

Appendix A

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

Product Name: BLUETOOTH SPEAKER

Trade Mark:N/A

Test Model: 7199-85

Environmental Conditions

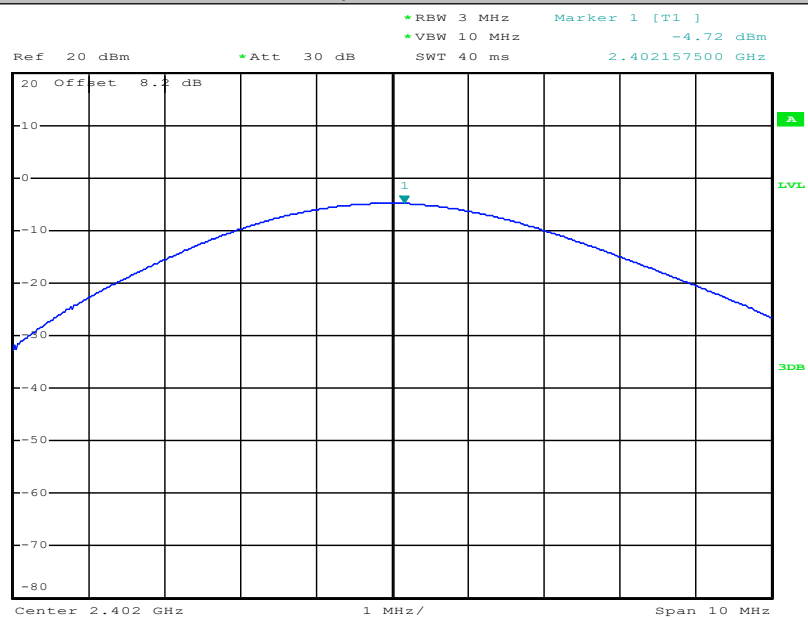
Temperature:	24.4° C
Relative Humidity:	53.5%
ATM Pressure:	100.0 kPa
Test Engineer:	SCOUT WU
Supervised by:	Wang.Chuang

A.1 Maximum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-4.720	30	PASS
	MCH	-2.310	30	PASS
	HCH	-0.780	30	PASS
$\pi/4$ DQPSK	LCH	-4.260	21	PASS
	MCH	-3.260	21	PASS
	HCH	-4.140	21	PASS
8DPSK	LCH	-1.820	21	PASS
	MCH	-1.390	21	PASS
	HCH	-2.770	21	PASS

