

Appendix A

RF Test Data for BT V5.0(BDR/EDR) (Conducted Measurement)

Product Name: Wireless Earbuds

Trade Mark: Holyhigh

Test Model: 5030

Environmental Conditions

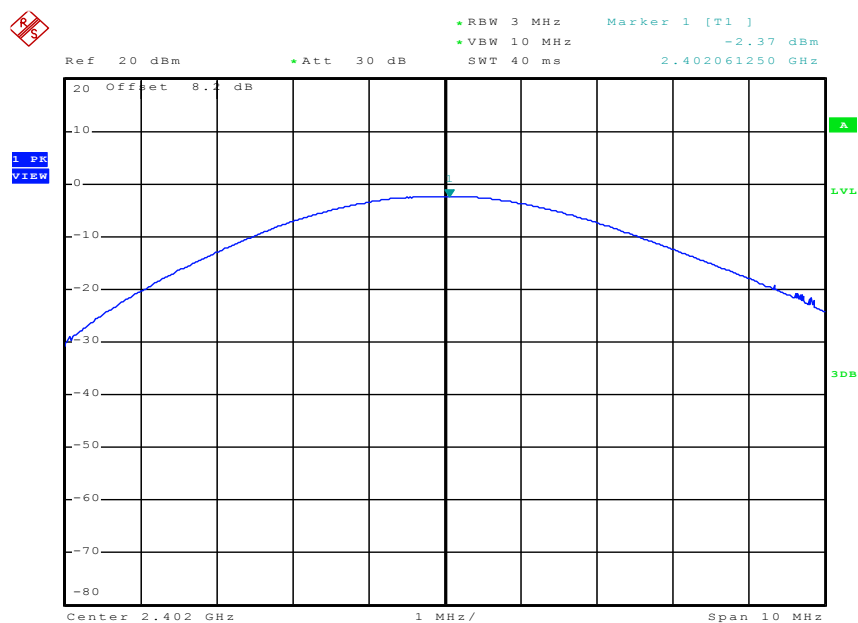
Temperature:	24.6 ° C
Relative Humidity:	53.8 %
ATM Pressure:	100.0 kPa
Test Engineer:	Alisa Huang
Supervised by:	Wang.Chuang

A.1 Maximum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-2.370	30	PASS
	MCH	-1.150	30	PASS
	HCH	-2.310	30	PASS
$\pi/4$ DQPSK	LCH	-3.070	21	PASS
	MCH	-1.880	21	PASS
	HCH	-2.800	21	PASS
8DPSK	LCH	-2.920	21	PASS
	MCH	-1.640	21	PASS
	HCH	-2.800	21	PASS

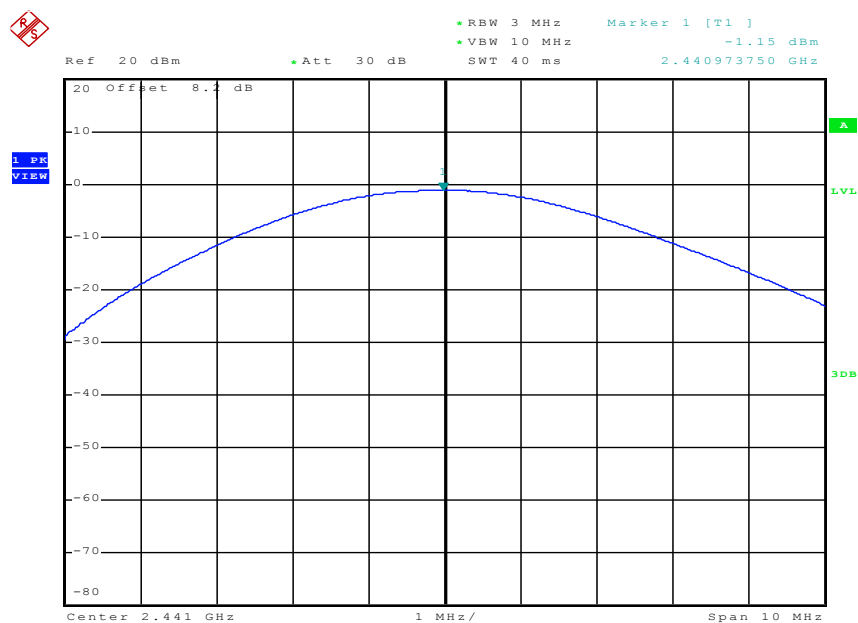
Test Graphs

GFSK/LCH



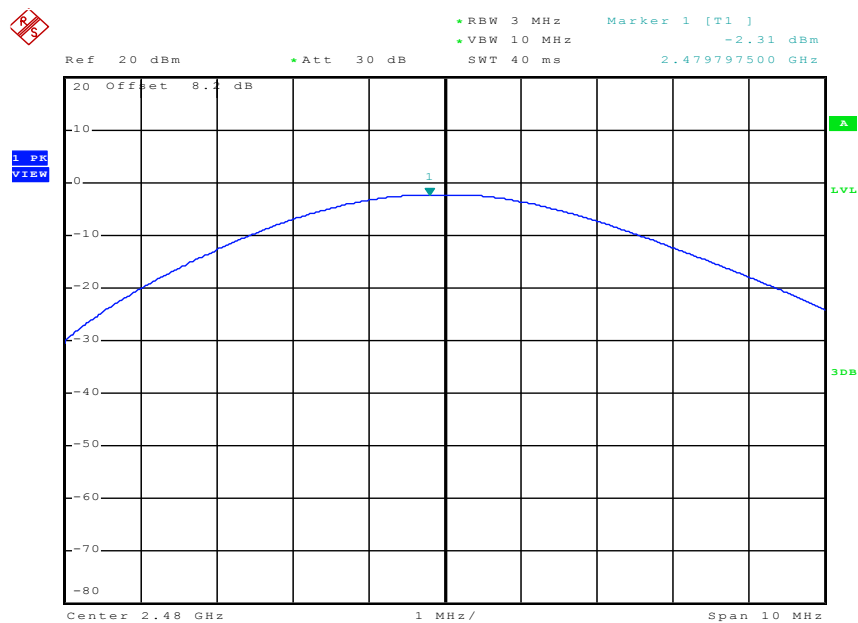
Date: 12 AUG 2019 21:52:13

GFSK/MCH

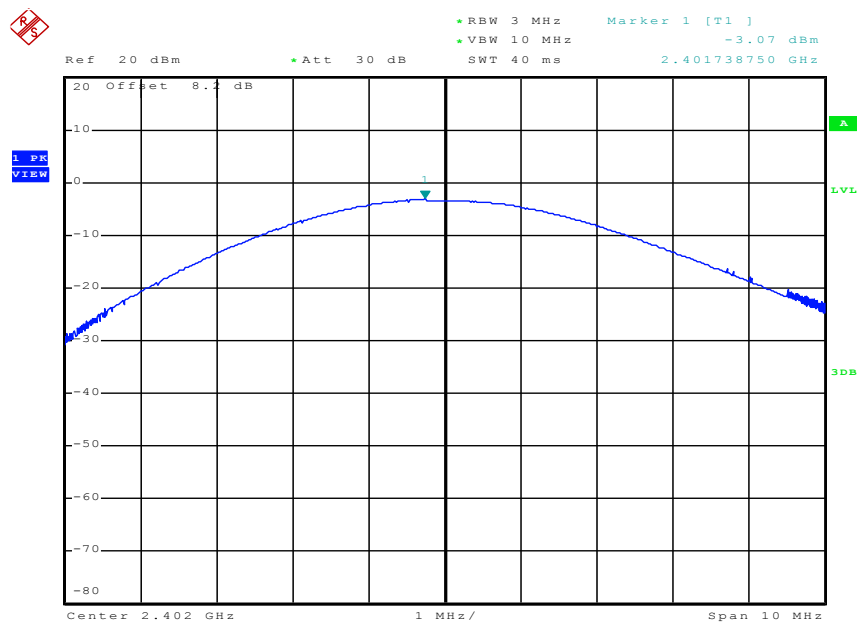


Date: 12 AUG 2019 21:54:48

GFSK/HCH

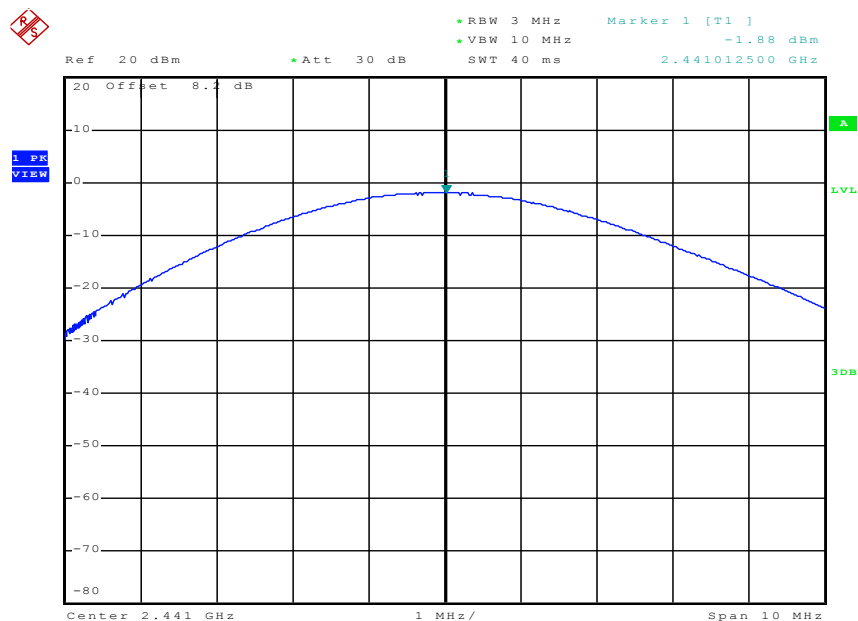


Date: 12 AUG 2019 21:56:58

 $\pi/4$ DQPSK/LCH

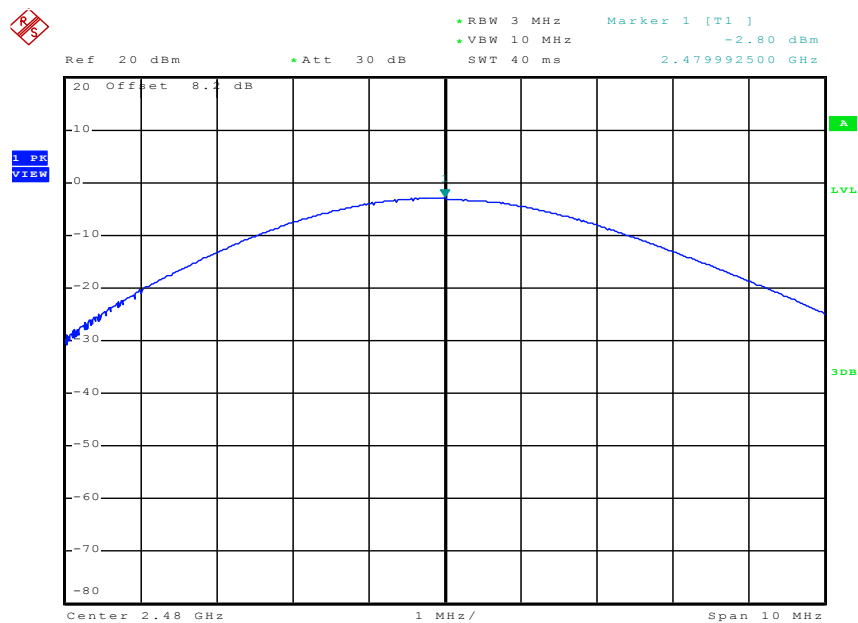
Date: 12 AUG 2019 21:59:39

$\pi/4$ DQPSK/MCH



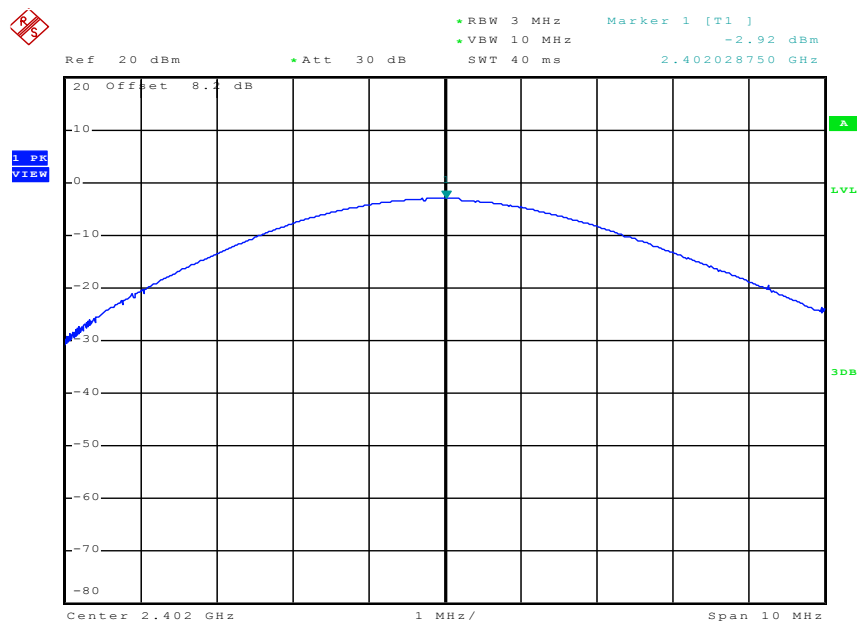
Date: 12 AUG 2019 22:02:16

$\pi/4$ DQPSK/HCH



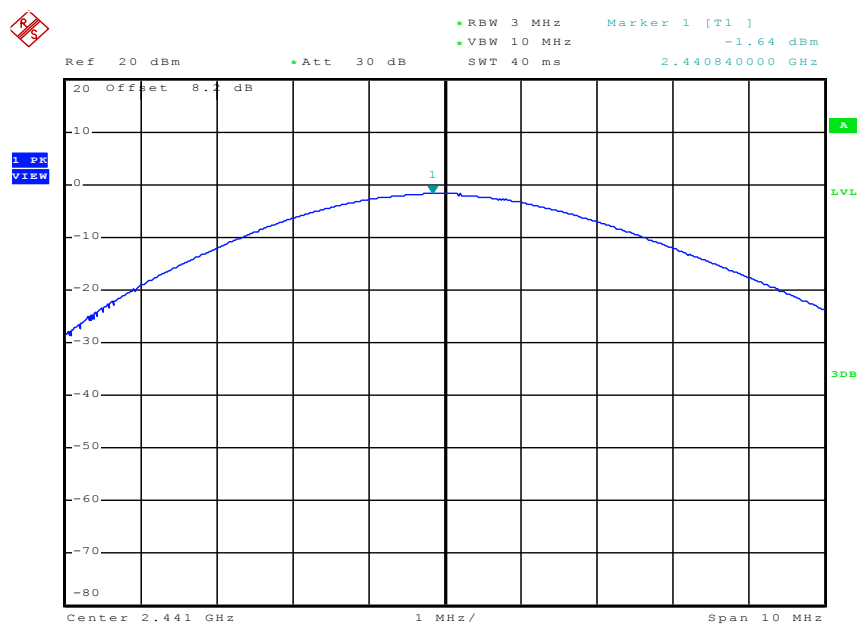
Date: 12 AUG 2019 22:04:14

8DPSK/LCH



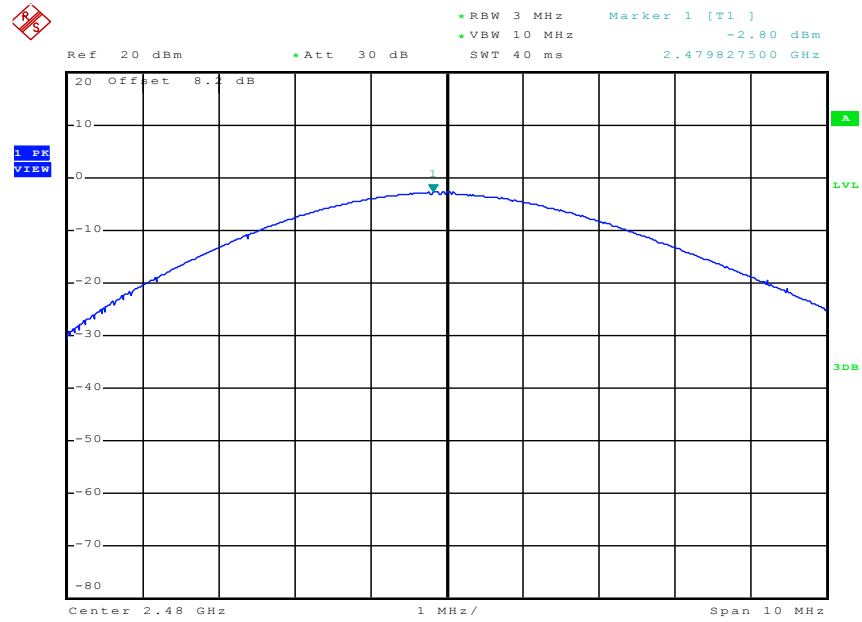
Date: 12 AUG 2019 22:07:16

8DPSK/MCH



Date: 12 AUG 2019 22:09:41

8DPSK/HCH



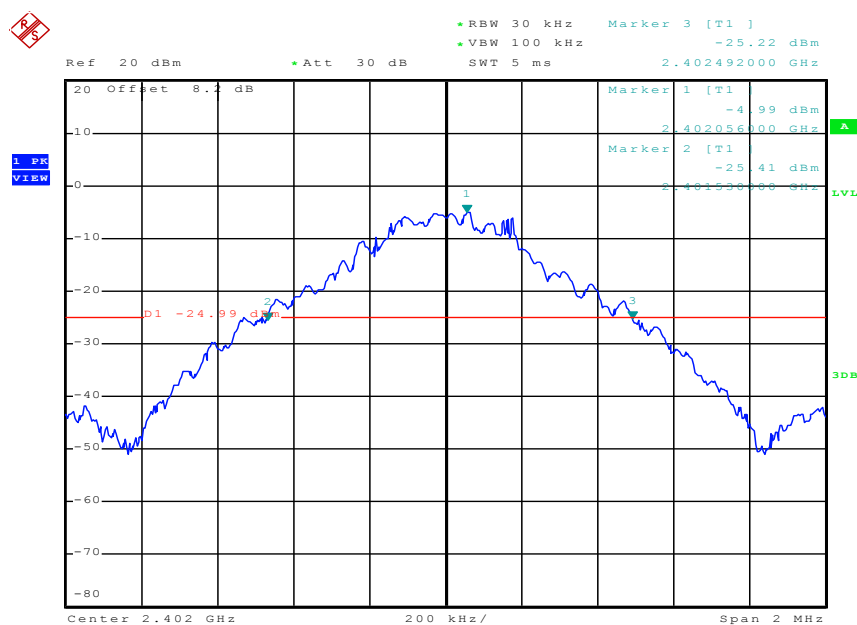
Date: 12 AUG 2019 22:11:22

A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.962	Not Specified	PASS
	MCH	1.022	Not Specified	PASS
	HCH	0.974	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.316	Not Specified	PASS
	MCH	1.292	Not Specified	PASS
	HCH	1.294	Not Specified	PASS
8DPSK	LCH	1.290	Not Specified	PASS
	MCH	1.308	Not Specified	PASS
	HCH	1.294	Not Specified	PASS

