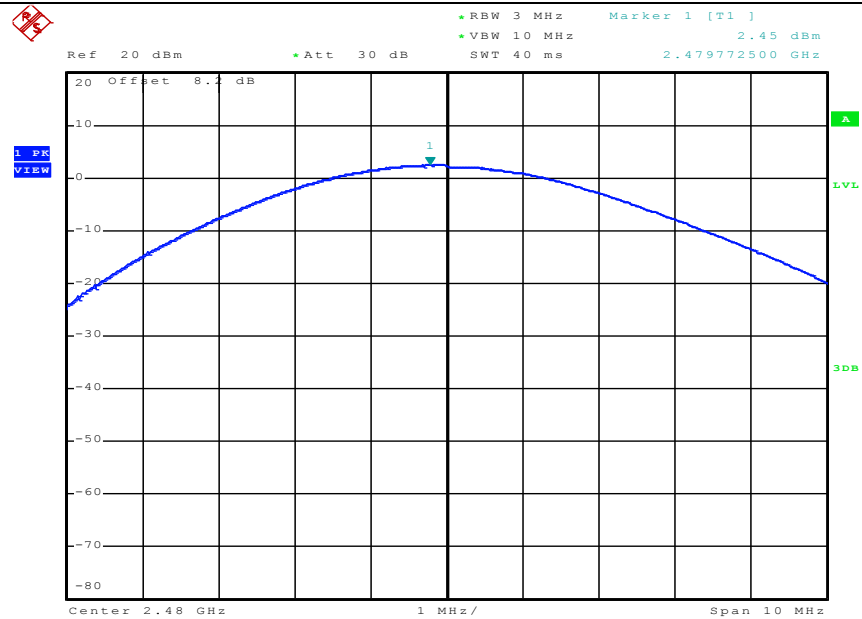
Date: 25.AUG.2019 17:42:39

$\pi/4$ DQPSK/MCH



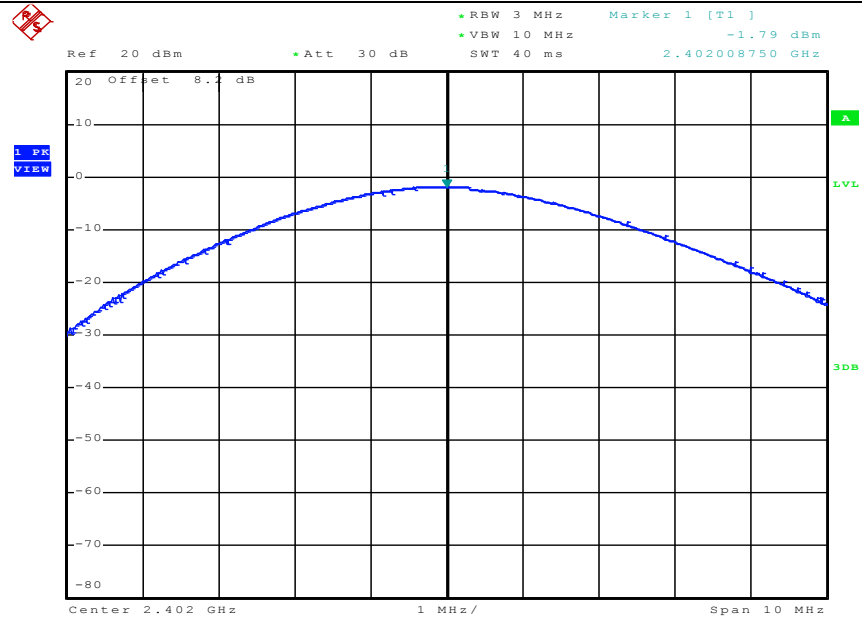
Date: 25.AUG.2019 17:44:59

$\pi/4$ DQPSK/HCH



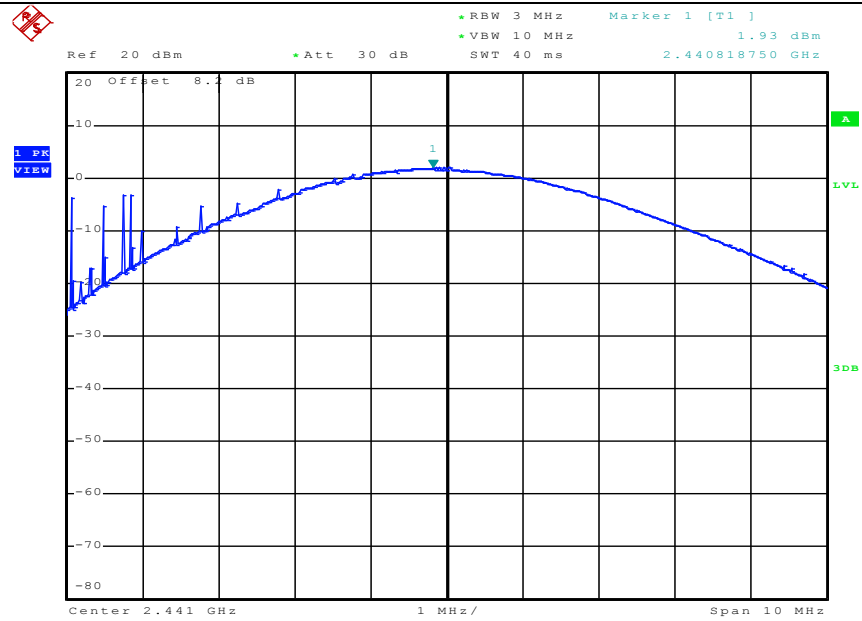
Date: 25.AUG.2019 17:46:41

8DPSK/LCH



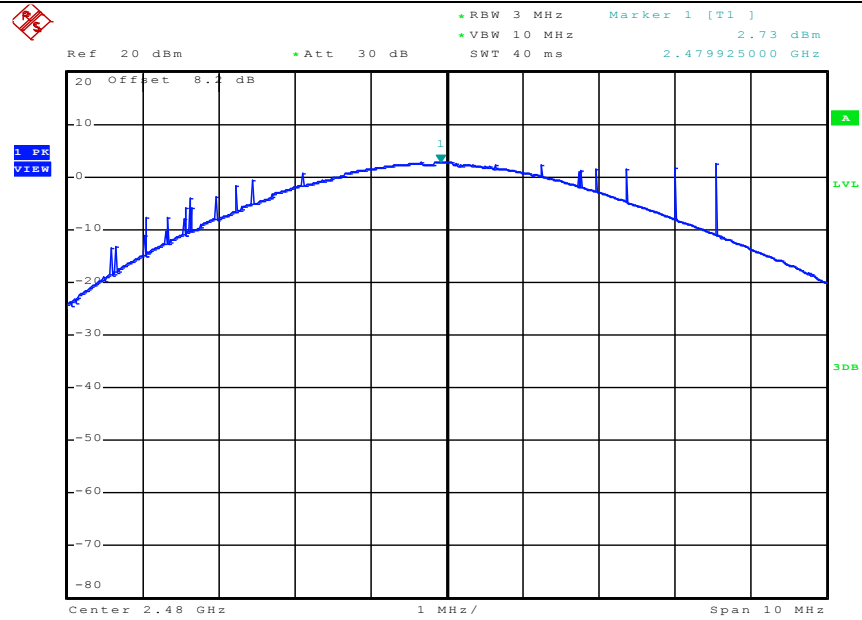
Date: 25.AUG.2019 17:48:58

8DPSK/MCH



Date: 25.AUG.2019 18:08:00

8DPSK/HCH



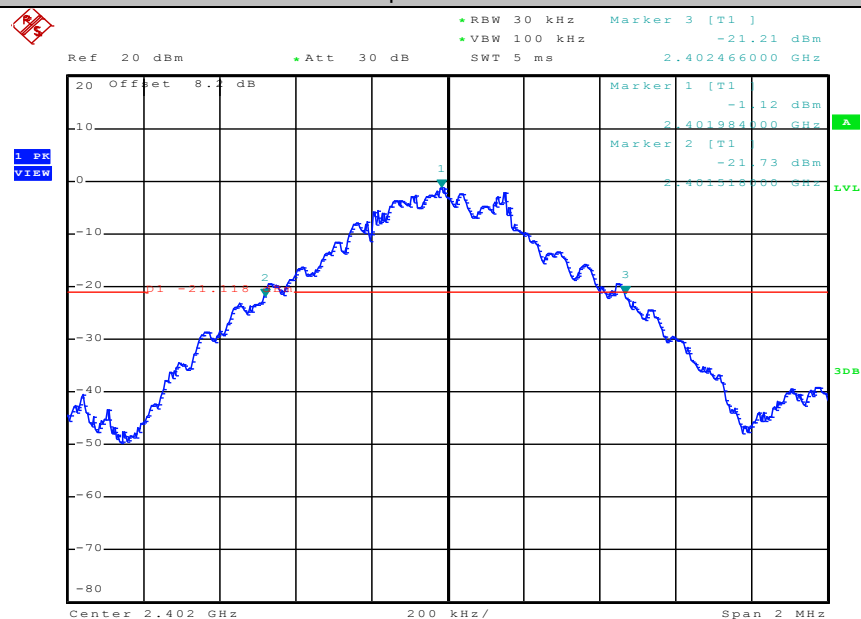
Date: 25.AUG.2019 18:24:38

A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.948	Not Specified	PASS
	MCH	0.942	Not Specified	PASS
	HCH	0.940	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.274	Not Specified	PASS
	MCH	1.234	Not Specified	PASS
	HCH	1.236	Not Specified	PASS
8DPSK	LCH	1.278	Not Specified	PASS
	MCH	1.286	Not Specified	PASS
	HCH	1.258	Not Specified	PASS

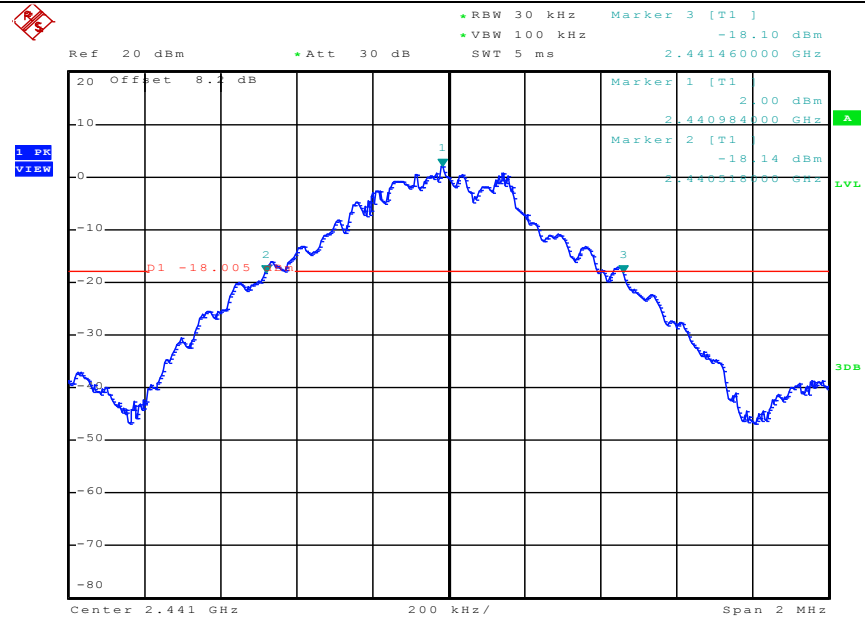
Test Graphs

GFSK/LCH



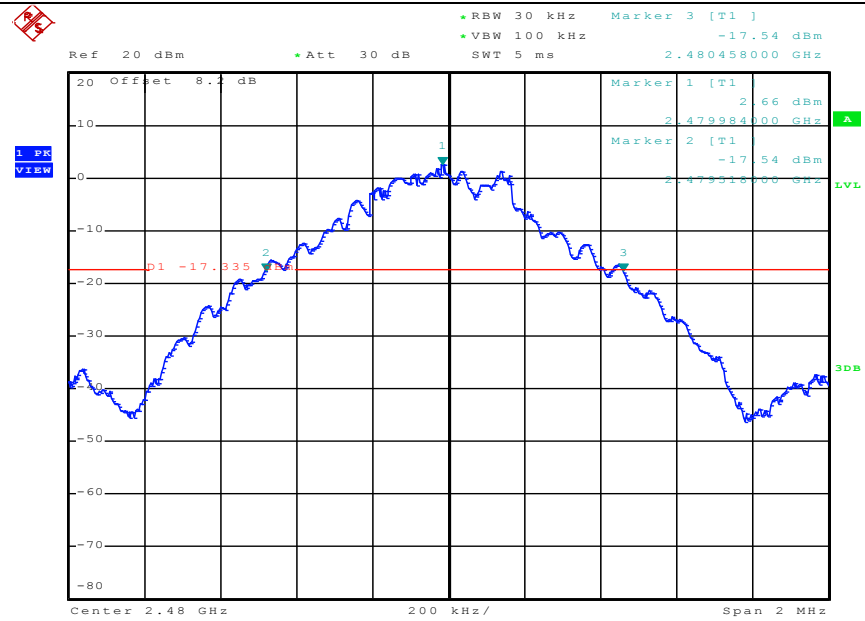
Date: 25.AUG.2019 16:34:42

GFSK/MCH



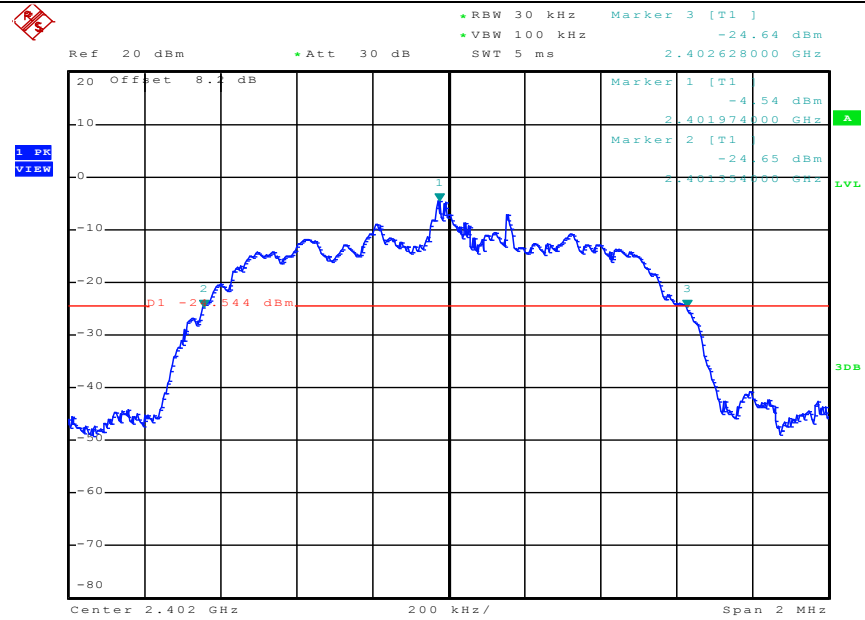
Date: 25.AUG.2019 16:37:10

GFSK/HCH



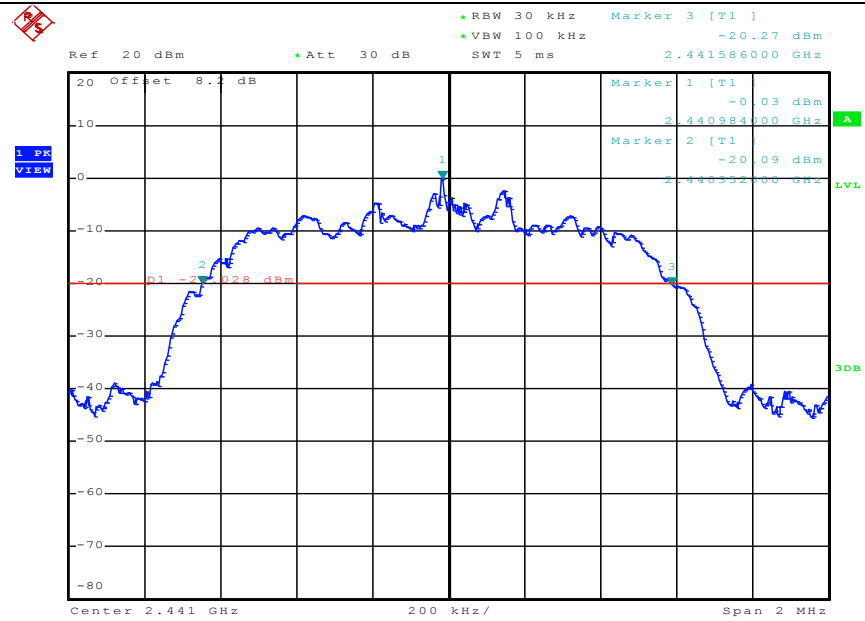
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$\pi/4$ DQPSK/LCH



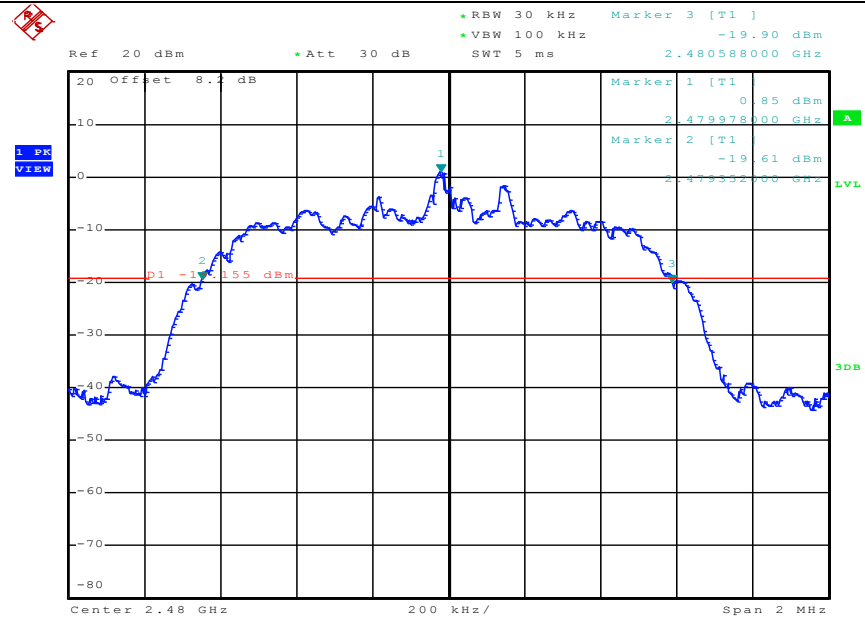
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$\pi/4$ DQPSK/MCH



