

Appendix A

RF Test Data for BT V3.0 (Conducted Measurement)

Product Name: Smart Watch

Test Model: Q18

Environmental Conditions

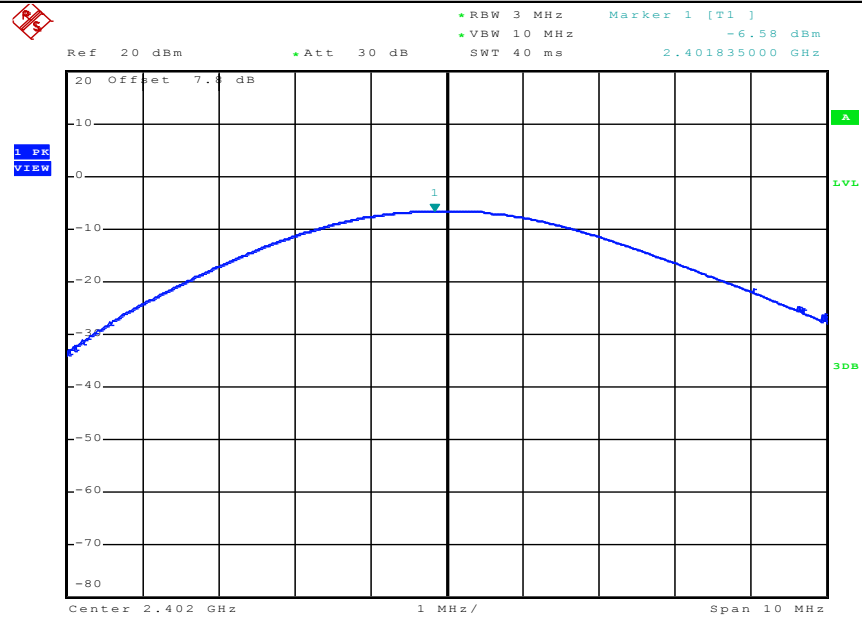
Temperature:	22.6 ° C
Relative Humidity:	53.6%
ATM Pressure:	100.0 kPa
Test Engineer:	Wang Chuang
Supervised by:	Tom Liu

A.1 Maxmum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Maximum Average Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-6.580	-6.794	21	PASS
	MCH	-6.220	-6.423	21	PASS
	HCH	-5.760	-5.943	21	PASS
$\pi/4$ DQPSK	LCH	-7.350	-7.493	21	PASS
	MCH	-7.130	-7.258	21	PASS
	HCH	-6.740	-6.902	21	PASS
8DPSK	LCH	-7.130	-7.274	21	PASS
	MCH	-6.950	-7.142	21	PASS
	HCH	-6.580	-6.749	21	PASS

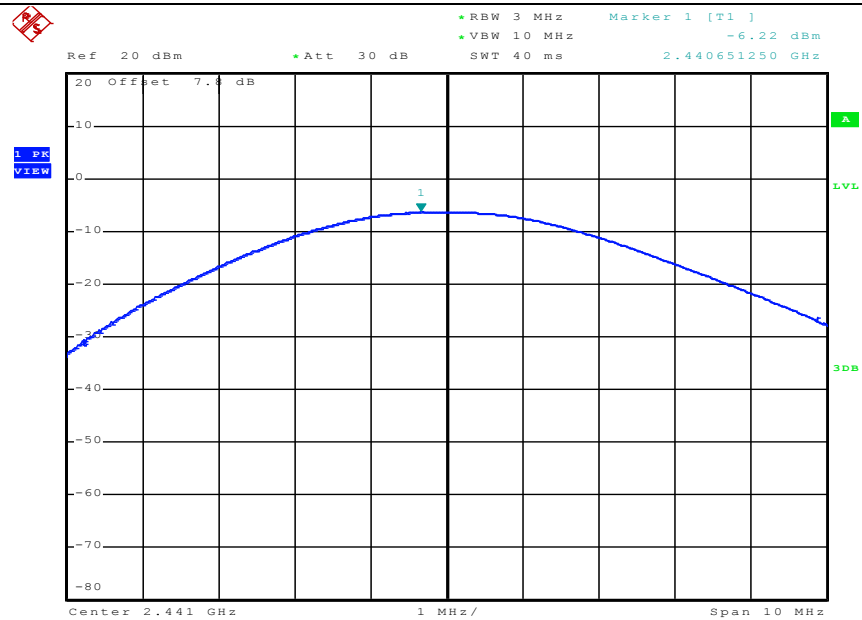
Test Graphs

GFSK/LCH



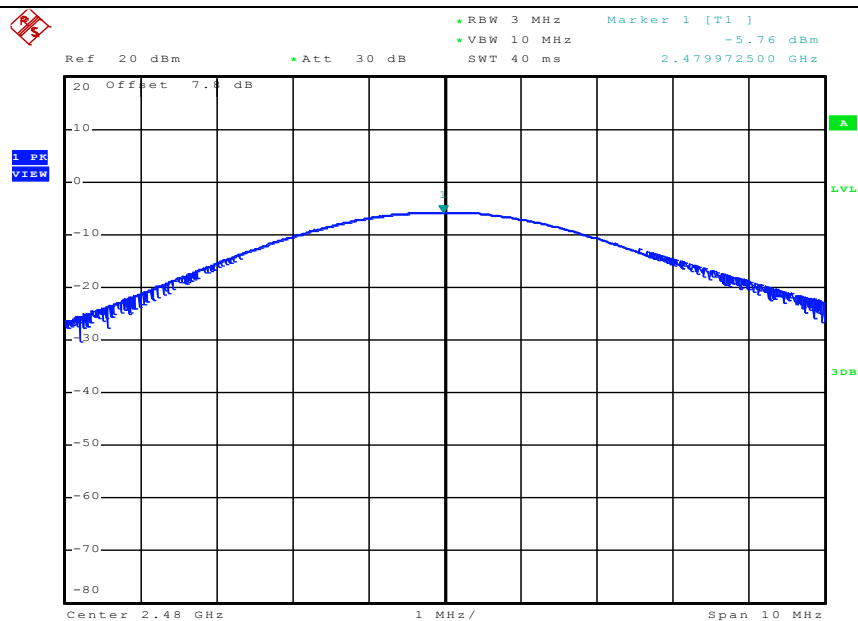
Date: 9.SEP.2019 20:17:20

GFSK/MCH



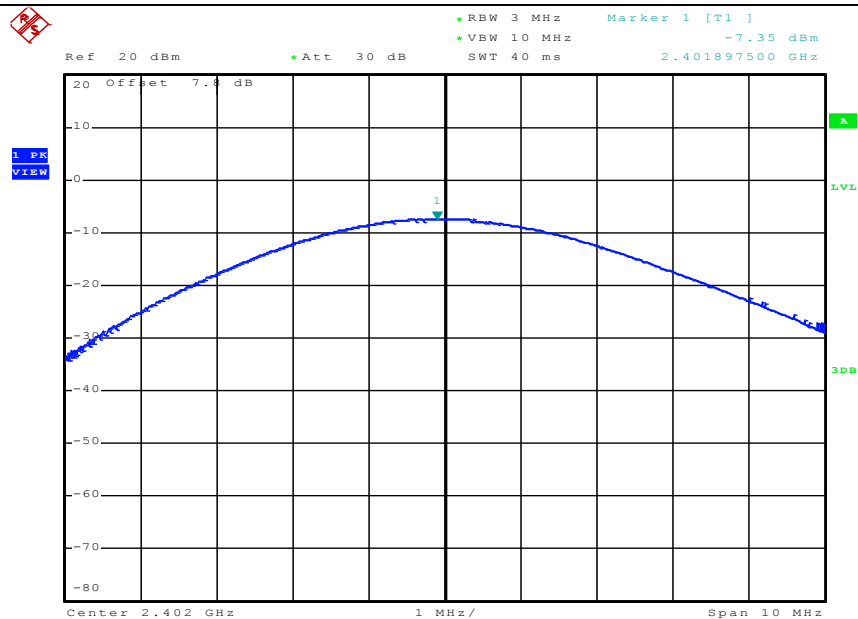
Date: 9.SEP.2019 20:20:40

GFSK/HCH



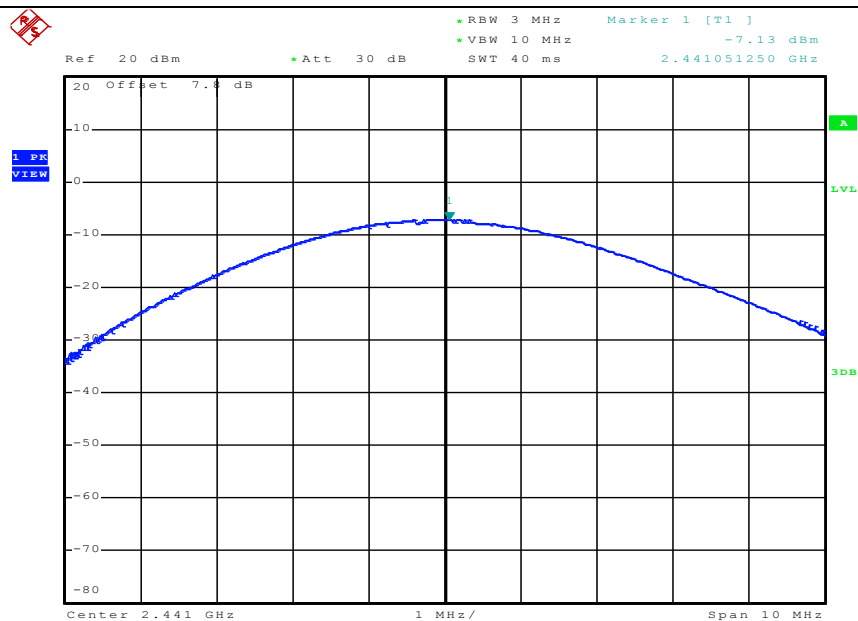
Date: 9.SEP.2019 20:22:24

$\pi/4$ DQPSK/LCH

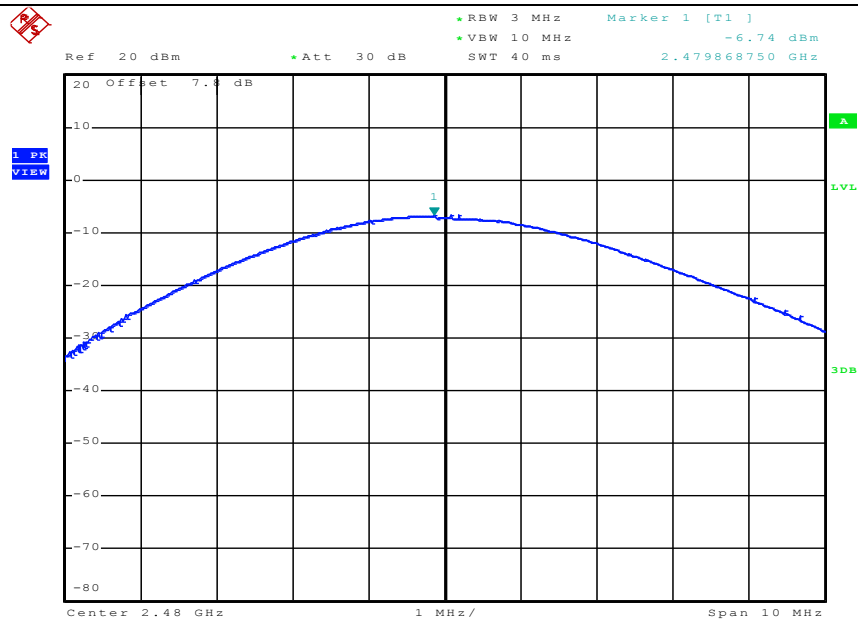


Date: 9.SEP.2019 20:25:23

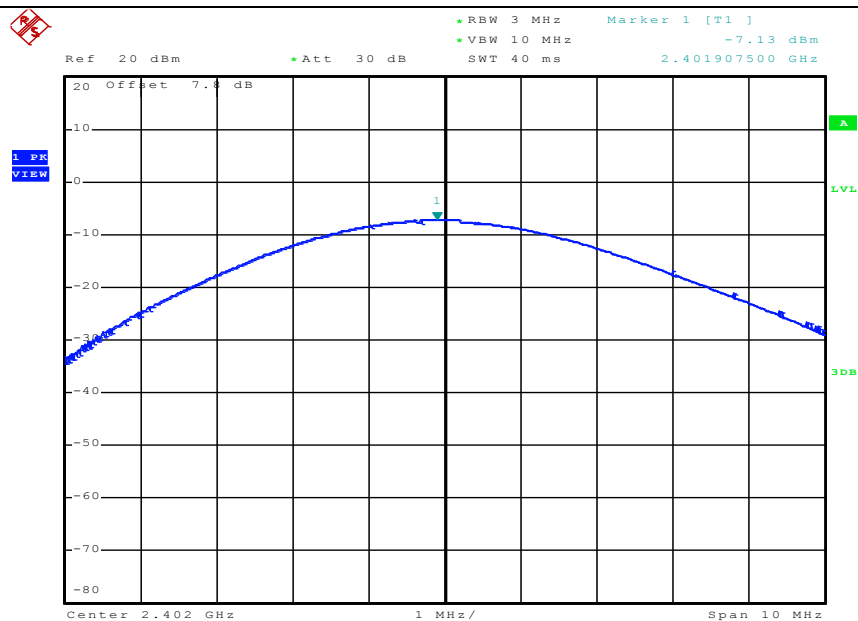
π /4DQPSK/MCH



π /4DQPSK/HCH

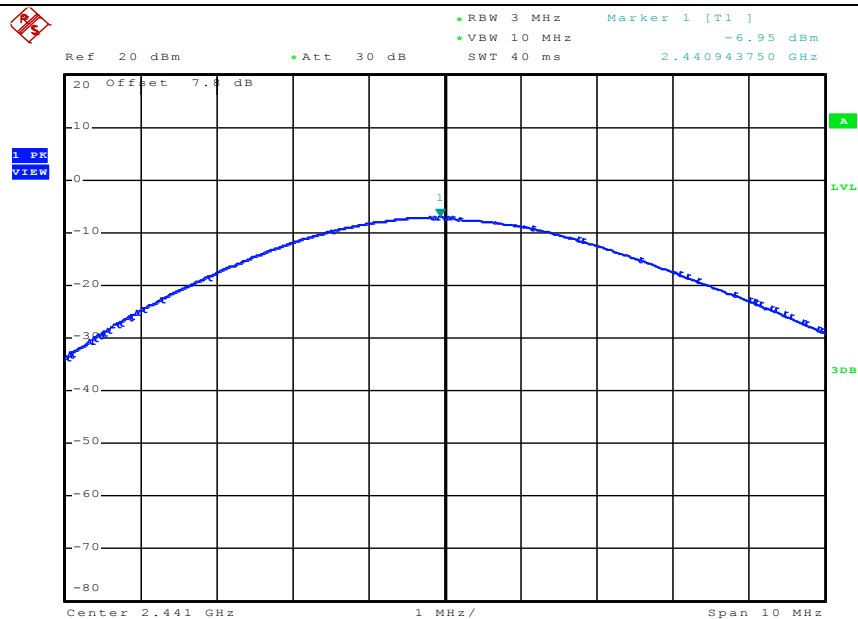


8DPSK/LCH



Date: 9.SEP.2019 20:33:39

8DPSK/MCH

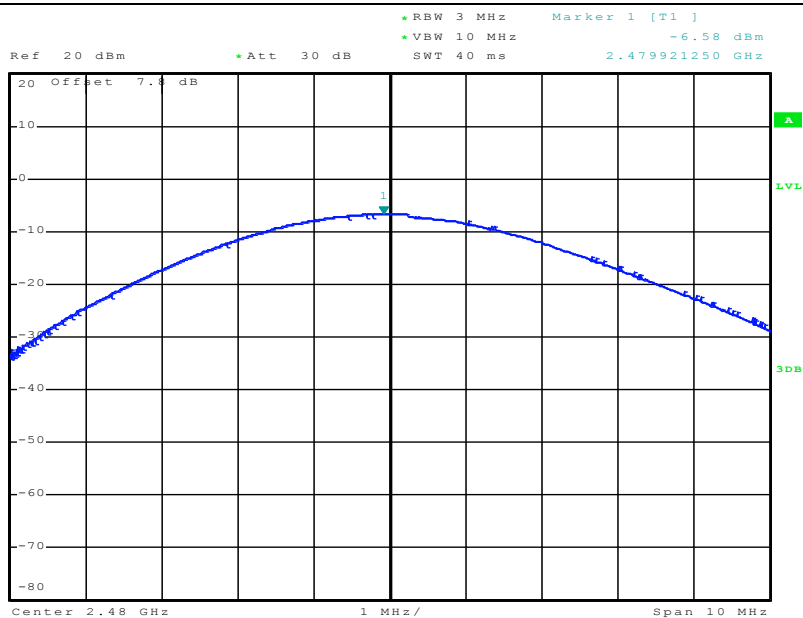


Date: 9.SEP.2019 20:36:08

8DPSK/HCH



1 PR
VIEW



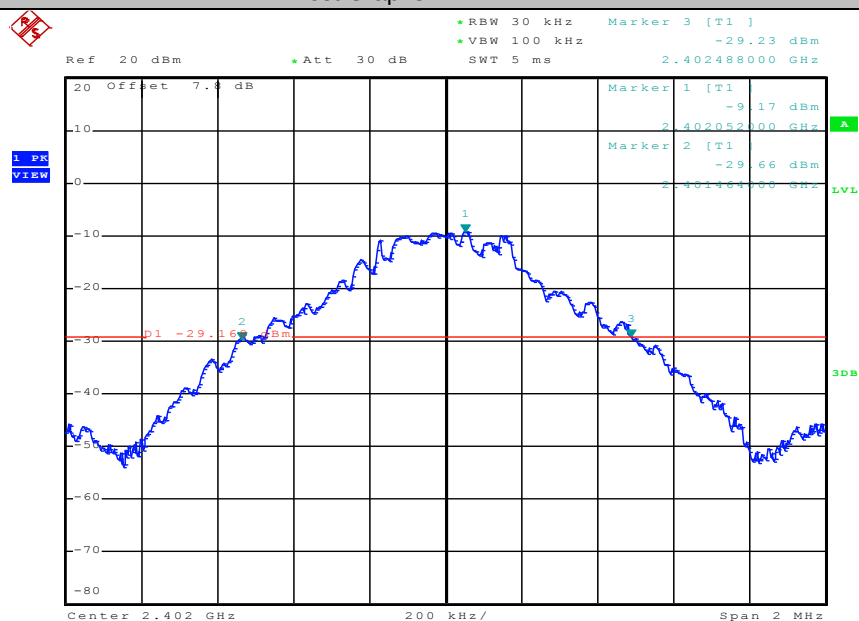
Date: 9.SEP.2019 20:38:00

A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.024	Not Specified	PASS
	MCH	1.020	Not Specified	PASS
	HCH	1.024	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.322	Not Specified	PASS
	MCH	1.282	Not Specified	PASS
	HCH	1.288	Not Specified	PASS
8DPSK	LCH	1.290	Not Specified	PASS
	MCH	1.286	Not Specified	PASS
	HCH	1.292	Not Specified	PASS