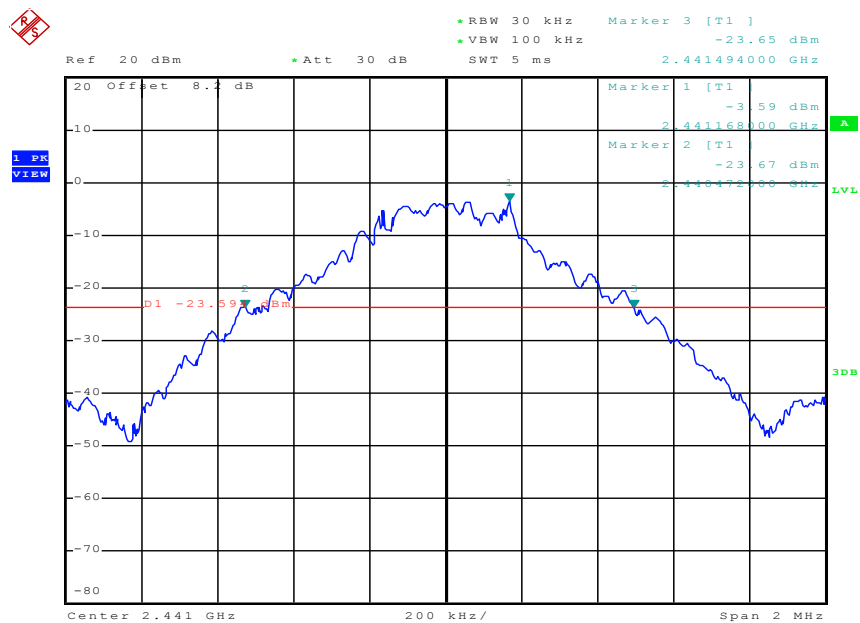
Test Graphs

GFSK/LCH



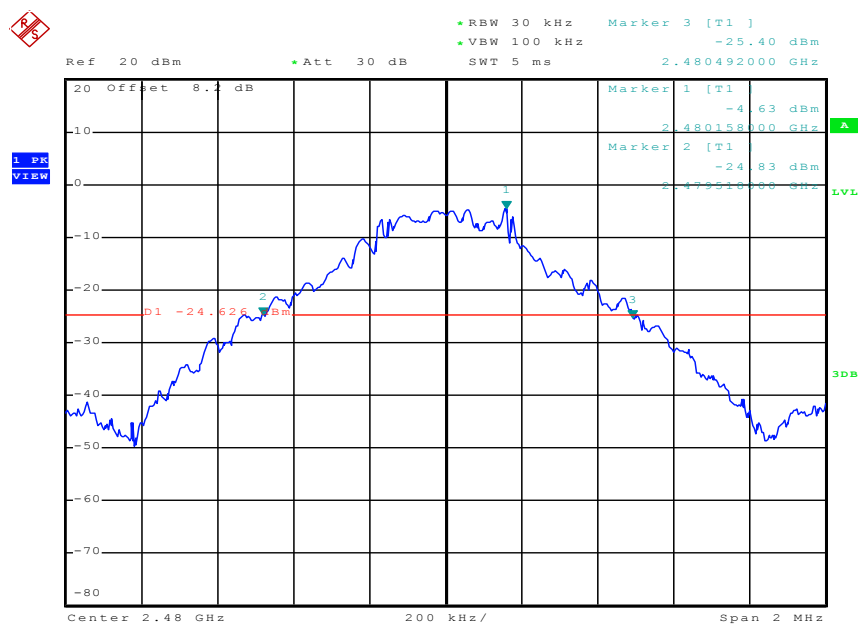
Date: 12.AUG.2019 21:51:36

GFSK/MCH

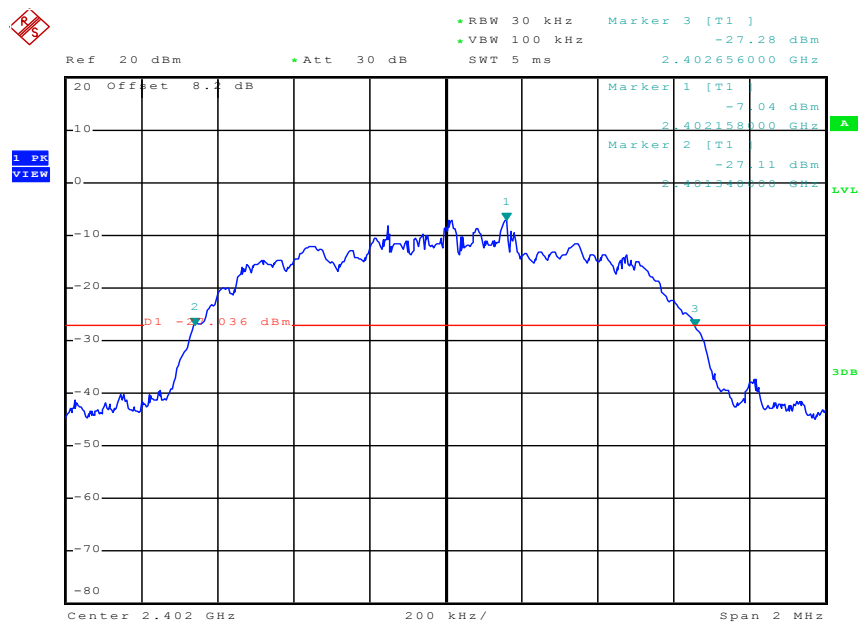


Date: 12 AUG 2019 21:54:12

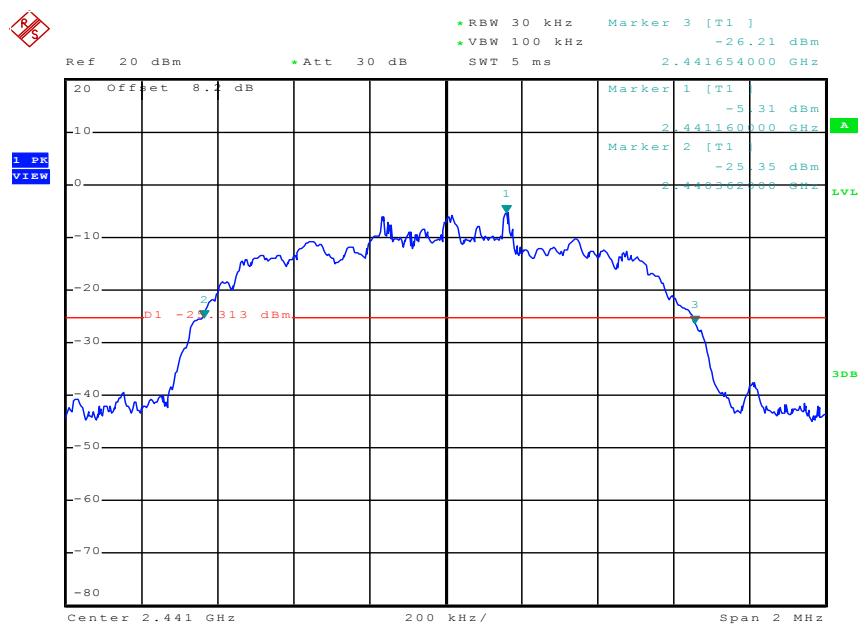
GFSK/HCH



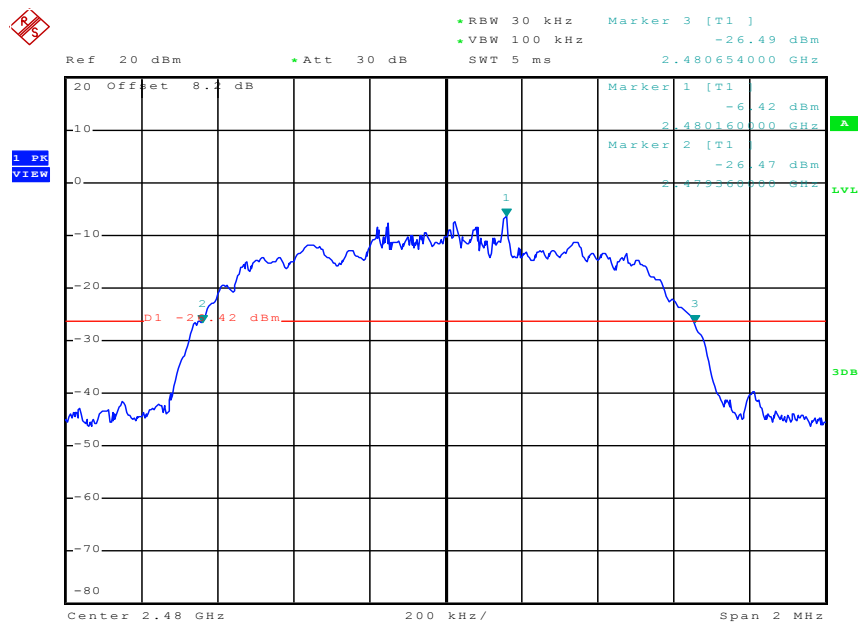
Date: 12 AUG 2019 21:56:22

$\pi/4$ DQPSK/LCH

Date: 12 AUG 2019 21:59:03

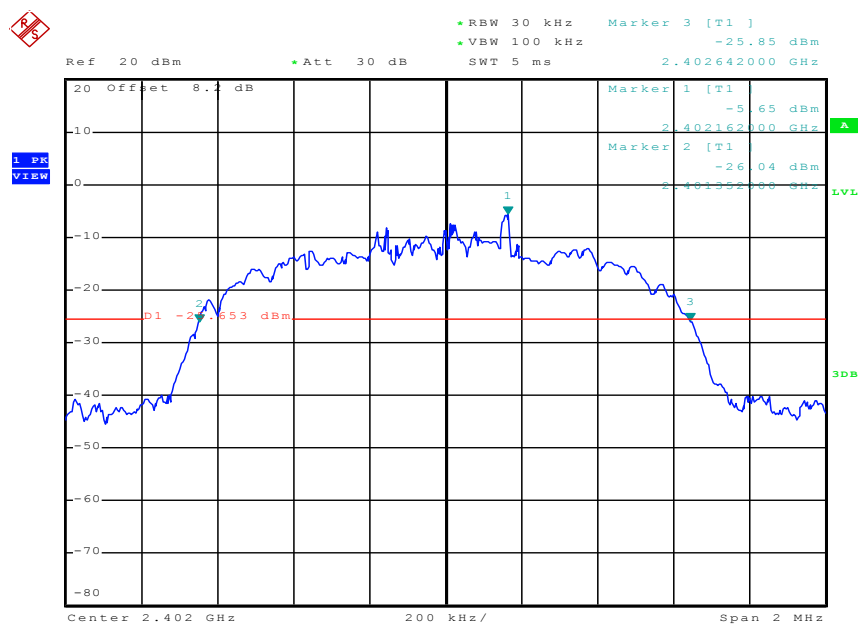
 $\pi/4$ DQPSK/MCH

Date: 12 AUG 2019 22:01:39

$\pi/4$ DQPSK/HCH

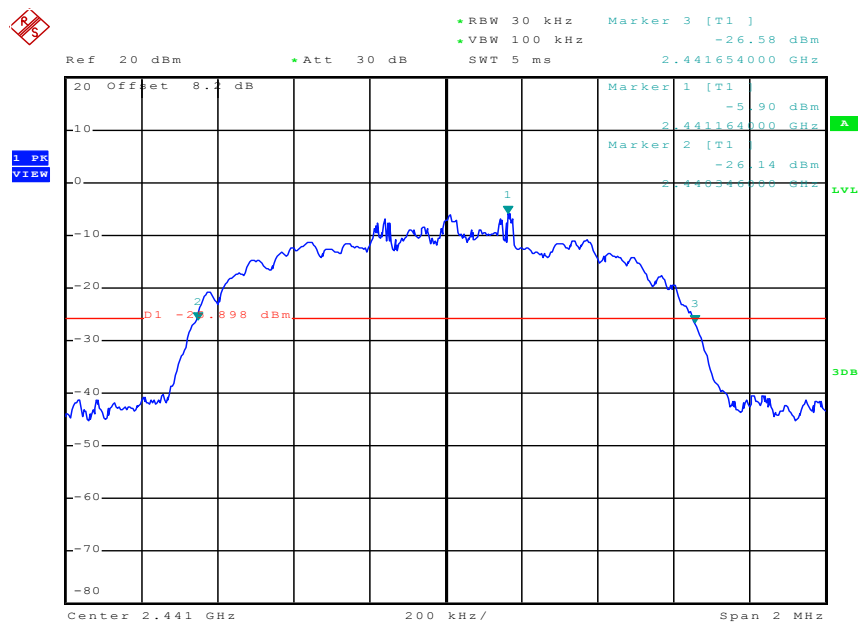
Date: 12 AUG 2019 22:03:38

8DPSK/LCH



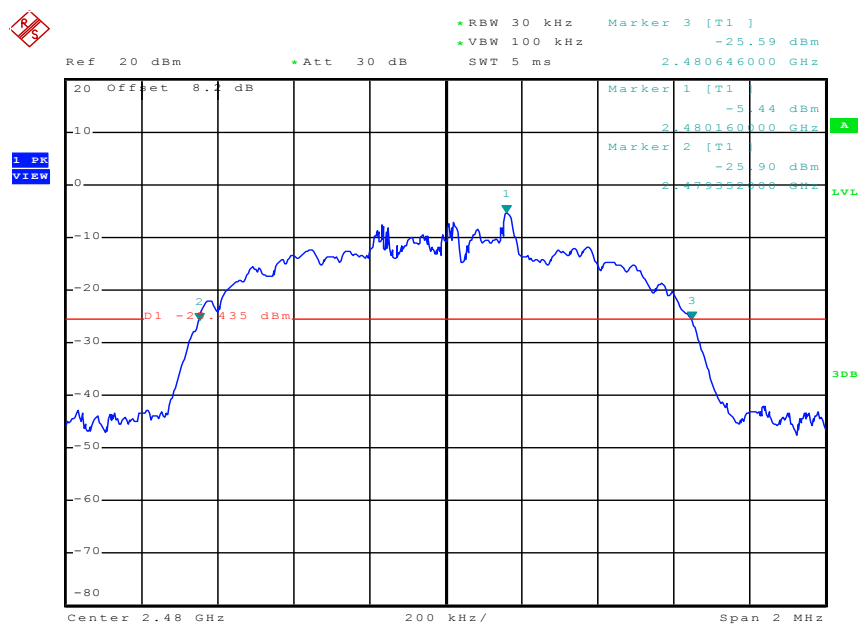
Date: 12 AUG 2019 22:06:40

8DPSK/MCH



Date: 12 AUG 2019 22:09:04

8DPSK/HCH



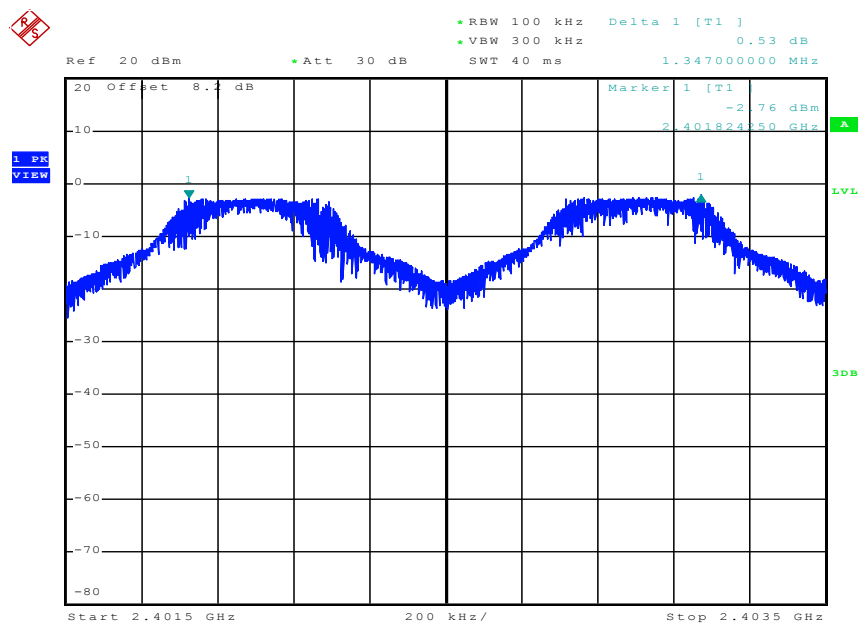
Date: 12 AUG 2019 22:10:45

A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.347	0.681	PASS
	MCH	1.110	0.681	PASS
	HCH	1.008	0.681	PASS
$\pi/4$ DQPSK	LCH	0.992	0.877	PASS
	MCH	1.044	0.877	PASS
	HCH	1.240	0.877	PASS
8DPSK	LCH	0.996	0.872	PASS
	MCH	1.004	0.872	PASS
	HCH	1.018	0.872	PASS