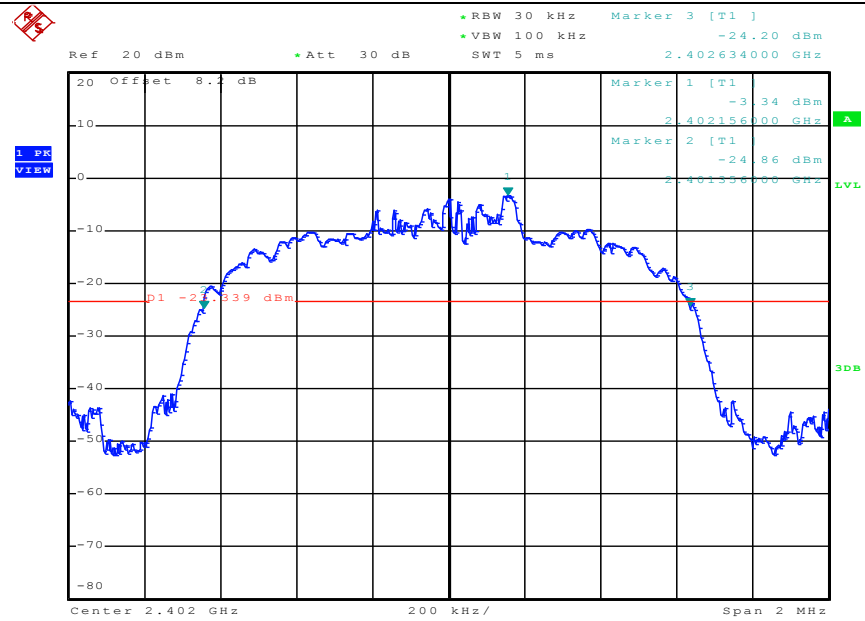
Date: 25.AUG.2019 17:44:22

$\pi/4$ DQPSK/HCH



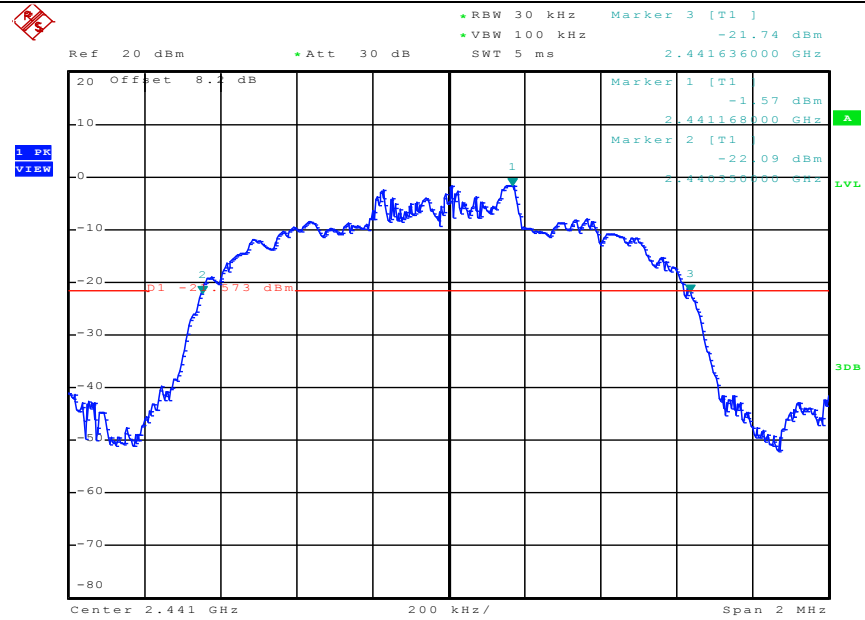
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8DPSK/LCH



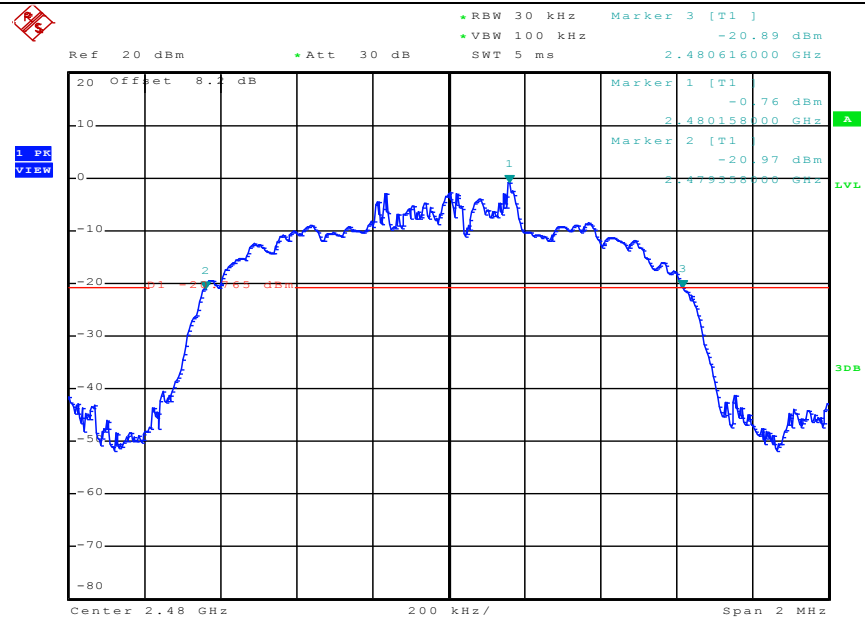
Date: 25.AUG.2019 20:30:08

8DPSK/MCH



Date: 25.AUG.2019 20:31:28

8DPSK/HCH



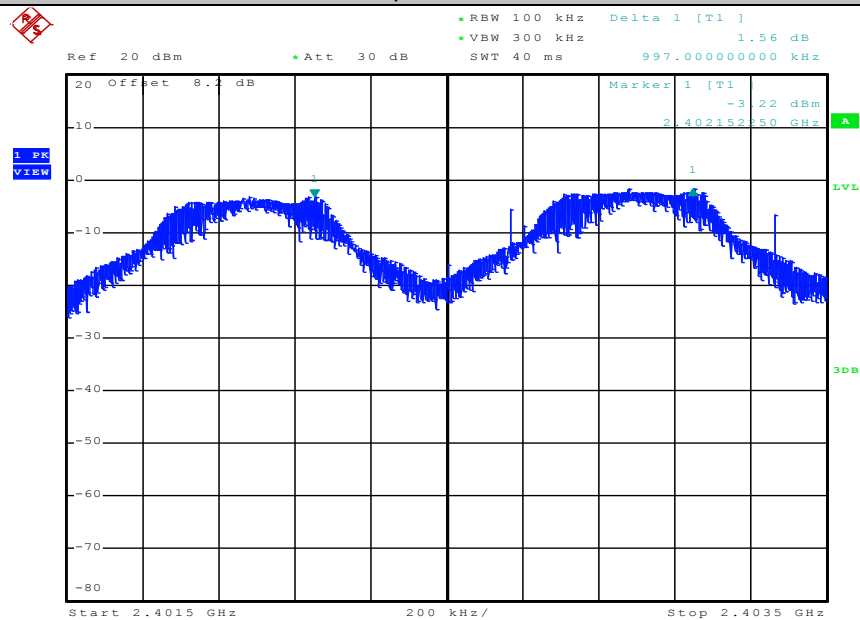
Date: 25.AUG.2019 20:32:01

A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.997	0.879	PASS
	MCH	1.046	0.879	PASS
	HCH	1.004	0.879	PASS
$\pi/4$ DQPSK	LCH	1.122	1.083	PASS
	MCH	1.168	1.083	PASS
	HCH	1.146	1.083	PASS
8DPSK	LCH	1.176	1.053	PASS
	MCH	1.330	1.053	PASS
	HCH	1.142	1.053	PASS