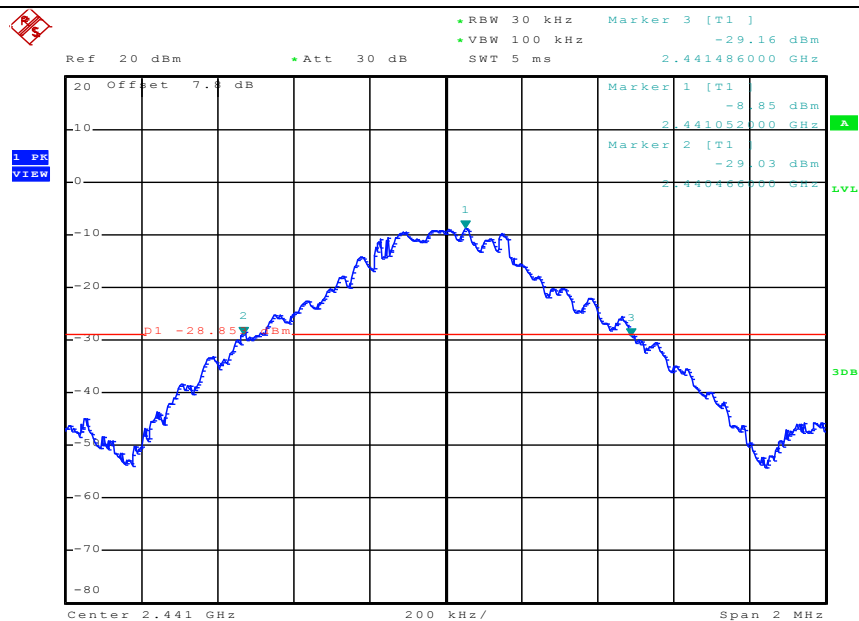
Test Graphs

GFSK/LCH

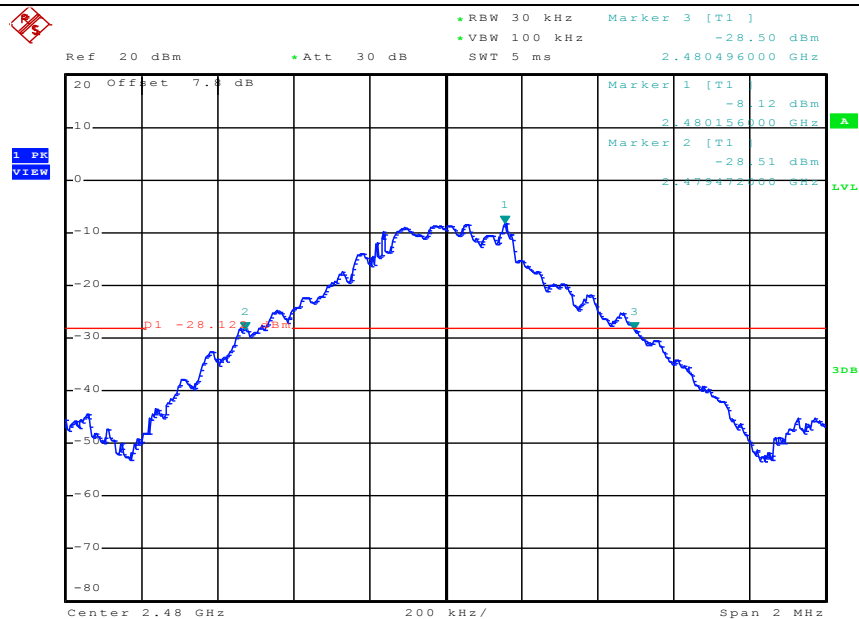


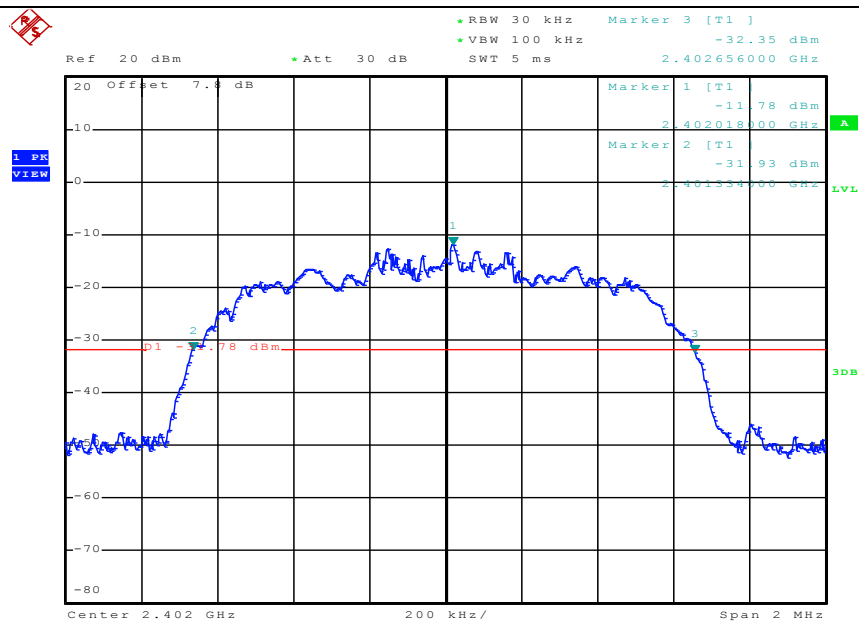
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GFSK/MCH

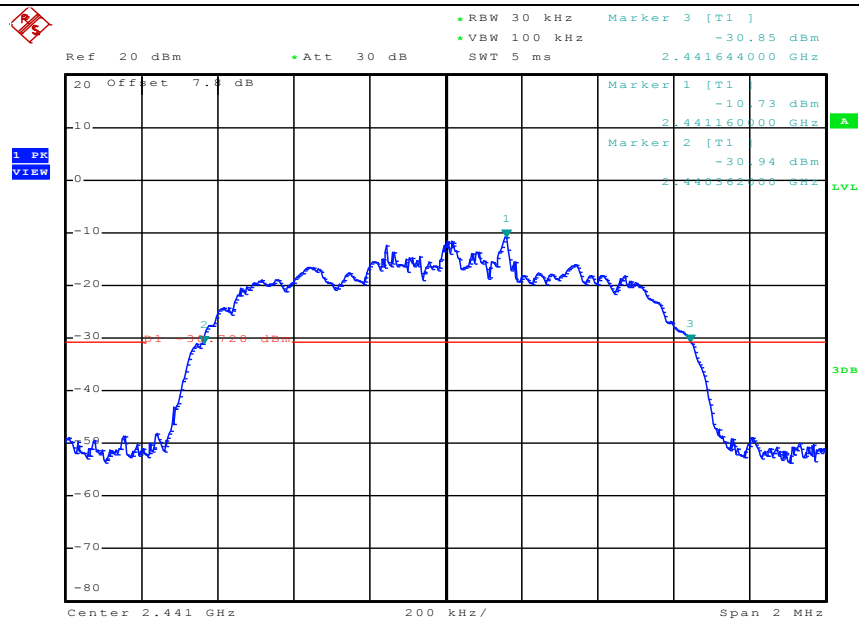


GFSK/HCH



$\pi/4$ DQPSK/LCH

Date: 9.SEP.2019 20:24:47

 $\pi/4$ DQPSK/MCH

Date: 9.SEP.2019 20:27:16

1 PR VIEW

Ref 20 dBm Att 30 dB RBW 30 kHz VBW 100 kHz SWT 5 ms

Marker 3 [T1] -30.76 dBm 2.480650000 GHz

Marker 1 [T1] -10.54 dBm 2.480158000 GHz

Marker 2 [T1] -31.07 dBm 2.479562000 GHz

Center 2.48 GHz 200 kHz/ Span 2 MHz

Date: 9.SEP.2019 20:29:20

1 PK
VIEW

Ref 20 dBm Att 30 dB RBW 30 kHz VBW 100 kHz SWT 5 ms

Marker 3 [T1] -30.86 dBm 2.402640000 GHz

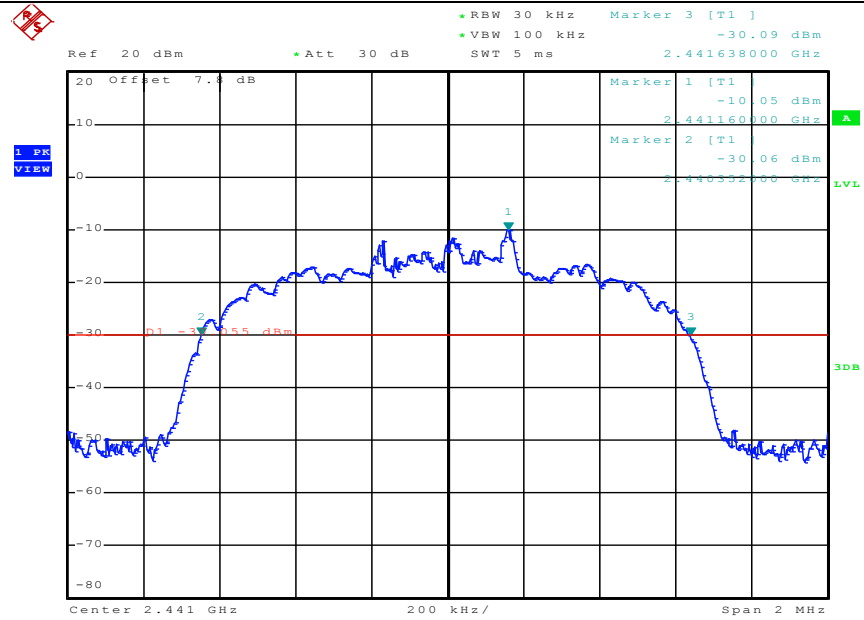
Marker 1 [T1] -10.05 dBm 2.402158000 GHz

Marker 2 [T1] -30.26 dBm 2.401350000 GHz

Center 2.402 GHz Span 2 MHz

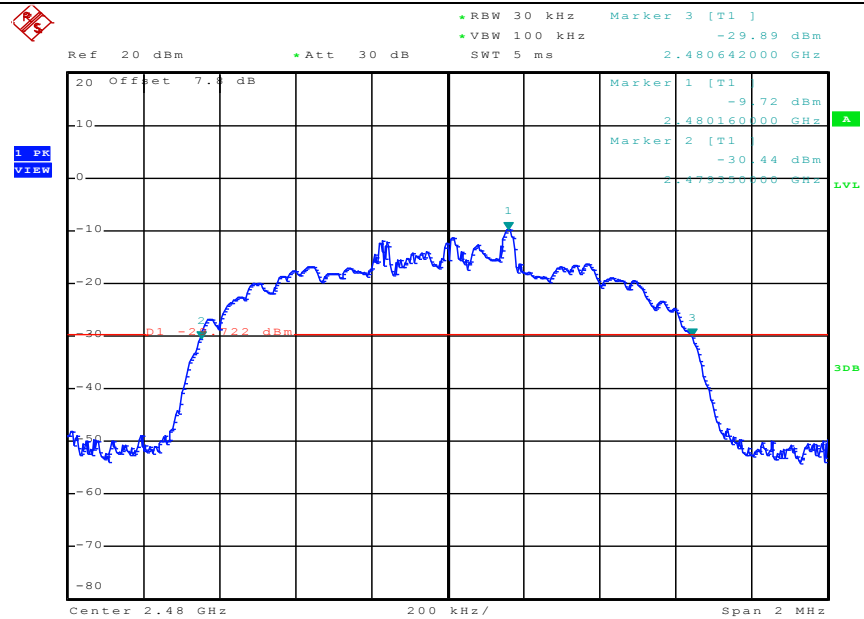
Date: 9.SEP.2019 20:33:02

8DPSK/MCH



Date: 9.SEP.2019 20:35:31

8DPSK/HCH



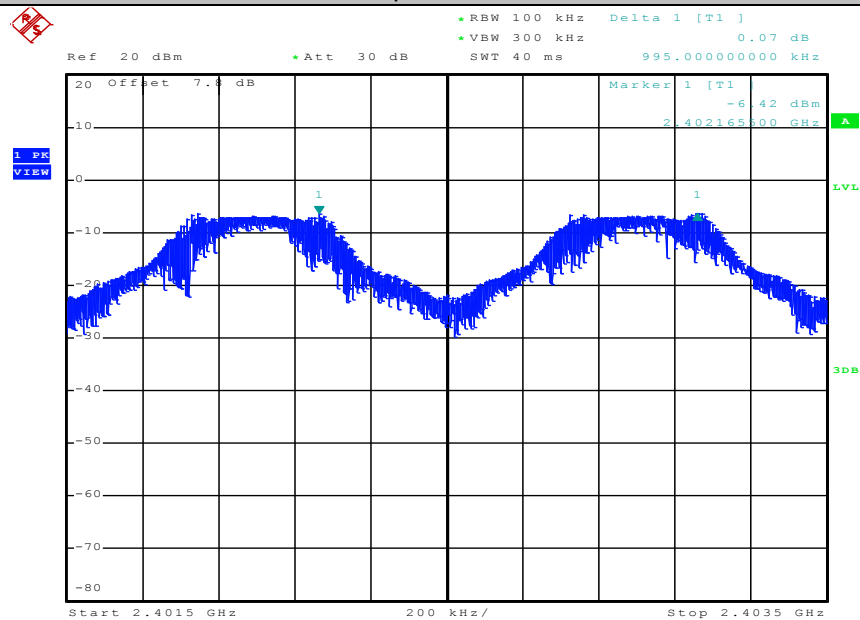
Date: 9.SEP.2019 20:37:23

A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.995	0.683	PASS
	MCH	1.014	0.683	PASS
	HCH	0.994	0.683	PASS
$\pi/4$ DQPSK	LCH	1.106	0.881	PASS
	MCH	0.982	0.881	PASS
	HCH	1.322	0.881	PASS
8DPSK	LCH	1.314	0.861	PASS
	MCH	0.992	0.861	PASS
	HCH	0.996	0.861	PASS