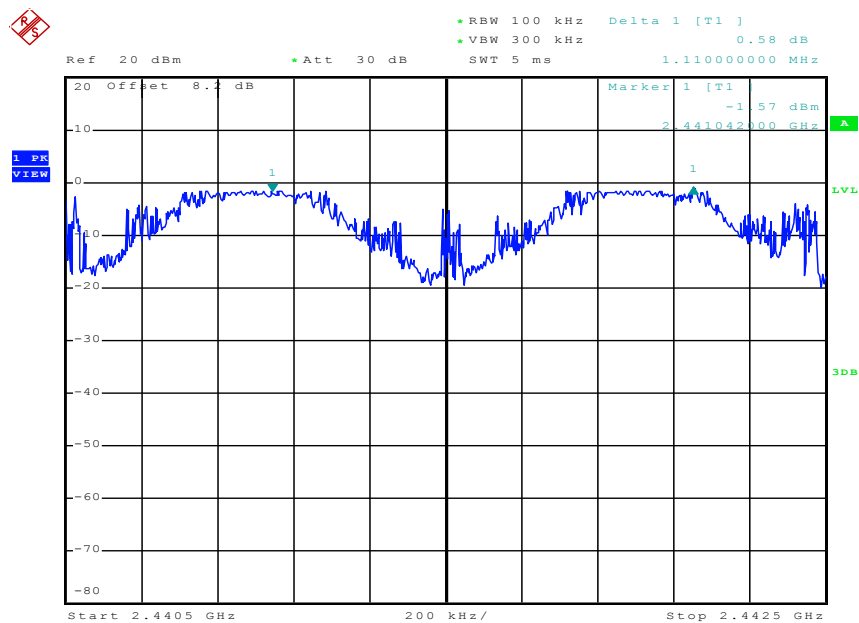
Test Graphs

GFSK/LCH



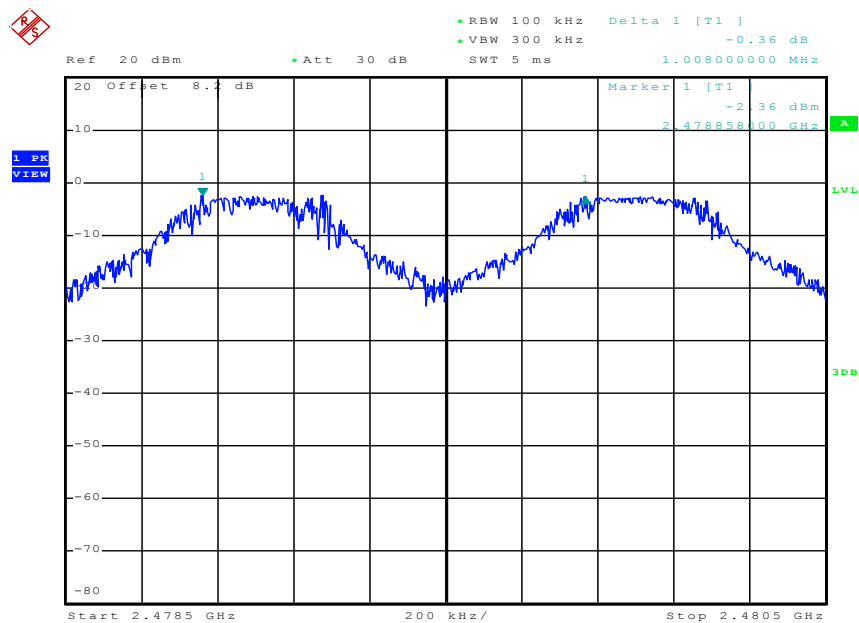
Date: 12.AUG.2019 22:15:41

GFSK/MCH

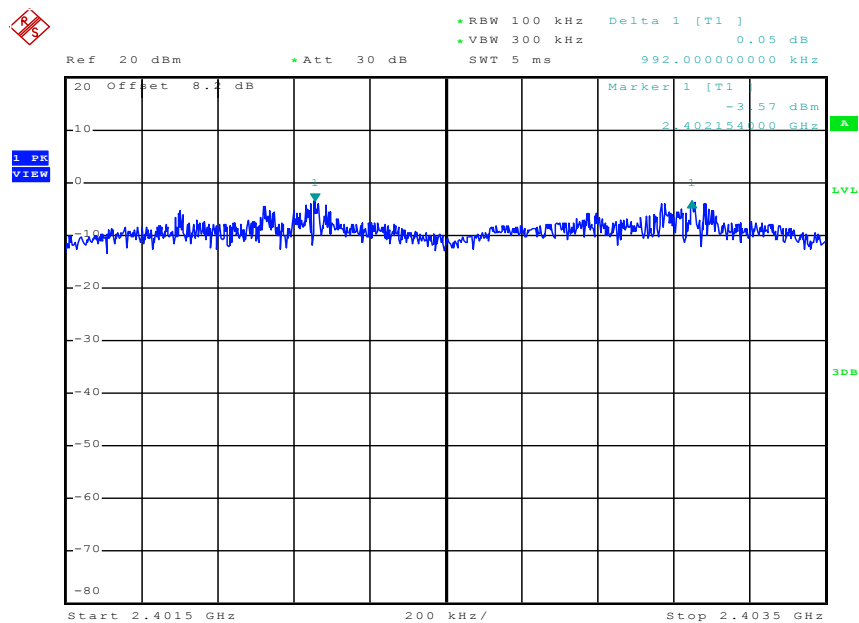


Date: 12 AUG 2019 22:19:10

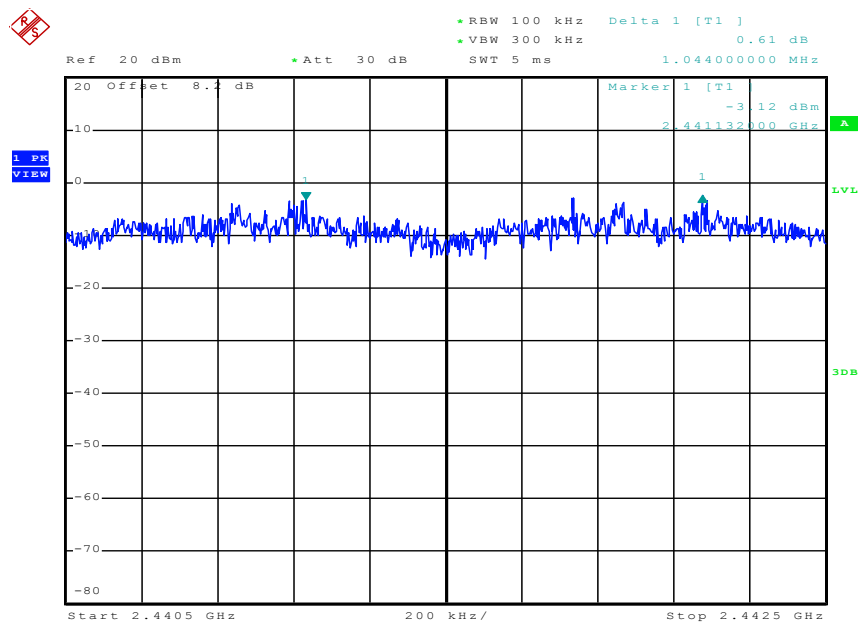
GFSK/HCH



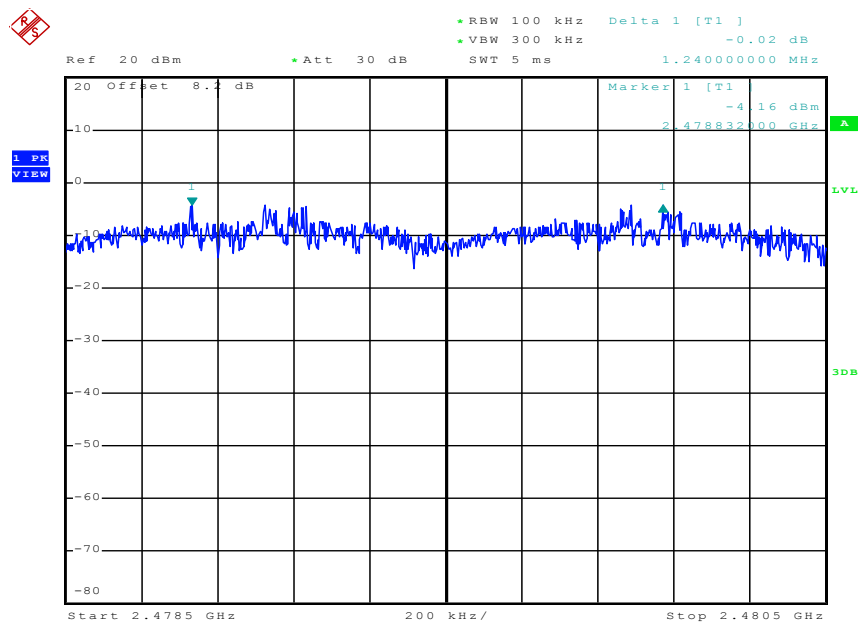
Date: 12 AUG 2019 22:19:50

$\pi/4$ DQPSK/LCH

Date: 12 AUG 2019 22:49:34

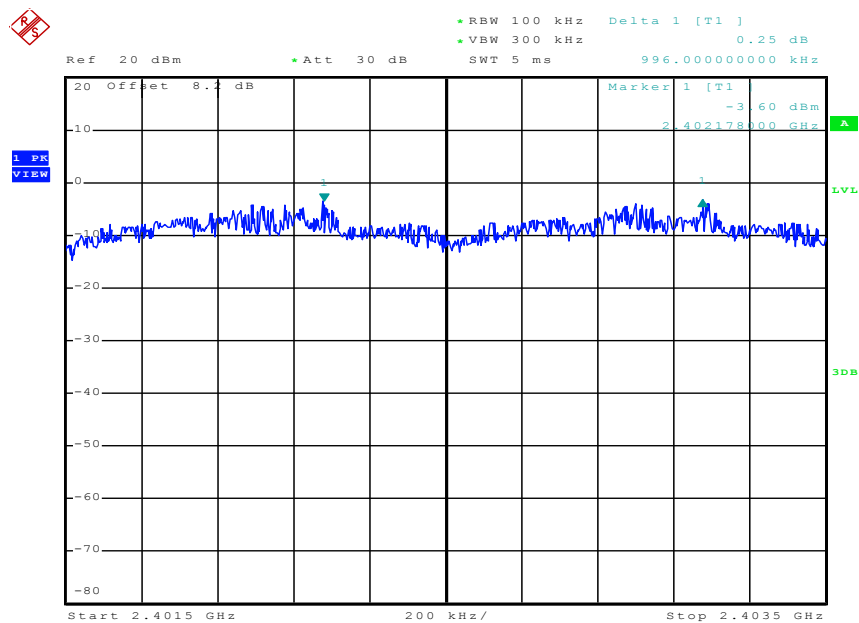
 $\pi/4$ DQPSK/MCH

Date: 12 AUG 2019 22:27:50

π /4DQPSK/HCH

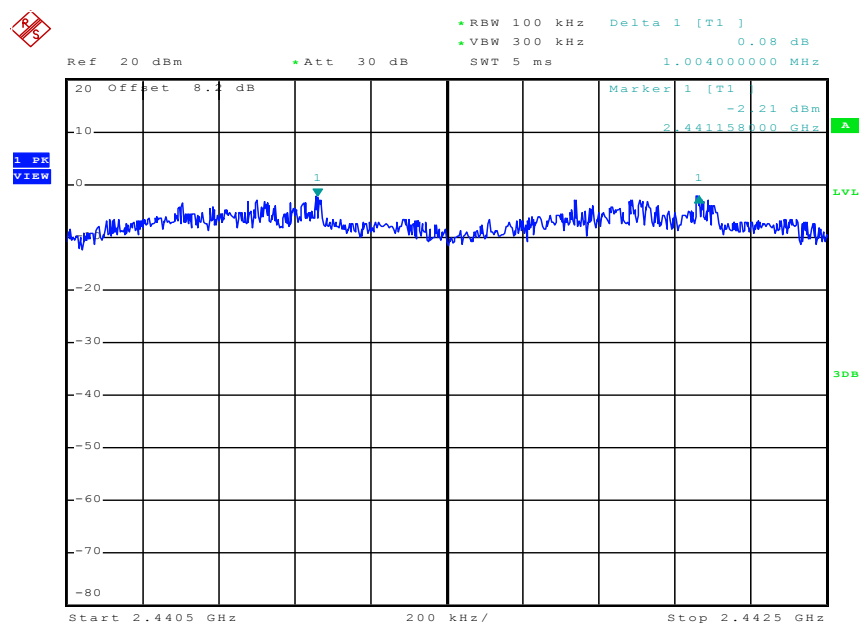
Date: 12 AUG 2019 22:28:15

8DPSK/LCH



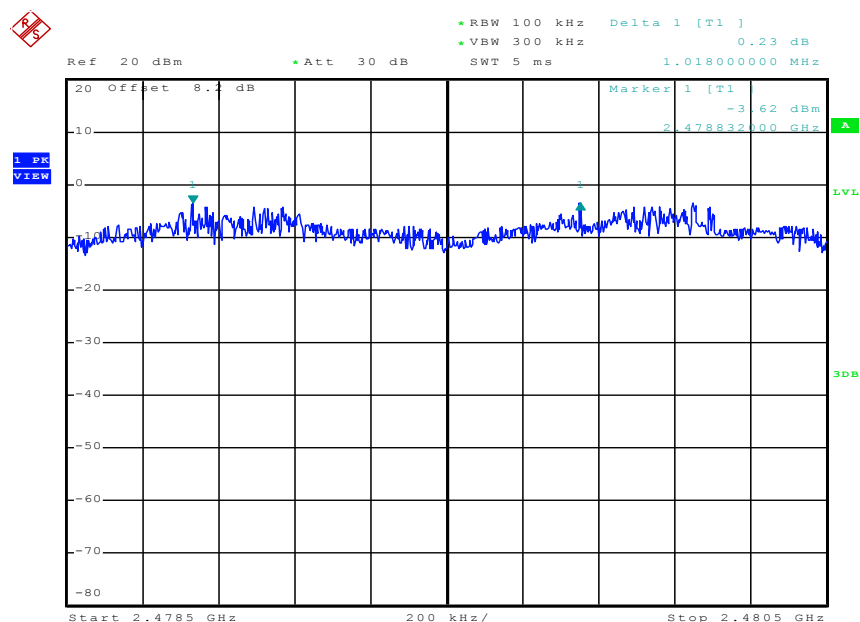
Date: 12 AUG 2019 22:51:01

8DPSK/MCH



Date: 12 AUG 2019 22:37:42

8DPSK/HCH



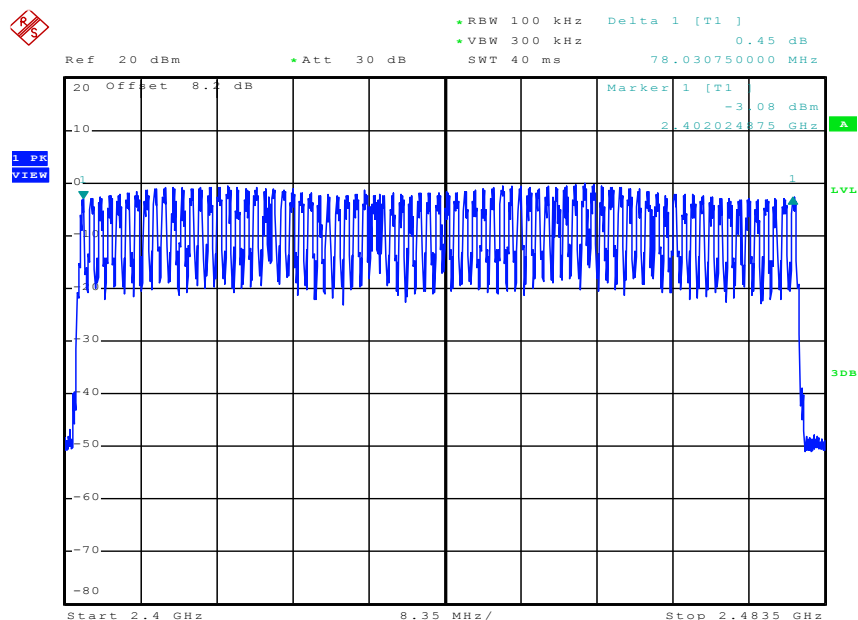
Date: 12 AUG 2019 22:38:52

A.4 Hopping Channel Number

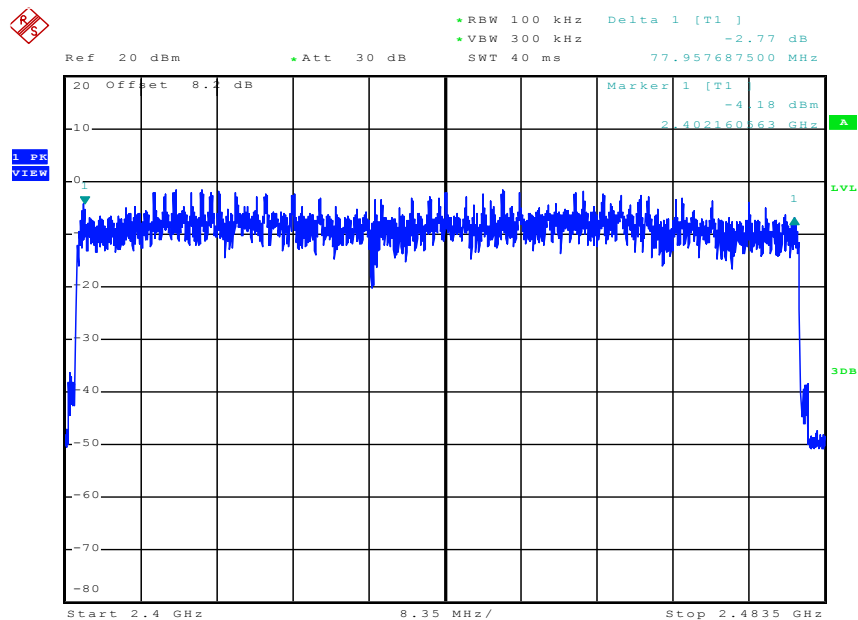
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

GFSK/Hop

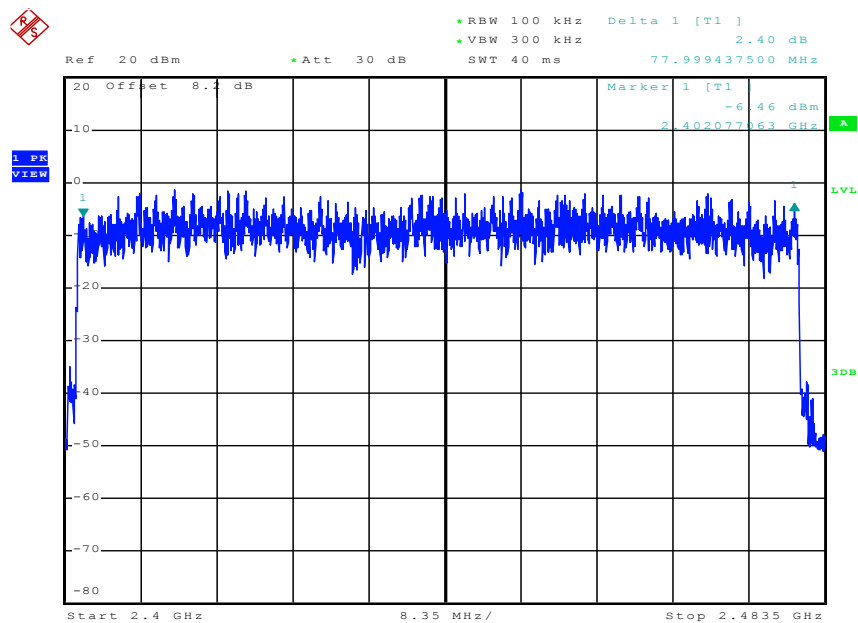


Date: 12 AUG 2019 22:23:49

 $\pi/4$ DQPSK/Hop

Date: 12 AUG 2019 22:33:07

8DPSK/Hop



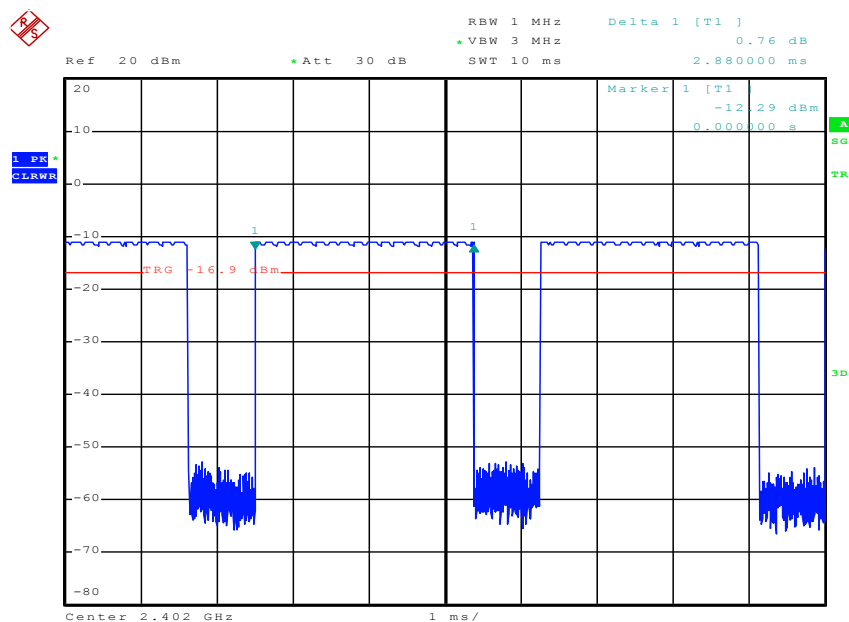
Date: 12 AUG 2019 22:42:22

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	2.88	106.7	0.307	0.4	PASS
	DH5	MCH	2.88	106.7	0.307	0.4	PASS
	DH5	HCH	2.88	106.7	0.307	0.4	PASS
$\pi/4$ DQPSK	2DH5	LCH	2.88	106.7	0.307	0.4	PASS
	2DH5	MCH	2.88	106.7	0.307	0.4	PASS
	2DH5	HCH	2.88	106.7	0.307	0.4	PASS
8DPSK	3DH5	LCH	2.88	106.7	0.308	0.4	PASS
	3DH5	MCH	2.88	106.7	0.308	0.4	PASS
	3DH5	HCH	2.88	106.7	0.308	0.4	PASS