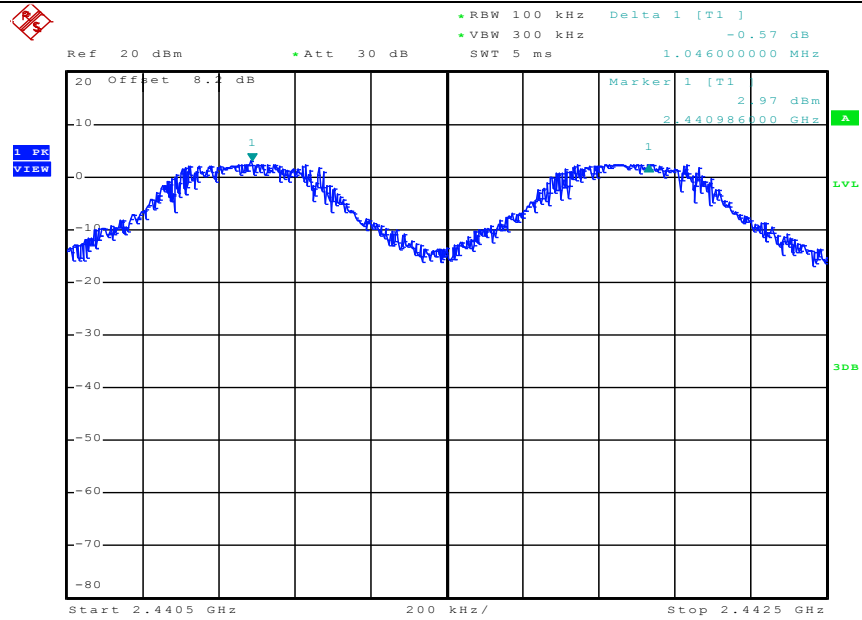
Test Graphs

GFSK/LCH



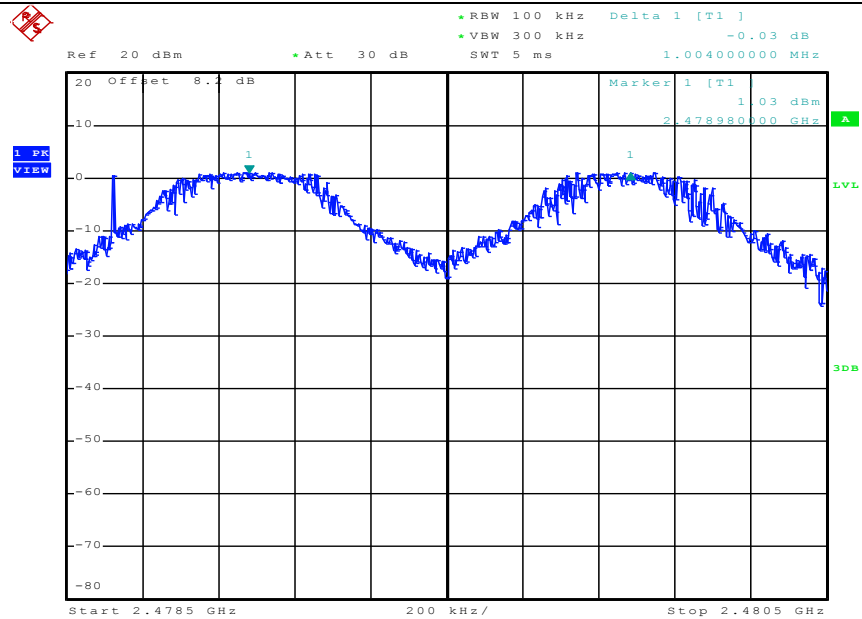
Date: 25.AUG.2019 16:58:20

GFSK/MCH



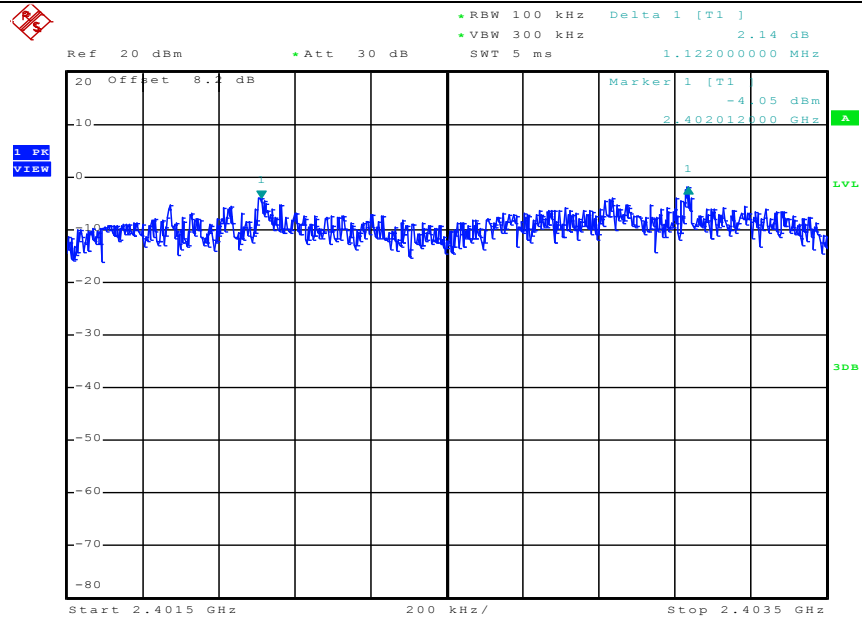
Date: 25.AUG.2019 17:34:51

GFSK/HCH



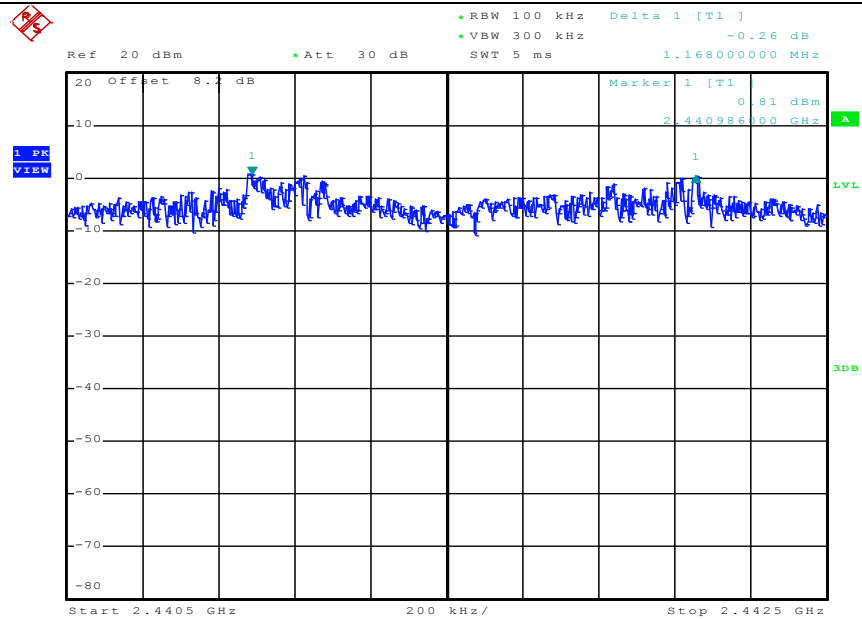
Date: 25.AUG.2019 17:02:04

$\pi/4$ DQPSK/LCH



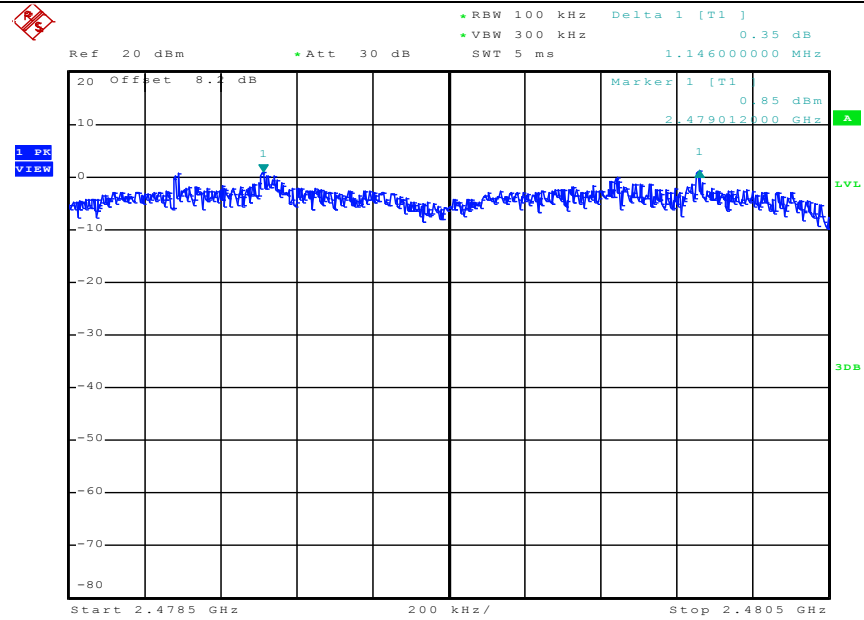
Date: 25.AUG.2019 17:06:25

$\pi/4$ DQPSK/MCH



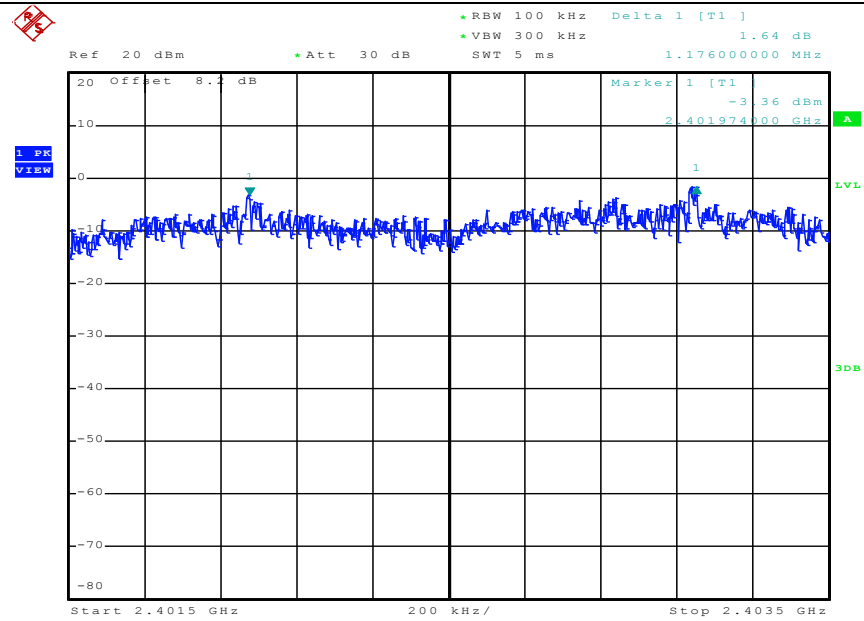
Date: 25.AUG.2019 17:09:25

π /4DQPSK/HCH



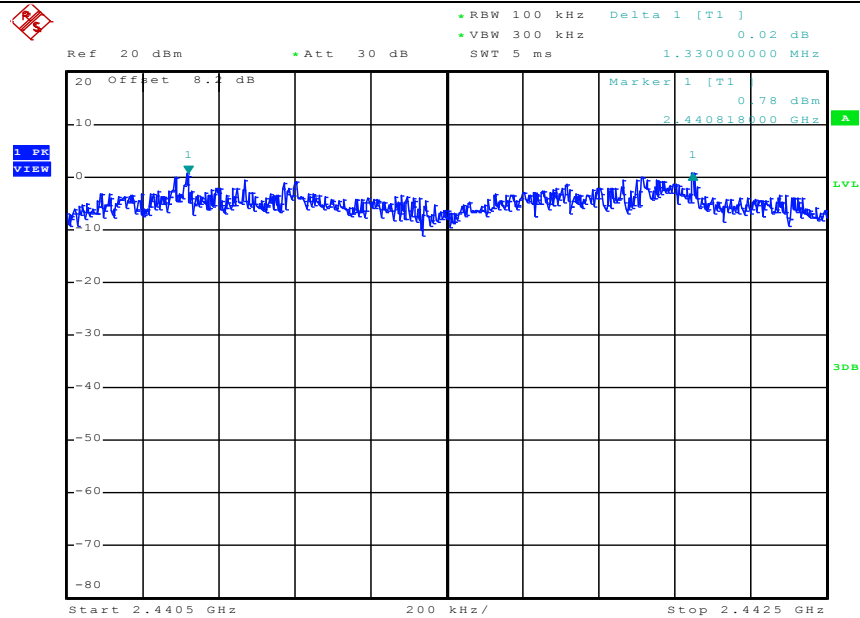
Date: 25.AUG.2019 17:37:49

8DPSK/LCH



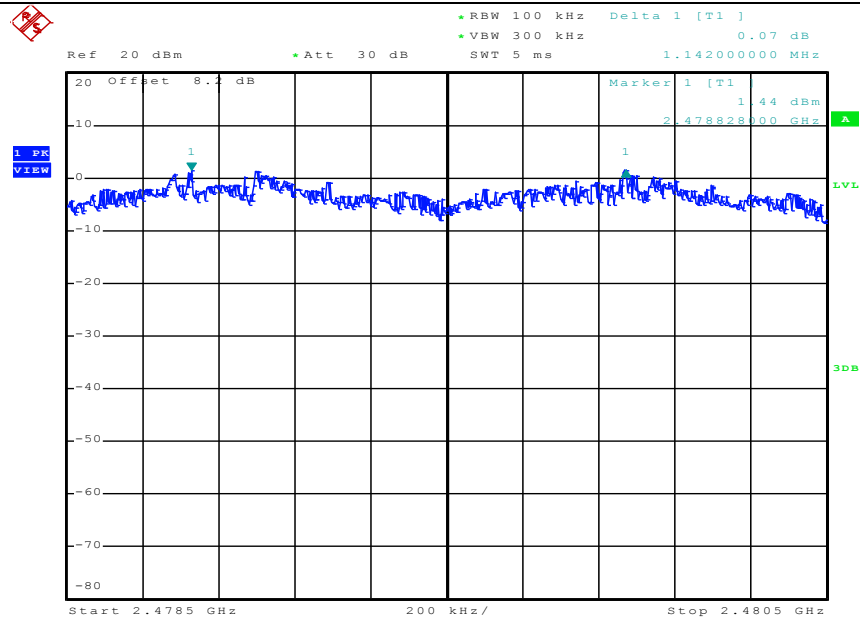
Date: 25.AUG.2019 17:15:49

8DPSK/MCH



Date: 25.AUG.2019 17:36:41

8DPSK/HCH



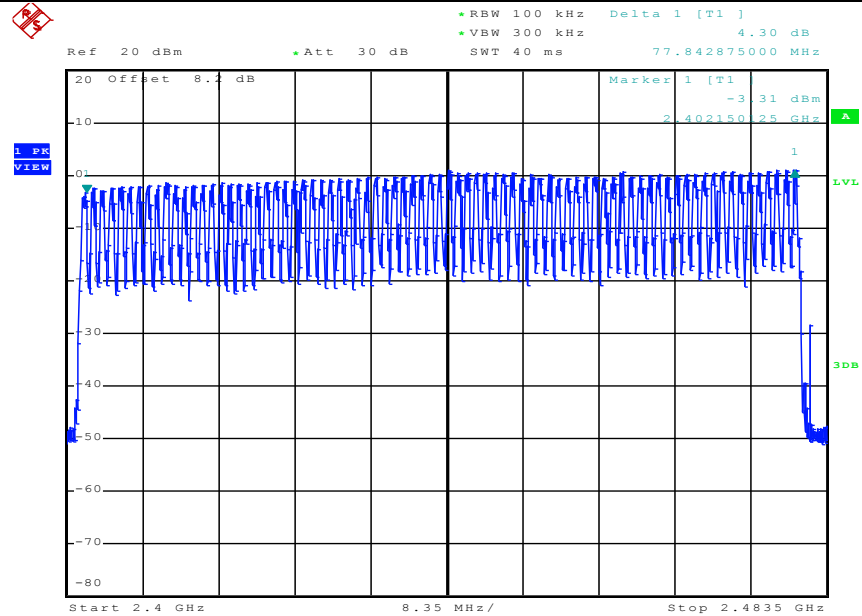
Date: 25.AUG.2019 17:20:11

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

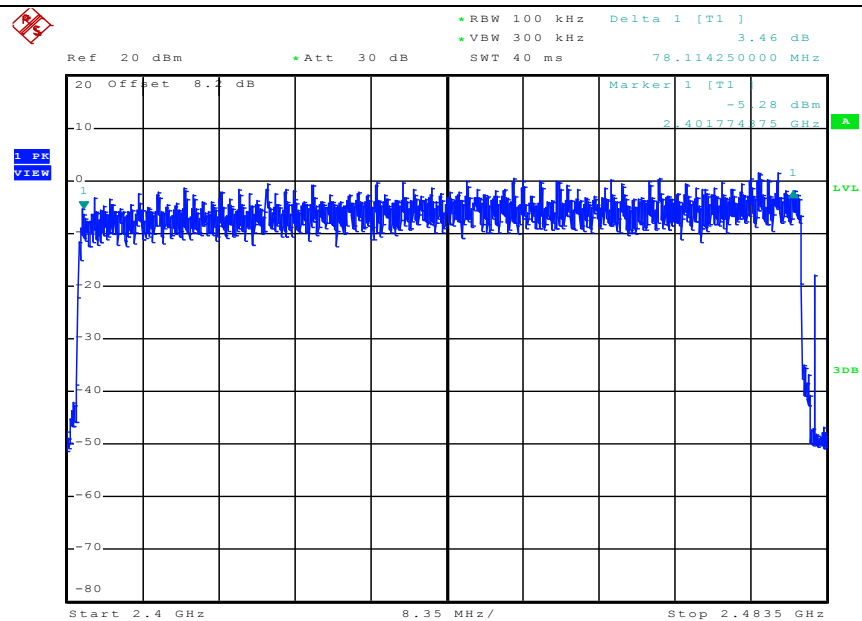
Test Graphs

GFSK/Hop



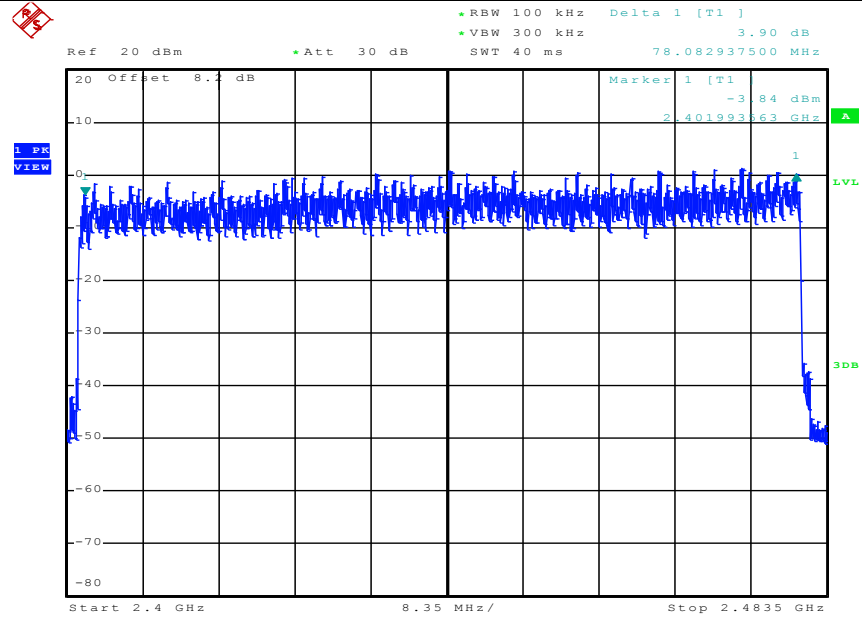
Date: 25.AUG.2019 17:05:46

$\pi/4$ DQPSK/Hop



Date: 25.AUG.2019 17:14:41

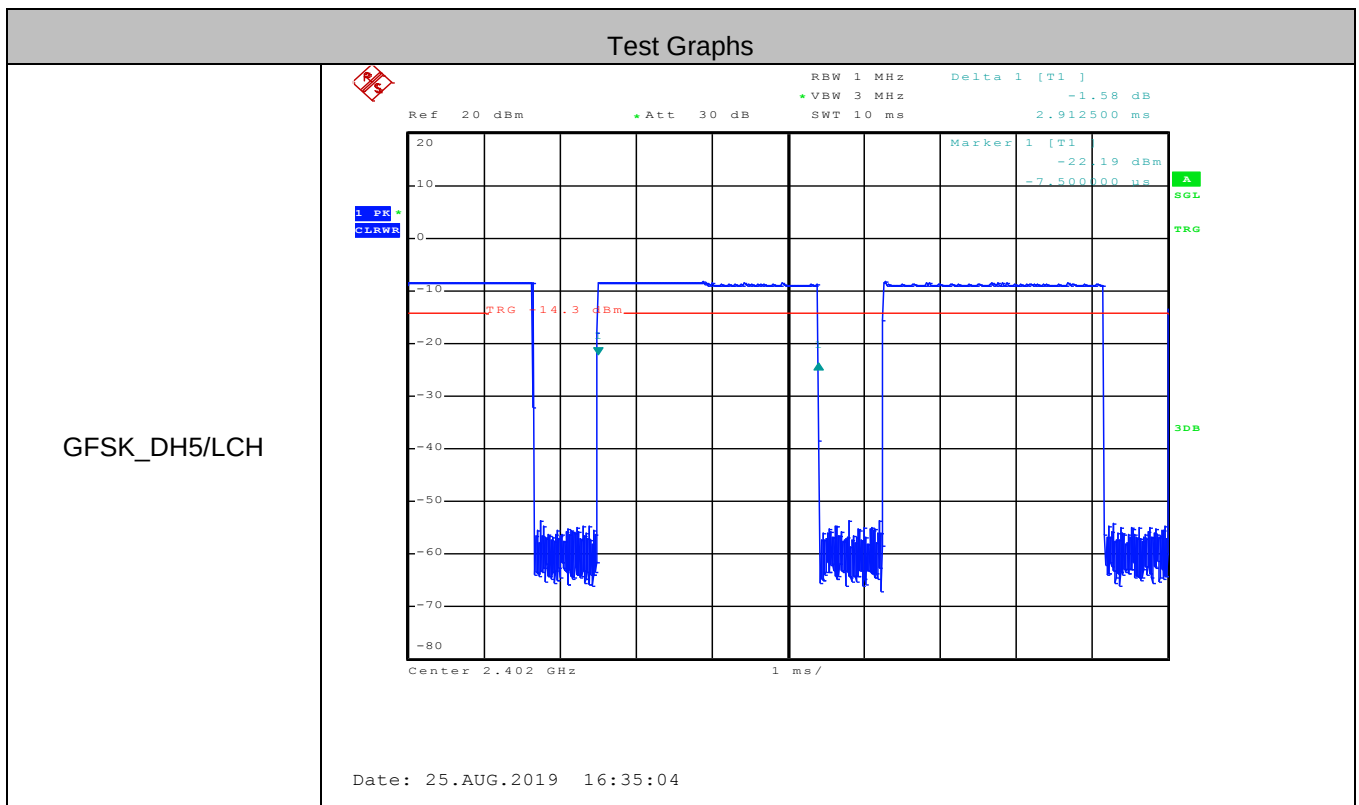
8DPSK/Hop



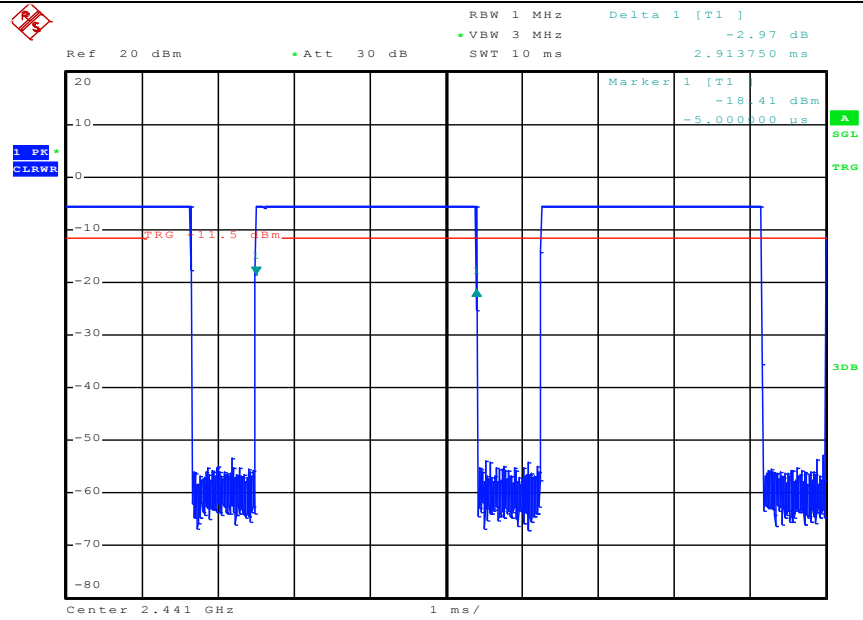
Date: 25.AUG.2019 17:25:19

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	2.91	106.7	0.31	0.4	PASS
	DH5	MCH	2.91	106.7	0.31	0.4	PASS
	DH5	HCH	2.91	106.7	0.31	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.91	106.7	0.312	0.4	PASS
	2DH5	MCH	2.91	106.7	0.312	0.4	PASS
	2DH5	HCH	2.91	106.7	0.312	0.4	PASS
8DPSK	3DH5	LCH	2.91	106.7	0.312	0.4	PASS
	3DH5	MCH	2.91	106.7	0.312	0.4	PASS
	3DH5	HCH	2.91	106.7	0.312	0.4	PASS