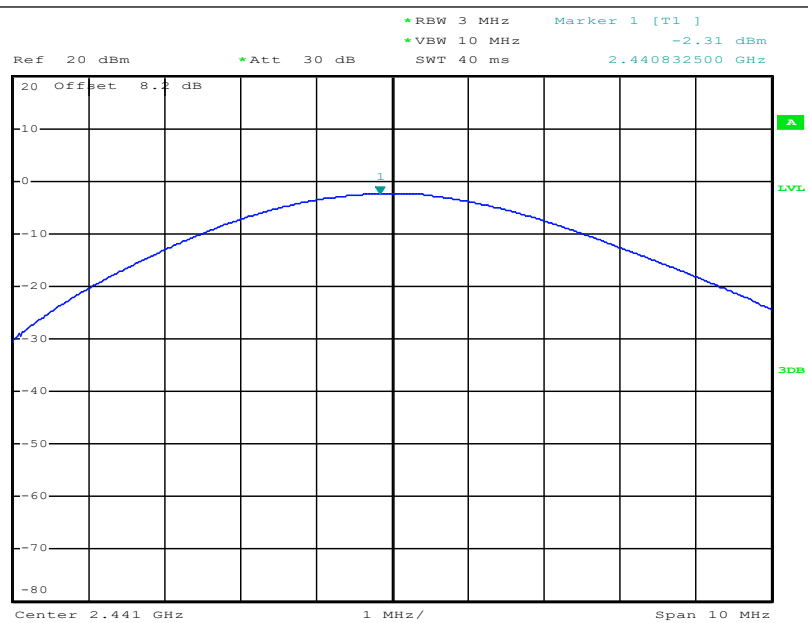
Test Graphs

GFSK/LCH

1 PR
VIEW

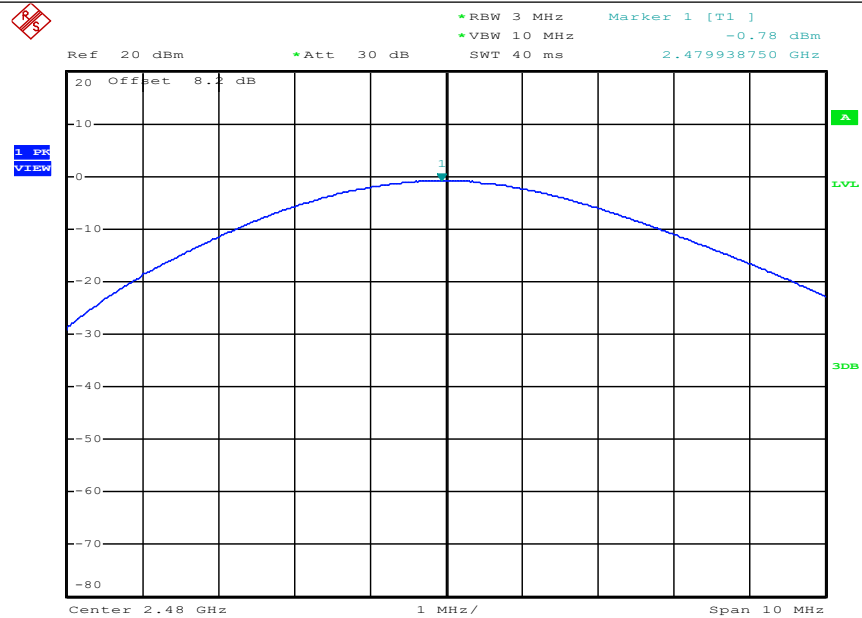
Date: 25.SEP.2019 22:01:00

GFSK/MCH

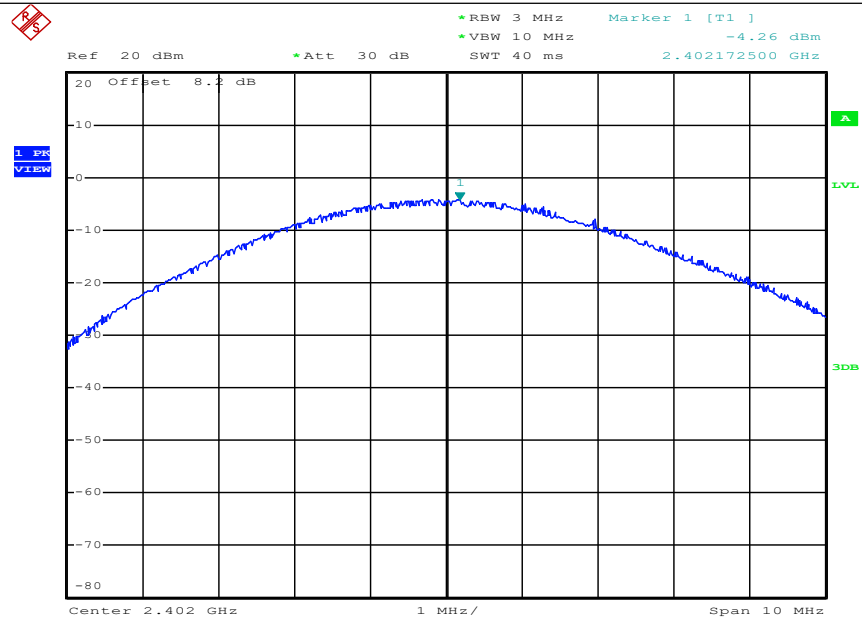
1 PR
VIEW

Date: 25.SEP.2019 22:03:42

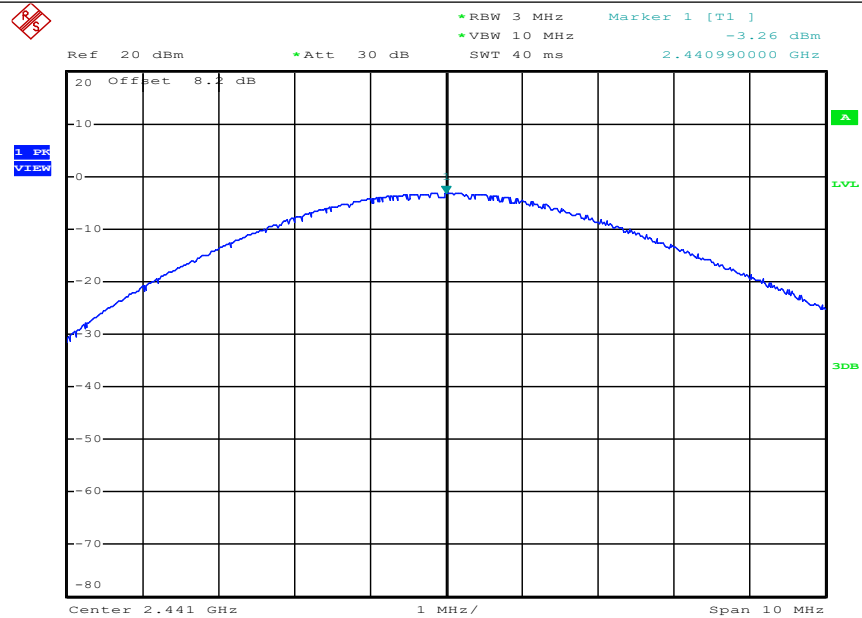
GFSK/HCH



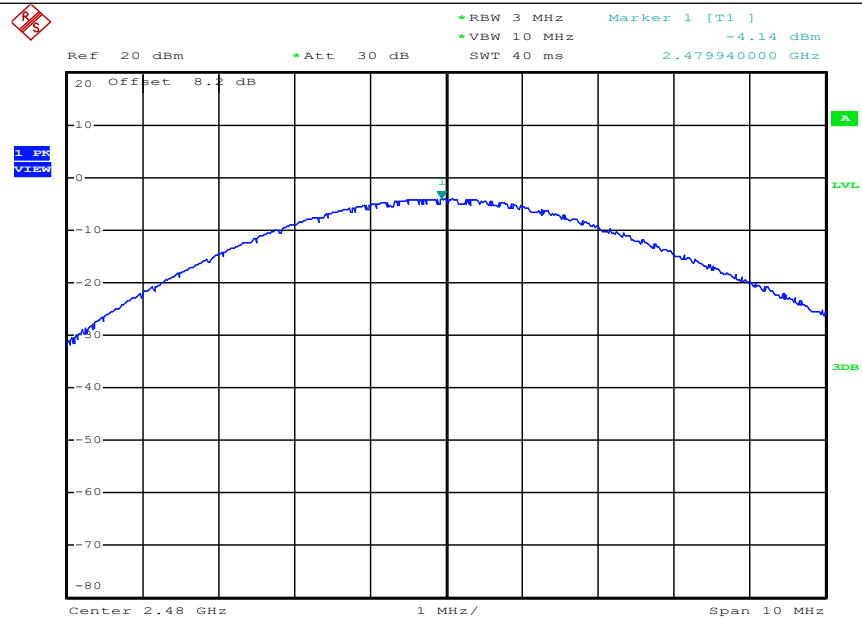