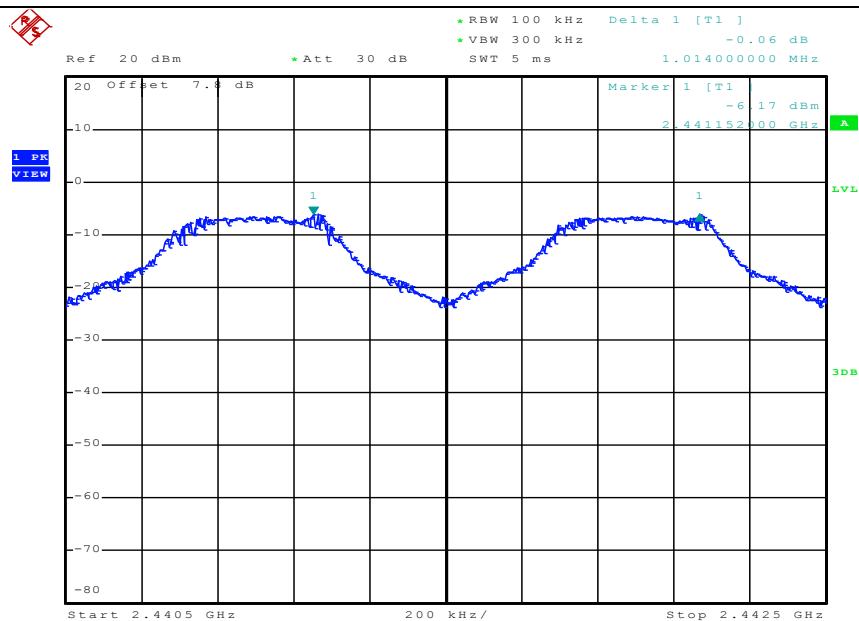
Test Graphs

GFSK/LCH



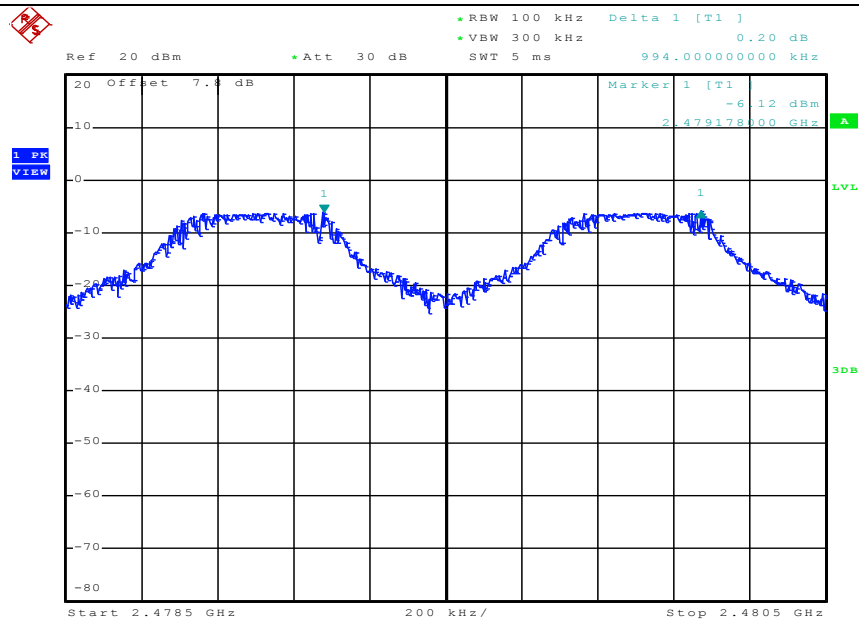
Date: 9.SEP.2019 21:17:52

GFSK/MCH

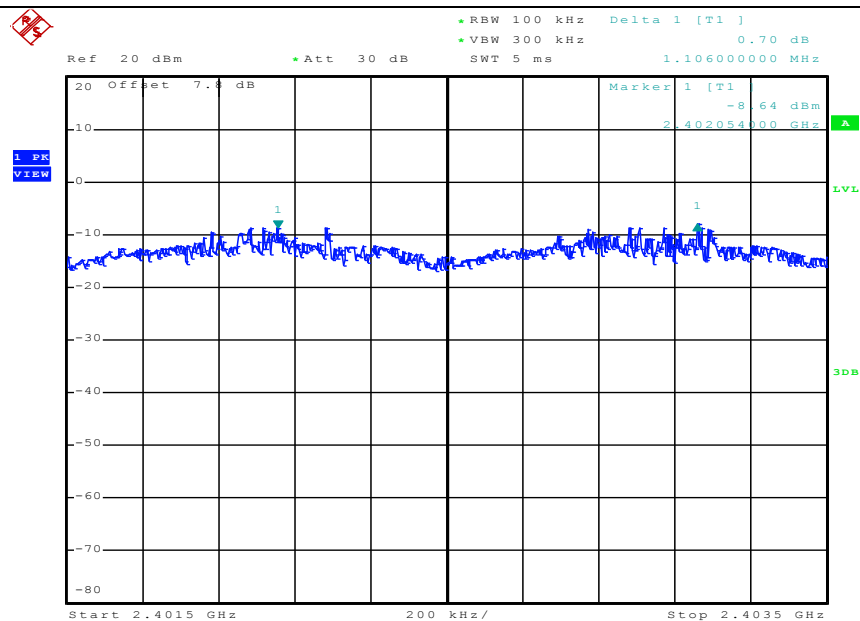


Date: 9.SEP.2019 20:46:24

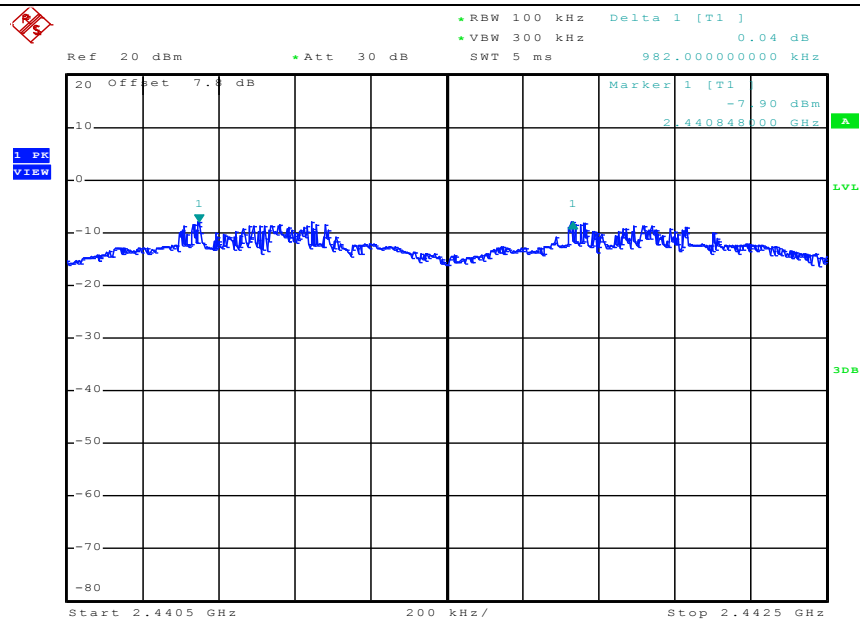
GFSK/HCH



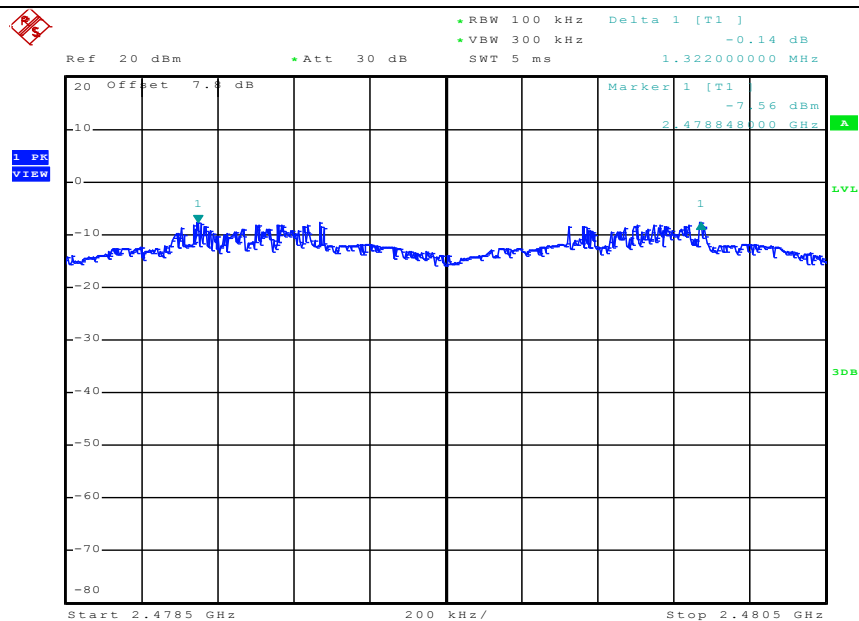
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$\pi/4$ DQPSK/LCH

Date: 9.SEP.2019 20:53:42

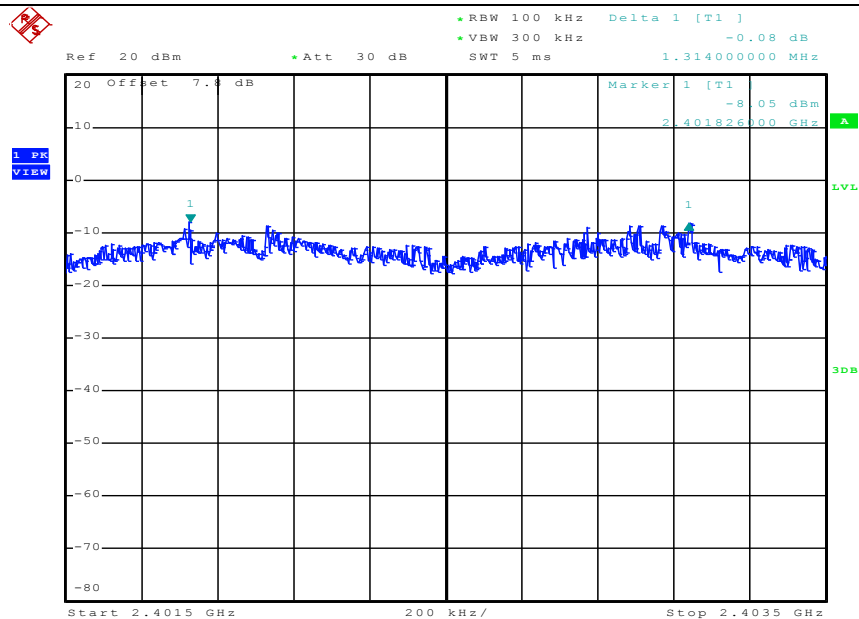
 $\pi/4$ DQPSK/MCH

Date: 9.SEP.2019 20:59:12

π /4DQPSK/HCH

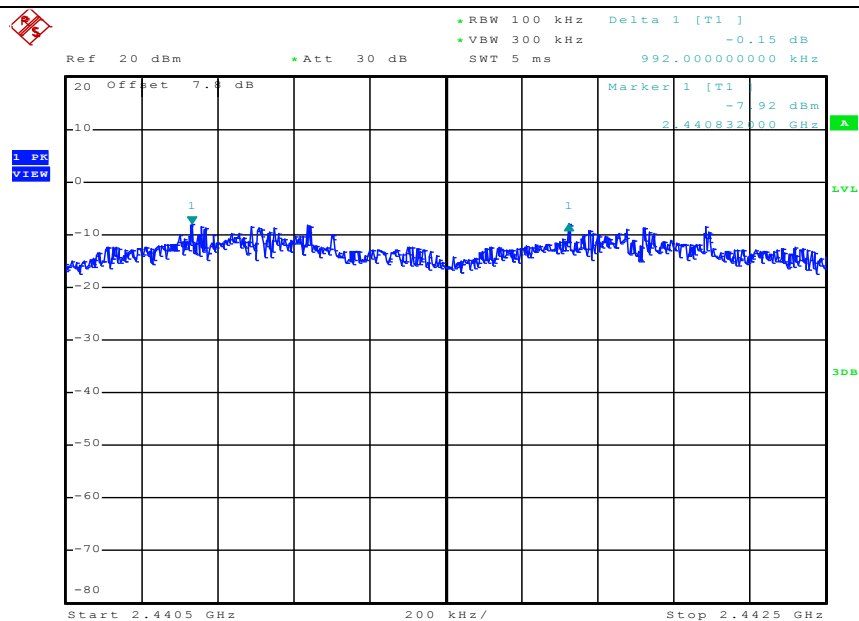
Date: 9.SEP.2019 21:01:46

8DPSK/LCH



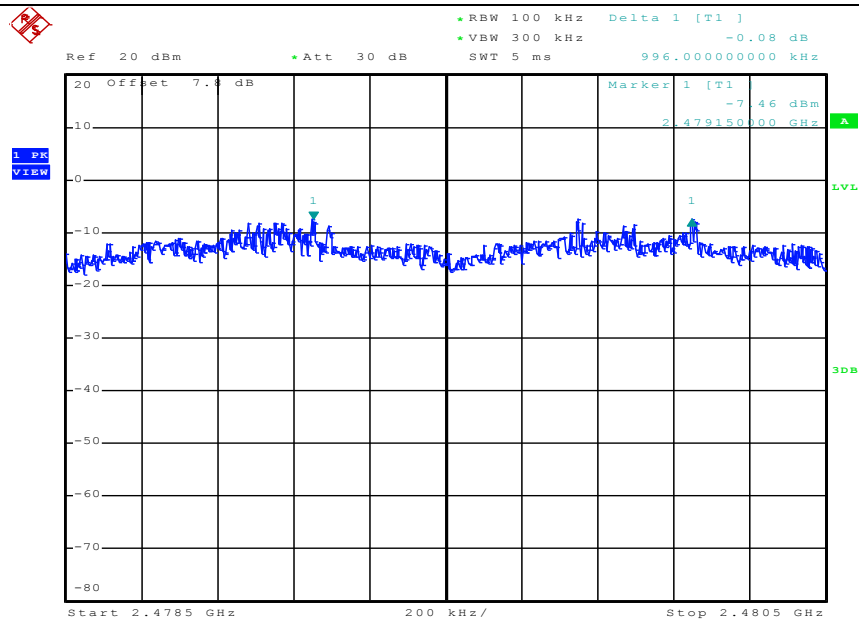
Date: 9.SEP.2019 21:07:49

8DPSK/MCH



Date: 9.SEP.2019 21:10:34

8DPSK/HCH



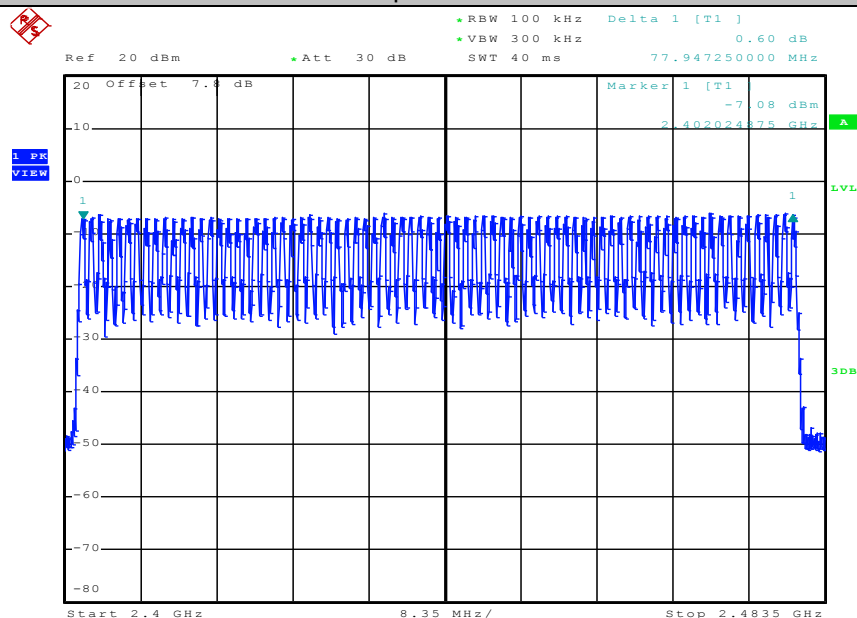
Date: 9.SEP.2019 21:11:21

A.4 Hopping Channel Number

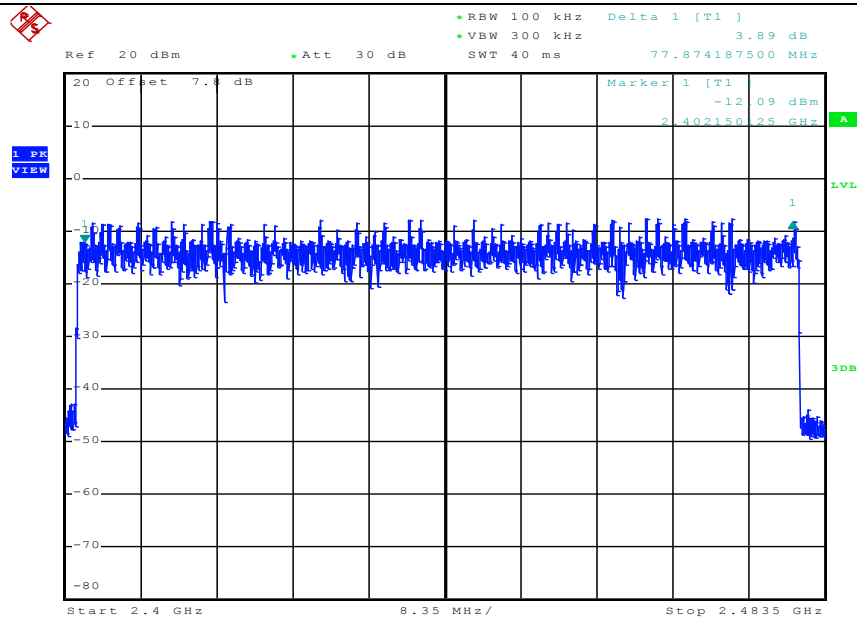
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

GFSK/Hop

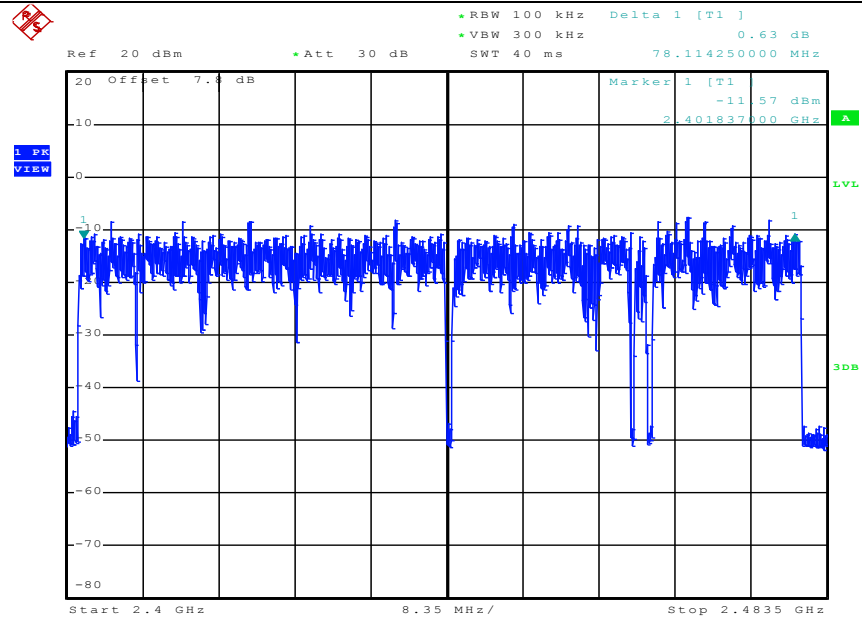


Date: 9.SEP.2019 20:51:34

 $\pi/4$ DQPSK/Hop

Date: 9.SEP.2019 21:06:15

8DPSK/Hop



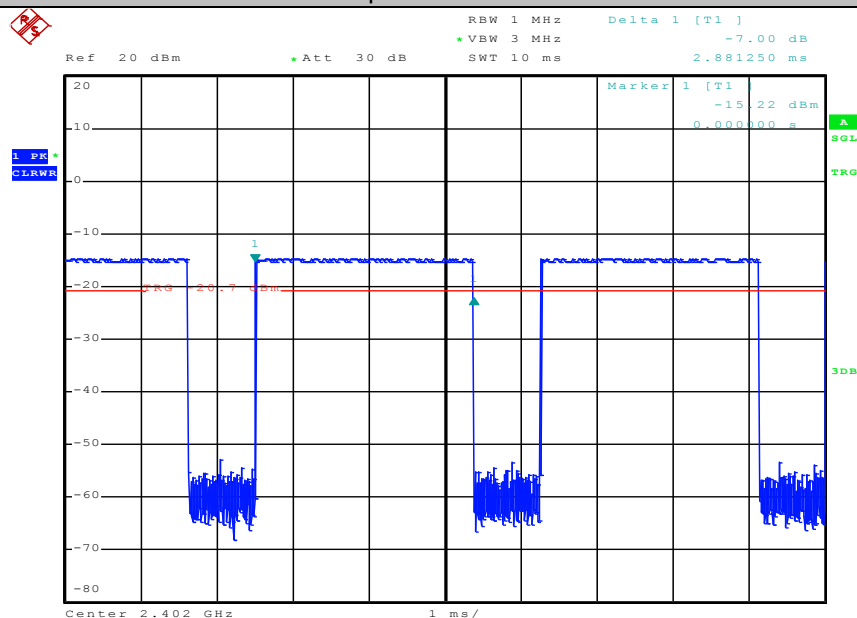
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A.5 Dwell Time