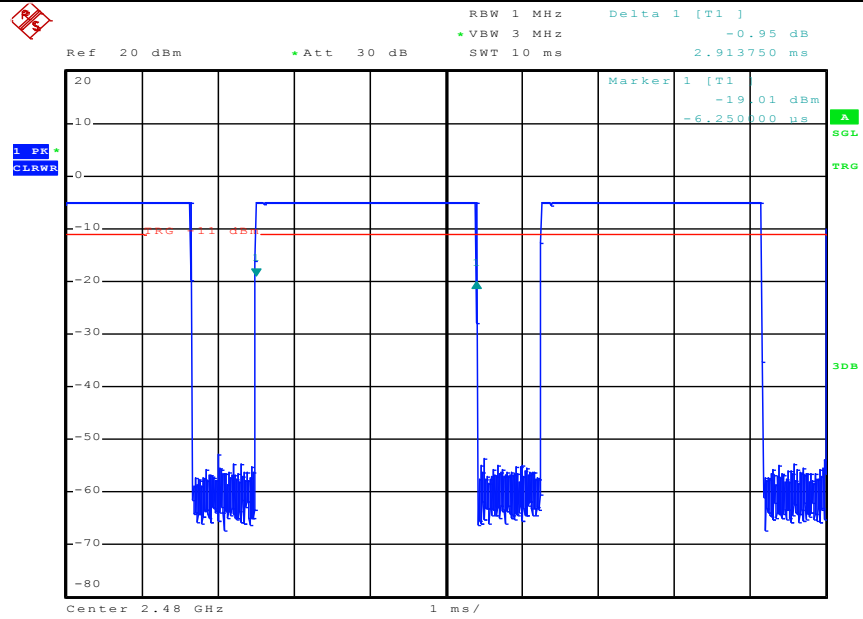


GFSK_DH5/MCH



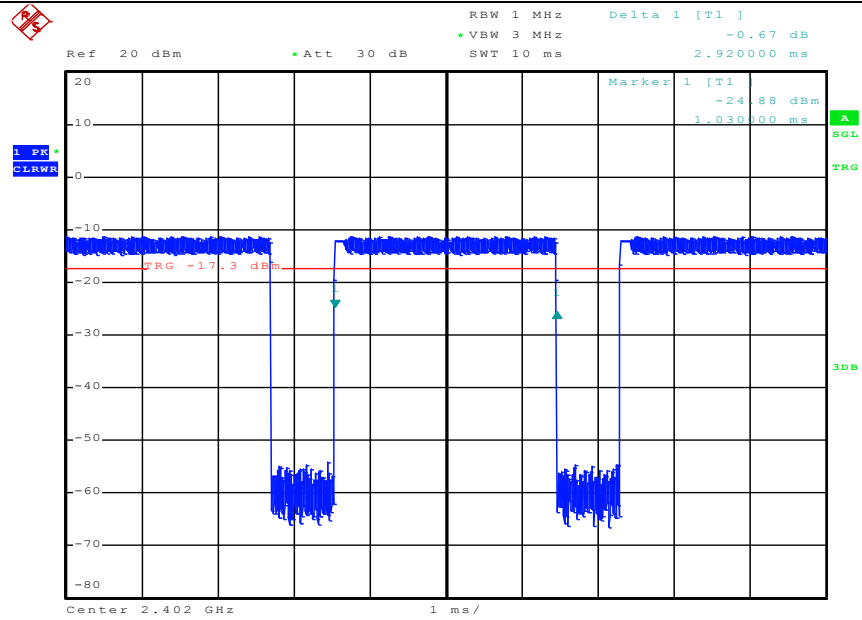
Date: 25.AUG.2019 16:37:32

GFSK_DH5/HCH



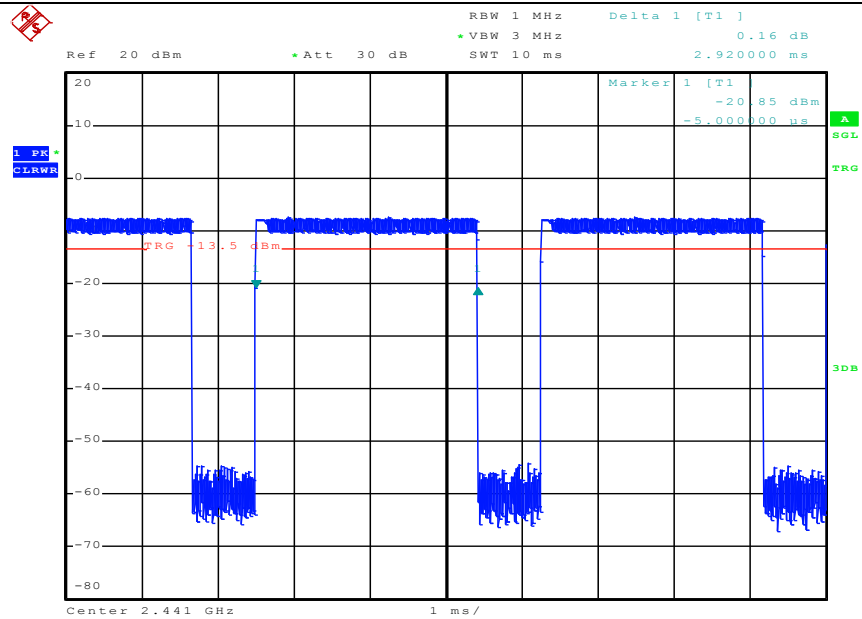
Date: 25.AUG.2019 17:40:11

$\pi/4$ DQPSK
_2DH5/LCH



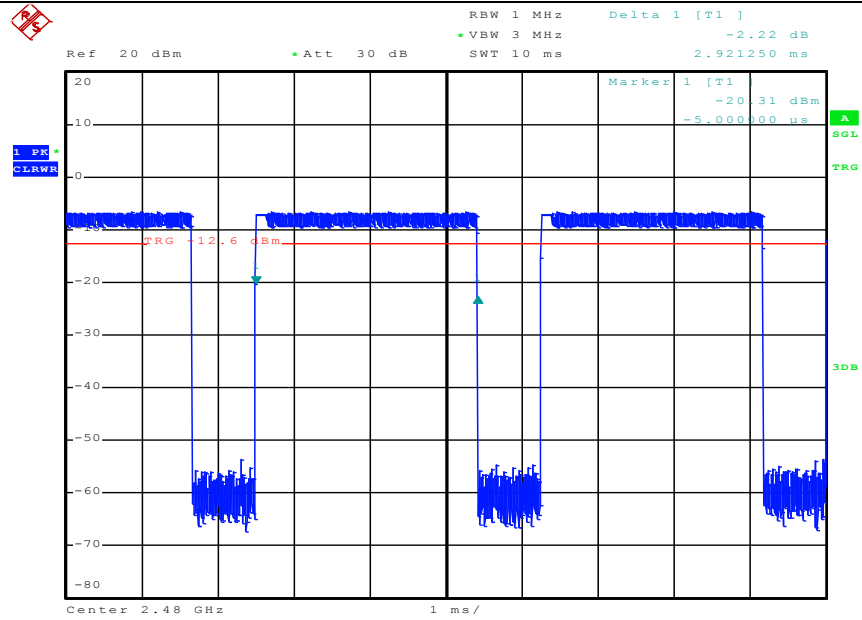
Date: 25.AUG.2019 17:42:24

$\pi/4$ DQPSK
_2DH5/MCH



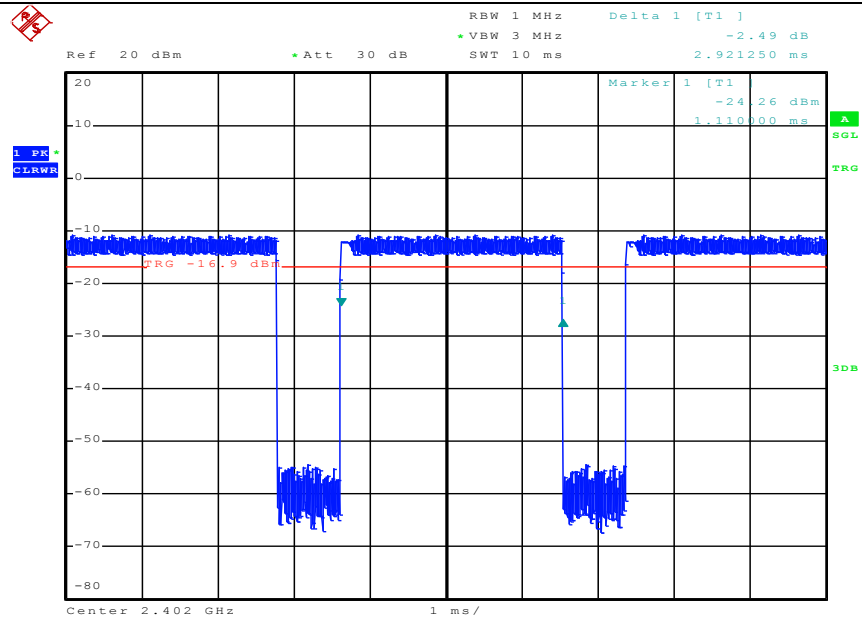
Date: 25.AUG.2019 17:44:43

$\pi/4$ DQPSK
_2DH5/HCH



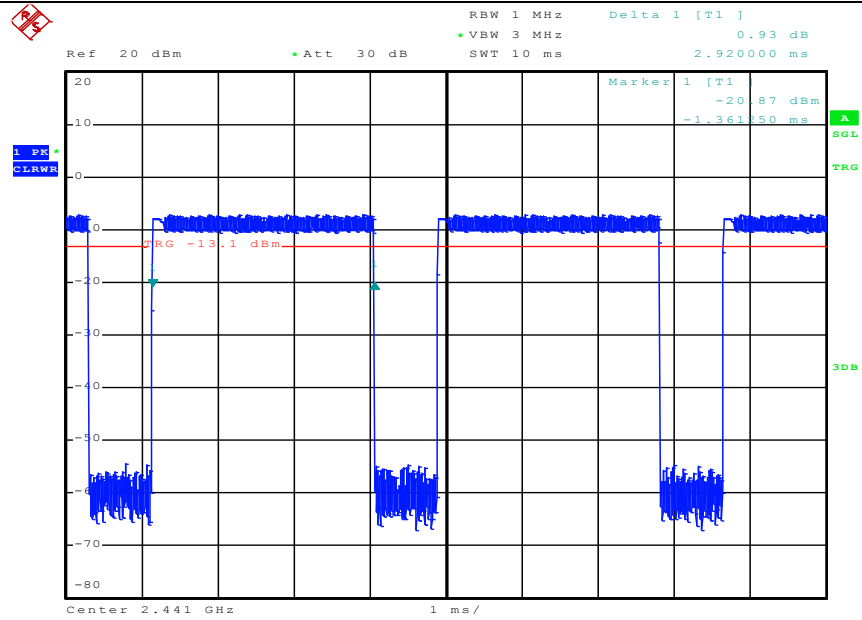
Date: 25.AUG.2019 17:46:26

8DPSK_3DH5/LCH



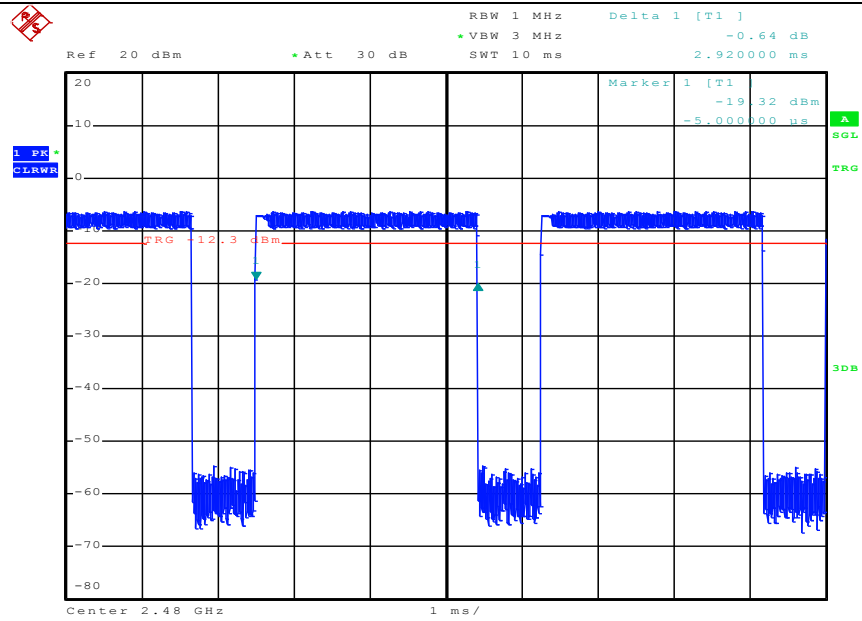
Date: 25.AUG.2019 17:48:43

8DPSK_3DH5/MCH



Date: 25.AUG.2019 18:07:45

8DPSK_3DH5/HCH



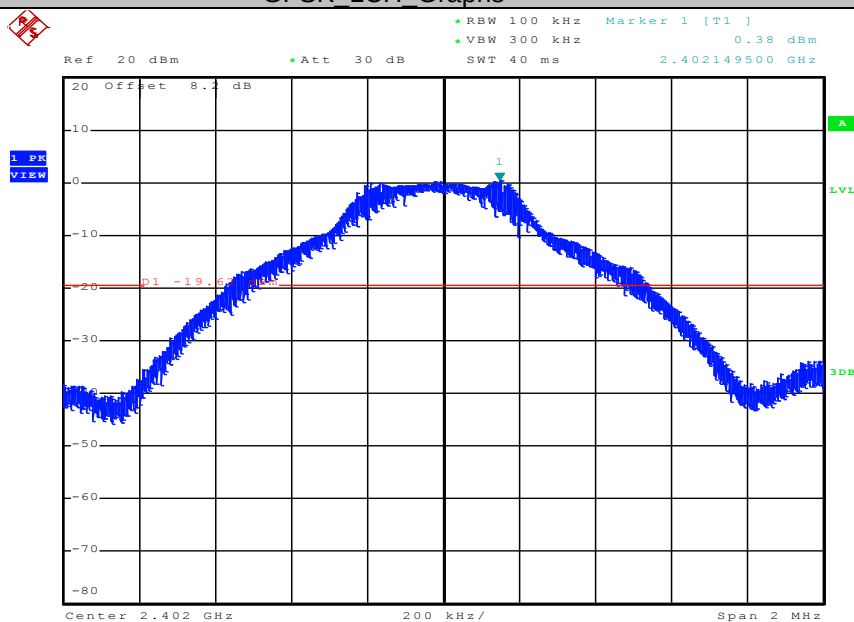
Date: 25.AUG.2019 18:24:23

A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.38	-32.050	-19.620	PASS
	MCH	3.13	-31.320	-16.870	PASS
	HCH	3.79	-32.360	-16.210	PASS
$\pi/4$ DQPSK	LCH	-3.4	-32.480	-23.400	PASS
	MCH	0.8	-32.630	-19.200	PASS
	HCH	1.56	-32.290	-18.440	PASS
8DPSK	LCH	-3.32	-32.460	-23.320	PASS
	MCH	0.86	-32.020	-19.140	PASS
	HCH	1.75	-32.710	-18.250	PASS