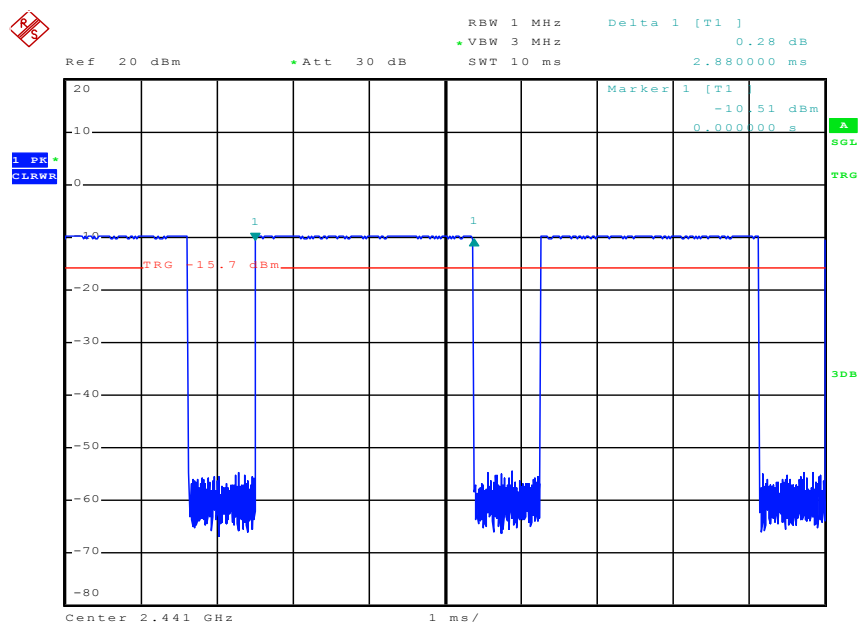
Test Graphs

GFSK_DH5/LCH



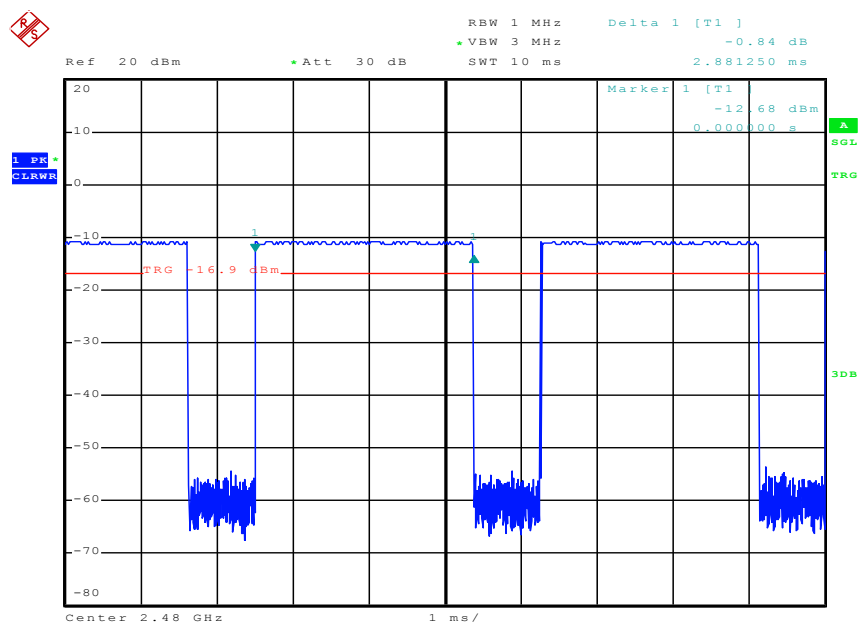
Date: 12.AUG.2019 21:51:58

GFSK_DH5/MCH



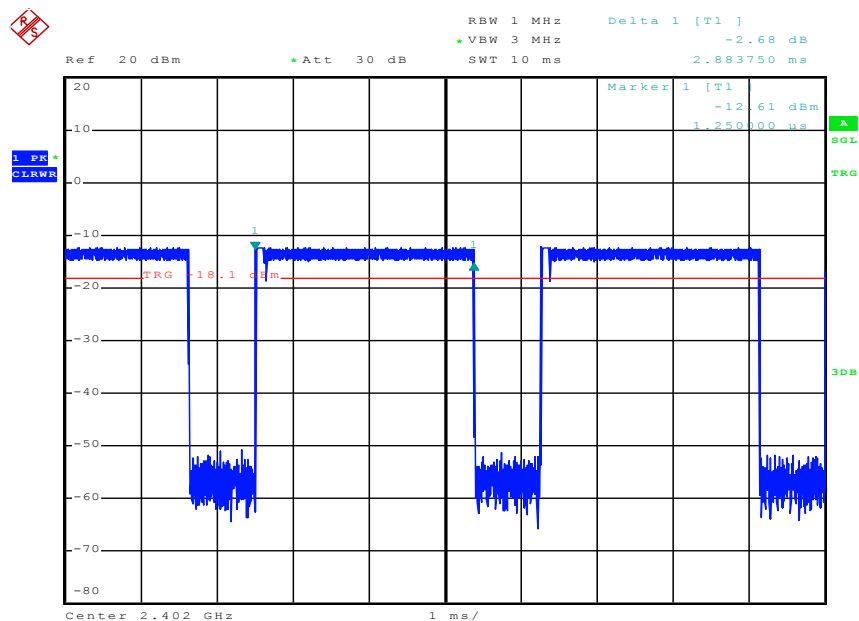
Date: 12 AUG 2019 21:54:33

GFSK_DH5/HCH



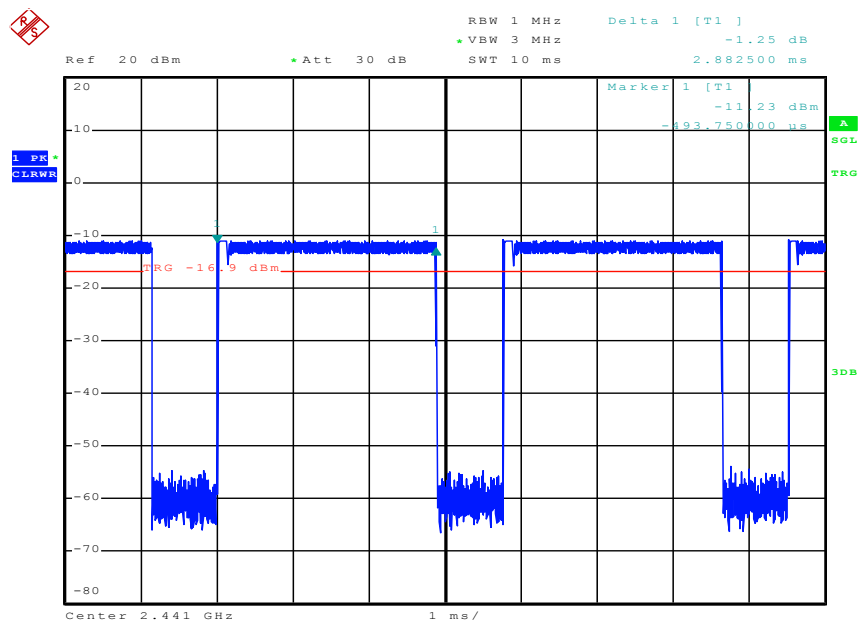
Date: 12 AUG 2019 21:56:43

$\pi/4$ DQPSK
_2DH5/LCH



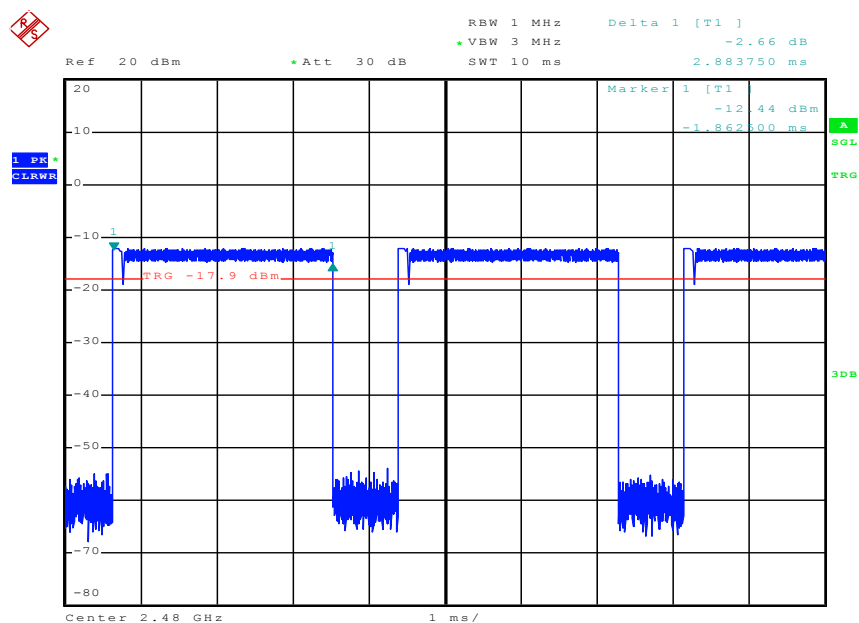
Date: 12 AUG 2019 21:59:25

$\pi/4$ DQPSK
_2DH5/MCH



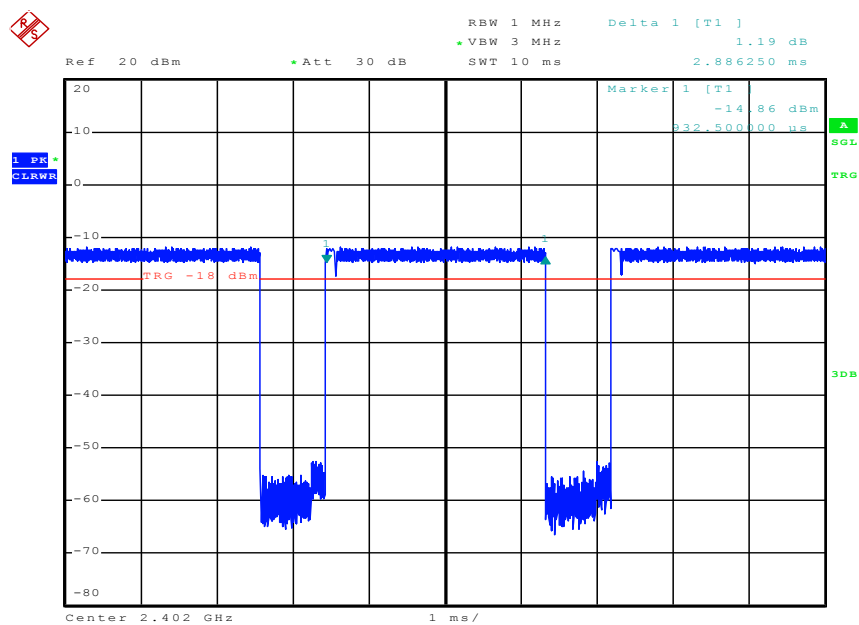
Date: 12 AUG 2019 22:02:01

$\pi/4$ DQPSK
_2DH5/HCH



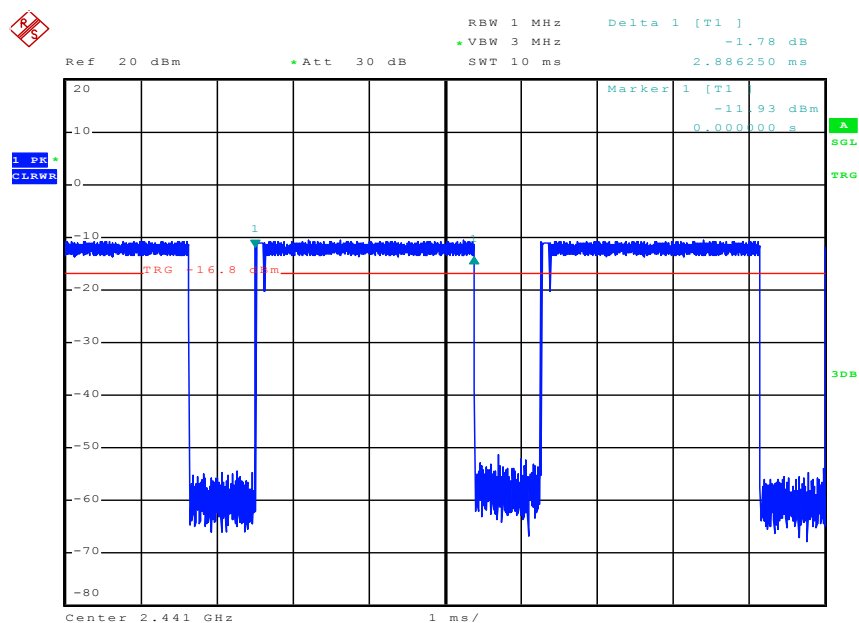
Date: 12 AUG 2019 22:03:59

8DPSK_3DH5/LCH



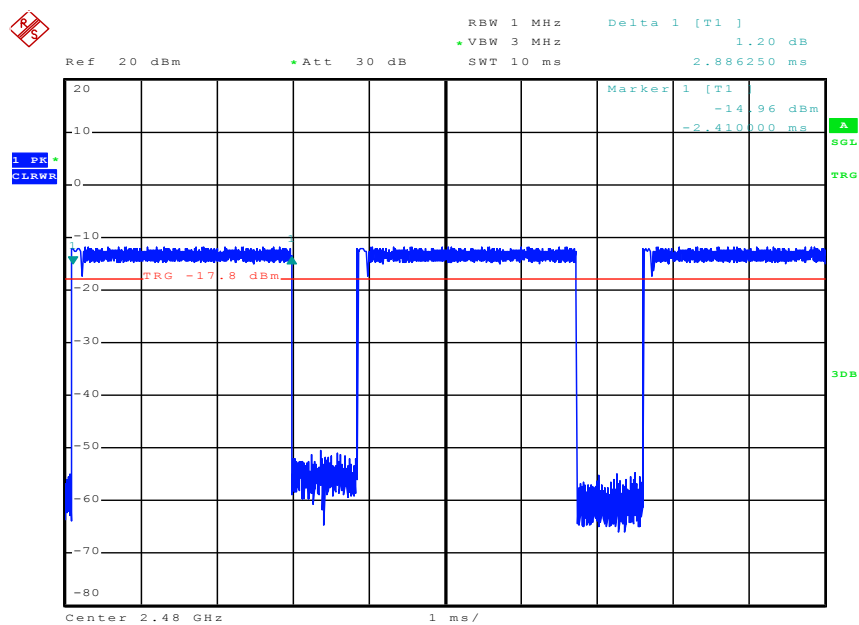
Date: 12 AUG 2019 22:07:01

8DPSK_3DH5/MCH



Date: 12 AUG 2019 22:09:26

8DPSK_3DH5/HCH



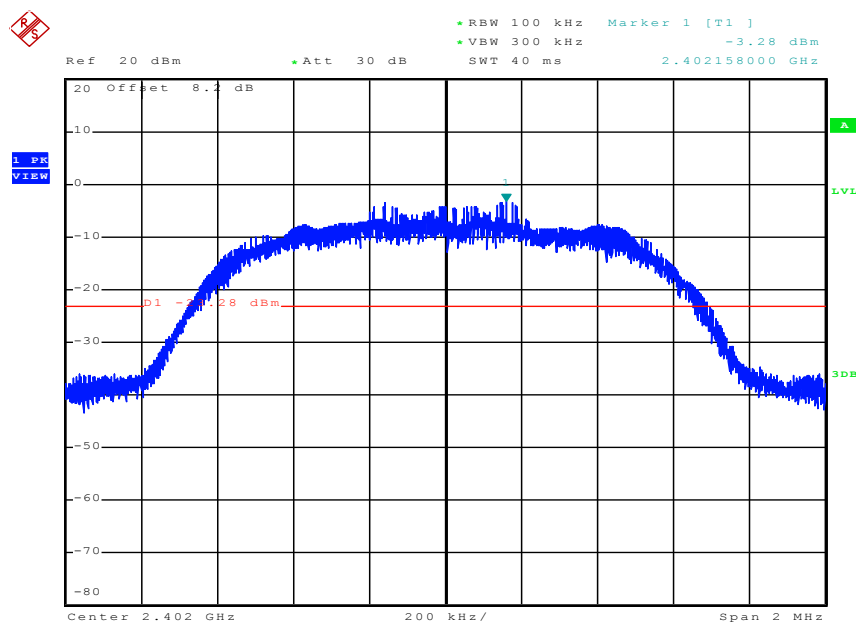
Date: 12 AUG 2019 22:11:07

A.6 RF Conducted Spurious Emissions

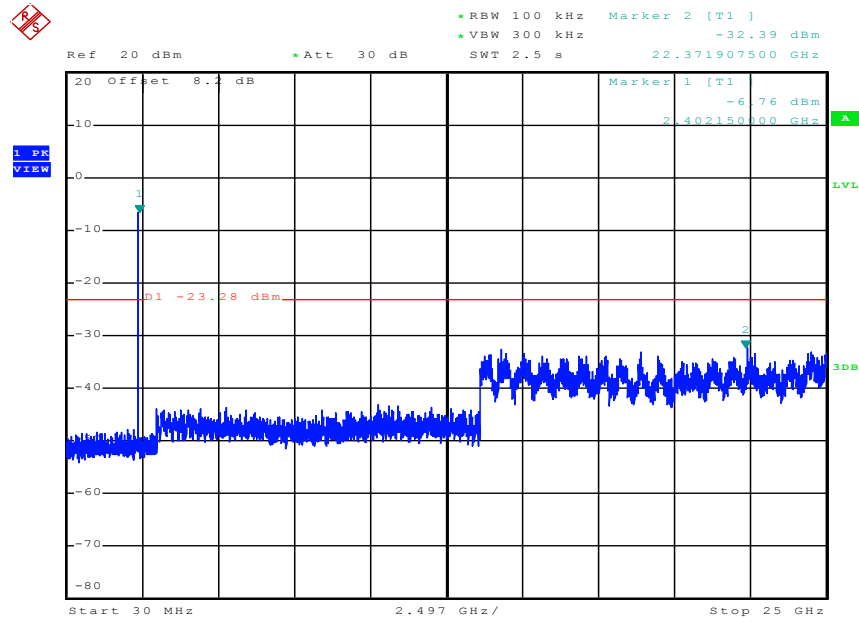
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-3.28	-32.390	-23.280	PASS
	MCH	-0.96	-30.990	-20.960	PASS
	HCH	-2.27	-32.460	-22.270	PASS
$\pi/4$ DQPSK	LCH	-3.52	-32.180	-23.520	PASS
	MCH	-2.38	-29.690	-22.380	PASS
	HCH	-3.3	-25.350	-23.300	PASS
8DPSK	LCH	-3.36	-31.780	-23.360	PASS
	MCH	-2.18	-32.160	-22.180	PASS
	HCH	-3.41	-31.510	-23.410	PASS