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	2.89	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

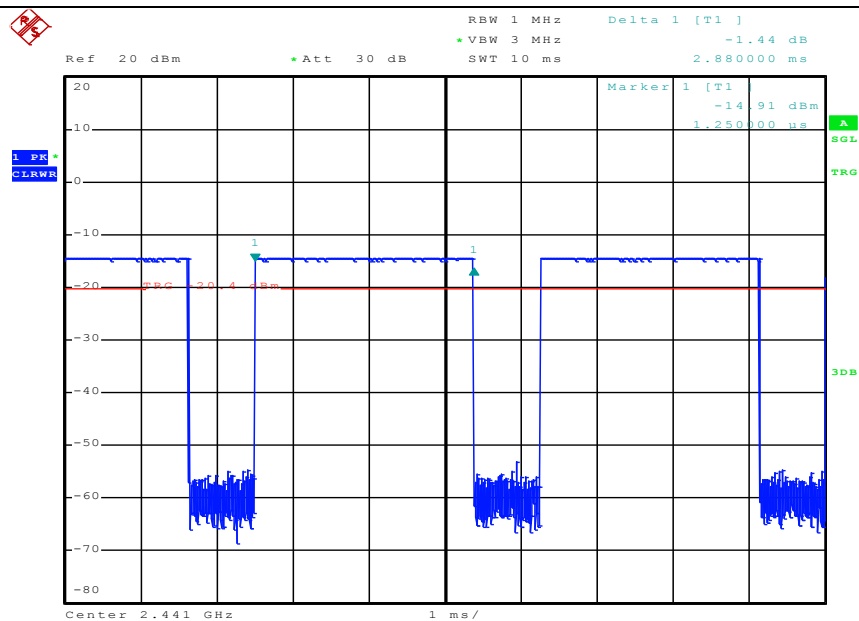
Test Graphs

GFSK_DH5/LCH



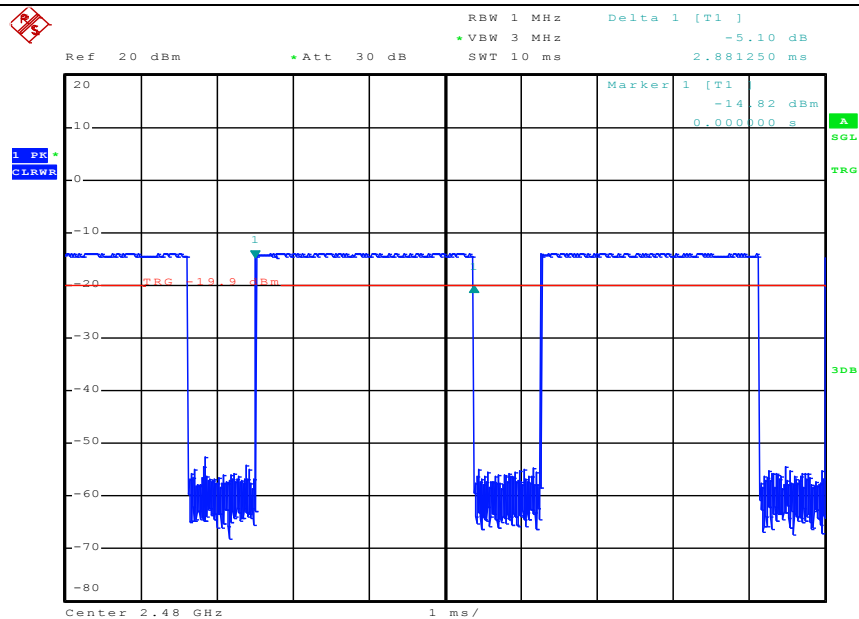
Date: 9.SEP.2019 20:17:05

GFSK_DH5/MCH



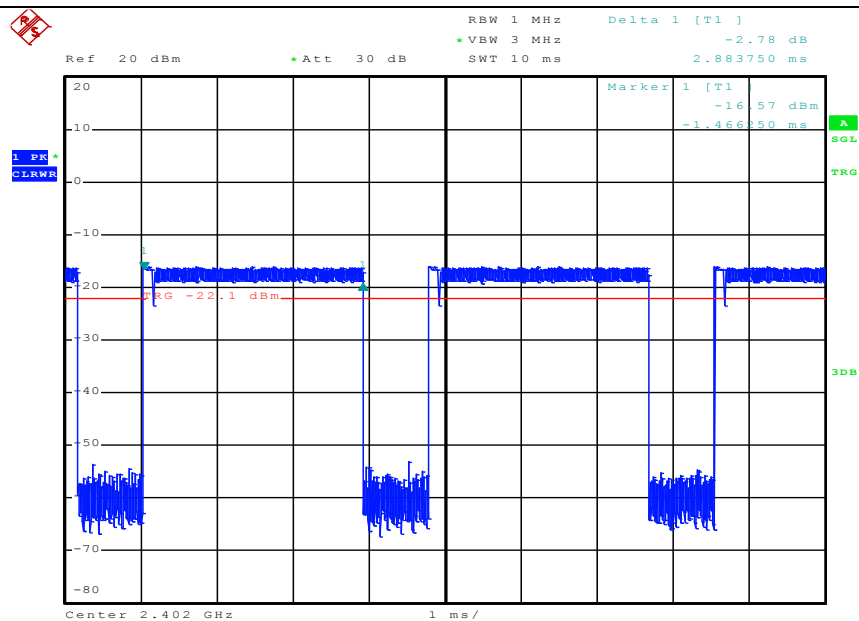
Date: 9.SEP.2019 20:20:25

GFSK_DH5/HCH



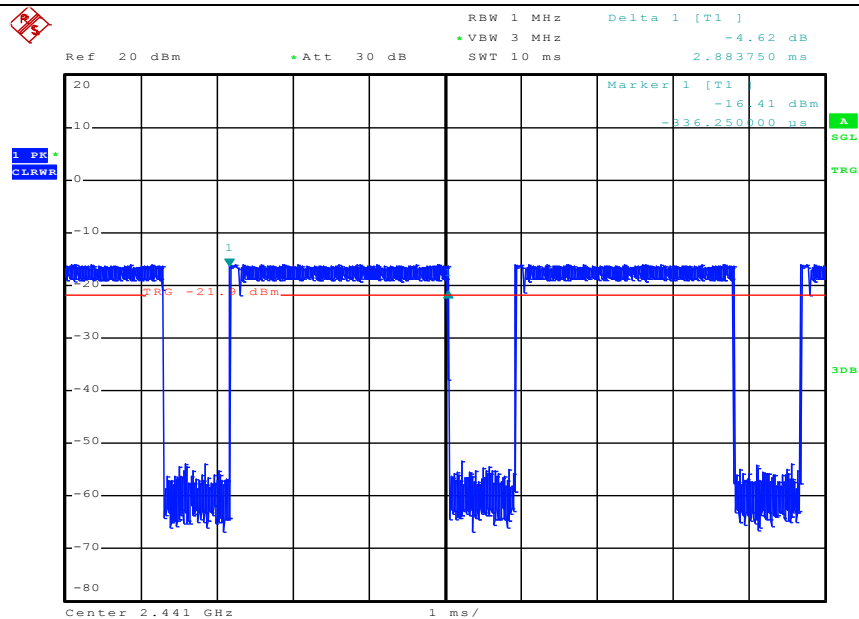
Date: 9.SEP.2019 20:22:09

$\pi/4$ DQPSK
_2DH5/LCH



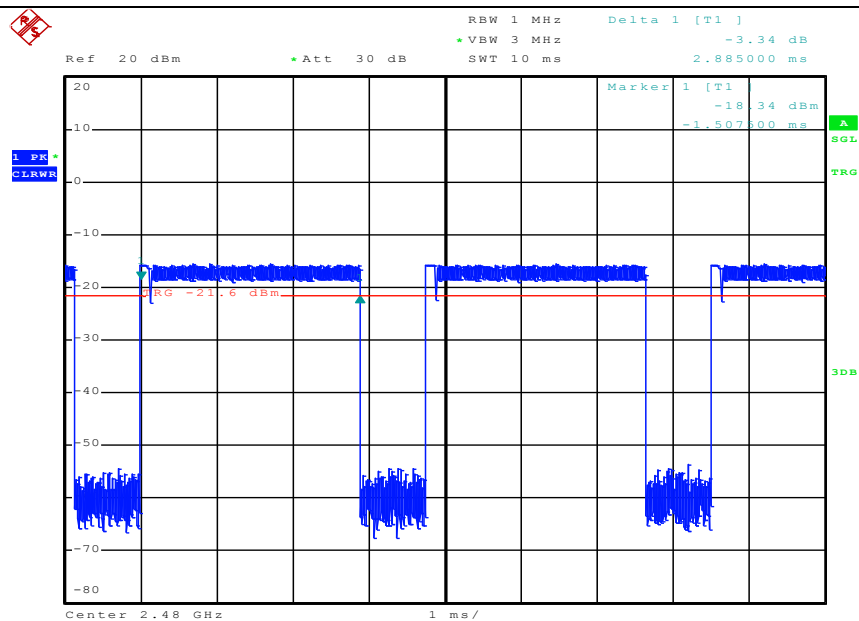
Date: 9.SEP.2019 20:25:08

$\pi/4$ DQPSK
_2DH5/MCH



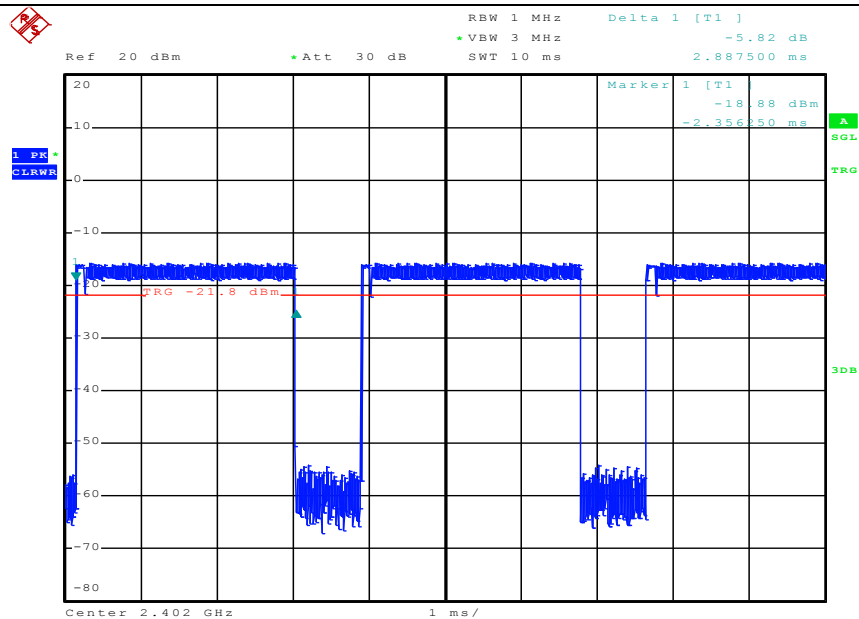
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$\pi/4$ DQPSK
_2DH5/HCH



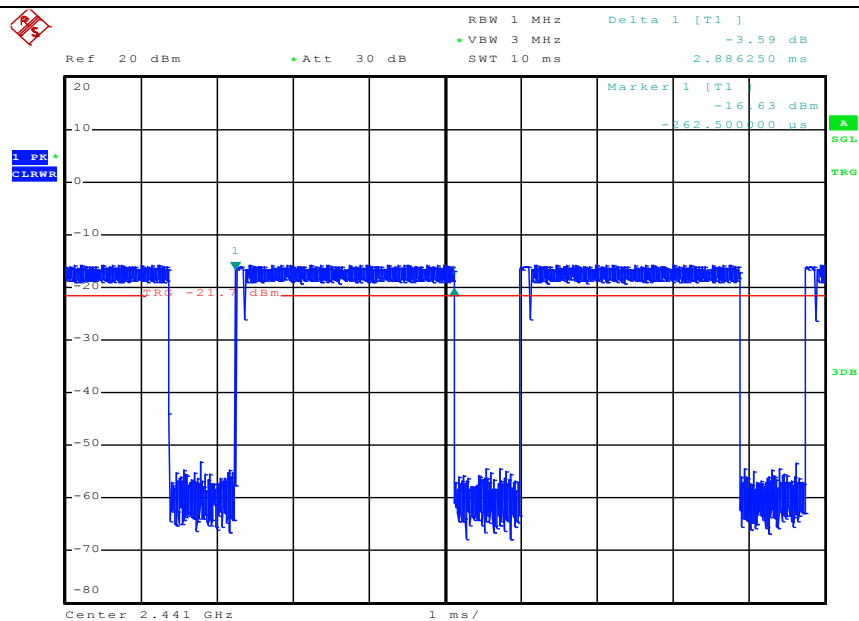
Date: 9.SEP.2019 20:29:42

8DPSK_3DH5/LCH



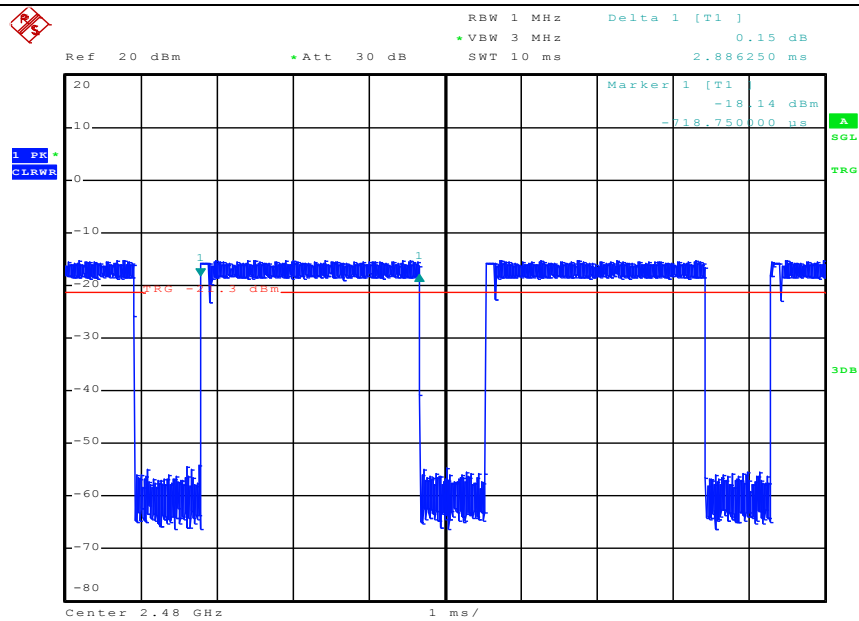
Date: 9.SEP.2019 20:33:23

8DPSK_3DH5/MCH



Date: 9.SEP.2019 20:35:53

8DPSK_3DH5/HCH



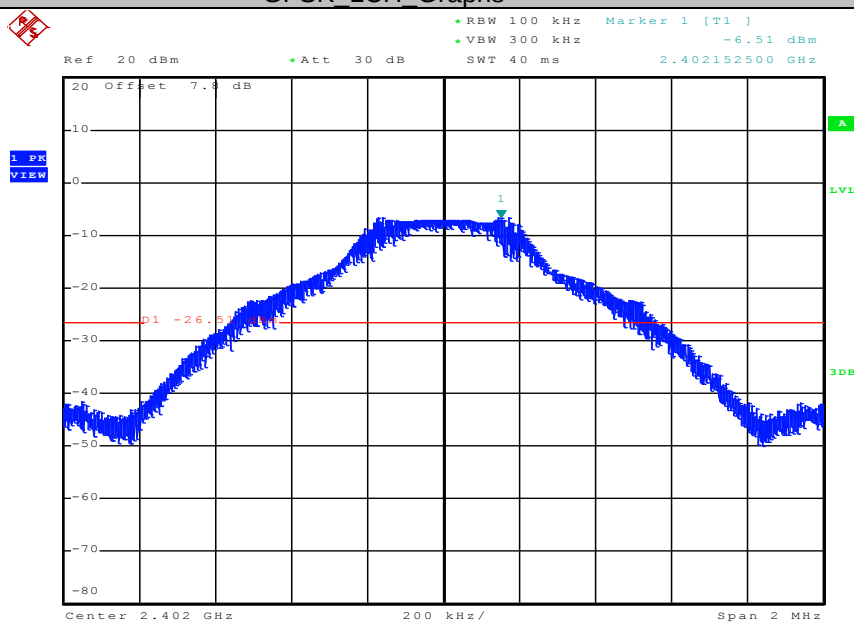
Date: 9.SEP.2019 20:37:45

A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-6.51	-33.140	-26.510	PASS
	MCH	-6.22	-32.910	-26.220	PASS
	HCH	-5.83	-32.610	-25.830	PASS
$\pi/4$ DQPSK	LCH	-7.91	-33.730	-27.910	PASS
	MCH	-7.8	-33.110	-27.800	PASS
	HCH	-7.52	-32.610	-27.520	PASS
8DPSK	LCH	-7.79	-32.330	-27.790	PASS
	MCH	-7.79	-32.630	-27.790	PASS
	HCH	-7.43	-33.290	-27.430	PASS