GFSK LCH Graphs

Pref

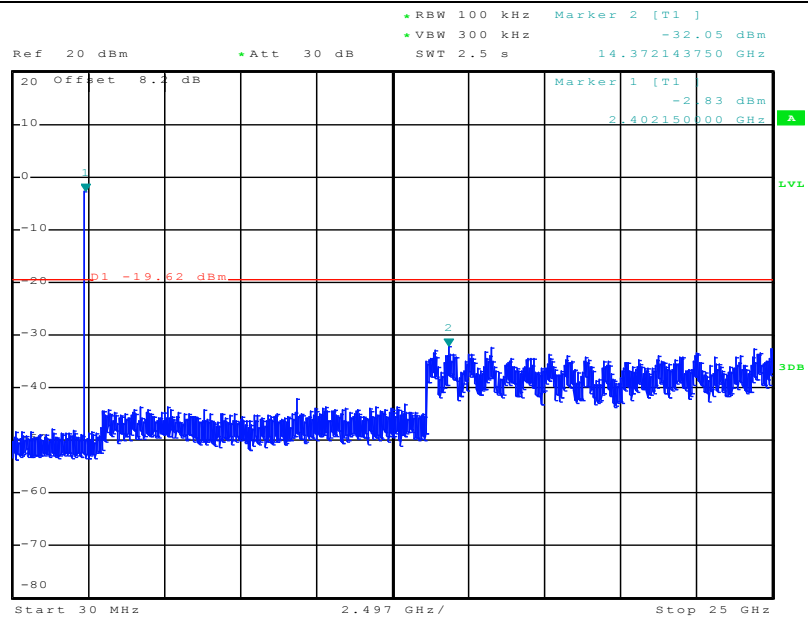


Date: 25.AUG.2019 16:35:48

Puw



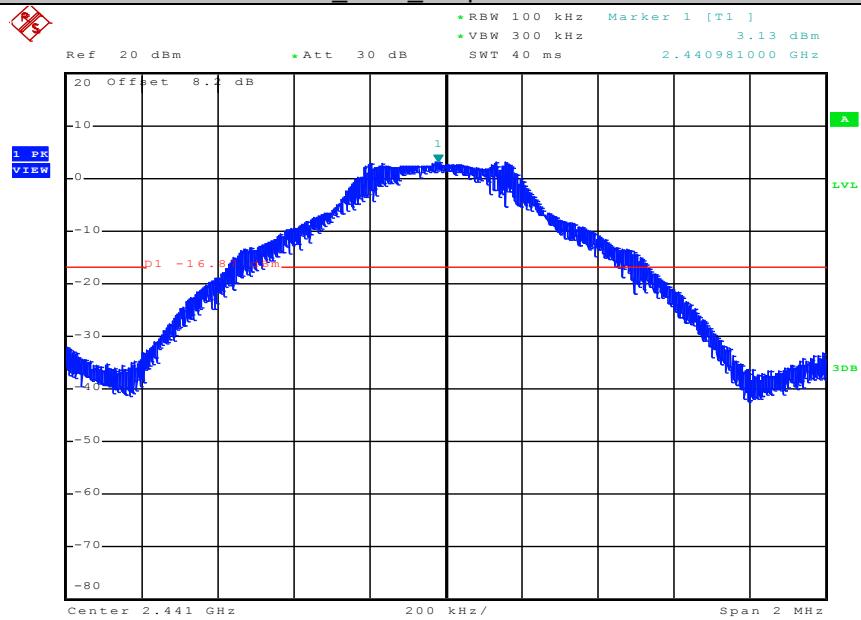
1. PK
VIEW



Date: 25.AUG.2019 16:36:02

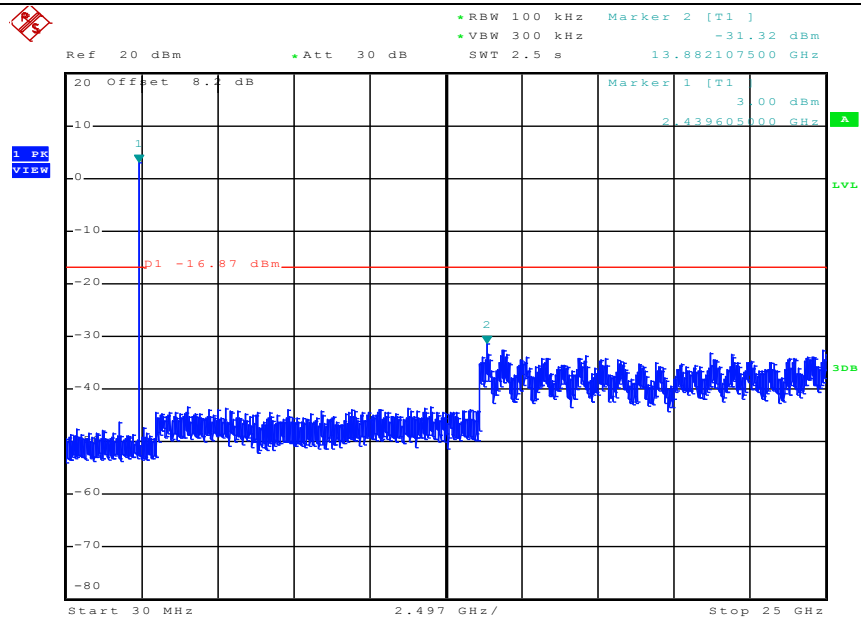
GFSK_MCH_Graphs

Pref



Date: 25.AUG.2019 16:37:59

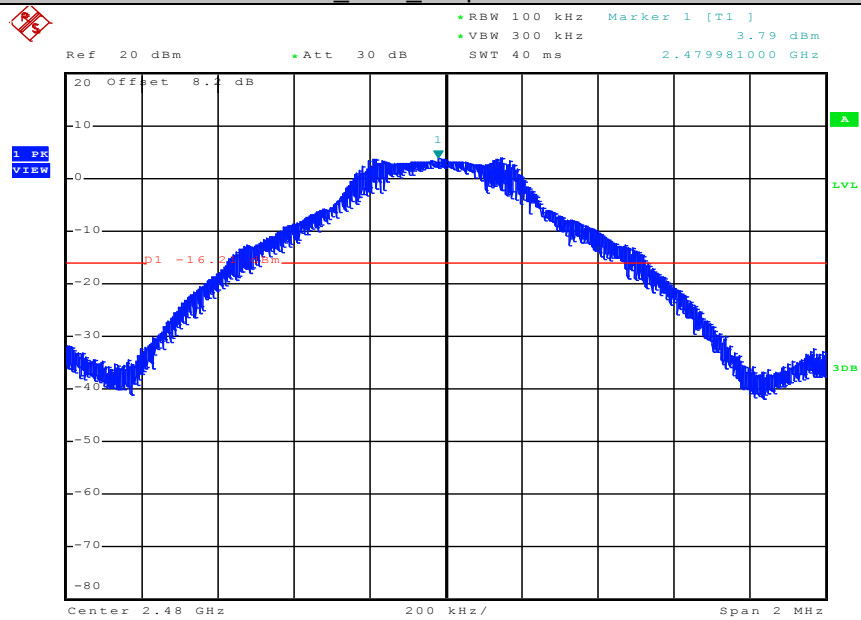
Puw



Date: 25.AUG.2019 16:38:14

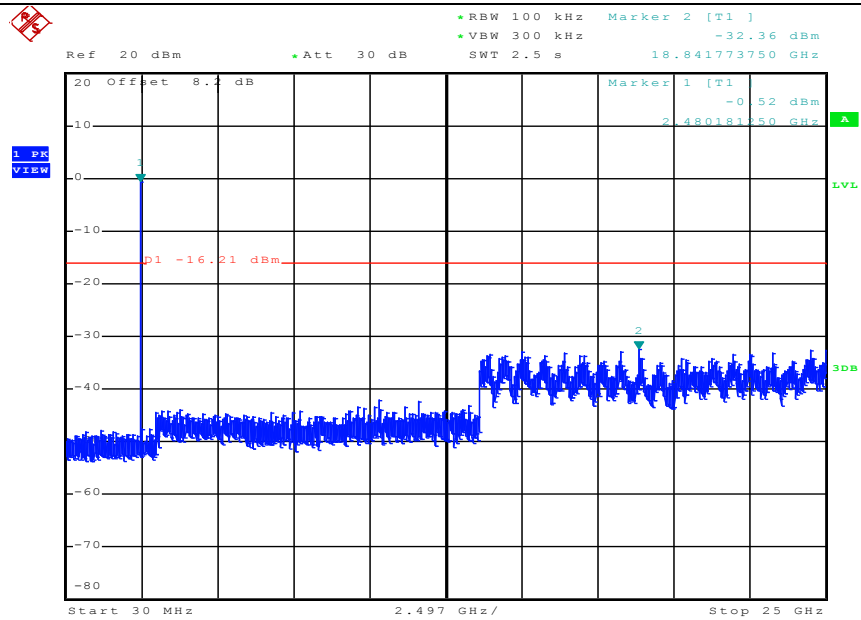
GFSK_HCH_Graphs

Pref



Date: 25.AUG.2019 17:40:55

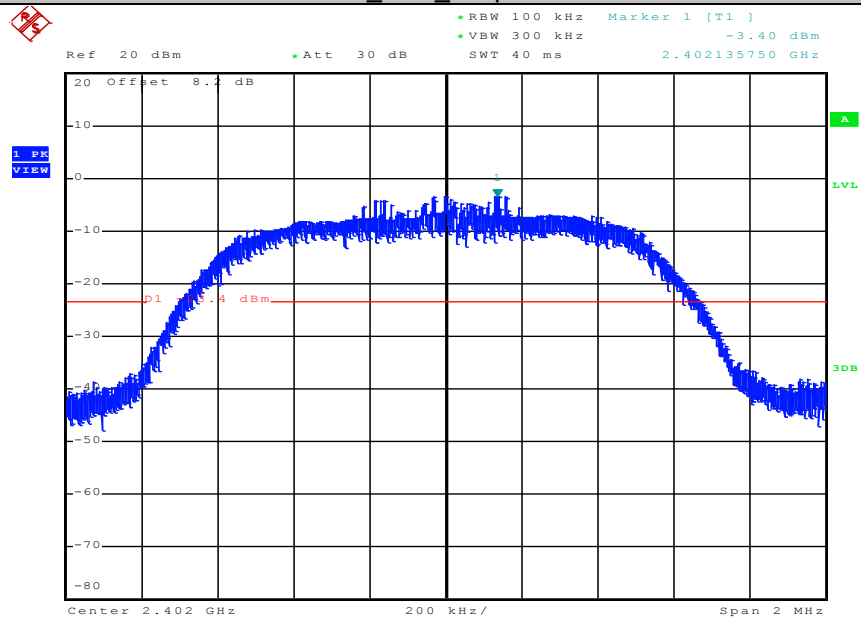
Puw



Date: 25.AUG.2019 17:41:10

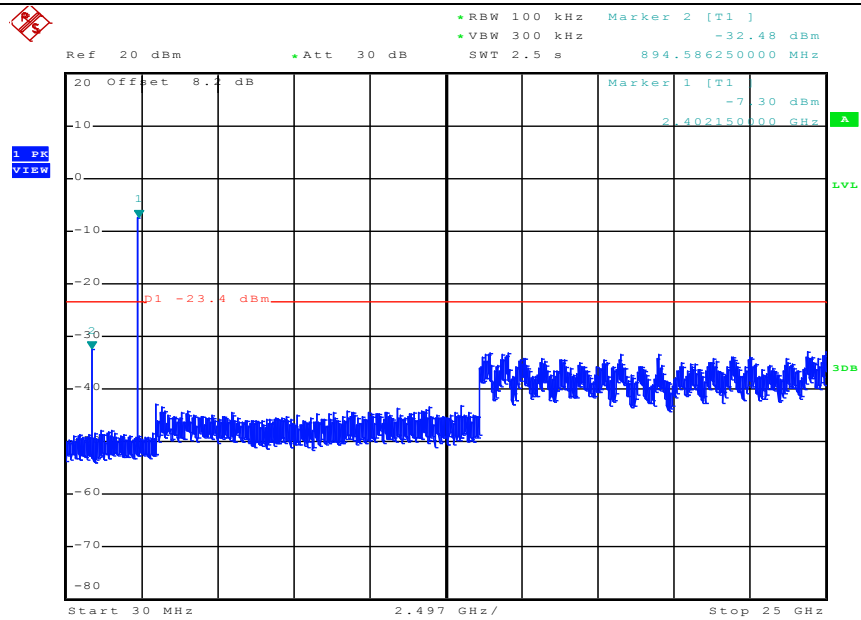
$\pi/4$ DQPSK_LCH_Graphs

Pref



Date: 25.AUG.2019 17:43:08

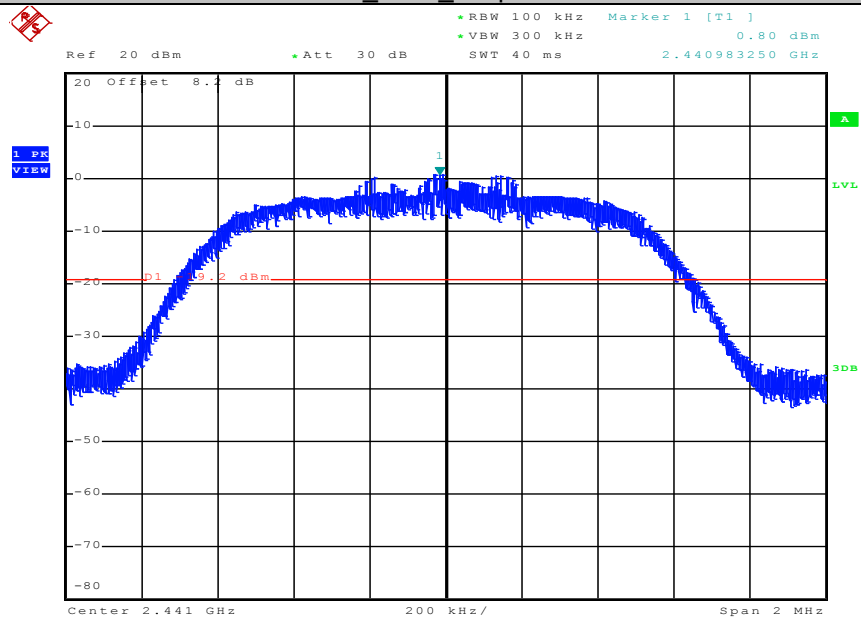
Puw



Date: 25.AUG.2019 17:43:23

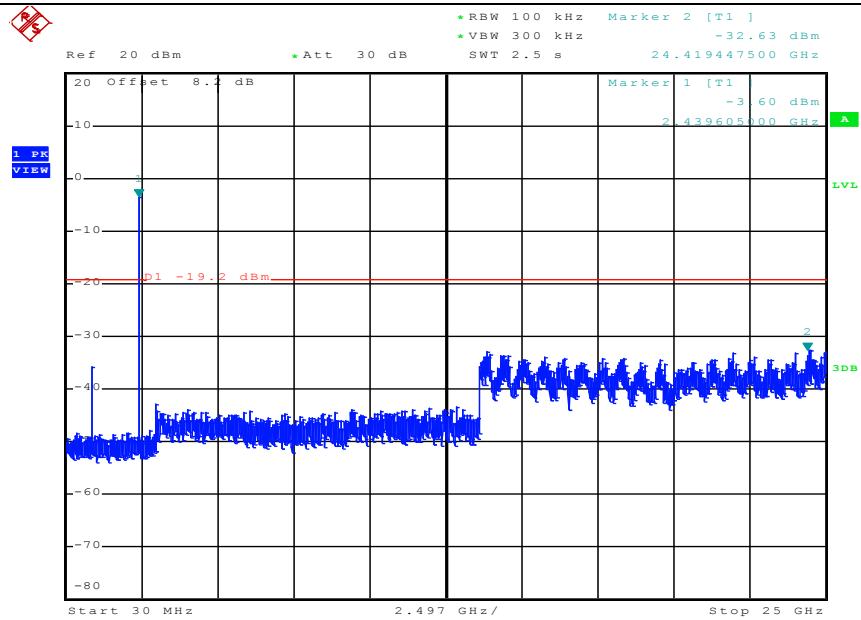
$\pi/4$ DQPSK_MCH_Graphs

Pref



Date: 25.AUG.2019 17:45:11

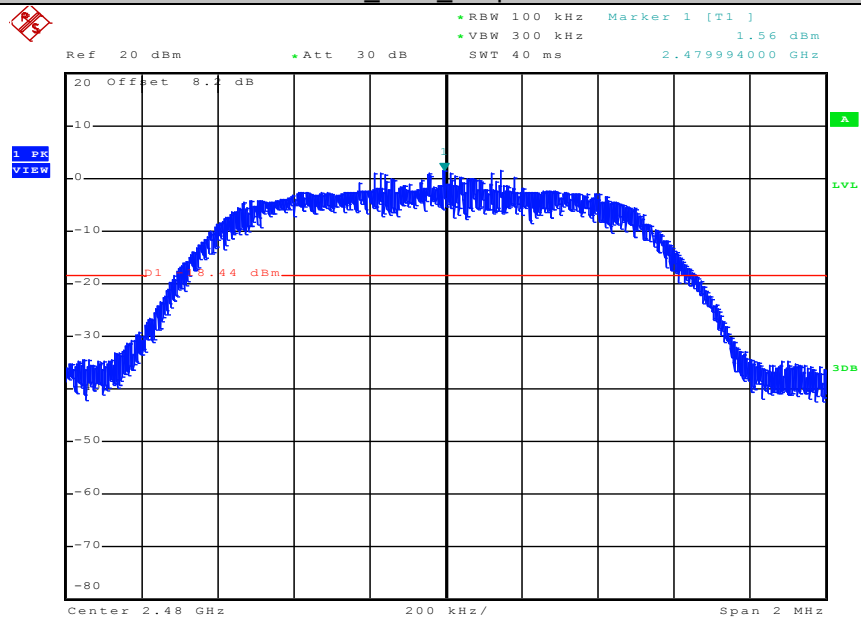
Puw



Date: 25.AUG.2019 17:45:26

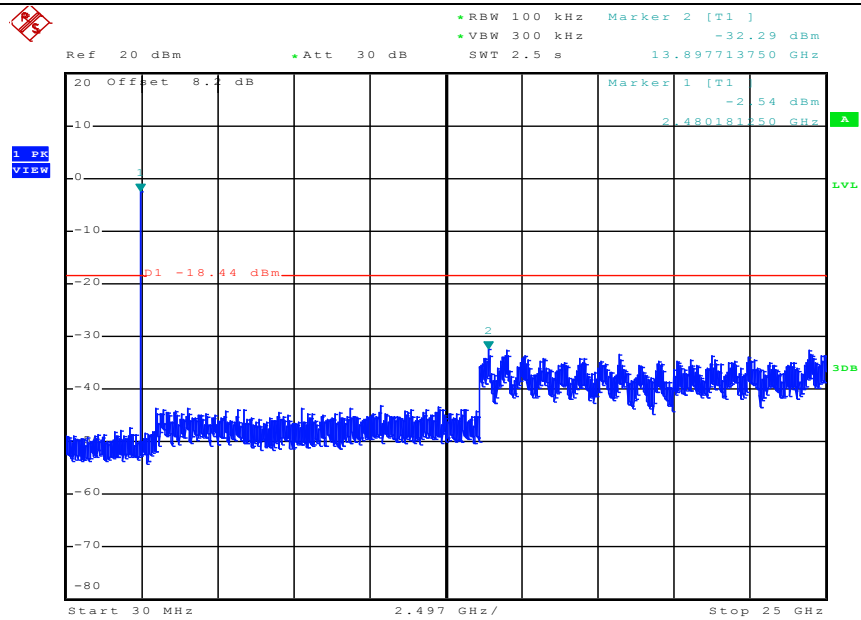
$\pi/4$ DQPSK_HCH_Graphs

Pref



Date: 25.AUG.2019 17:47:10

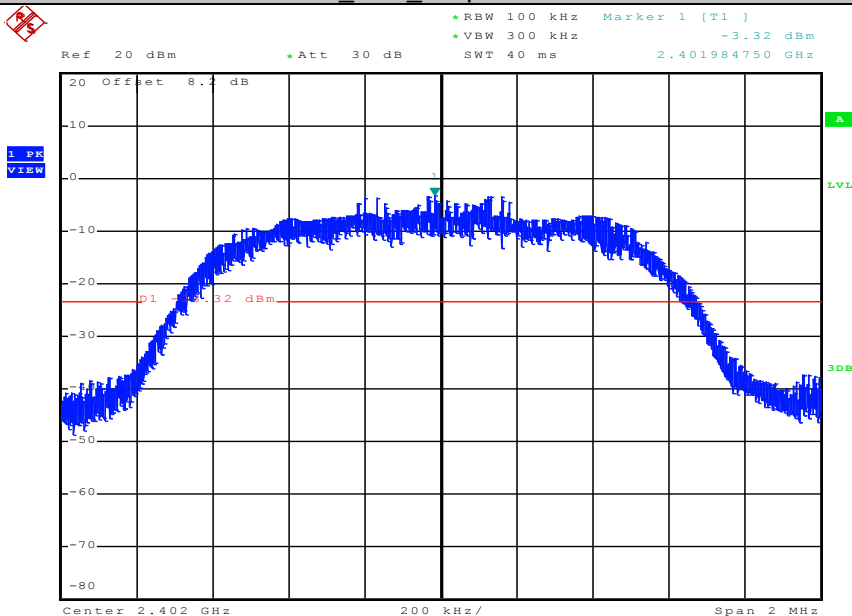
Puw