GFSK LCH Graphs

Pref

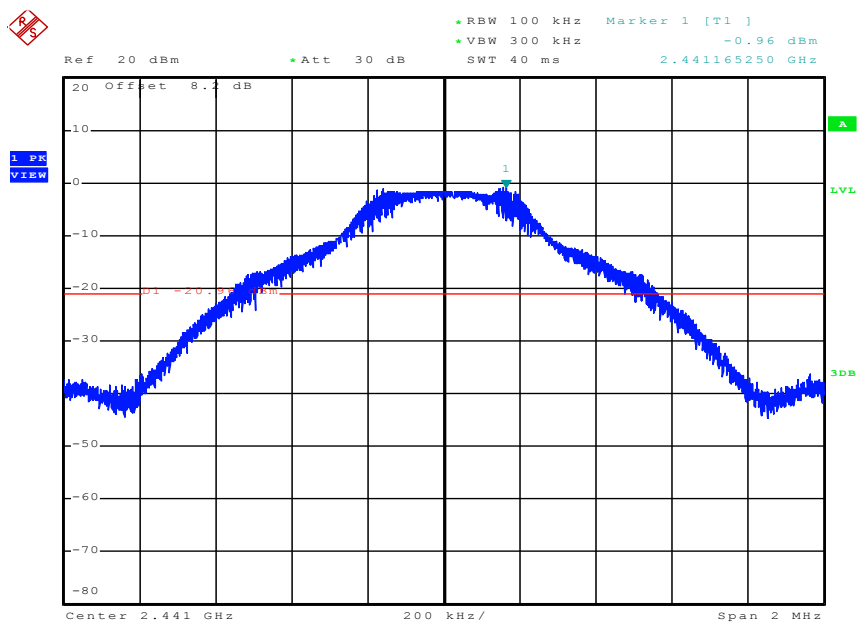


Date: 12.AUG.2019 23:05:41

Pu_w

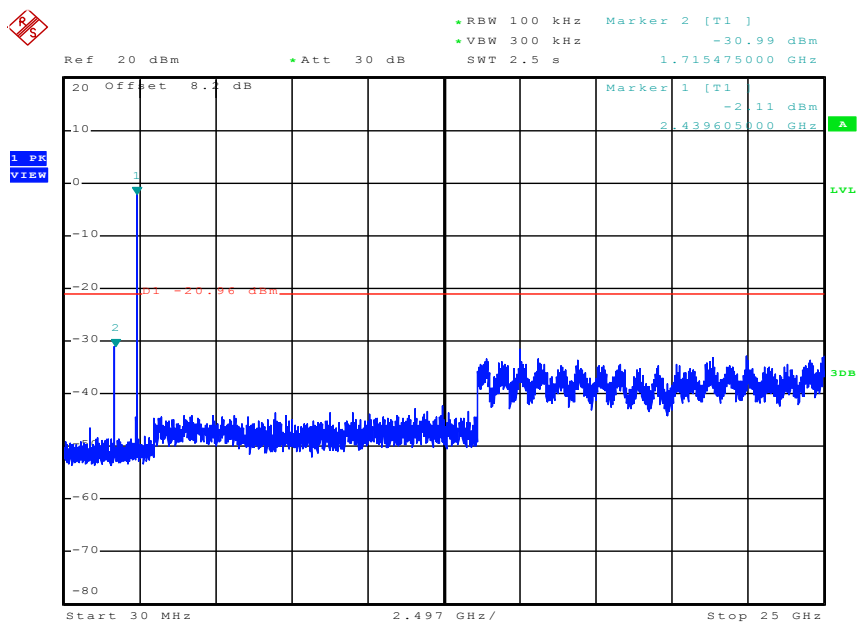
Date: 12 AUG 2019 23:05:55

Pref



Date: 12 AUG 2019 21:55:01

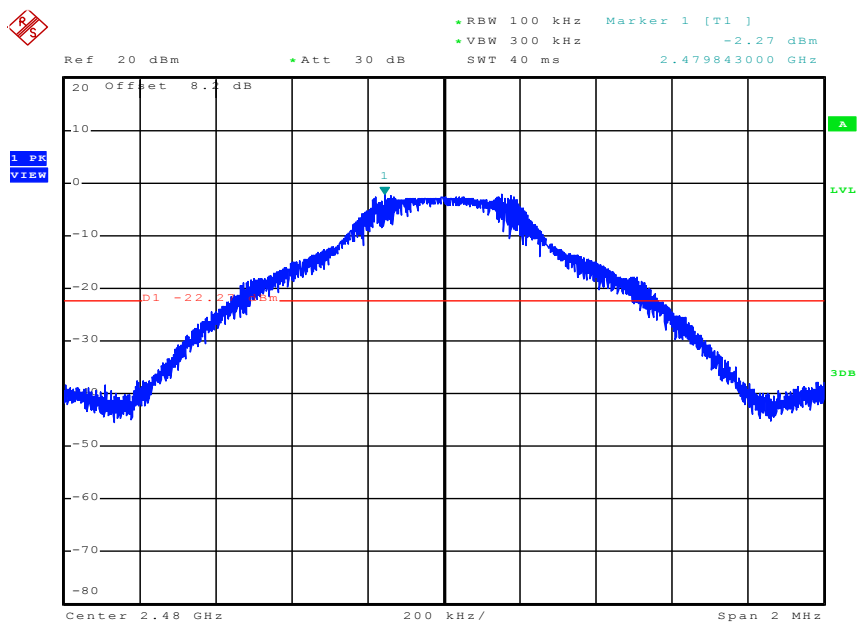
PuW



Date: 12 AUG 2019 21:55:16

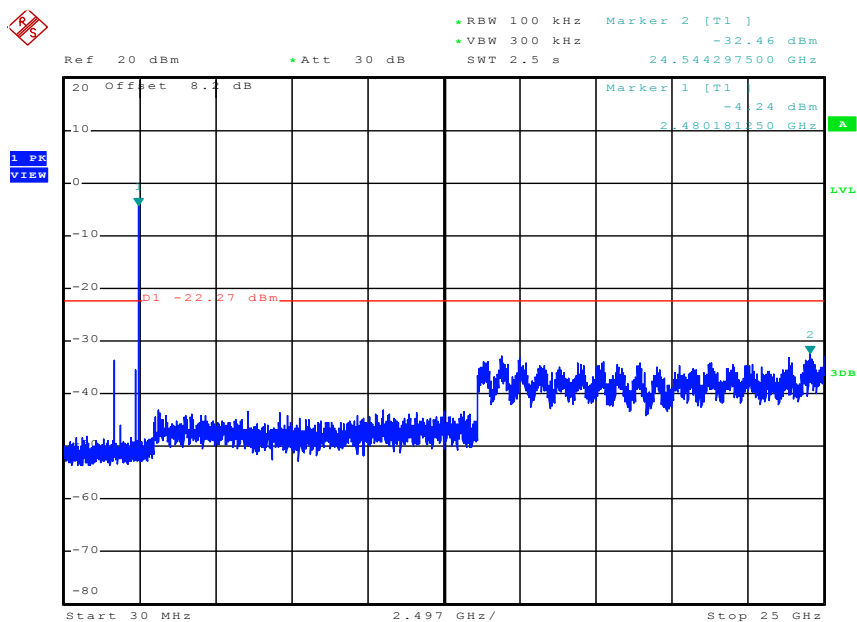
GFSK_HCH_Graphs

Pref



Date: 12 AUG 2019 21:57:27

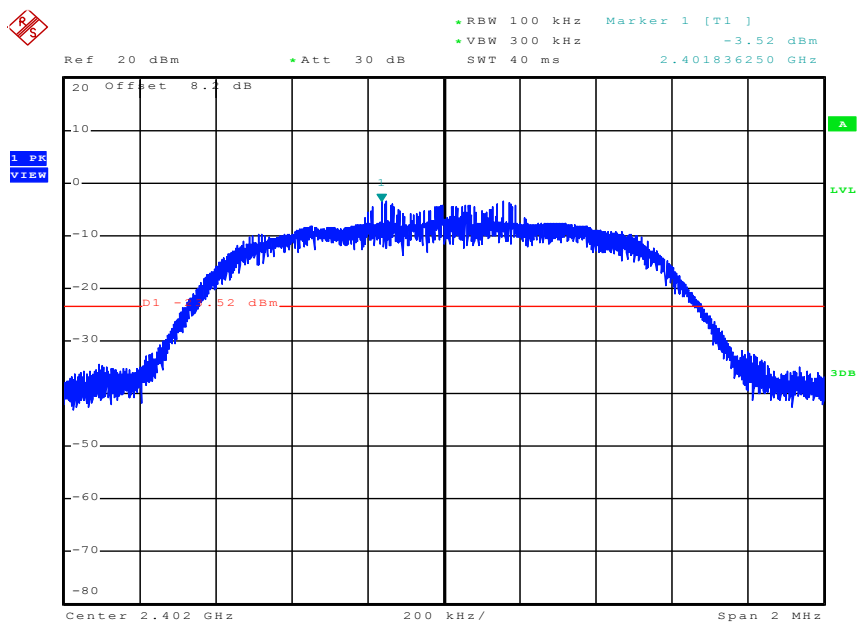
Puw



Date: 12 AUG 2019 21:57:41

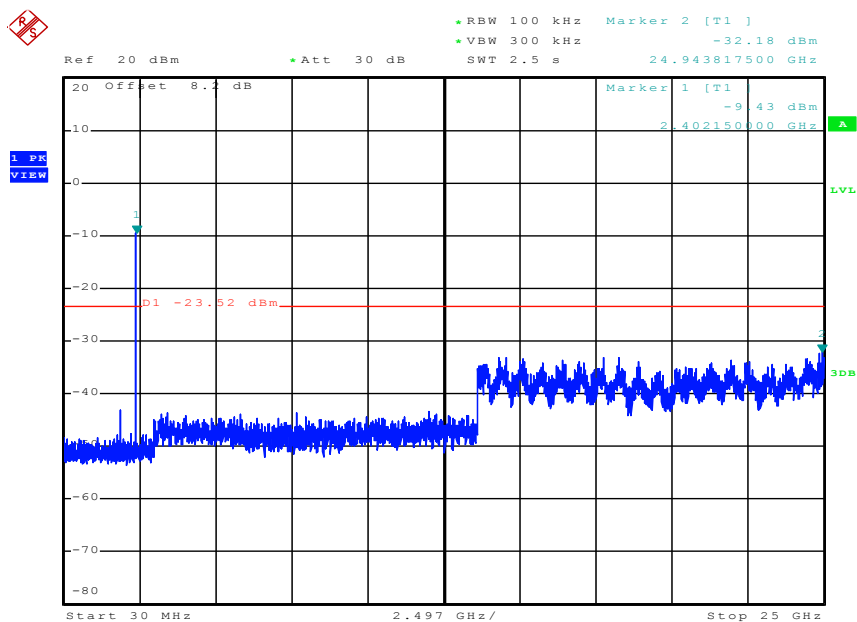
$\pi/4$ DQPSK_LCH_Graphs

Pref



Date: 12 AUG 2019 22:00:08

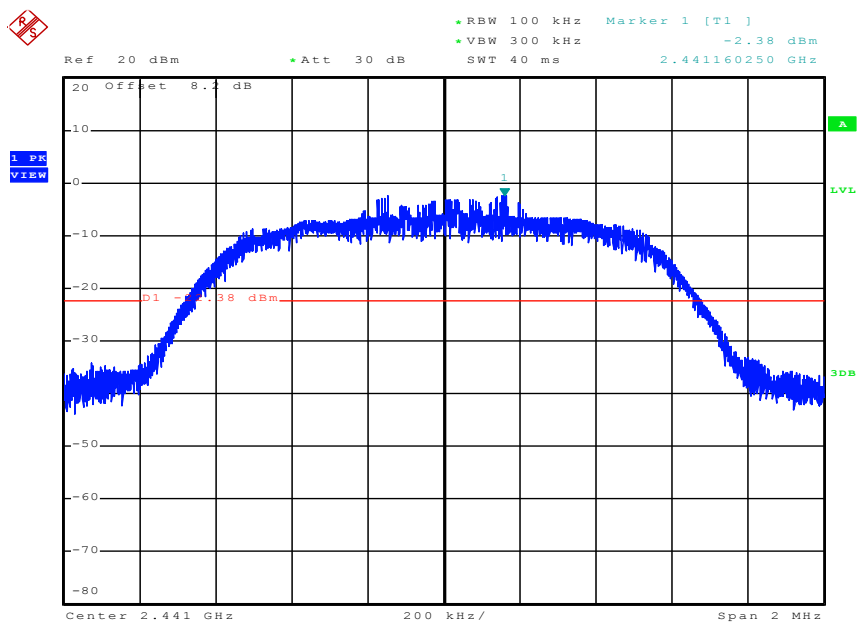
Puw



Date: 12 AUG 2019 22:00:23

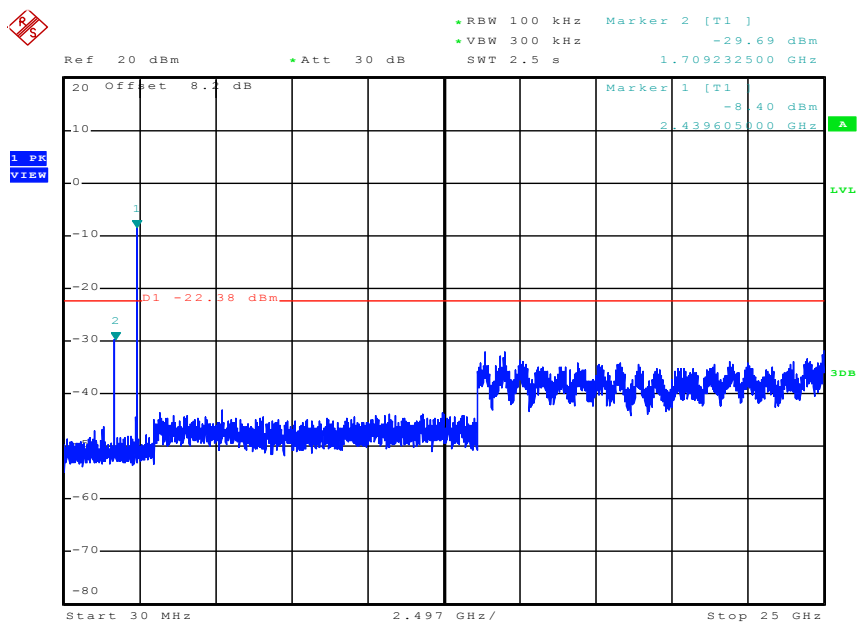
$\pi/4$ DQPSK_MCH_Graphs

Pref



Date: 12 AUG 2019 22:02:28

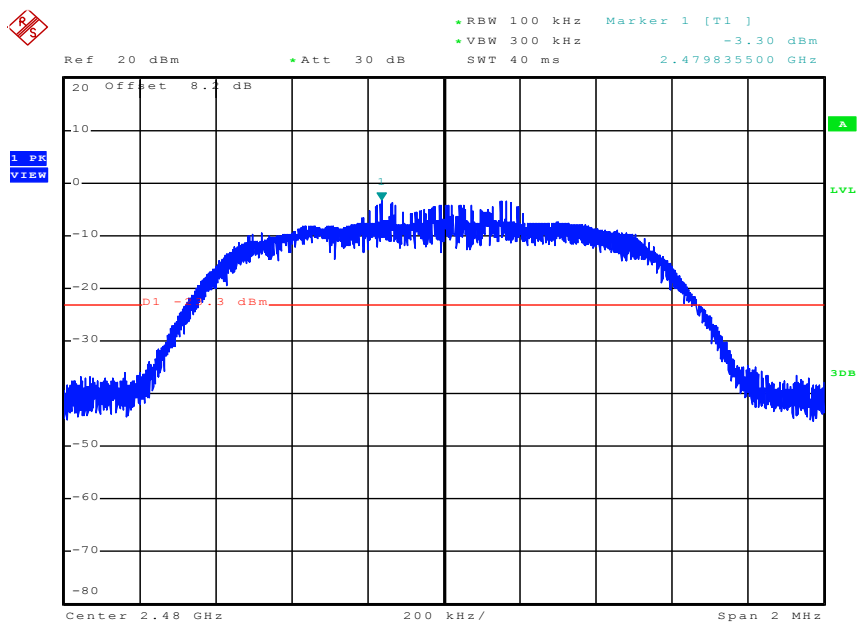
Puw



Date: 12 AUG 2019 22:02:43

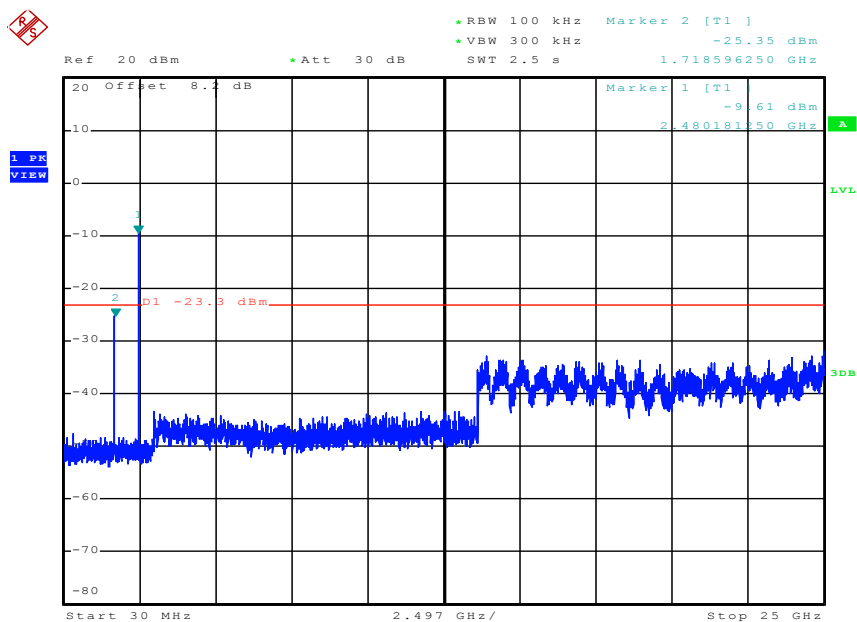
$\pi/4$ DQPSK_HCH_Graphs

Pref



Date: 12 AUG 2019 22:04:43

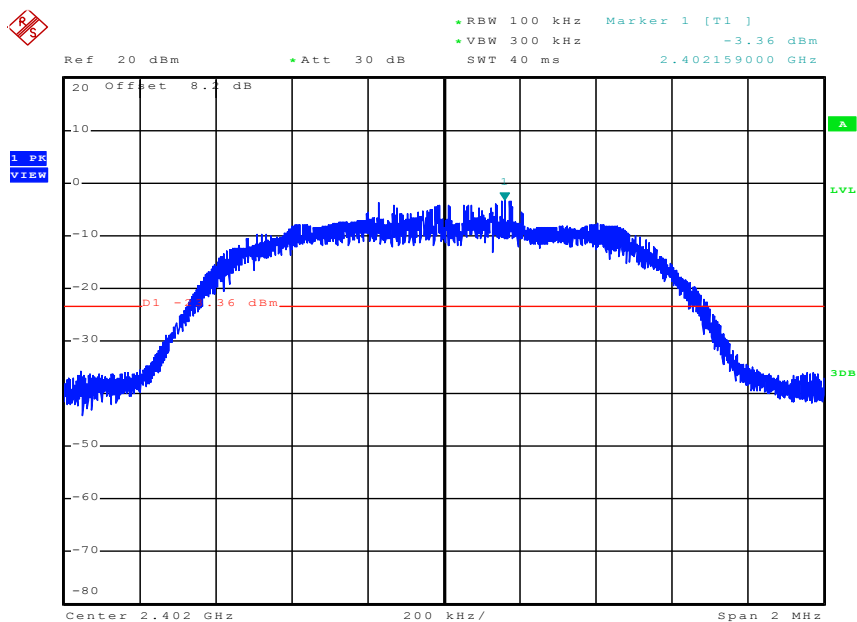
Puw



Date: 12 AUG 2019 22:04:58