GFSK LCH Graphs

Pref

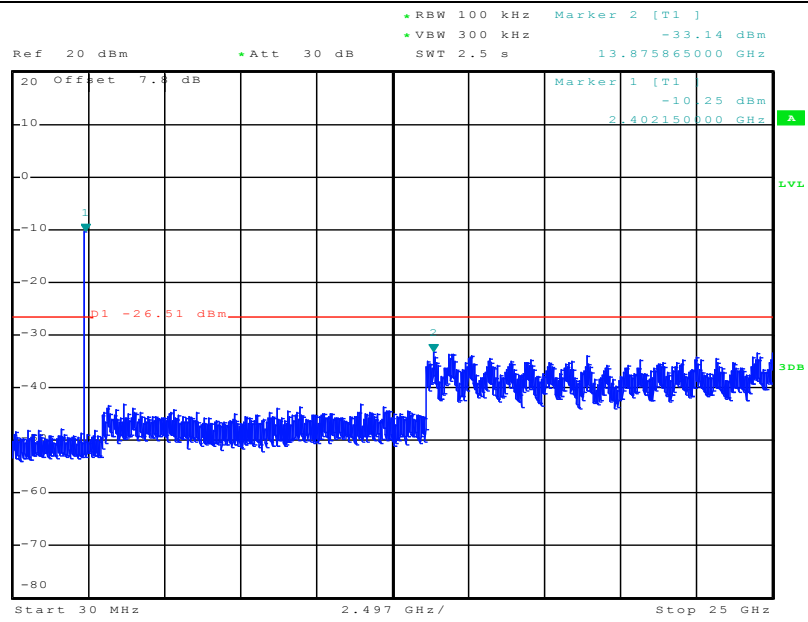


Date: 9.SEP.2019 20:17:49

P_uw



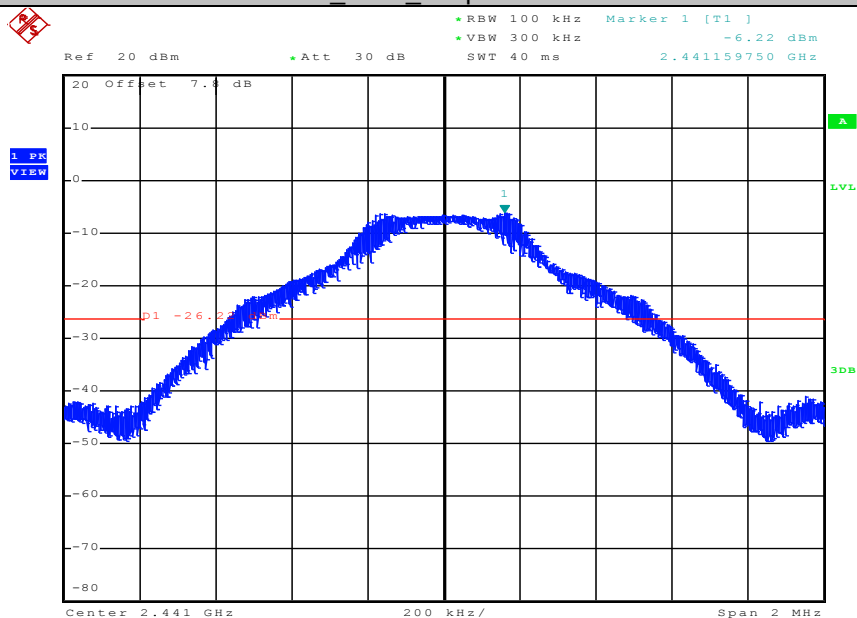
1. PK
VIEW



Date: 9.SEP.2019 20:18:04

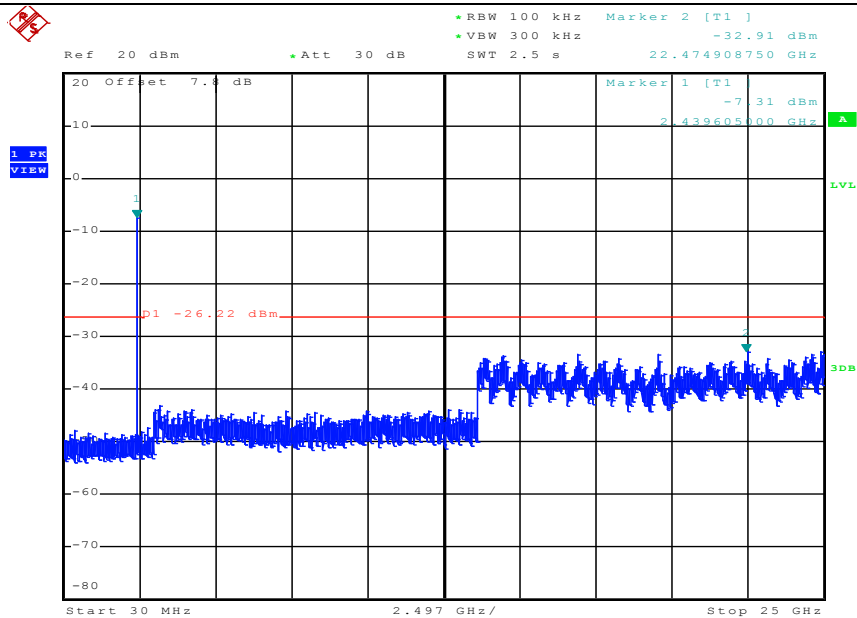
GFSK_MCH_Graphs

Pref



Date: 9.SEP.2019 20:20:52

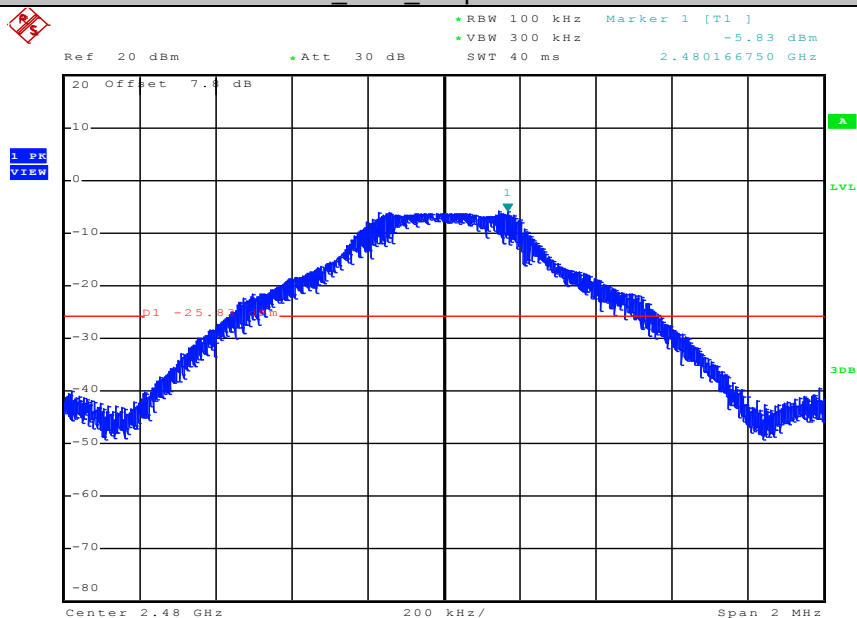
Puw



Date: 9.SEP.2019 20:21:07

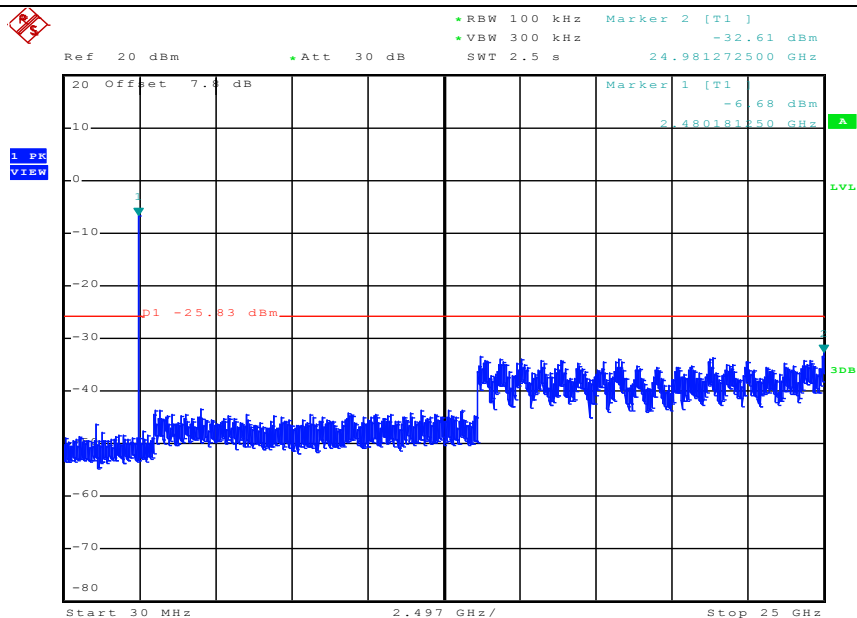
GFSK_HCH_Graphs

Pref



Date: 9.SEP.2019 20:22:54

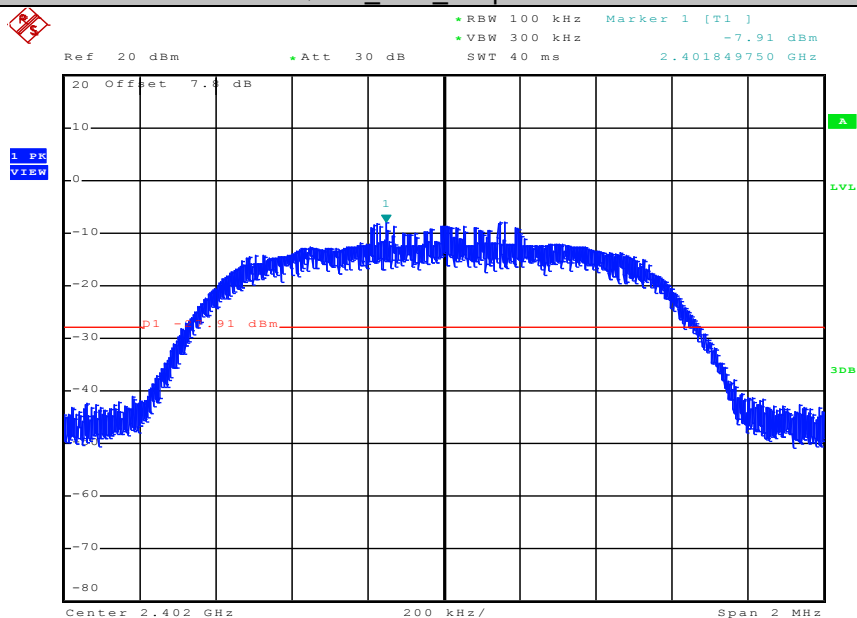
Puw



Date: 9.SEP.2019 20:23:09

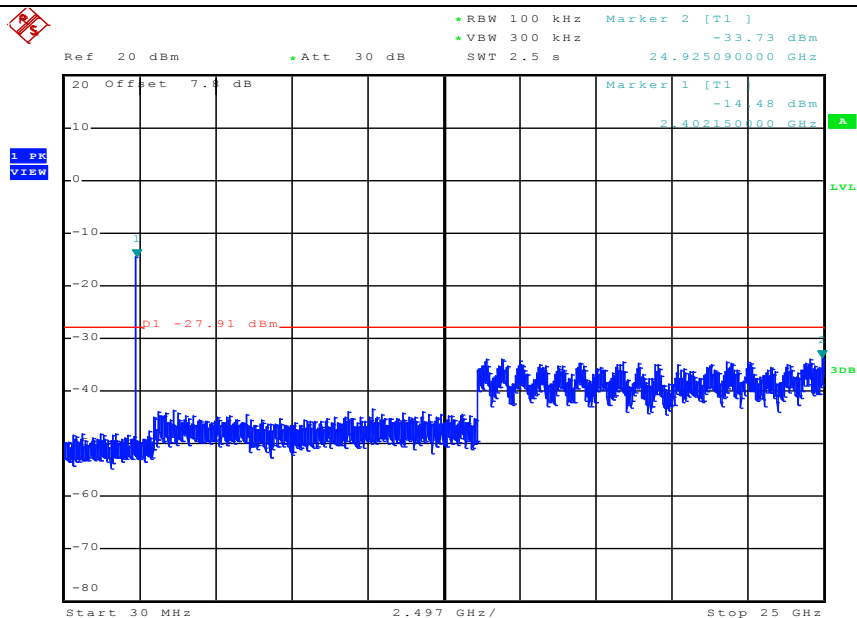
$\pi/4$ DQPSK_LCH_Graphs

Pref



Date: 9.SEP.2019 20:25:52

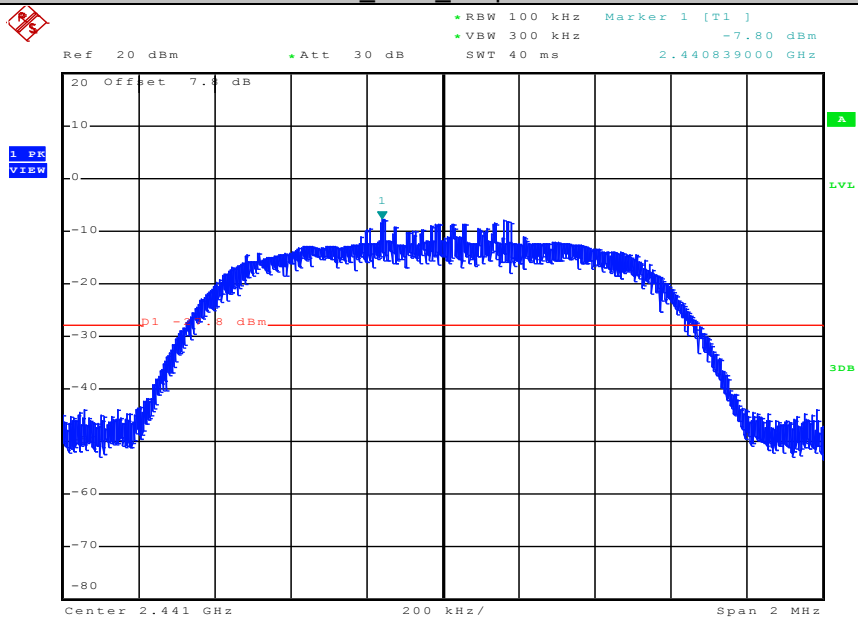
Puw



Date: 9.SEP.2019 20:26:07

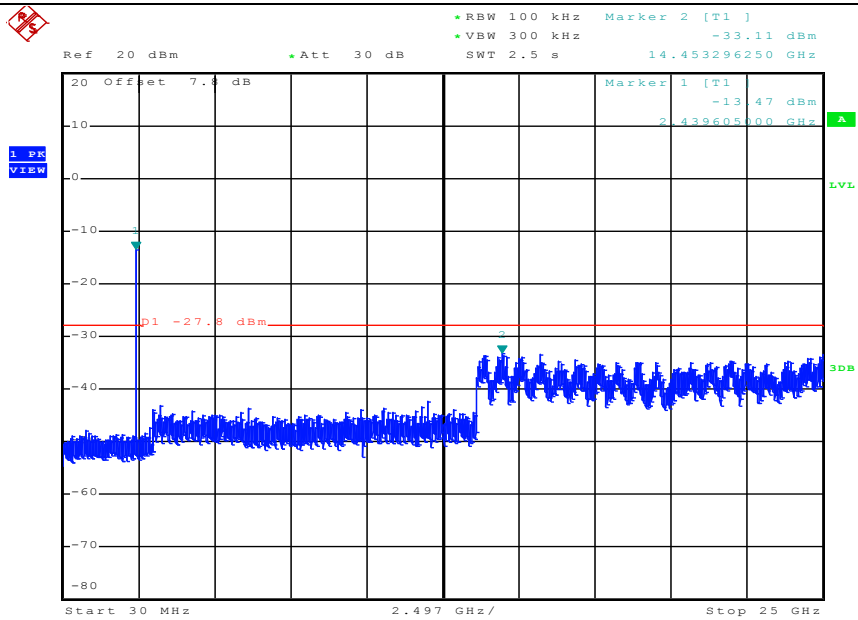
$\pi/4$ DQPSK_MCH_Graphs

Pref



Date: 9.SEP.2019 20:28:05

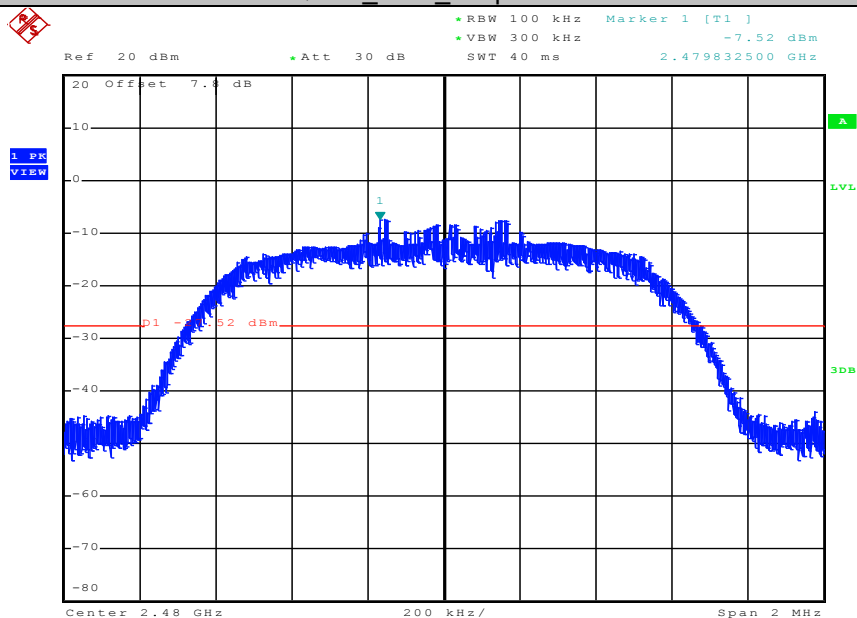
Puw



Date: 9.SEP.2019 20:28:20

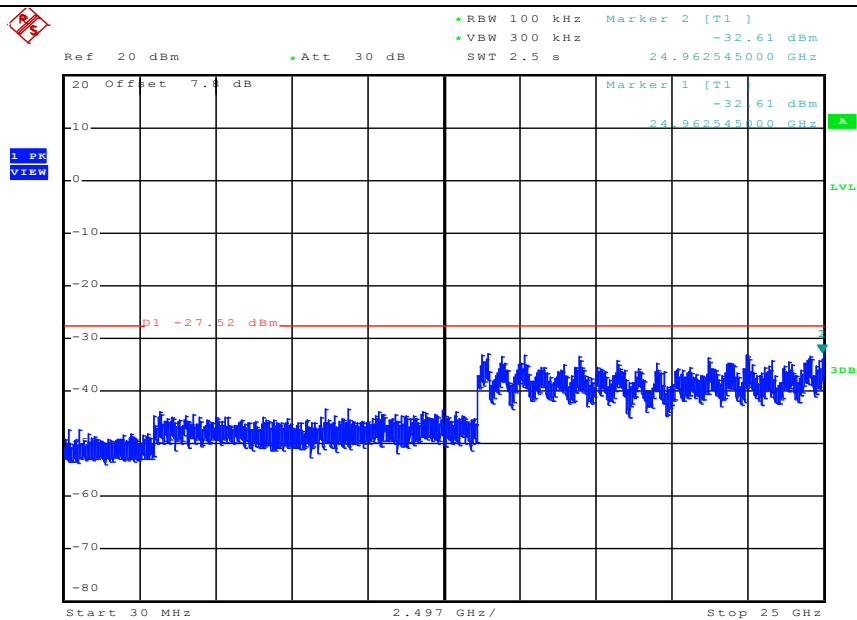
$\pi/4$ DQPSK_HCH_Graphs

Pref



Date: 9.SEP.2019 20:30:26

Puw



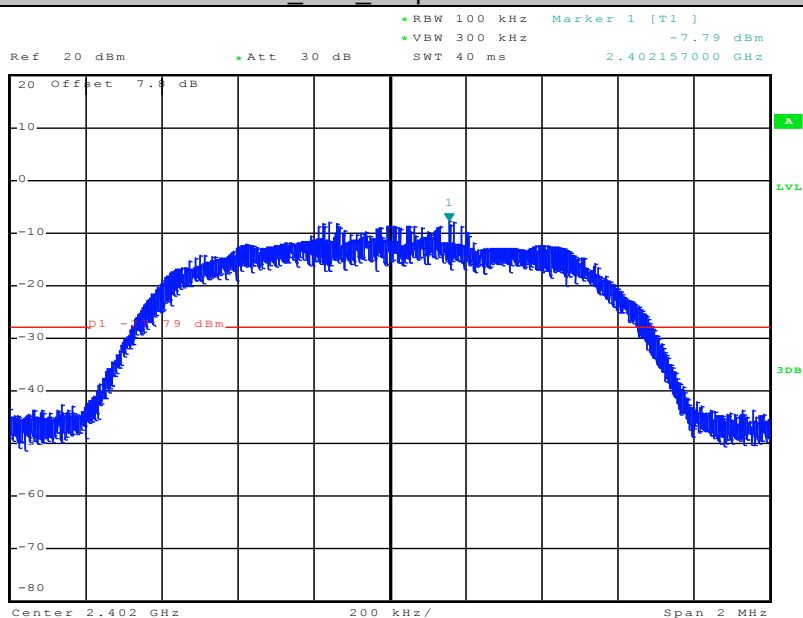
Date: 9.SEP.2019 20:30:41

8DPSK_LCH_Graphs

Pref



1 PR
VIEW

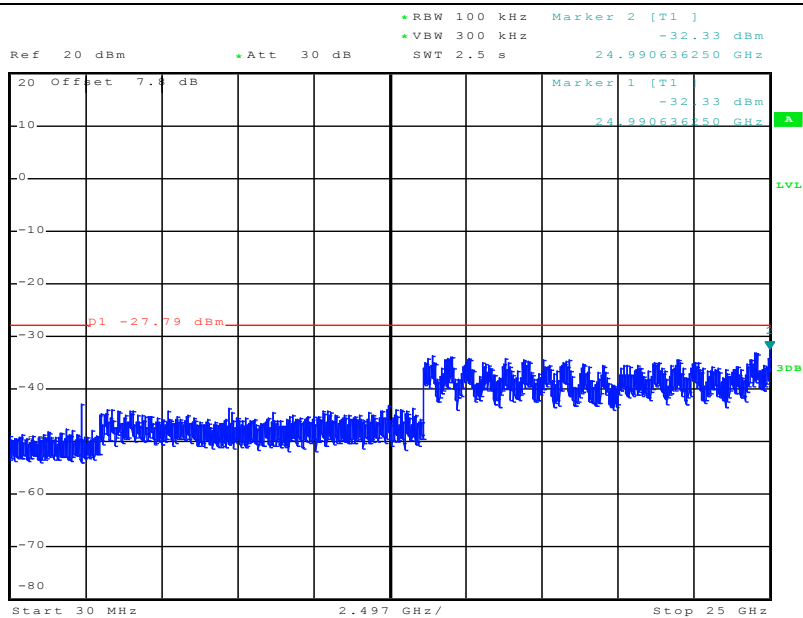


Date: 9.SEP.2019 20:34:08

Puw



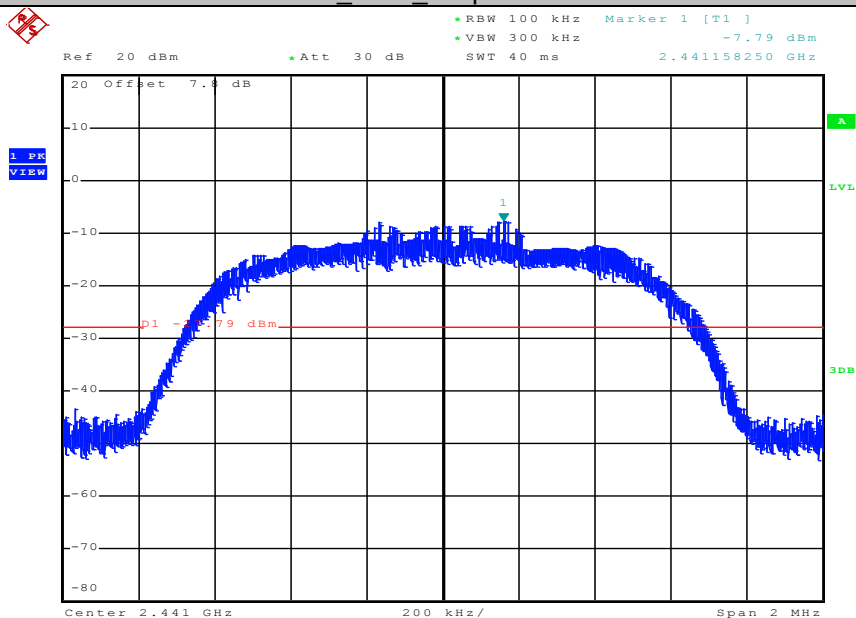
1 PR
VIEW



Date: 9.SEP.2019 20:34:23