Date: 25.AUG.2019 17:47:24

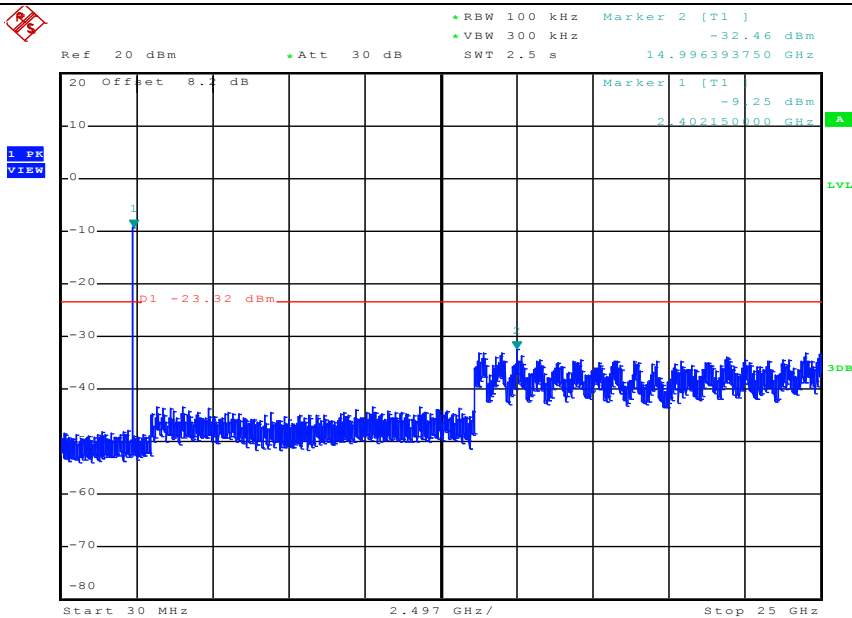
8DPSK LCH Graphs

Pref



Date: 25.AUG.2019 17:49:27

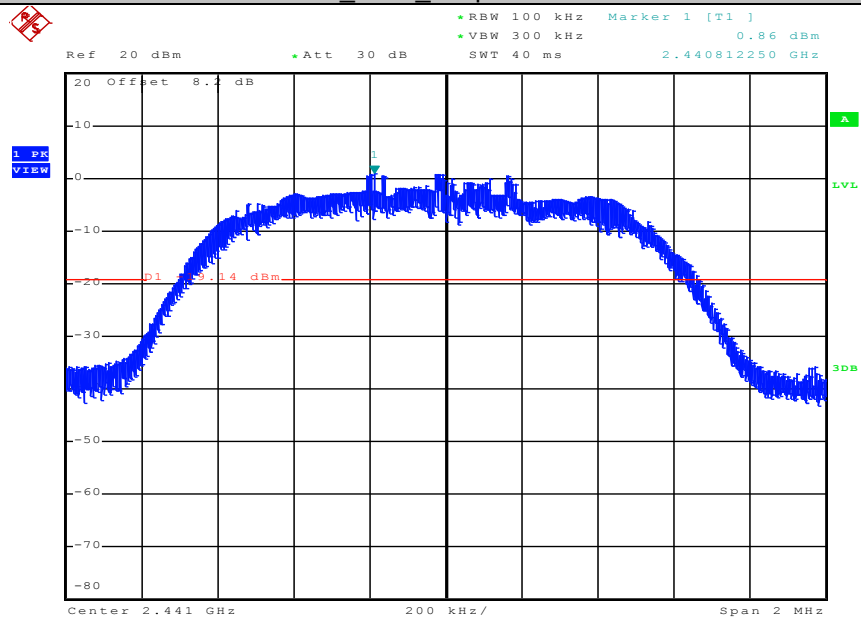
Puw



Date: 25.AUG.2019 17:49:42

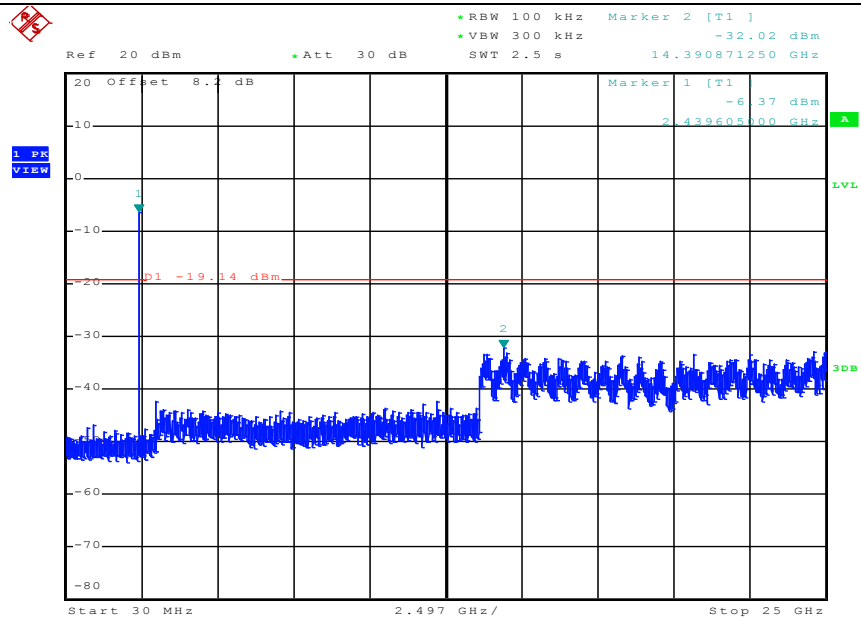
8DPSK_MCH_Graphs

Pref



Date: 25.AUG.2019 18:08:13

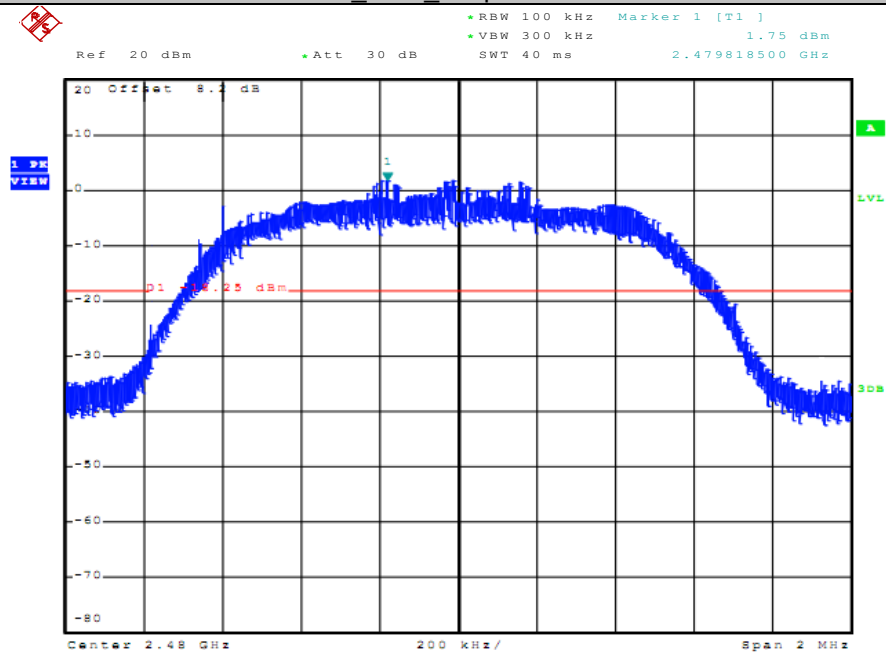
Puw



Date: 25.AUG.2019 18:08:28

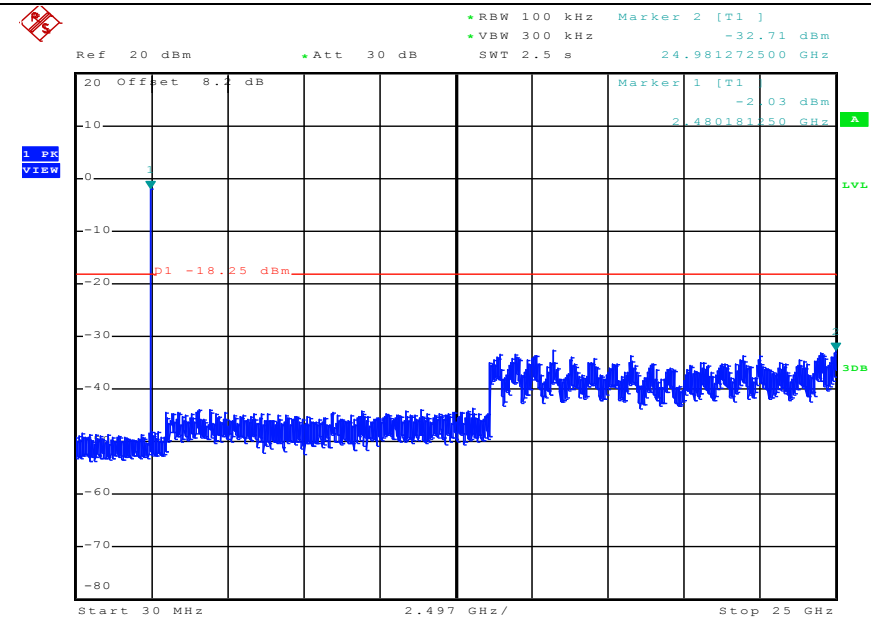
8DPSK_HCH_Graphs

Pref



Date: 25.AUG.2019 18:25:08

Puw



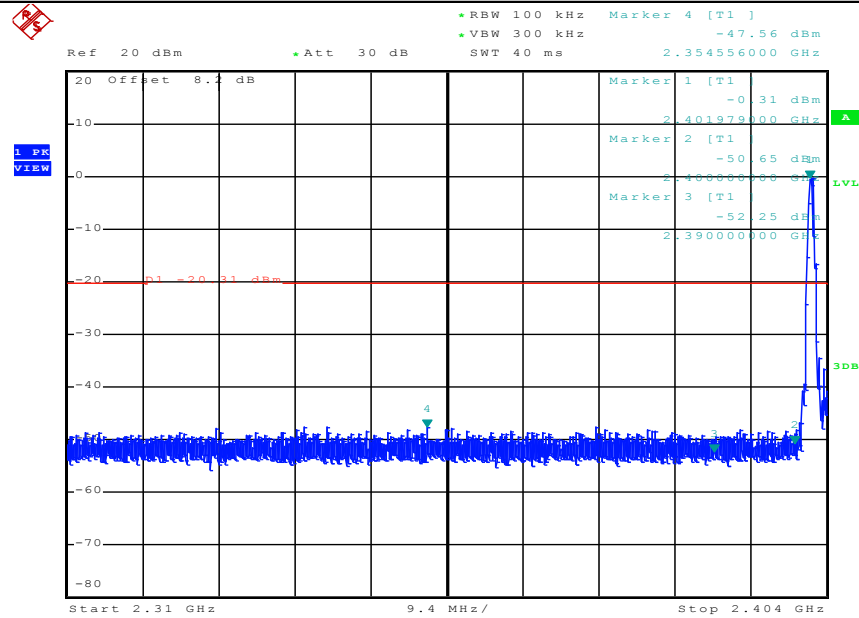
Date: 25.AUG.2019 18:25:22

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	-0.310	Off	-47.564	-20.31	PASS
			-0.710	On	-46.409	-20.71	PASS
	HCH	2480	3.790	Off	-47.490	-16.21	PASS
			0.900	On	-45.539	-19.1	PASS
$\pi/4$ DQPSK	LCH	2402	-5.050	Off	-47.304	-25.05	PASS
			-0.470	On	-46.898	-20.47	PASS
	HCH	2480	1.630	Off	-47.372	-18.37	PASS
			1.250	On	-36.999	-18.75	PASS
8DPSK	LCH	2402	-3.760	Off	-47.551	-23.76	PASS
			-0.110	On	-47.109	-20.11	PASS
	HCH	2480	1.680	Off	-46.980	-18.32	PASS
			1.390	On	-46.151	-18.61	PASS