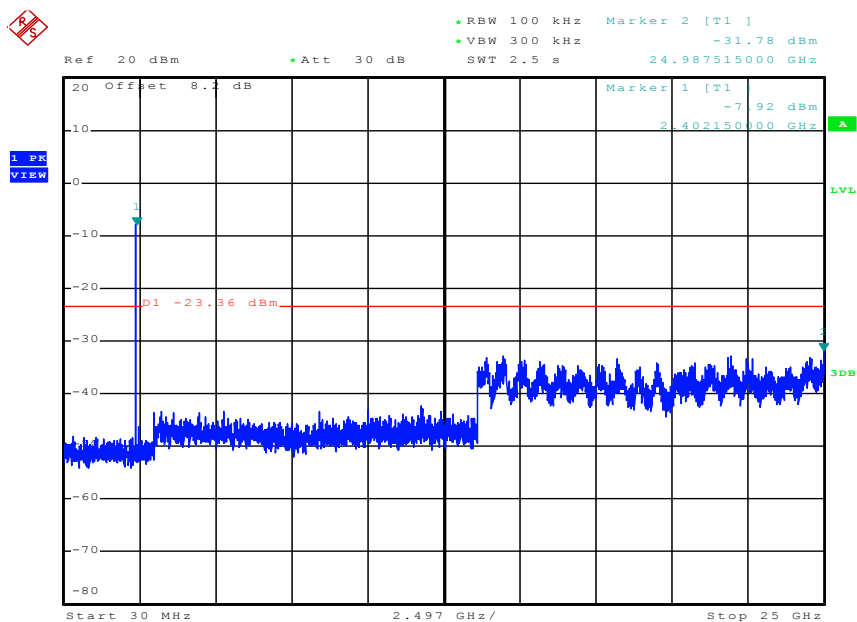
8DPSK_LCH_Graphs

Pref



Date: 12 AUG 2019 23:06:35

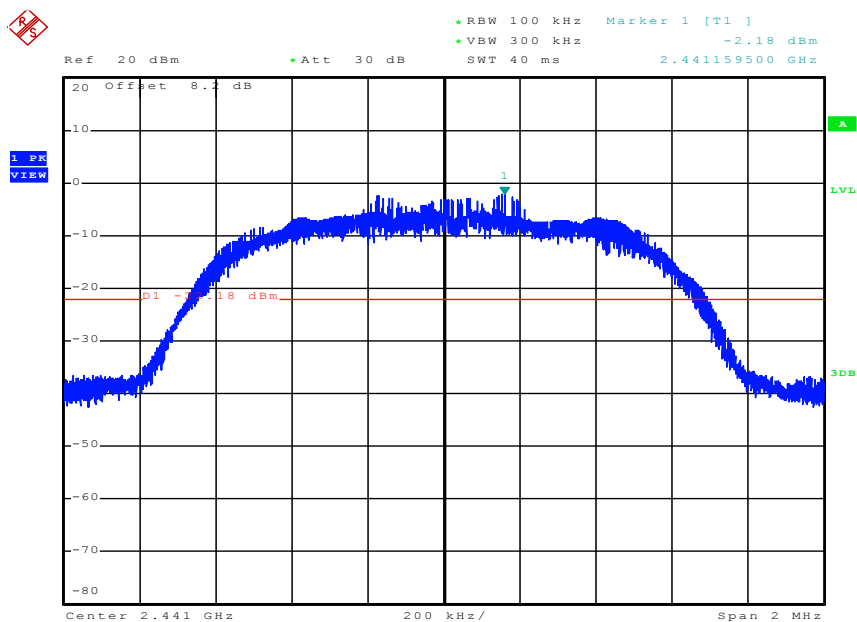
Puw



Date: 12 AUG 2019 23:06:49

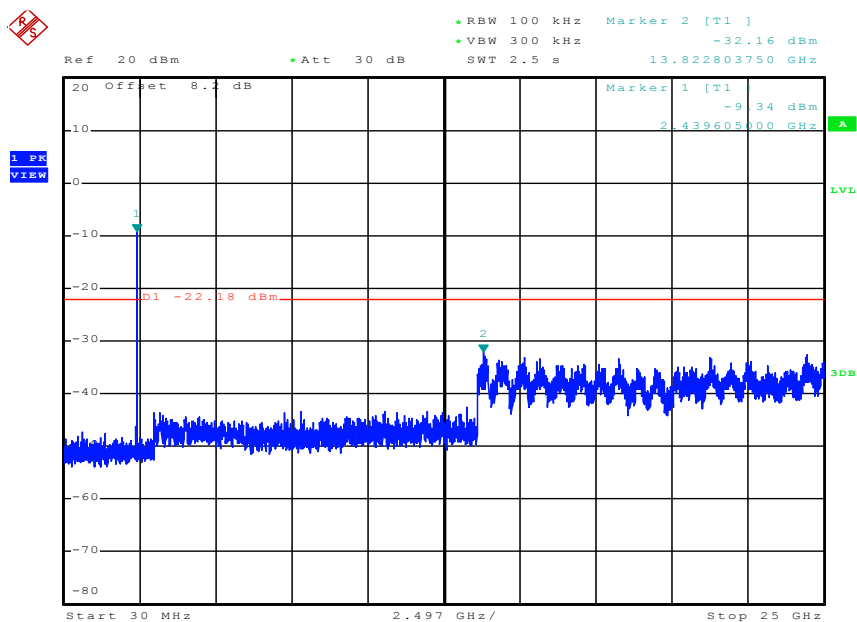
8DPSK_MCH_Graphs

Pref



Date: 12 AUG 2019 22:09:53

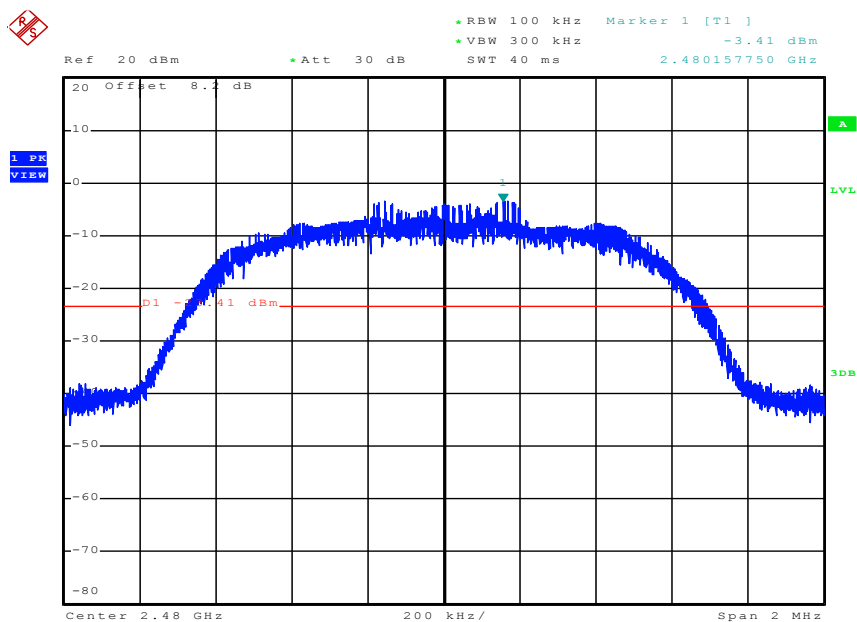
Puw



Date: 12 AUG 2019 22:10:08

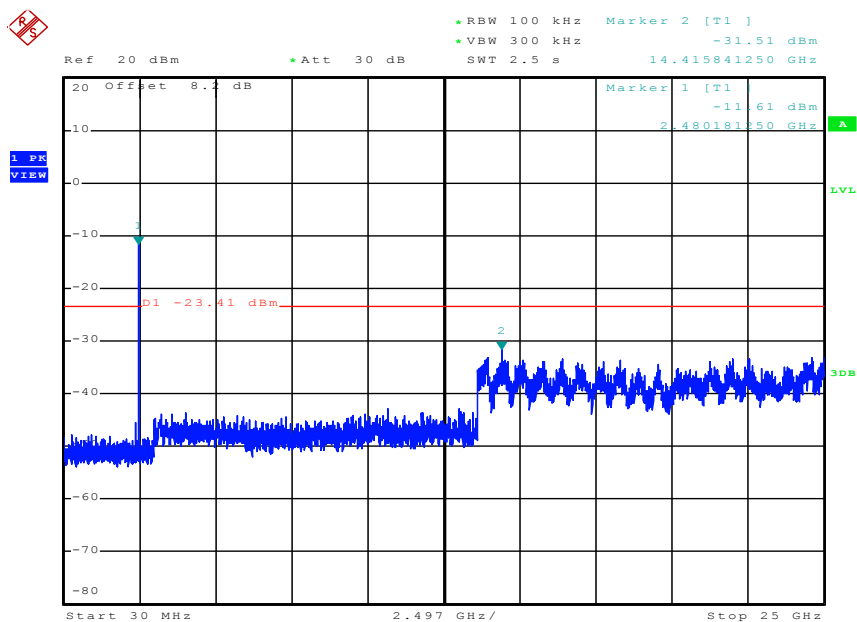
8DPSK_HCH_Graphs

Pref



Date: 12 AUG 2019 22:11:51

Puw



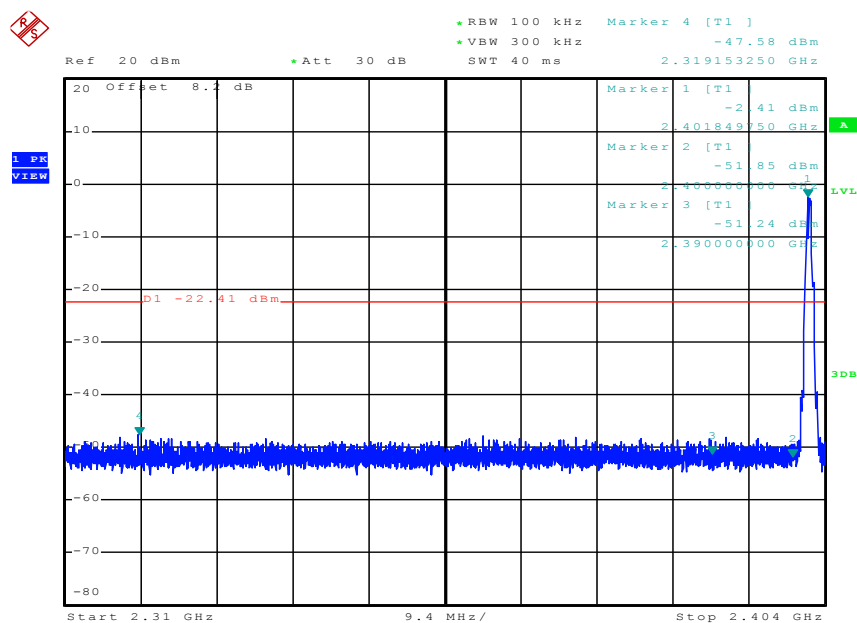
Date: 12 AUG 2019 22:12:06

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	-2.410	Off	-47.578	-22.41	PASS
			-0.300	On	-46.788	-20.3	PASS
	HCH	2480	-2.160	Off	-47.142	-22.16	PASS
			-0.160	On	-44.094	-20.16	PASS
$\pi/4$ DQPSK	LCH	2402	-6.720	Off	-46.344	-26.72	PASS
			-1.580	On	-46.676	-21.58	PASS
	HCH	2480	-3.260	Off	-46.968	-23.26	PASS
			-2.010	On	-46.648	-22.01	PASS
8DPSK	LCH	2402	-3.990	Off	-47.134	-23.99	PASS
			-1.390	On	-46.522	-21.39	PASS
	HCH	2480	-3.310	Off	-47.231	-23.31	PASS
			-2.310	On	-46.613	-22.31	PASS