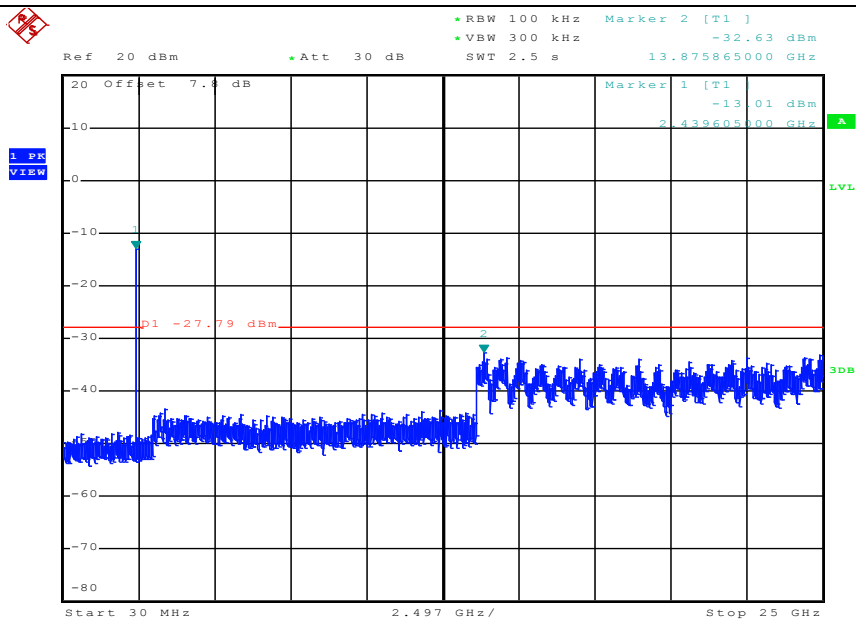
8DPSK_MCH_Graphs

Pref



Date: 9.SEP.2019 20:36:21

Puw



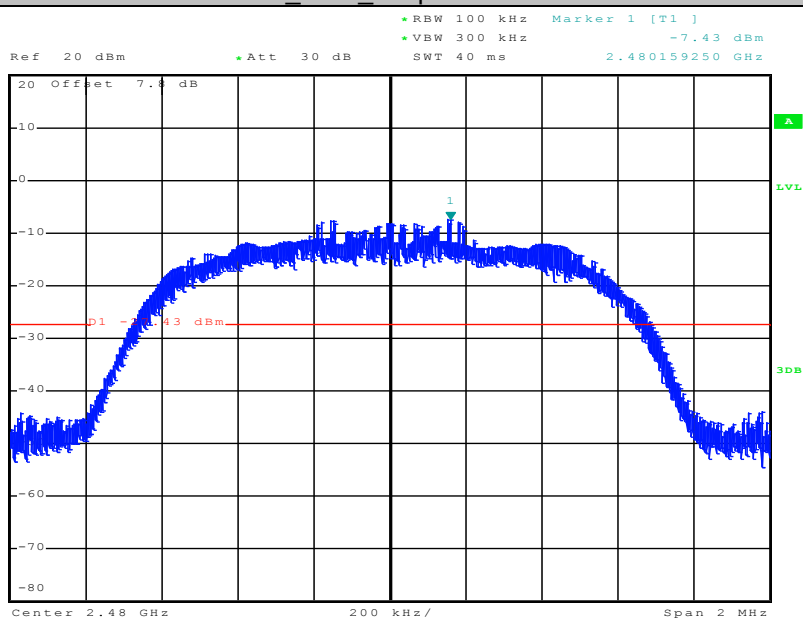
Date: 9.SEP.2019 20:36:36

8DPSK_HCH_Graphs

Pref



1 PR
VIEW

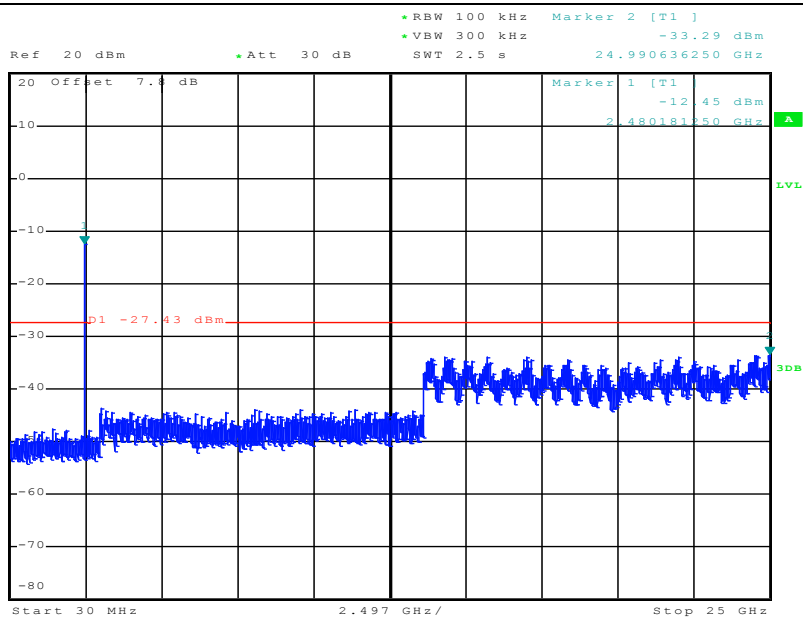


Date: 9.SEP.2019 20:38:29

Puw



1 PR
VIEW



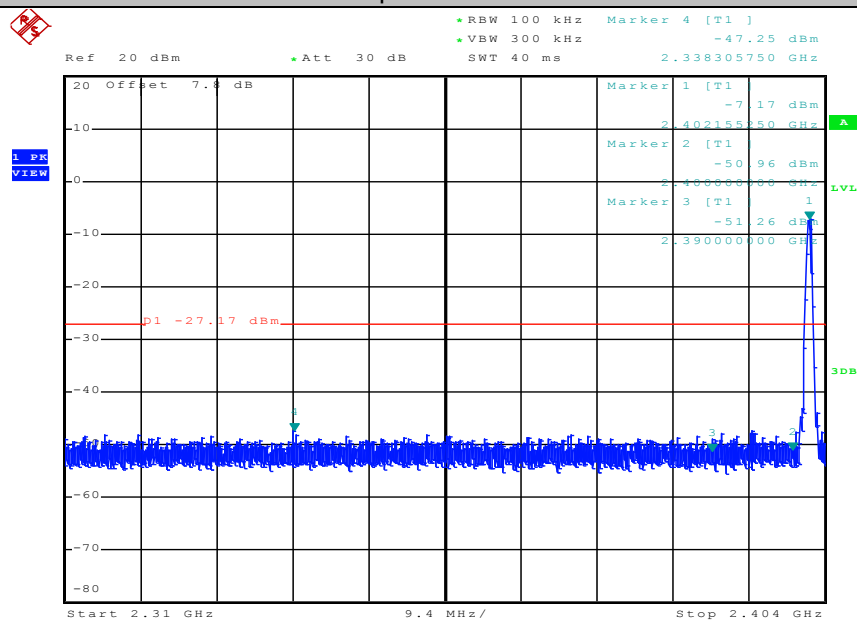
Date: 9.SEP.2019 20:38:44

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	-7.170	Off	-47.248	-27.17	PASS
			-6.330	On	-47.017	-26.33	PASS
	HCH	2480	-5.950	Off	-44.038	-25.95	PASS
			-5.910	On	-46.336	-25.91	PASS
$\pi/4$ DQPSK	LCH	2402	-7.980	Off	-47.050	-27.98	PASS
			-7.970	On	-46.169	-27.97	PASS
	HCH	2480	-7.500	Off	-47.569	-27.5	PASS
			-7.650	On	-44.454	-27.65	PASS
8DPSK	LCH	2402	-7.960	Off	-47.591	-27.96	PASS
			-7.870	On	-46.784	-27.87	PASS
	HCH	2480	-7.820	Off	-46.943	-27.82	PASS
			-7.660	On	-46.943	-27.66	PASS

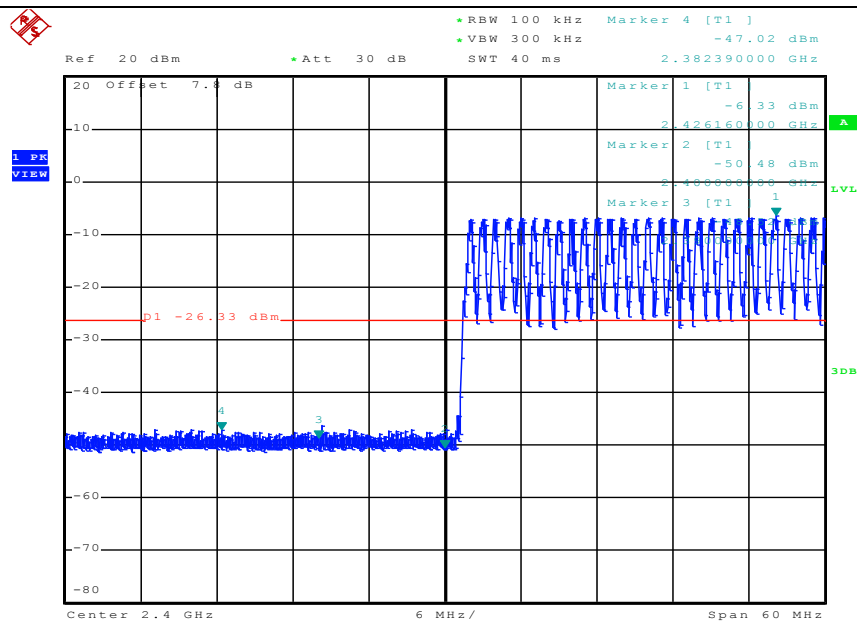
Test Graphs

GFSK/LCH/No Hop



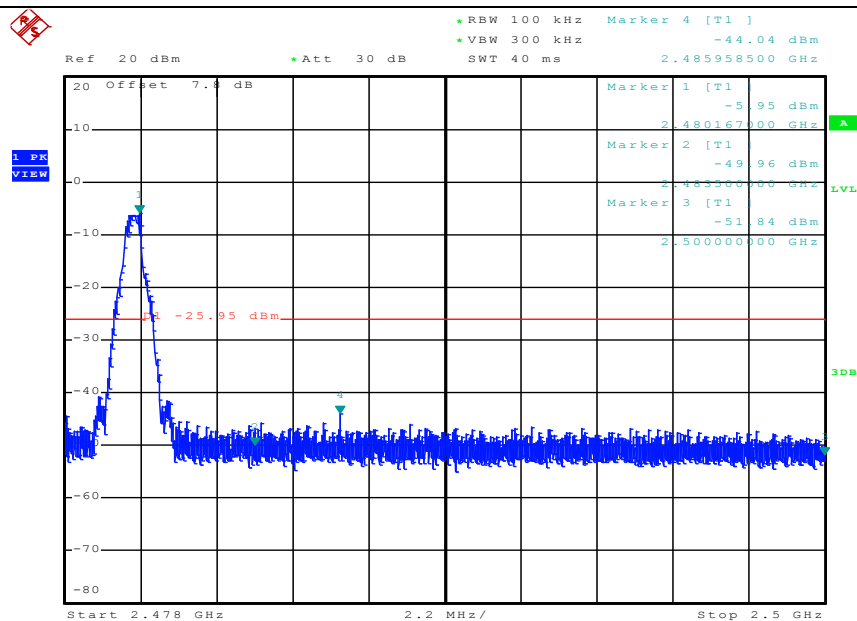
Date: 9.SEP.2019 20:17:37

GFSK/LCH/Hop



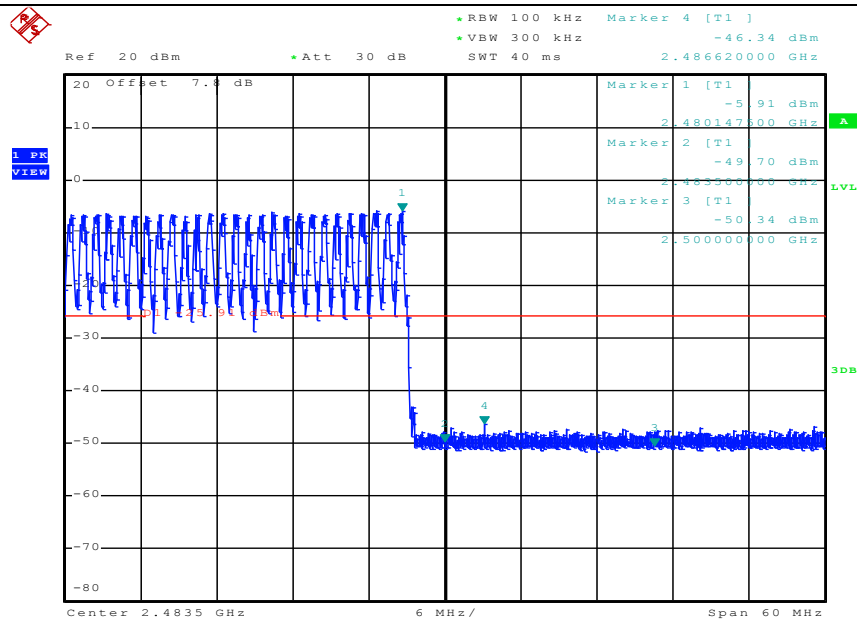
Date: 9.SEP.2019 20:44:18

GFSK/HCH/No Hop



Date: 9.SEP.2019 20:22:40

GFSK/HCH/Hop



Date: 9.SEP.2019 20:49:30

Ref 20 dBm Att 30 dB RBW 100 kHz VBW 300 kHz SWT 40 ms Marker 4 [T1]