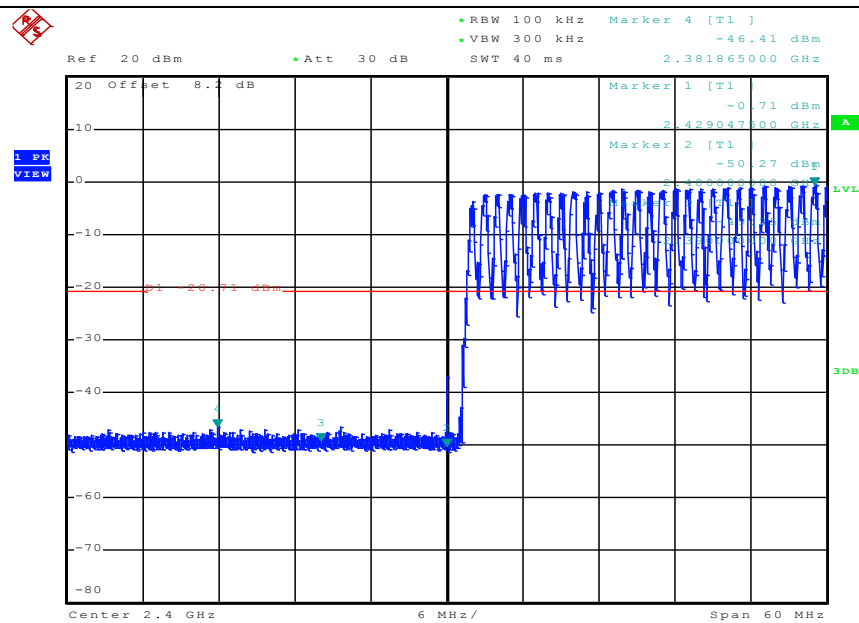
Test Graphs

GFSK/LCH/No Hop



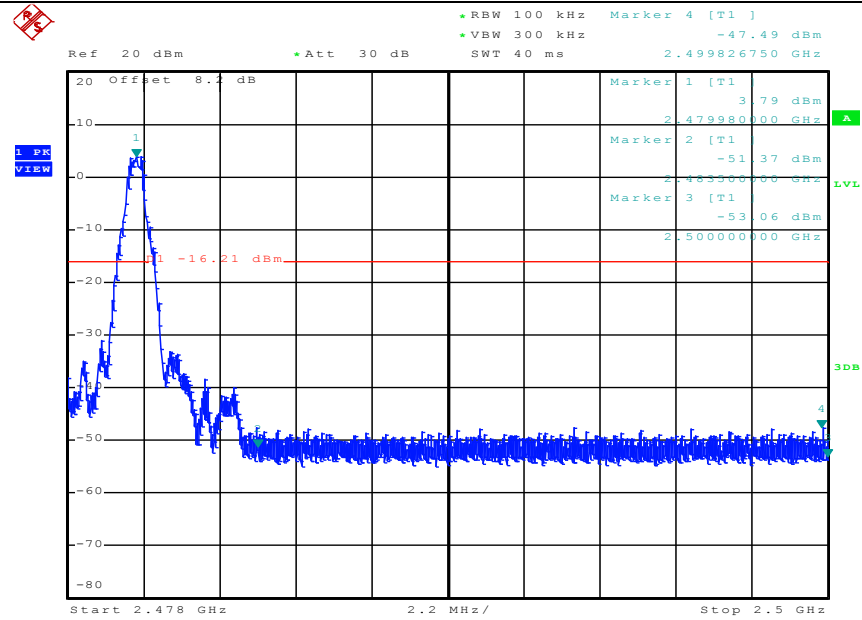
Date: 25.AUG.2019 16:35:35

GFSK/LCH/Hop



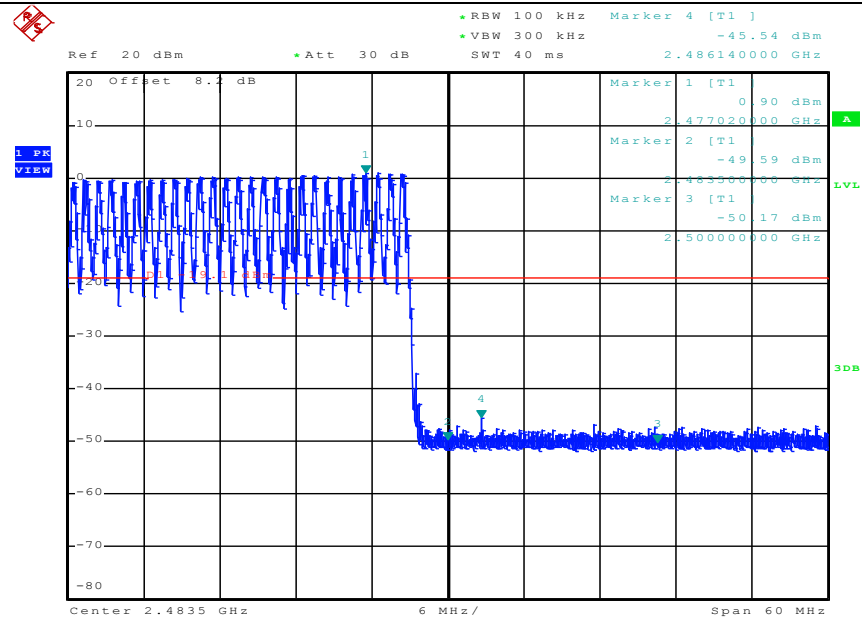
Date: 25.AUG.2019 17:00:34

GFSK/HCH/No Hop



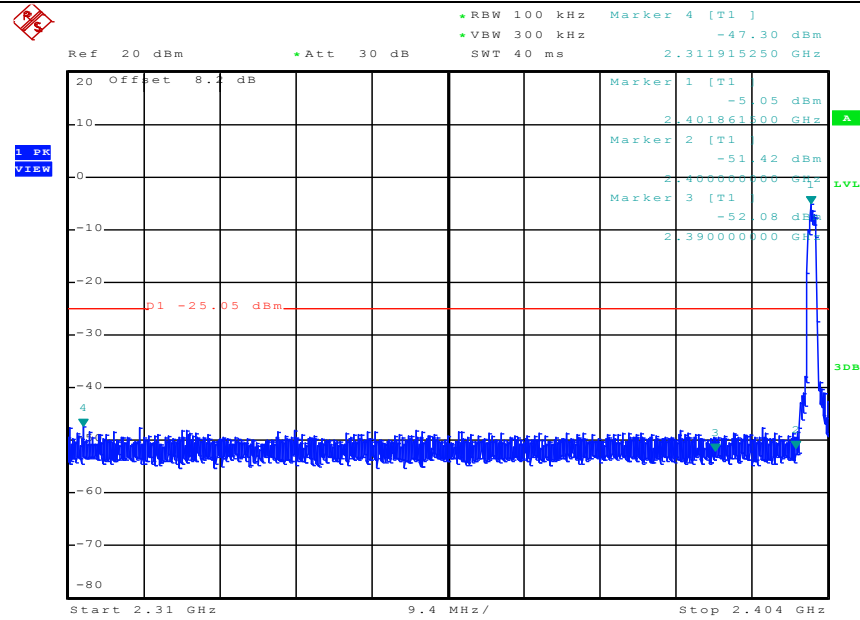
Date: 25.AUG.2019 17:40:42

GFSK/HCH/Hop



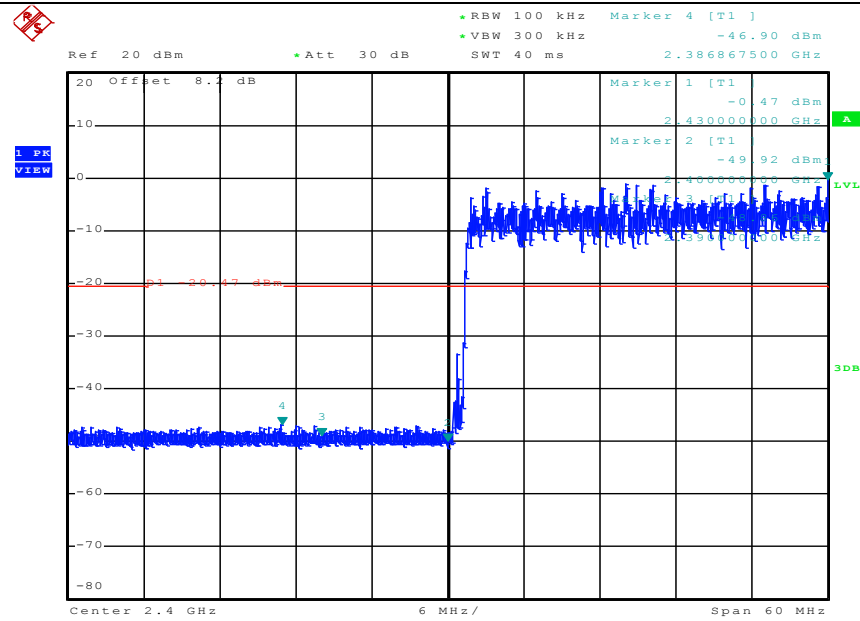
Date: 25.AUG.2019 17:03:14

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



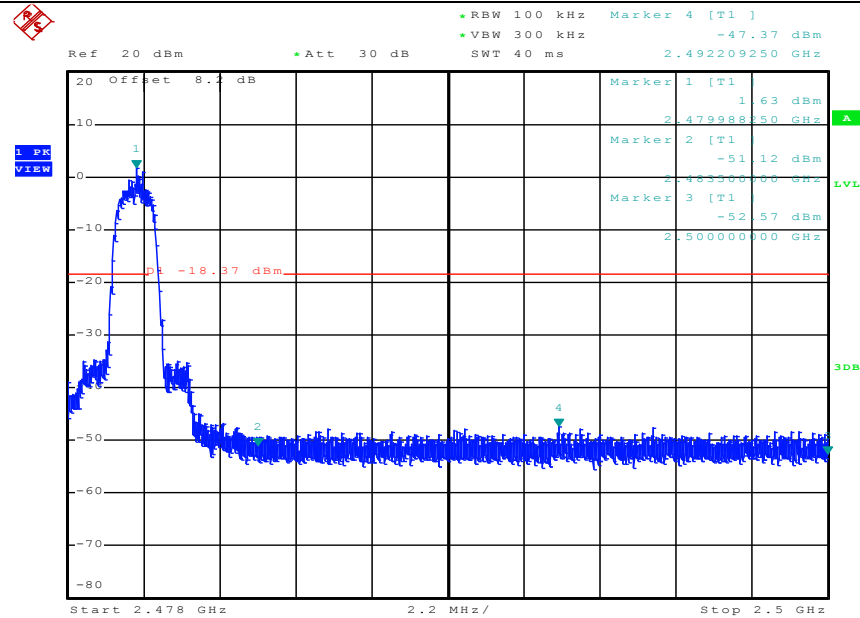
Date: 25.AUG.2019 17:42:55

$\pi/4$ DQPSK/LCH/Hop



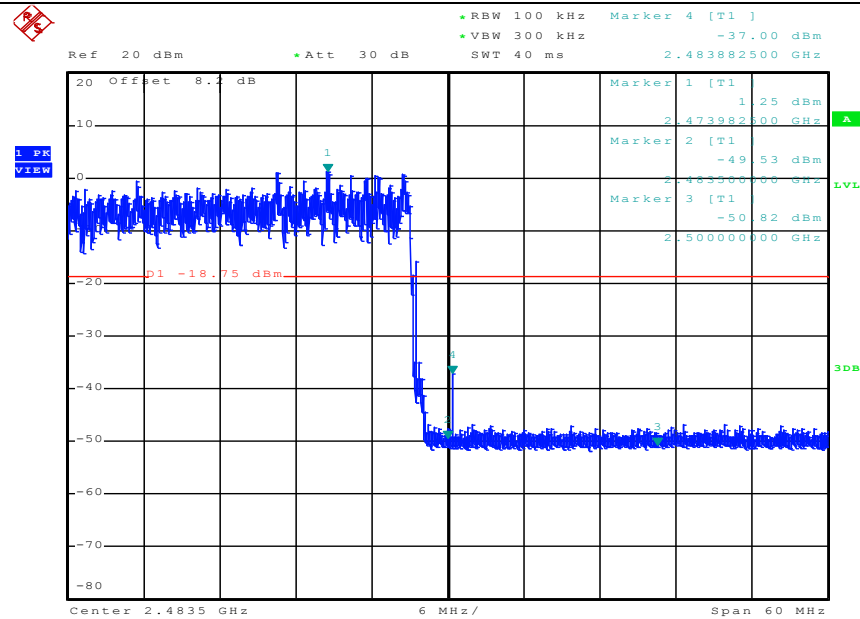
Date: 25.AUG.2019 17:08:54

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



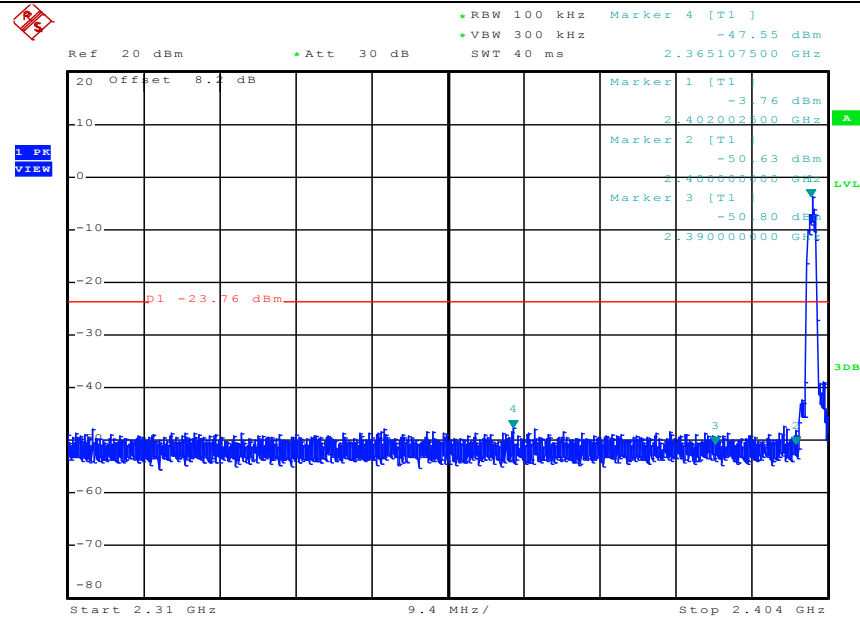
Date: 25.AUG.2019 17:46:57

$\pi/4$ DQPSK/HCH/Hop



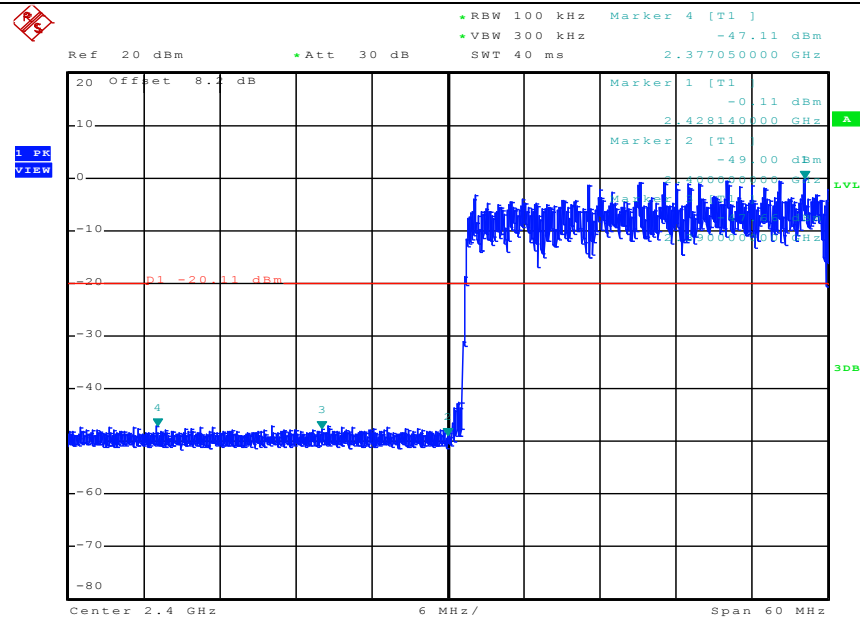
Date: 25.AUG.2019 17:11:54

8DPSK/LCH/No Hop



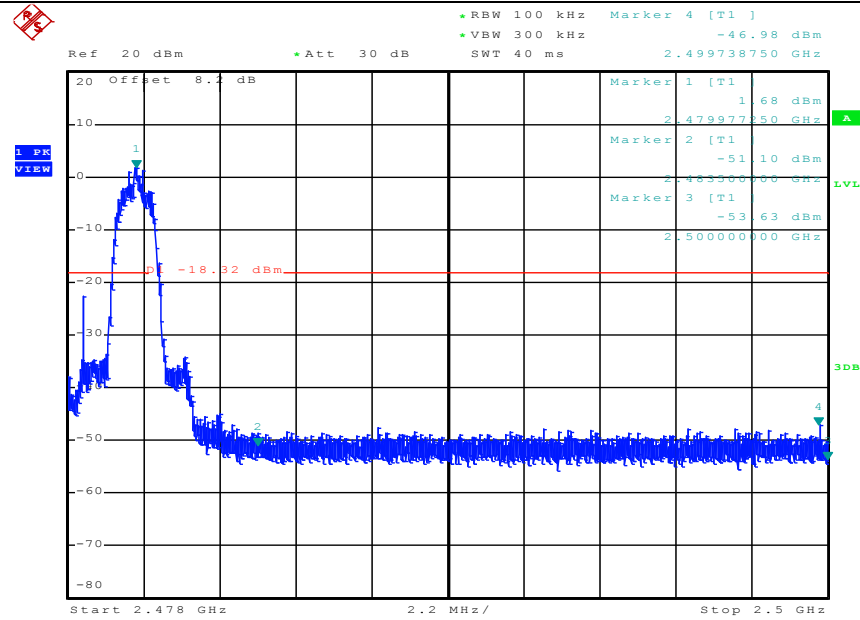
Date: 25.AUG.2019 17:49:14

8DPSK/LCH/Hop



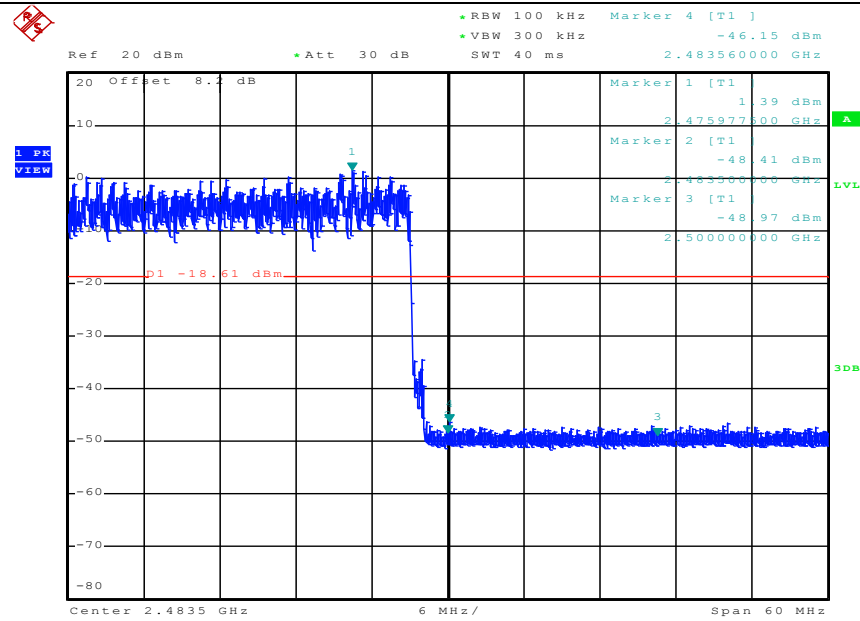
Date: 25.AUG.2019 17:17:53

8DPSK/HCH/No Hop



Date: 25.AUG.2019 18:24:55

8DPSK/HCH/Hop

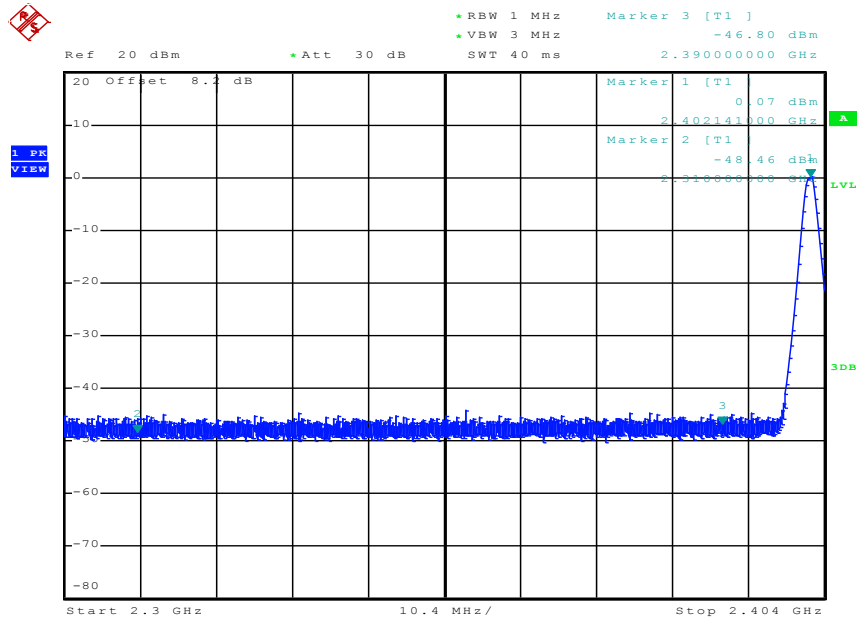


Date: 25.AUG.2019 17:22:22

A.8 Restrict-band band-edge measurements

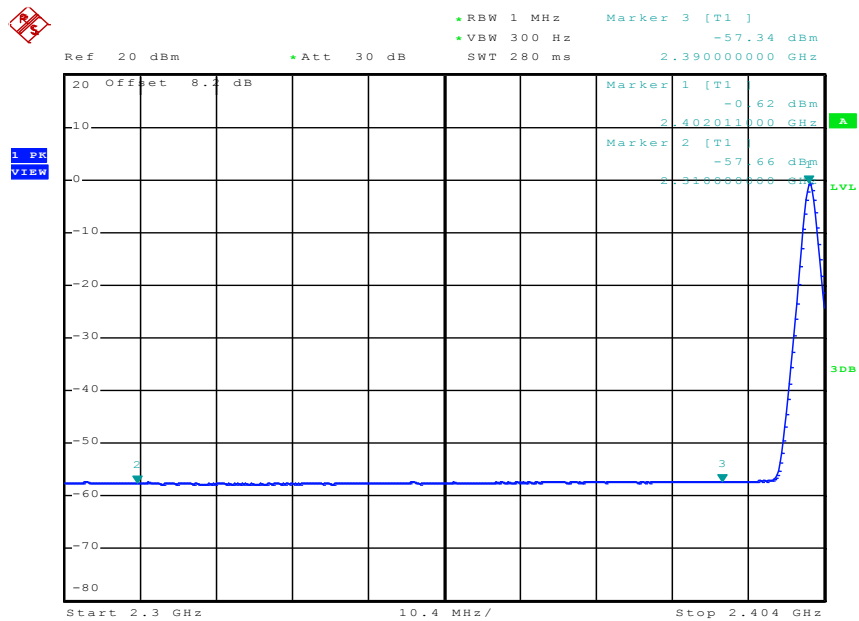
Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-48.46	2.0	0	48.80	PEAK	74	PASS
	Off	2310.0	-57.66	2.0	0	39.60	AV	54	PASS
	Off	2390.0	-46.80	2.0	0	50.46	PEAK	74	PASS
	Off	2390.0	-57.34	2.0	0	39.92	AV	54	PASS
	Off	2483.5	-37.67	2.0	0	59.59	PEAK	74	PASS
	Off	2483.5	-43.90	2.0	0	53.36	AV	54	PASS
	Off	2500.0	-47.69	2.0	0	49.57	PEAK	74	PASS
	Off	2500.0	-57.42	2.0	0	39.84	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-48.07	2.0	0	49.19	PEAK	74	PASS
	Off	2310.0	-57.64	2.0	0	39.62	AV	54	PASS
	Off	2390.0	-47.80	2.0	0	49.46	PEAK	74	PASS
	Off	2390.0	-57.54	2.0	0	39.72	AV	54	PASS
	Off	2483.5	-39.59	2.0	0	57.67	PEAK	74	PASS
	Off	2483.5	-45.42	2.0	0	51.84	AV	54	PASS
	Off	2500.0	-48.07	2.0	0	49.19	PEAK	74	PASS
	Off	2500.0	-58.04	2.0	0	39.22	AV	54	PASS
8DPSK	Off	2310.0	-48.40	2.0	0	48.86	PEAK	74	PASS
	Off	2310.0	-57.73	2.0	0	39.53	AV	54	PASS
	Off	2390.0	-49.51	2.0	0	47.75	PEAK	74	PASS
	Off	2390.0	-57.45	2.0	0	39.81	AV	54	PASS
	Off	2483.5	-39.63	2.0	0	57.63	PEAK	74	PASS
	Off	2483.5	-45.35	2.0	0	51.91	AV	54	PASS
	Off	2500.0	-48.41	2.0	0	48.85	PEAK	74	PASS
	Off	2500.0	-58.09	2.0	0	39.17	AV	54	PASS