Date: 26.SEP.2019 09:08:31

 $\pi/4$ DQPSK/LCH

Date: 26.SEP.2019 09:17:10

$\pi/4$ DQPSK/MCH

Date: 26.SEP.2019 09:19:40

 $\pi/4$ DQPSK/HCH

Date: 26.SEP.2019 09:26:44

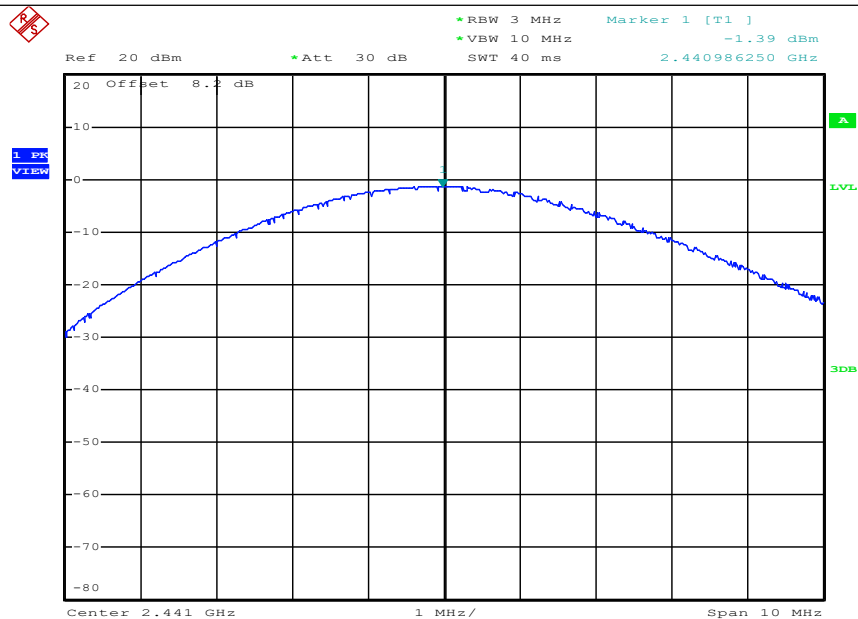
Ref 20 dBm *Att 30 dB RBW 3 MHz VBW 10 MHz Marker 1 [T1] -1.82 dBm SWT 40 ms 2.401795000 GHz