2.346272250 GHz

1 [T1] -7.98 dBm

2 [T1] -50.00 dBm

3 [T1] -51.60 dBm

4 [T1] -51.60 dBm

Start 2.31 GHz 9.4 MHz/div Stop 2.404 GHz

Date: 9.SEP.2019 20:25:40

1 PR VIEW

Ref 20 dBm Att 30 dB

RBW 100 kHz VBW 300 kHz SWT 40 ms

Marker 4 [T1] -46.17 dBm 2.380897500 GHz

Marker 2 [T1] -47.49 dBm 2.400000000 GHz

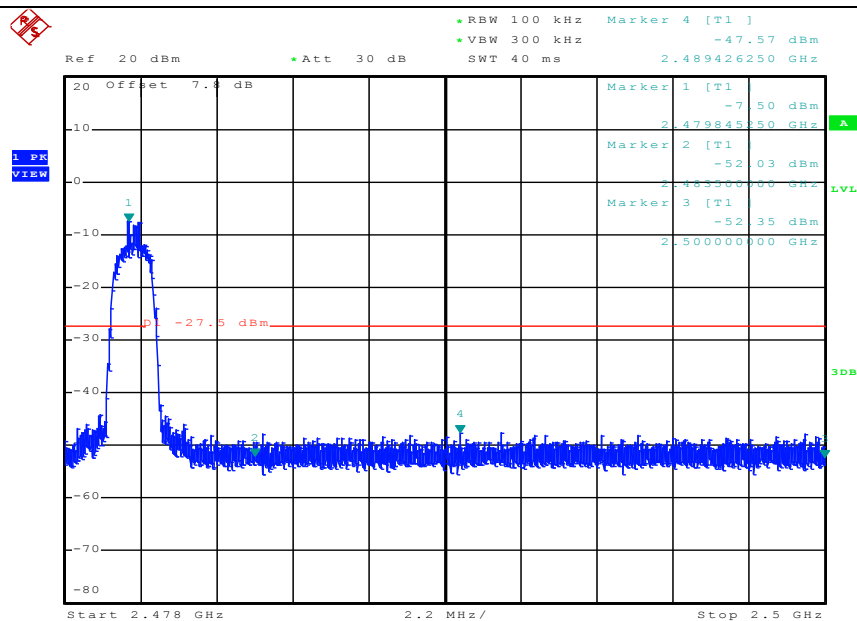
Marker 3 [T1] -48.81 dBm 2.400000000 GHz

D1 -27.97 dBm

Center 2.4 GHz 6 MHz/ Span 60 MHz

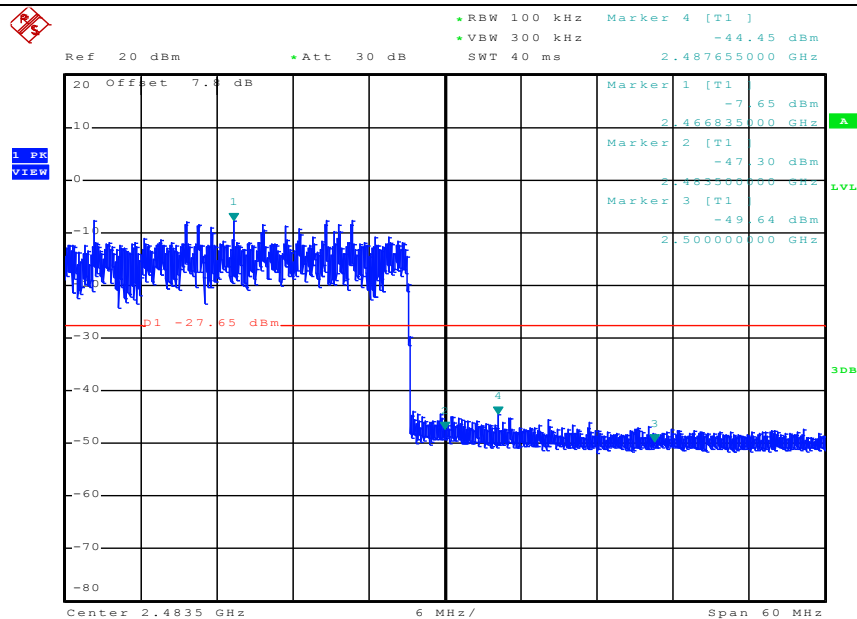
Date: 9.SEP.2019 20:56:42

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



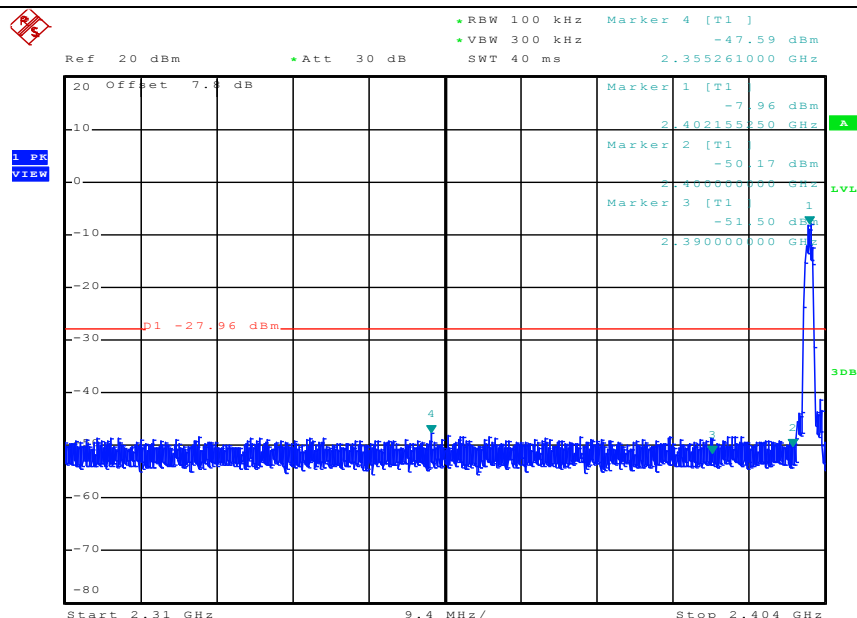
Date: 9.SEP.2019 20:30:13

$\pi/4$ DQPSK/HCH/Hop



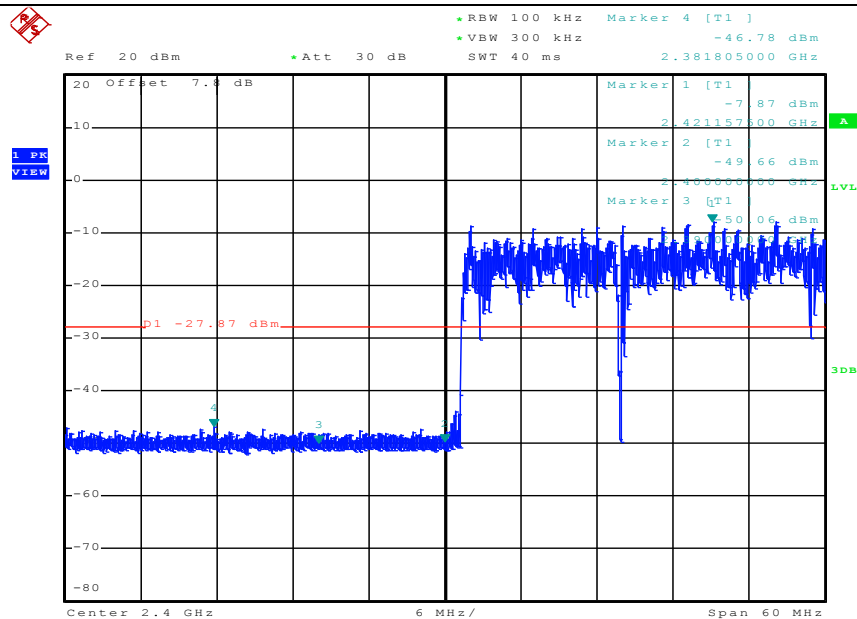
Date: 9.SEP.2019 21:03:13

8DPSK/LCH/No Hop



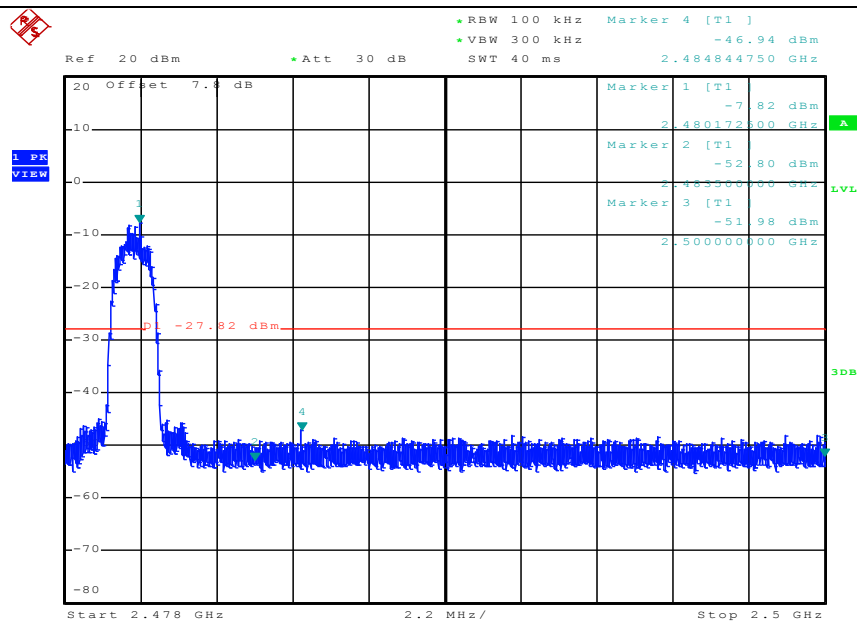
Date: 9.SEP.2019 20:33:55

8DPSK/LCH/Hop



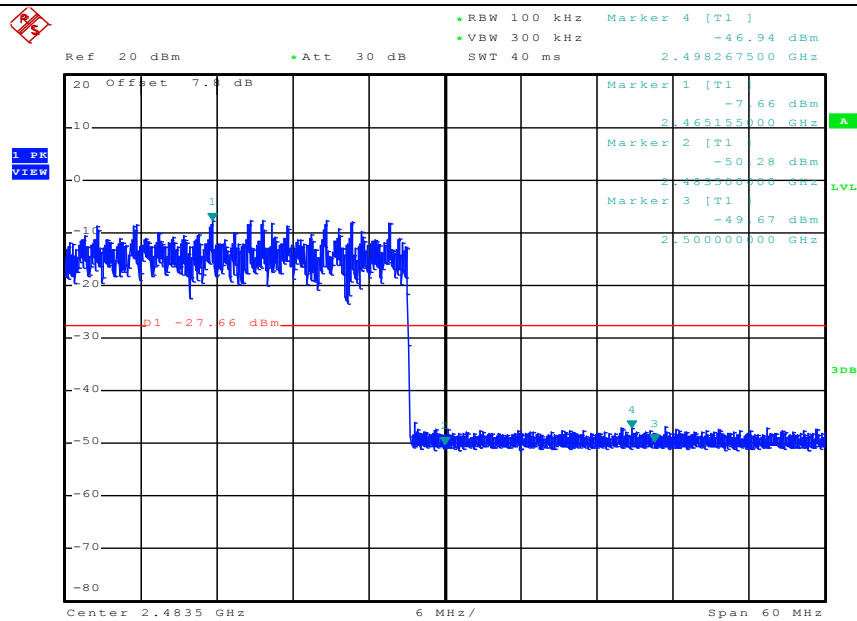
Date: 9.SEP.2019 21:09:12

8DPSK/HCH/No Hop



Date: 9.SEP.2019 20:38:16

8DPSK/HCH/Hop

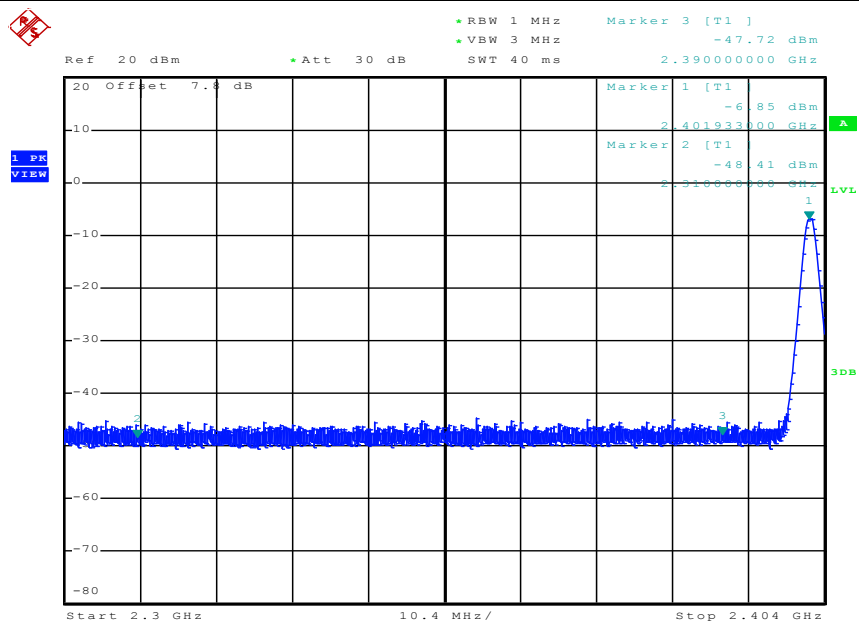


Date: 9.SEP.2019 21:13:44

A.8 Restrict-band band-edge measurements

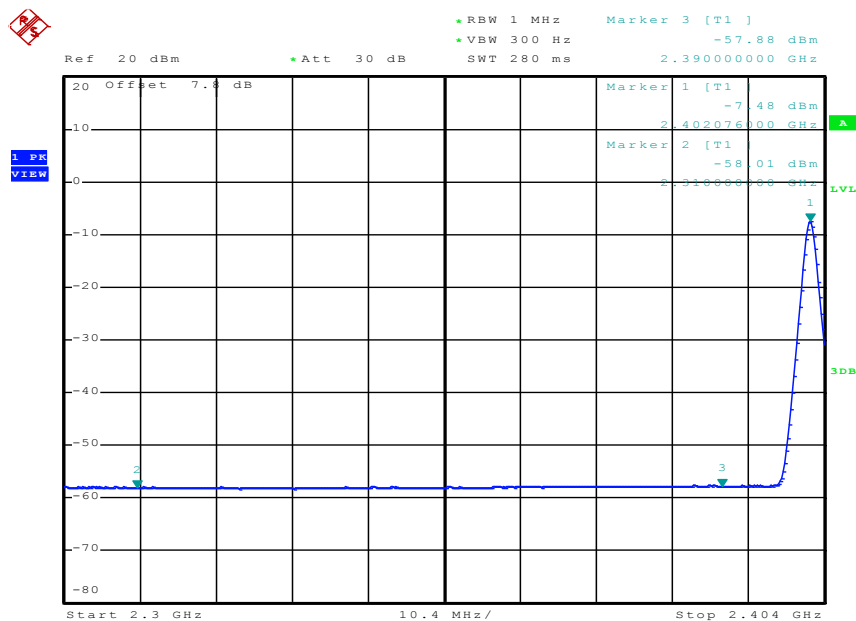
Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-48.41	2.0	0	48.85	PEAK	74	PASS
	Off	2310.0	-58.01	2.0	0	39.25	AV	54	PASS
	Off	2390.0	-47.72	2.0	0	49.54	PEAK	74	PASS
	Off	2390.0	-57.88	2.0	0	39.38	AV	54	PASS
	Off	2483.5	-36.50	2.0	0	60.76	PEAK	74	PASS
	Off	2483.5	-47.80	2.0	0	49.46	AV	54	PASS
	Off	2500.0	-41.90	2.0	0	55.36	PEAK	74	PASS
	Off	2500.0	-56.65	2.0	0	40.61	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-47.90	2.0	0	49.36	PEAK	74	PASS
	Off	2310.0	-58.08	2.0	0	39.18	AV	54	PASS
	Off	2390.0	-48.19	2.0	0	49.07	PEAK	74	PASS
	Off	2390.0	-57.71	2.0	0	39.55	AV	54	PASS
	Off	2483.5	-44.73	2.0	0	52.53	PEAK	74	PASS
	Off	2483.5	-51.27	2.0	0	45.99	AV	54	PASS
	Off	2500.0	-49.39	2.0	0	47.87	PEAK	74	PASS
	Off	2500.0	-58.36	2.0	0	38.90	AV	54	PASS
8DPSK	Off	2310.0	-48.69	2.0	0	48.57	PEAK	74	PASS
	Off	2310.0	-58.00	2.0	0	39.26	AV	54	PASS
	Off	2390.0	-47.41	2.0	0	49.85	PEAK	74	PASS
	Off	2390.0	-57.86	2.0	0	39.40	AV	54	PASS
	Off	2483.5	-44.80	2.0	0	52.46	PEAK	74	PASS
	Off	2483.5	-51.28	2.0	0	45.98	AV	54	PASS
	Off	2500.0	-48.38	2.0	0	48.88	PEAK	74	PASS
	Off	2500.0	-58.46	2.0	0	38.80	AV	54	PASS