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



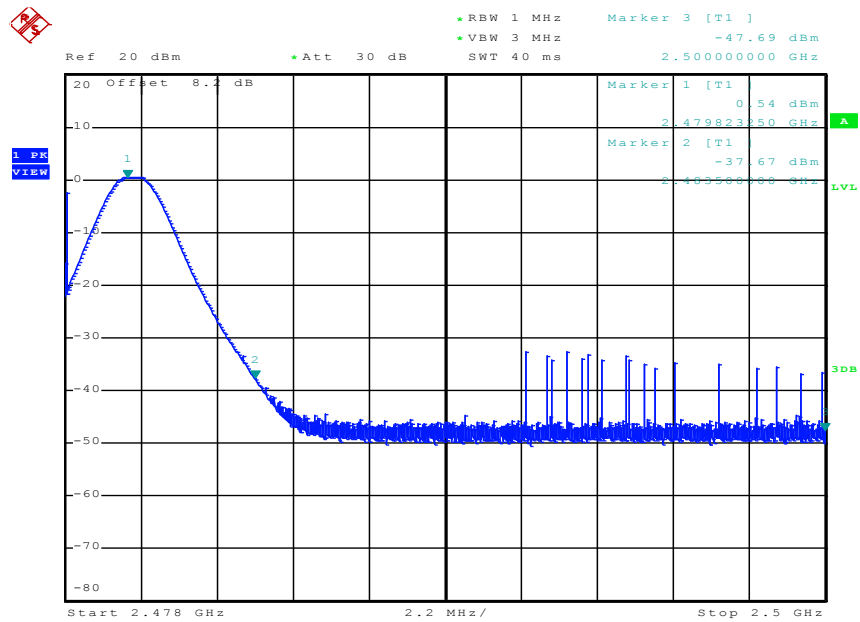
Date: 25.AUG.2019 16:36:21

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



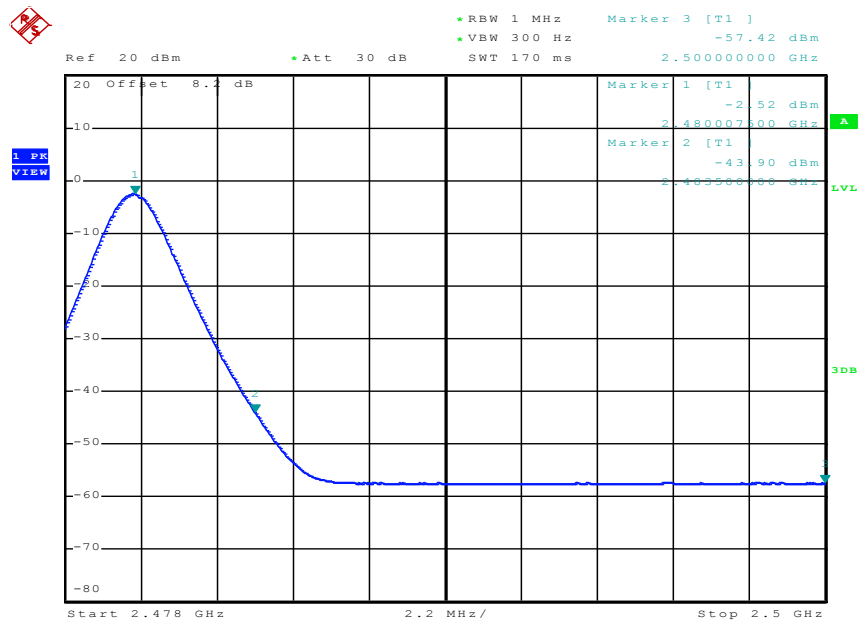
Date: 25.AUG.2019 16:36:34

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



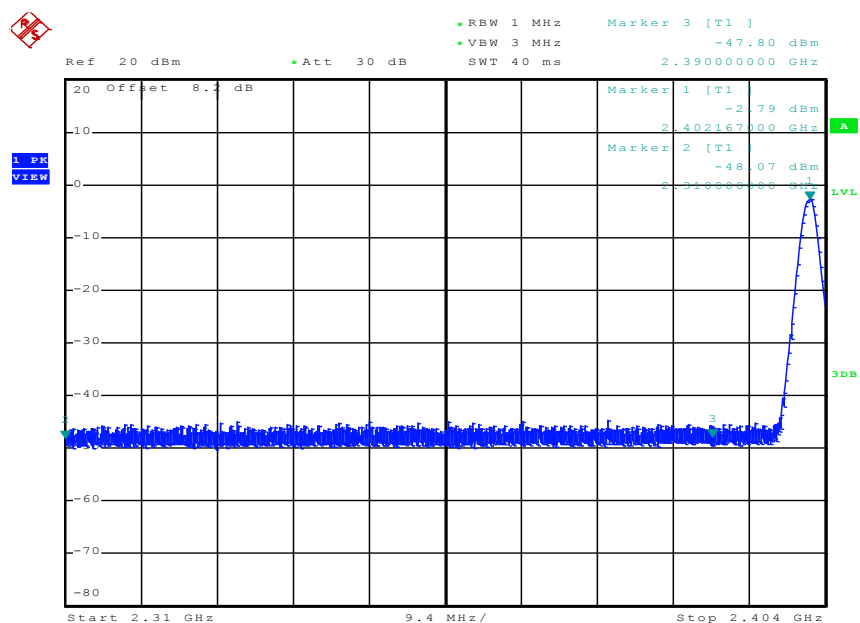
Date: 25.AUG.2019 18:30:14

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



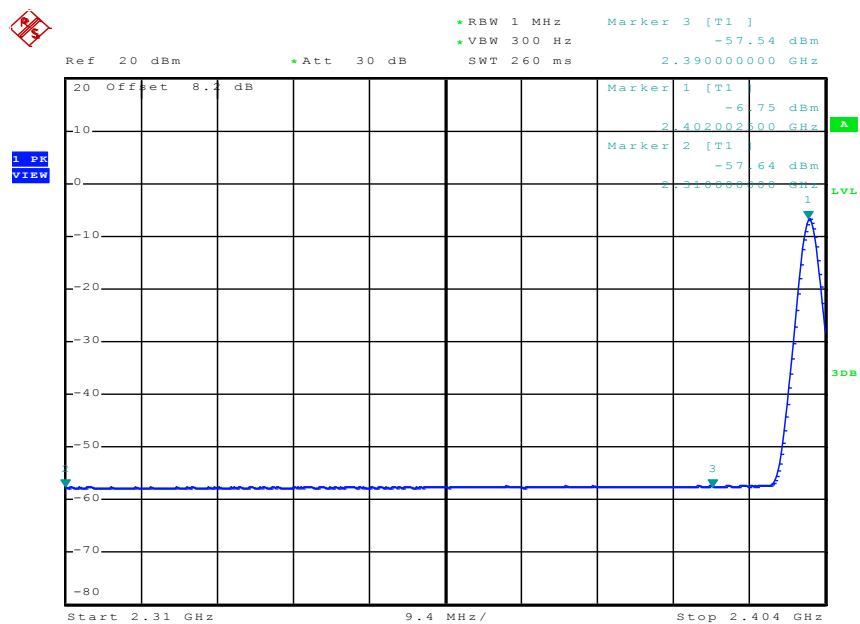
Date: 25.AUG.2019 20:24:01

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



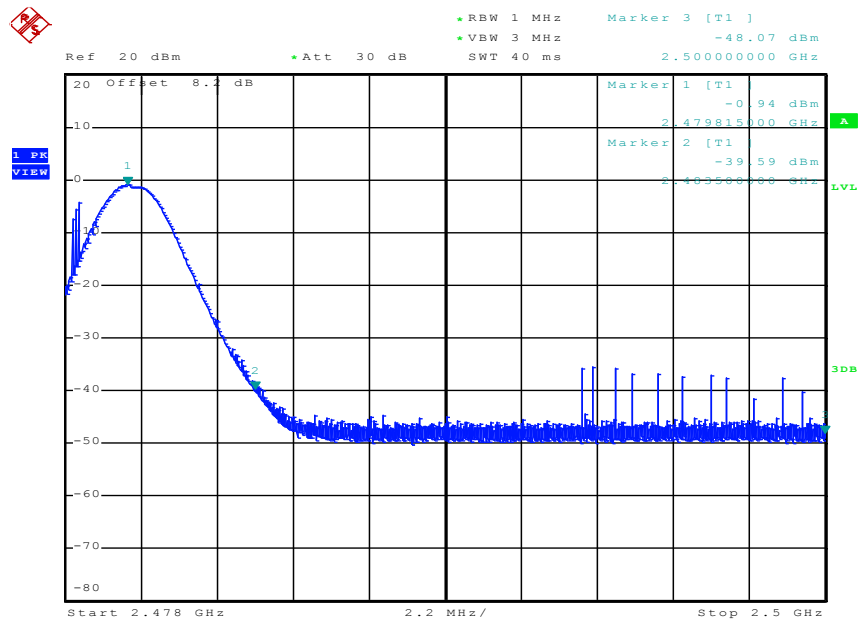
Date: 25.AUG.2019 17:43:42

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



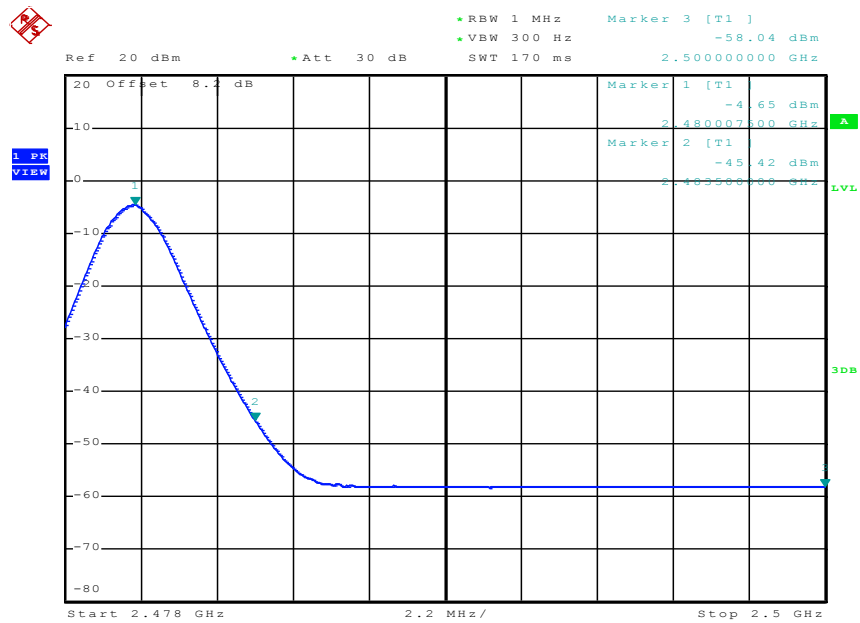
Date: 25.AUG.2019 17:43:55

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



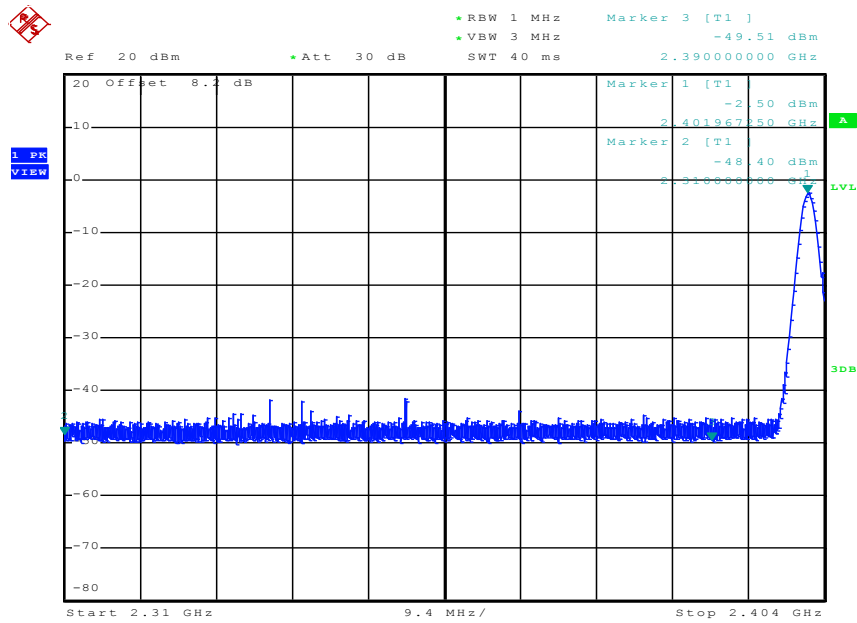
Date: 25.AUG.2019 18:31:27

Restrict-band band-edge measurements_Hopping Off_π/4-DQPSK_Average (High Channel)



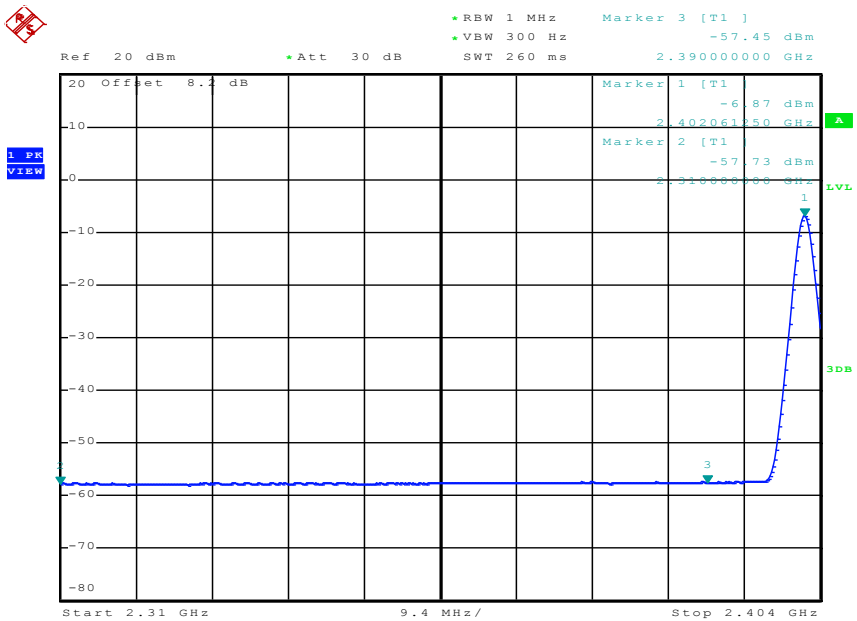
Date: 25.AUG.2019 18:31:40

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



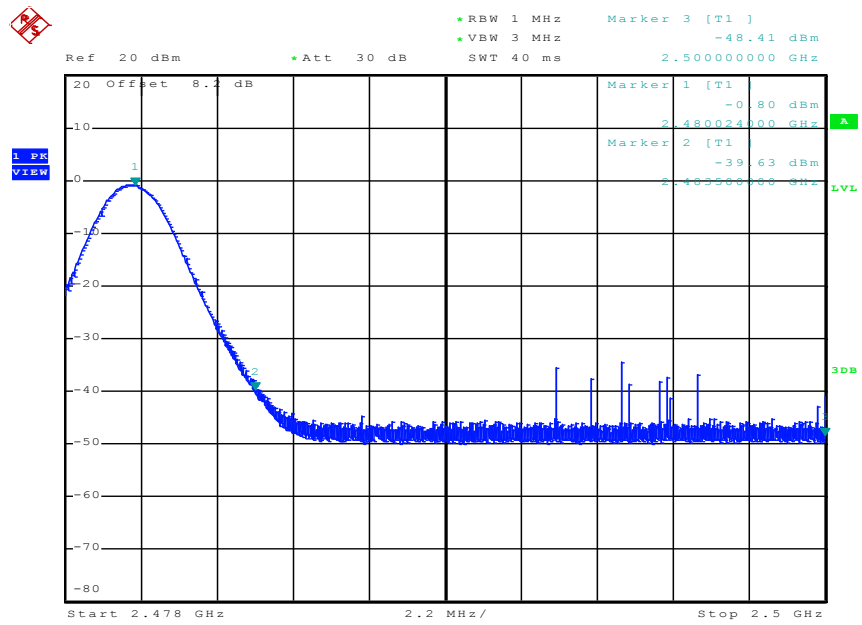
Date: 25.AUG.2019 17:54:28

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



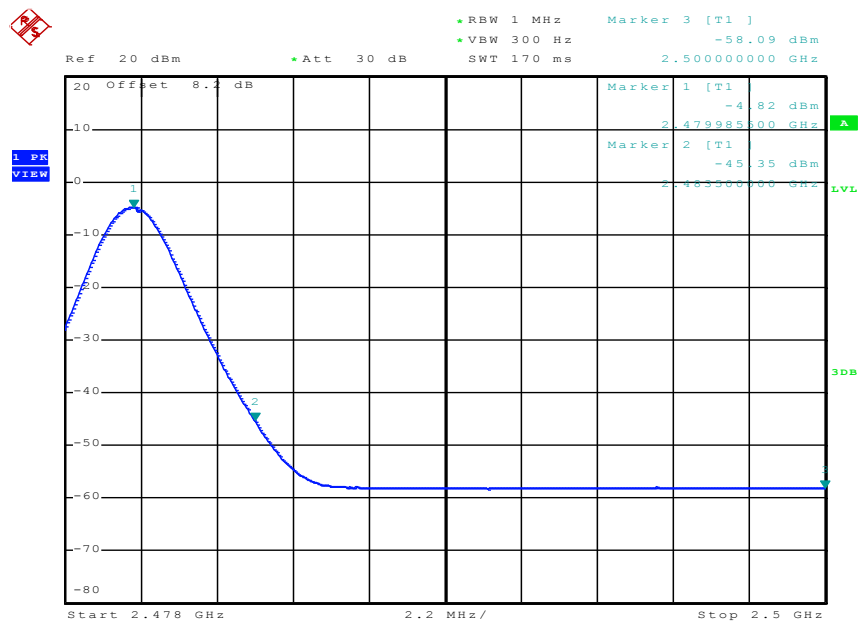
Date: 25.AUG.2019 17:54:41

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



Date: 25.AUG.2019 18:33:19

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



Date: 25.AUG.2019 18:33:32