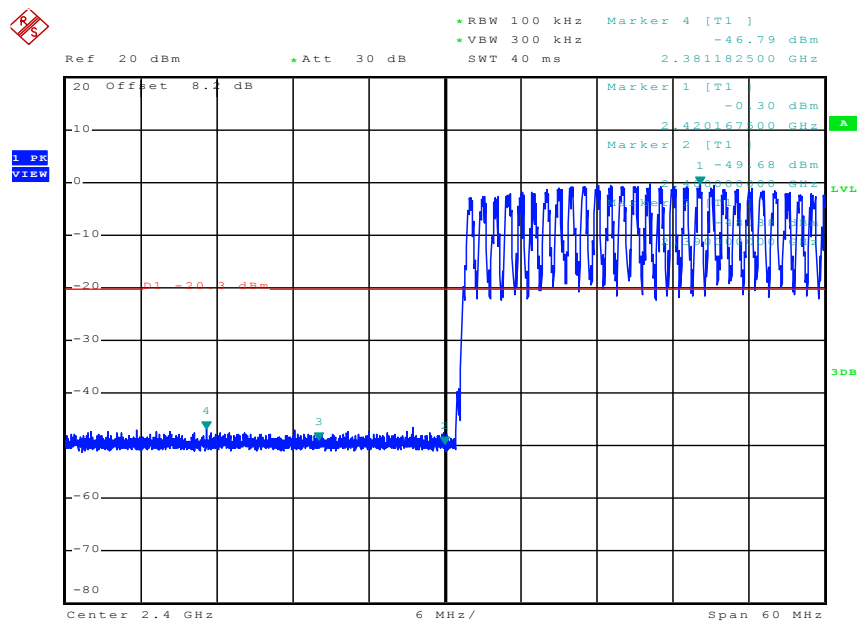
Test Graphs

GFSK/LCH/No Hop



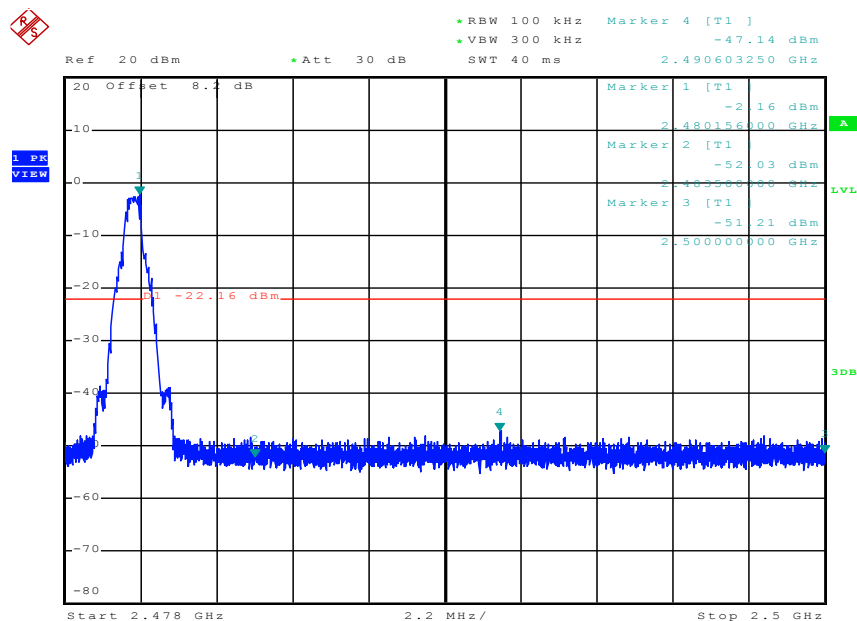
Date: 12 AUG 2019 22:55:54

GFSK/LCH/Hop



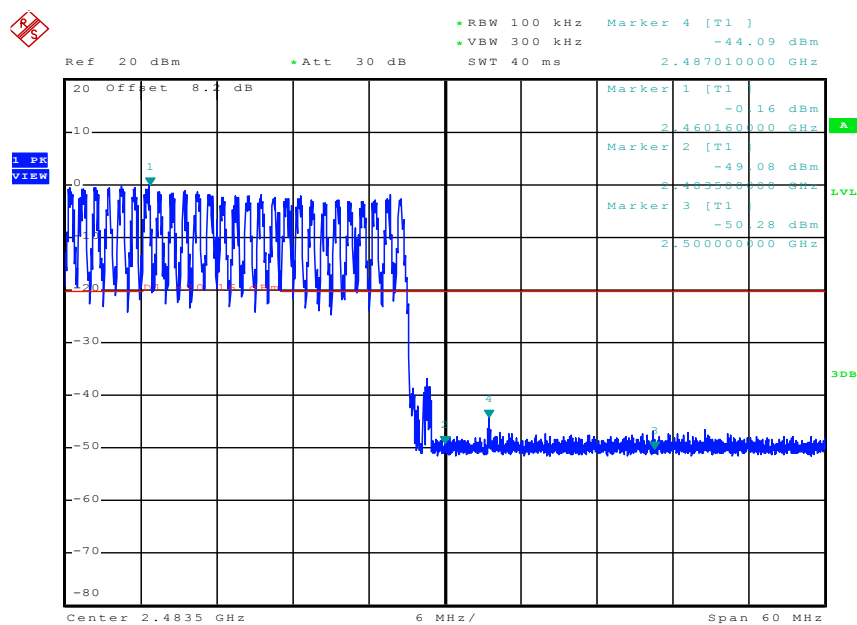
Date: 12 AUG 2019 22:18:04

GFSK/HCH/No Hop



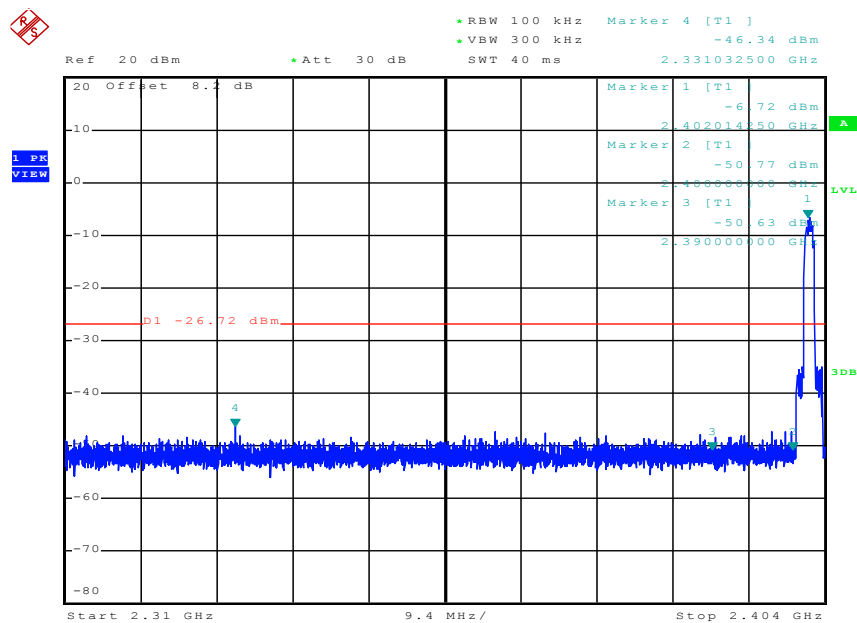
Date: 12 AUG 2019 21:57:14

GFSK/HCH/Hop



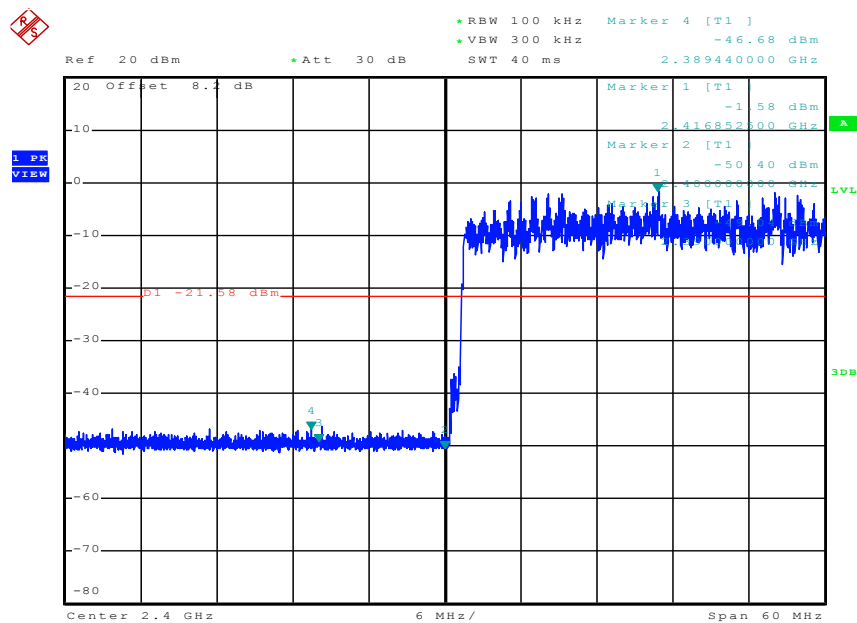
Date: 12 AUG 2019 22:21:27

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



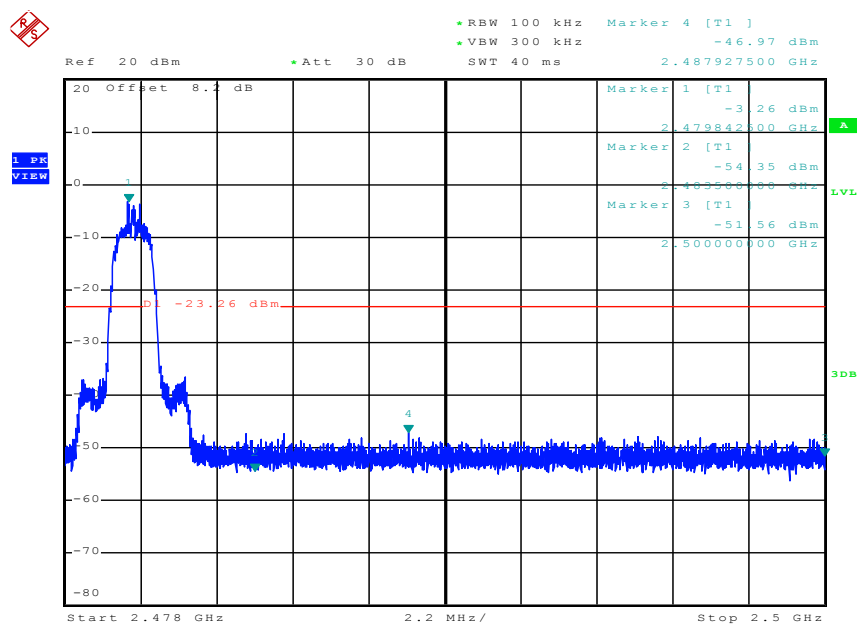
Date: 12 AUG 2019 21:59:55

$\pi/4$ DQPSK/LCH/Hop



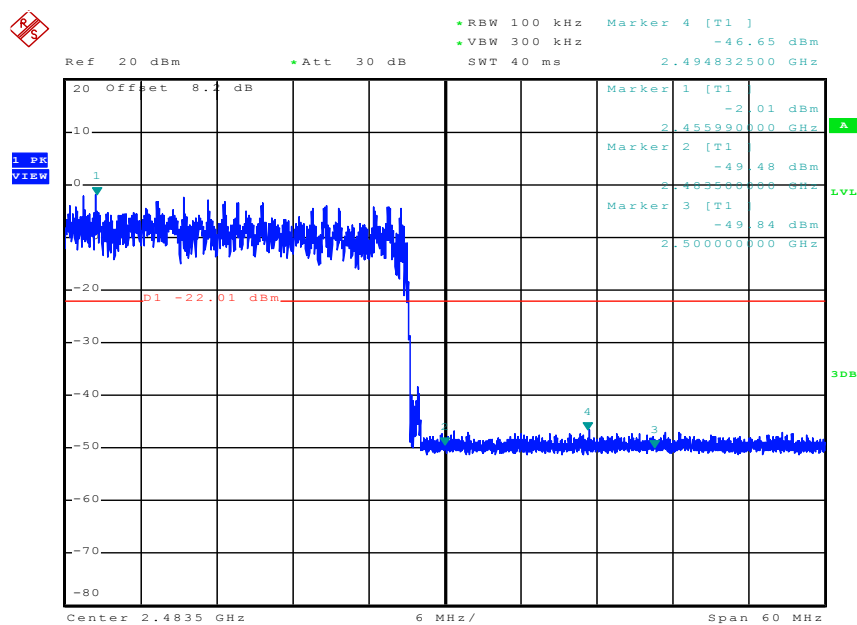
Date: 12 AUG 2019 22:27:21

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



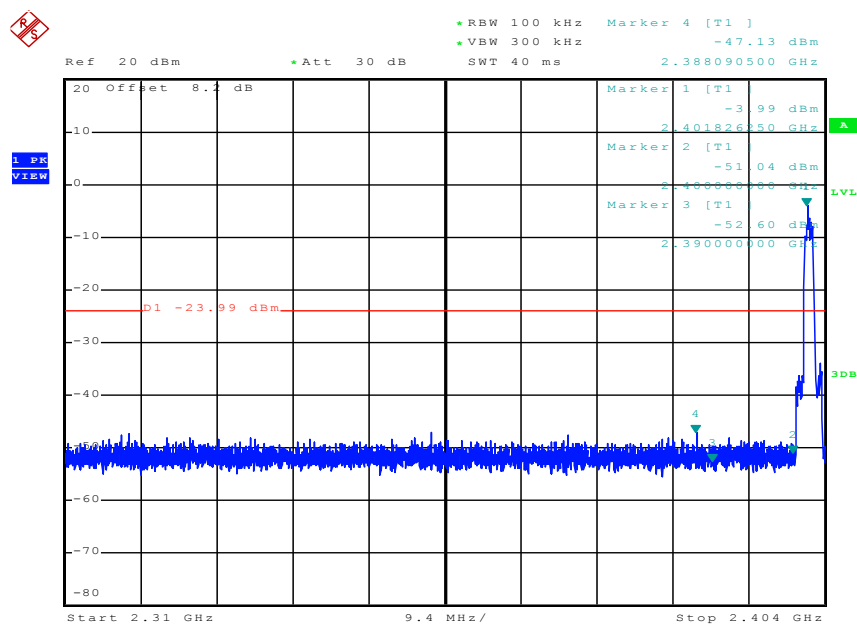
Date: 12 AUG 2019 22:04:30

$\pi/4$ DQPSK/HCH/Hop



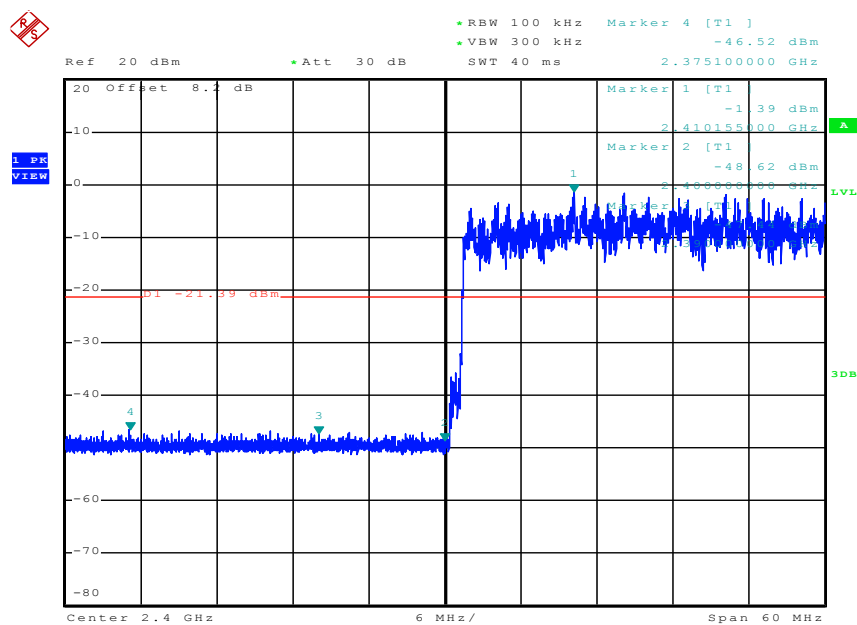
Date: 12 AUG 2019 22:30:33

8DPSK/LCH/No Hop



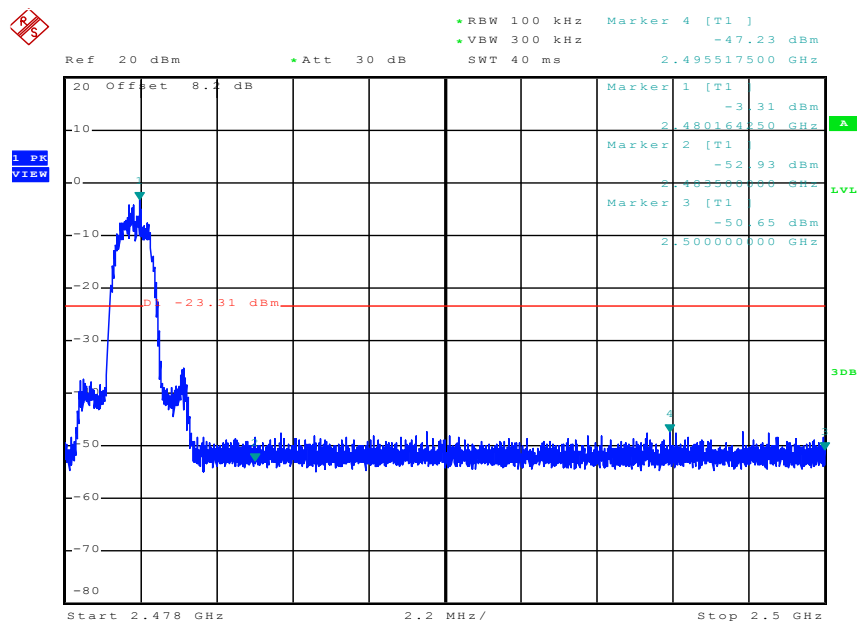
Date: 12 AUG 2019 23:06:22

8DPSK/LCH/Hop



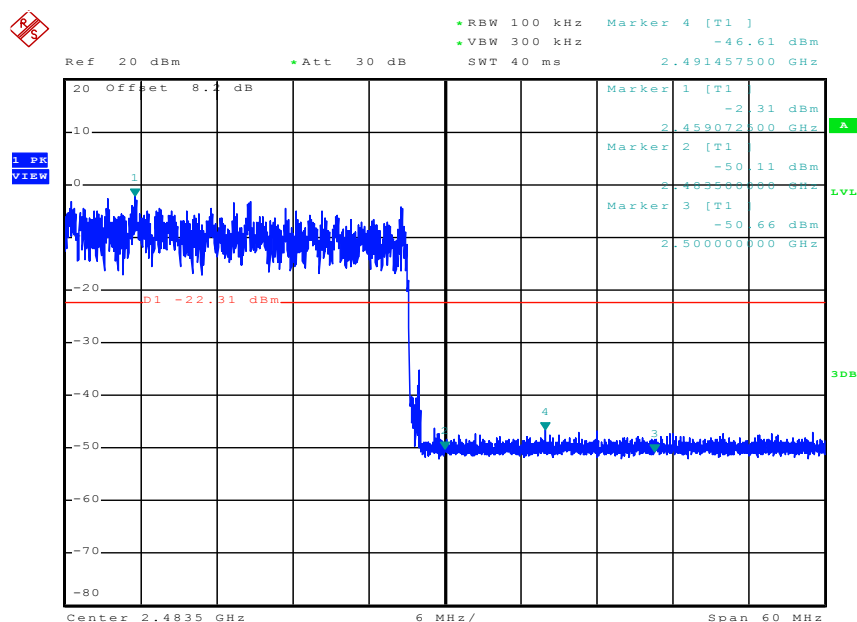
Date: 12 AUG 2019 22:36:17

8DPSK/HCH/No Hop



Date: 12 AUG 2019 22:11:38

8DPSK/HCH/Hop

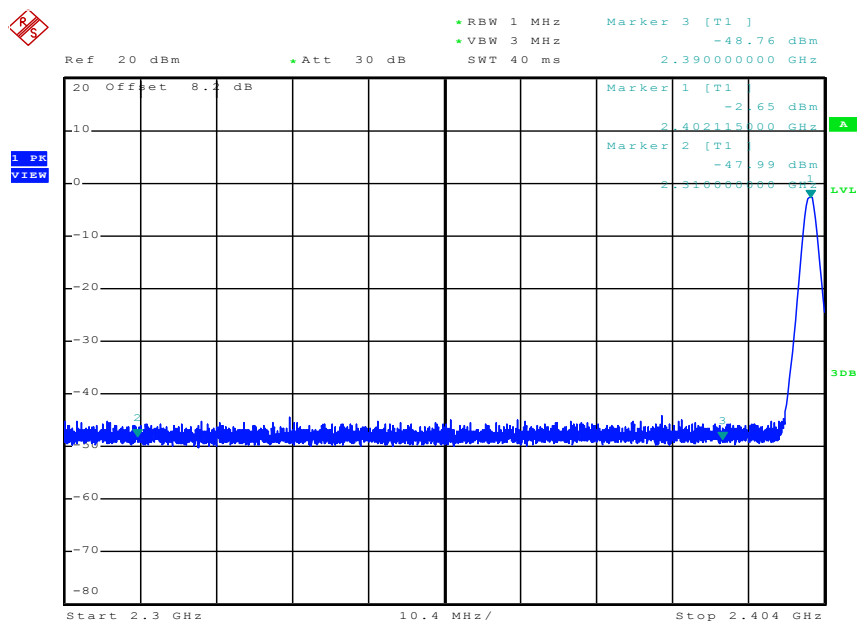


Date: 12 AUG 2019 22:40:08

A.8 Restrict-band band-edge measurements

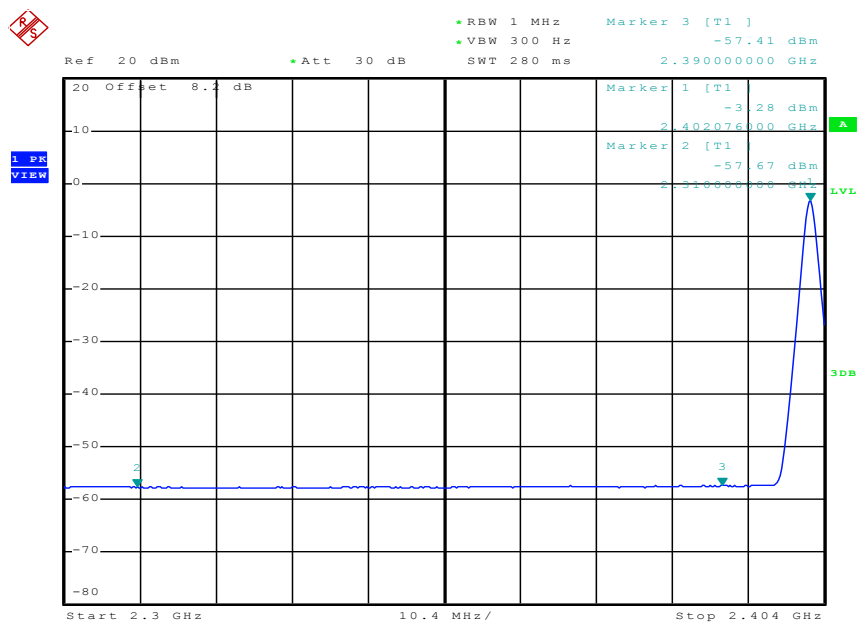
Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-47.99	2.0	0	48.27	PEAK	74	PASS
	Off	2310.0	-57.67	2.0	0	38.59	AV	54	PASS
	Off	2390.0	-48.76	2.0	0	47.50	PEAK	74	PASS
	Off	2390.0	-57.41	2.0	0	38.85	AV	54	PASS
	Off	2483.5	-41.15	2.0	0	55.11	PEAK	74	PASS
	Off	2483.5	-45.36	2.0	0	50.90	AV	54	PASS
	Off	2500.0	-48.11	2.0	0	48.15	PEAK	74	PASS
	Off	2500.0	-57.98	2.0	0	38.28	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-48.18	2.0	0	48.08	PEAK	74	PASS
	Off	2310.0	-57.73	2.0	0	38.53	AV	54	PASS
	Off	2390.0	-47.16	2.0	0	49.10	PEAK	74	PASS
	Off	2390.0	-57.44	2.0	0	38.82	AV	54	PASS
	Off	2483.5	-41.58	2.0	0	54.68	PEAK	74	PASS
	Off	2483.5	-47.25	2.0	0	49.01	AV	54	PASS
	Off	2500.0	-48.53	2.0	0	47.73	PEAK	74	PASS
	Off	2500.0	-58.06	2.0	0	38.20	AV	54	PASS
8DPSK	Off	2310.0	-48.84	2.0	0	47.42	PEAK	74	PASS
	Off	2310.0	-57.73	2.0	0	38.53	AV	54	PASS
	Off	2390.0	-48.23	2.0	0	48.03	PEAK	74	PASS
	Off	2390.0	-57.56	2.0	0	38.70	AV	54	PASS
	Off	2483.5	-40.75	2.0	0	55.51	PEAK	74	PASS
	Off	2483.5	-47.40	2.0	0	48.86	AV	54	PASS
	Off	2500.0	-47.54	2.0	0	48.72	PEAK	74	PASS
	Off	2500.0	-58.08	2.0	0	38.18	AV	54	PASS