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



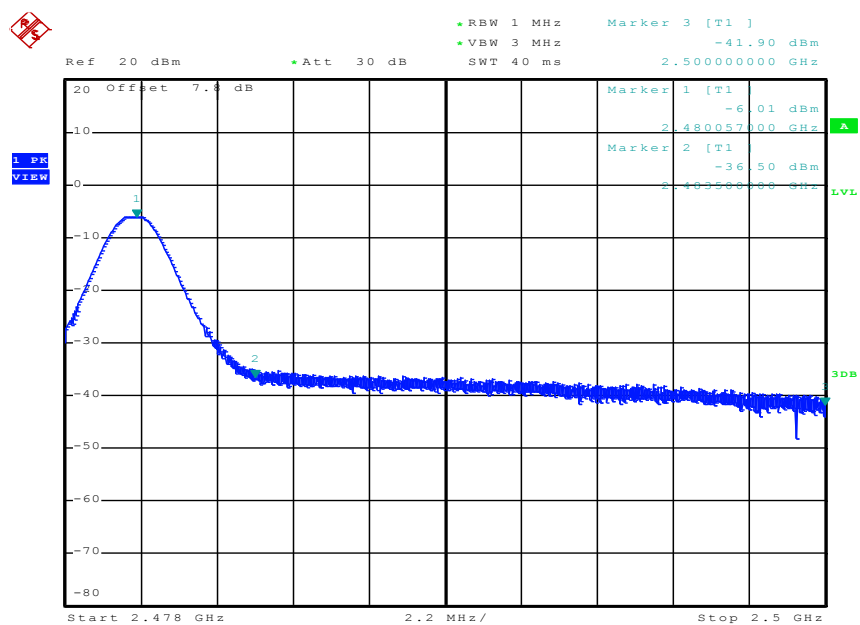
Date: 9.SEP.2019 20:18:23

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



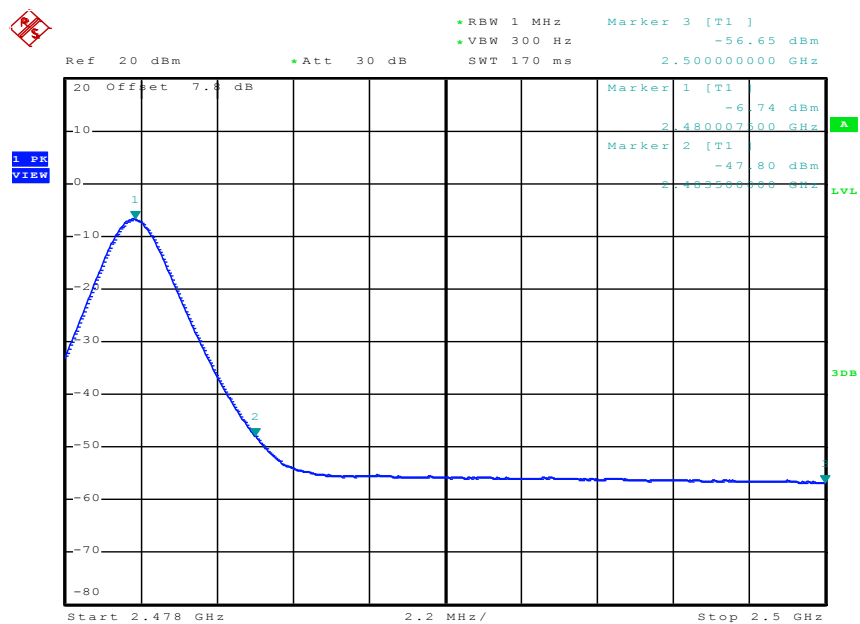
Date: 9.SEP.2019 20:18:37

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

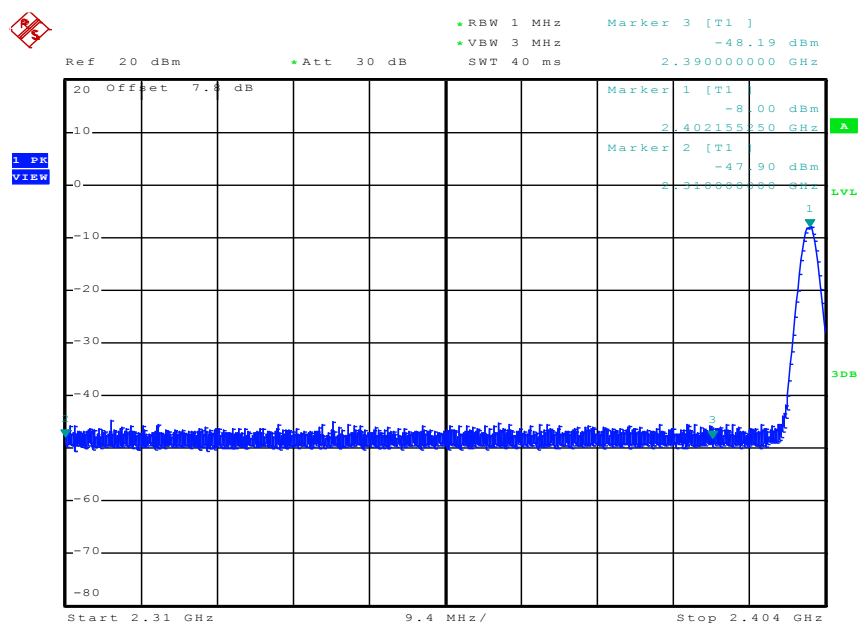


Date: 9.SEP.2019 20:23:27

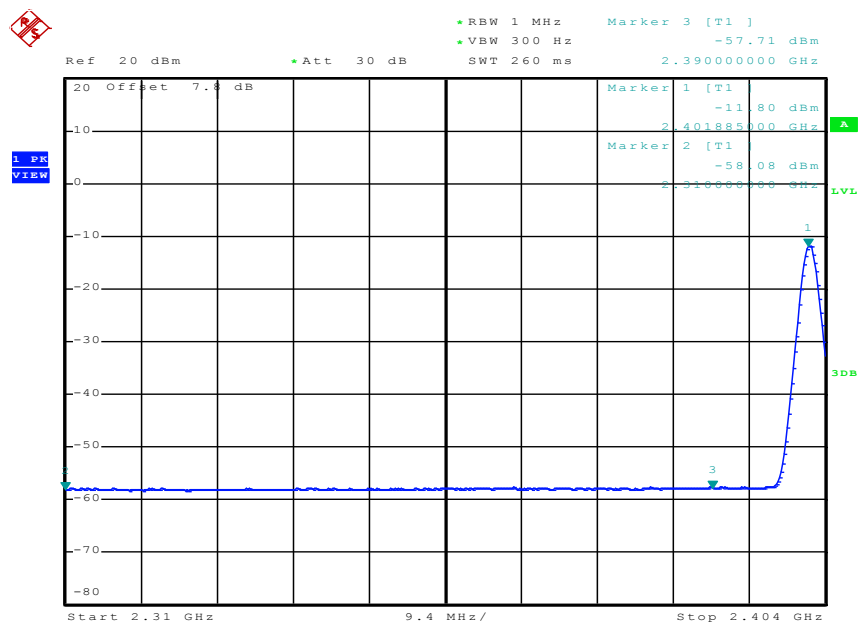
Restrict-band band-edge measurements_Hopping Off_GFSK_Average (High Channel)



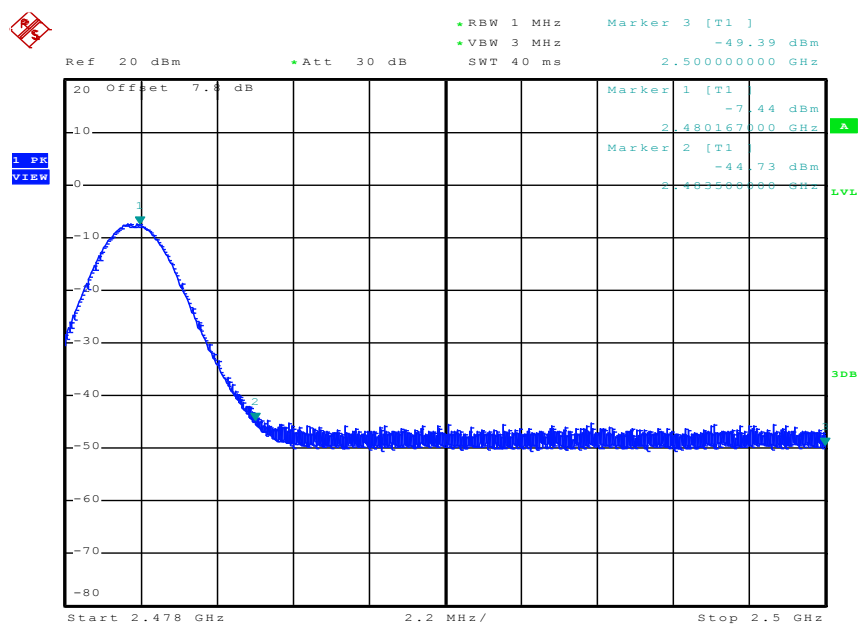
Date: 9.SEP.2019 20:23:41

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

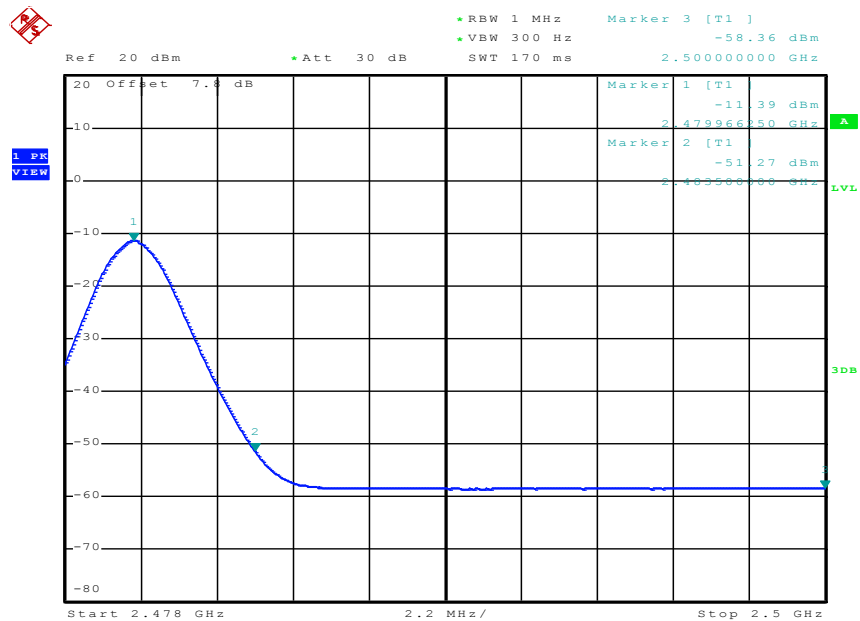
Date: 9.SEP.2019 20:26:26

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

Date: 9.SEP.2019 20:26:40

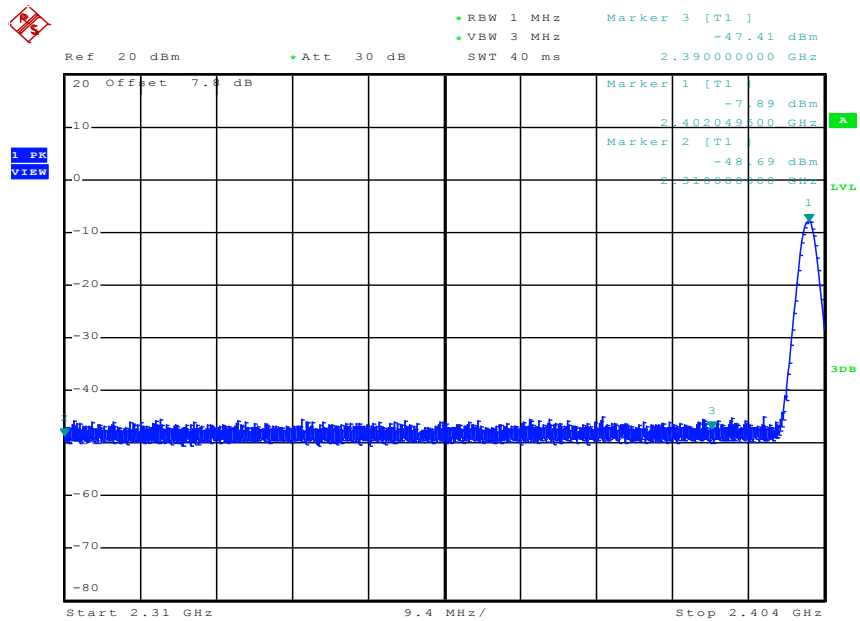
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (High Channel)

Date: 9.SEP.2019 20:31:00

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

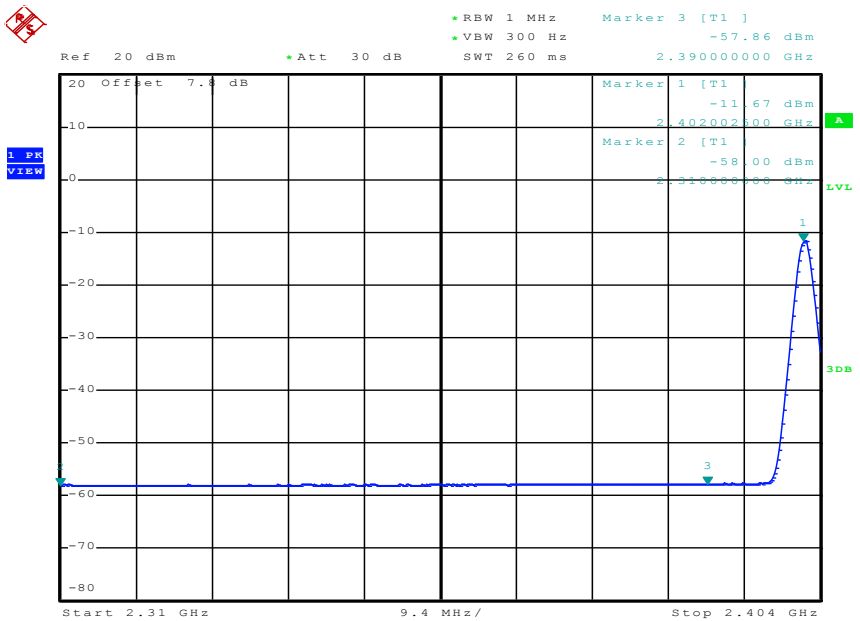
Date: 9.SEP.2019 20:31:14

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



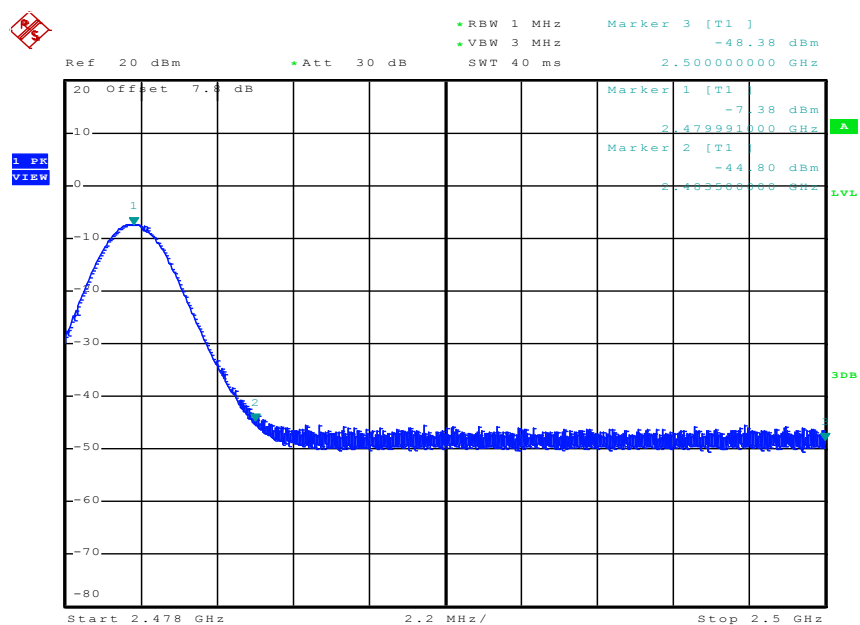
Date: 9.SEP.2019 20:34:42

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



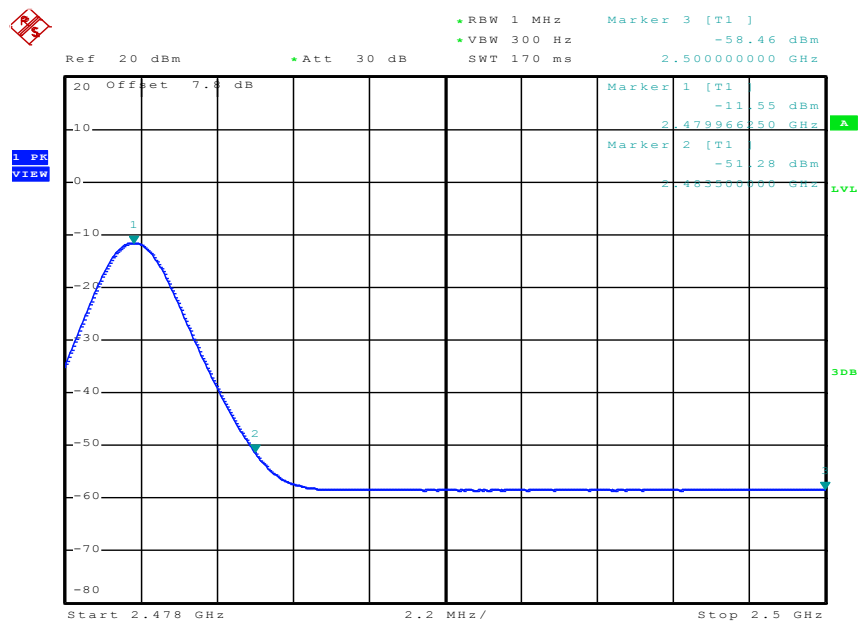
Date: 9.SEP.2019 20:34:56

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



Date: 9.SEP.2019 20:39:03

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



Date: 9.SEP.2019 20:39:17