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



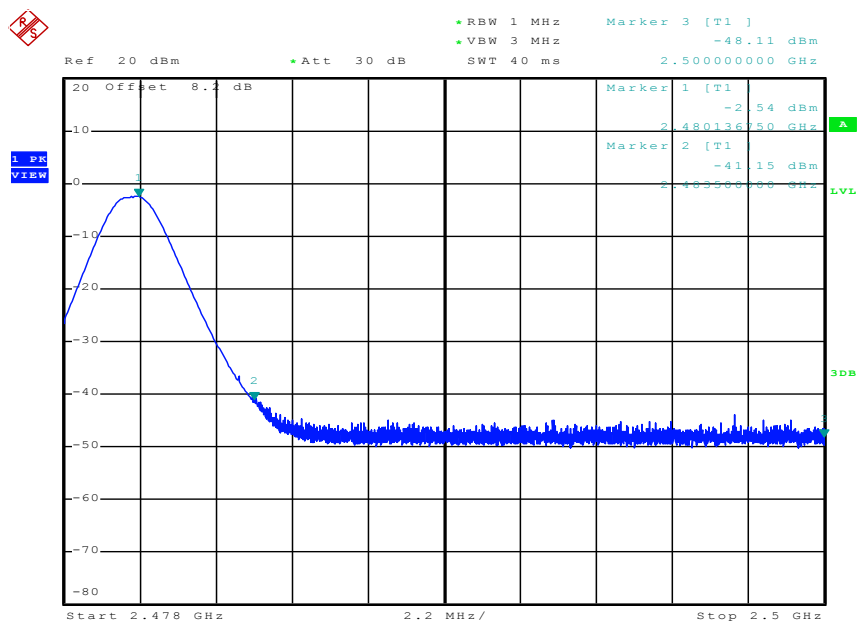
Date: 12.AUG.2019 22:57:13

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



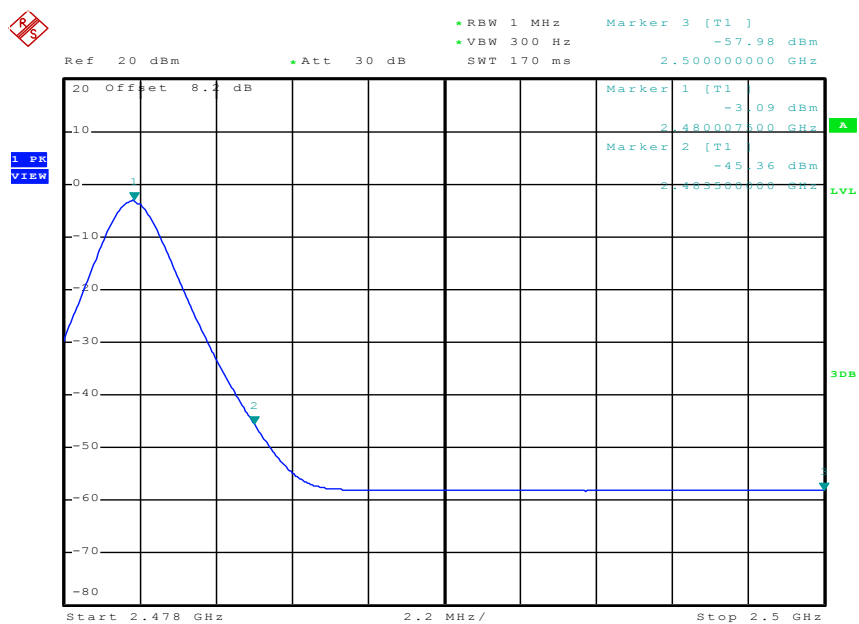
Date: 12.AUG.2019 22:57:27

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

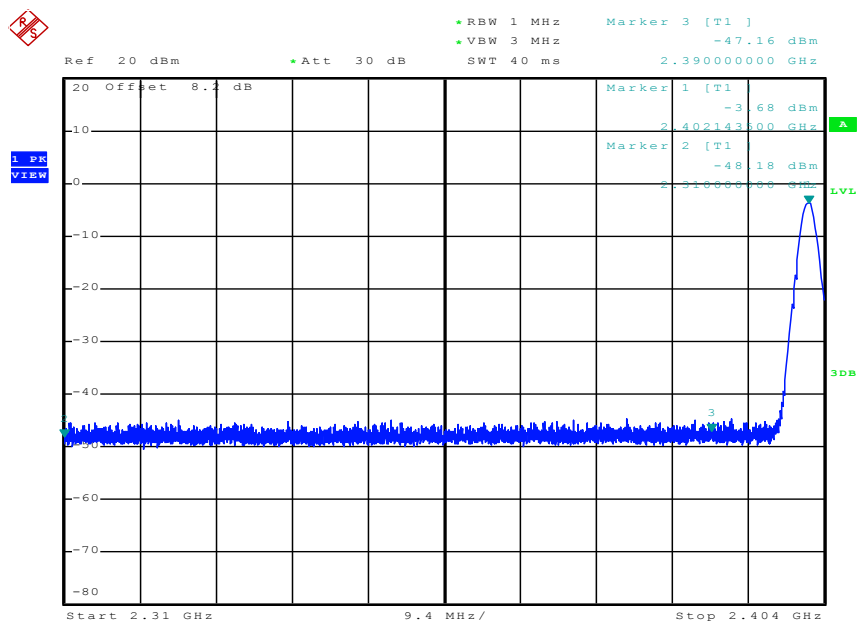


Date: 12.AUG.2019 21:58:00

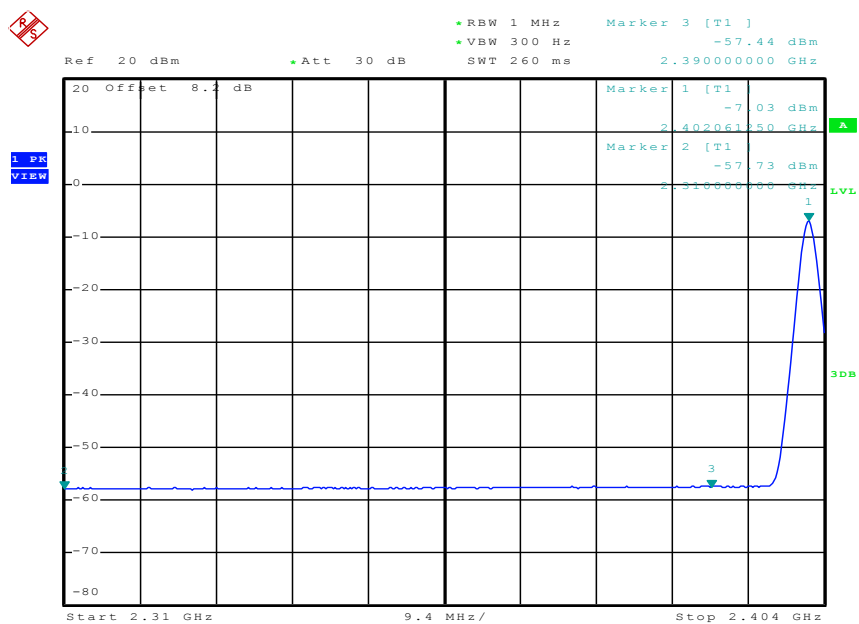
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



Date: 12.AUG.2019 21:58:14

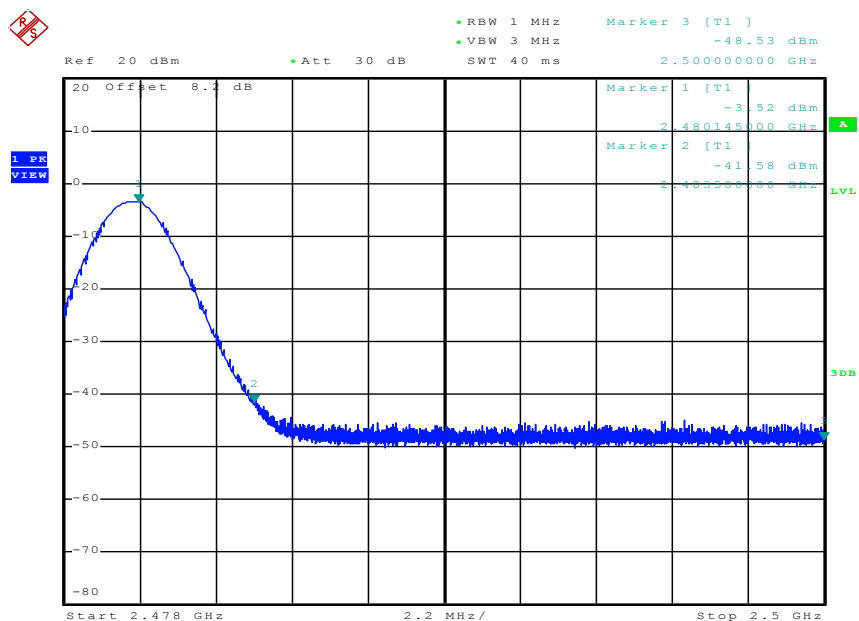
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (Low Channel)

Date: 12.AUG.2019 22:00:41

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

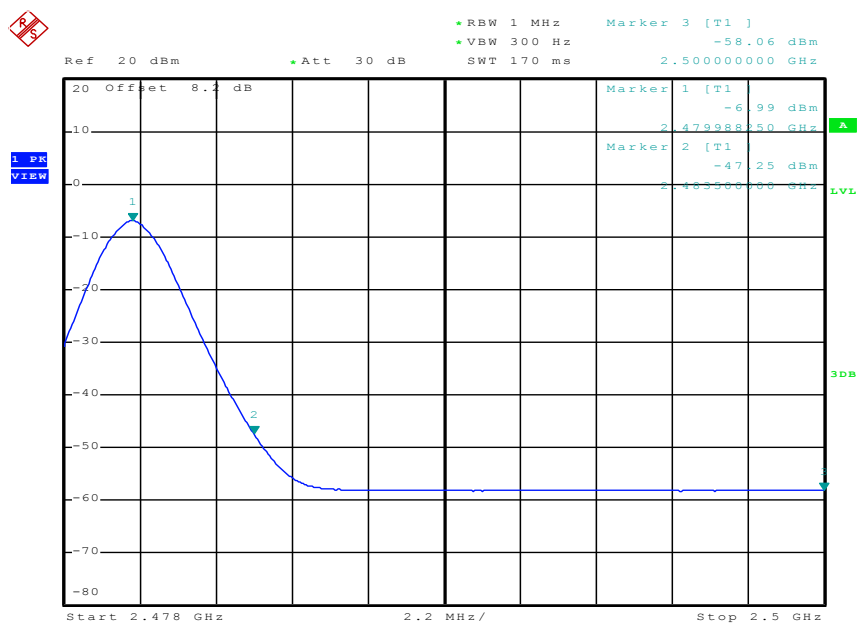
Date: 12.AUG.2019 22:00:54

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



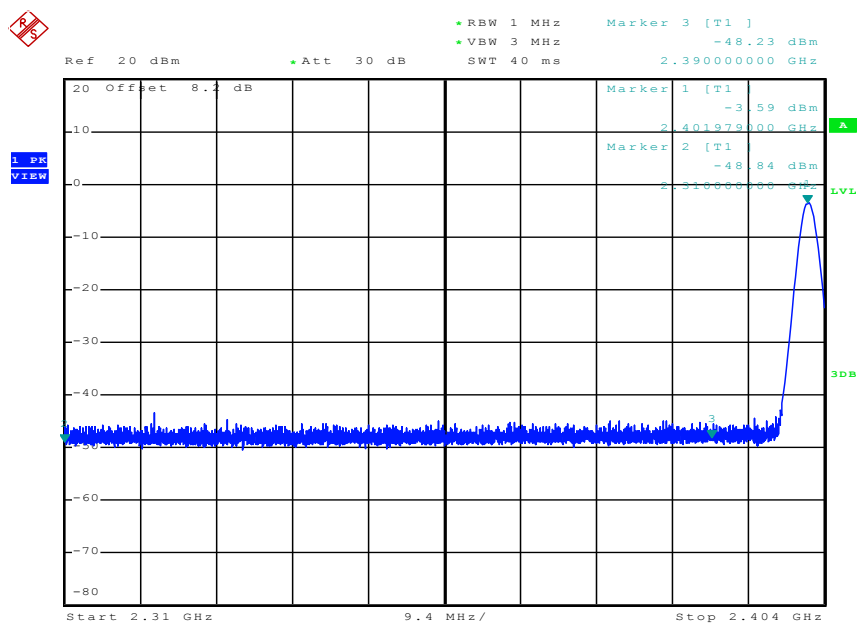
Date: 12.AUG.2019 22:05:16

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



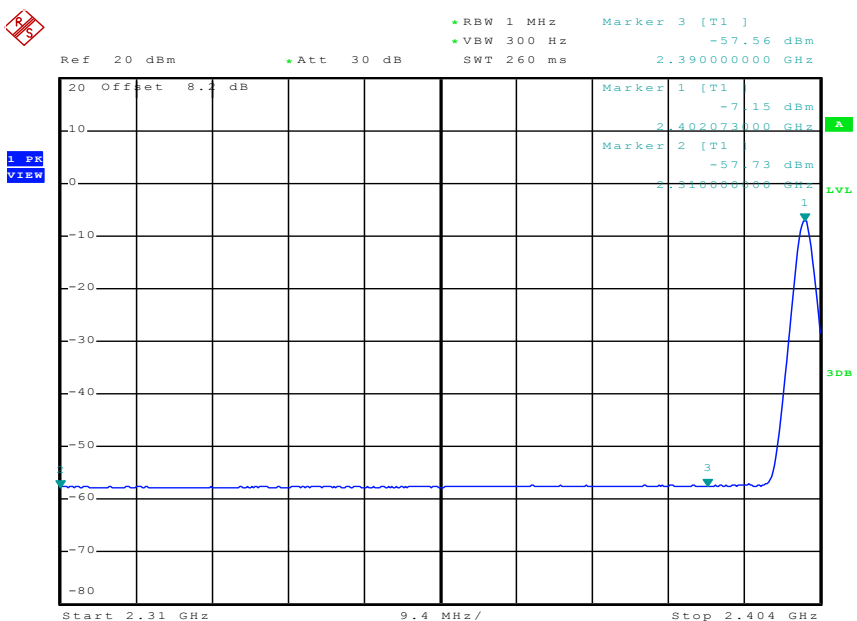
Date: 12.AUG.2019 22:05:30

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



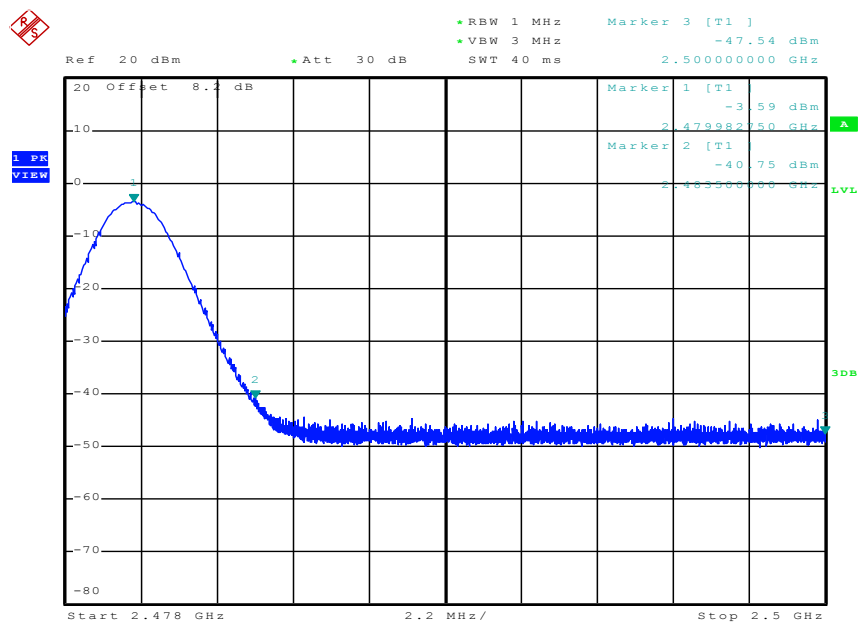
Date: 12.AUG.2019 23:07:07

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



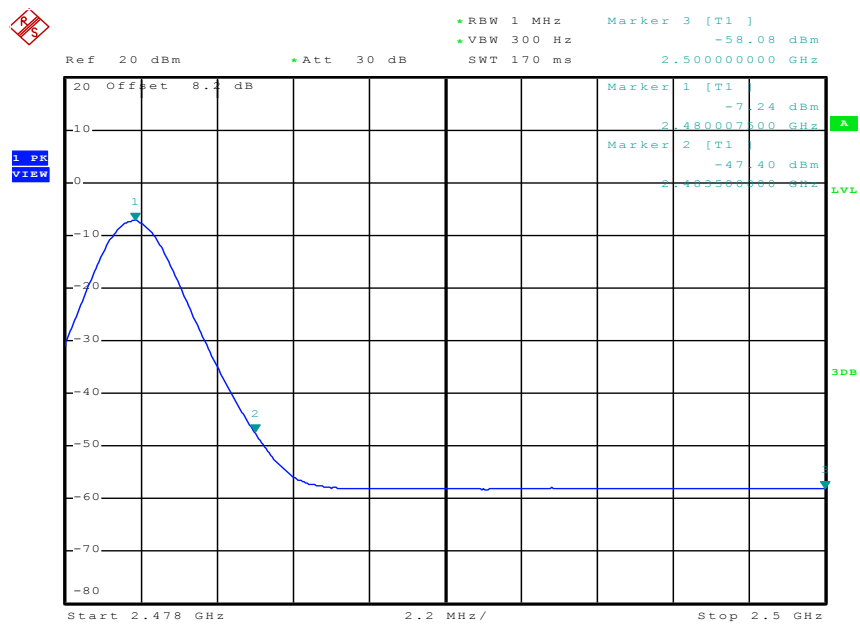
Date: 12.AUG.2019 23:07:20

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



Date: 12.AUG.2019 22:12:24

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



Date: 12.AUG.2019 22:12:38