Offset 8.2 dB

1.82 dBm

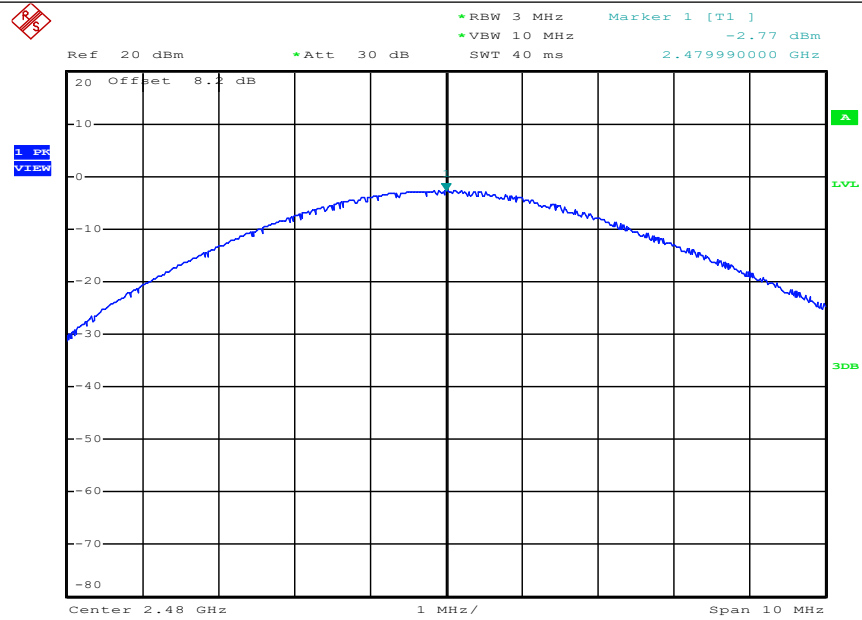
Center 2.402 GHz Span 10 MHz

8DPSK/MCH



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8DPSK/HCH



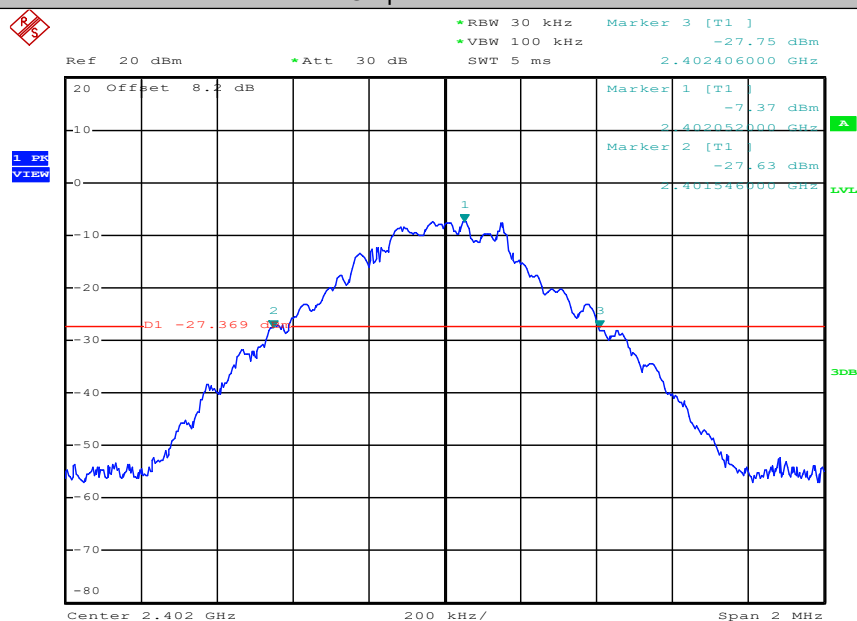
Date: 26.SEP.2019 09:34:06

A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.860	Not Specified	PASS
	MCH	0.856	Not Specified	PASS
	HCH	0.860	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.248	Not Specified	PASS
	MCH	1.260	Not Specified	PASS
	HCH	1.274	Not Specified	PASS
8DPSK	LCH	1.290	Not Specified	PASS
	MCH	1.258	Not Specified	PASS
	HCH	1.266	Not Specified	PASS

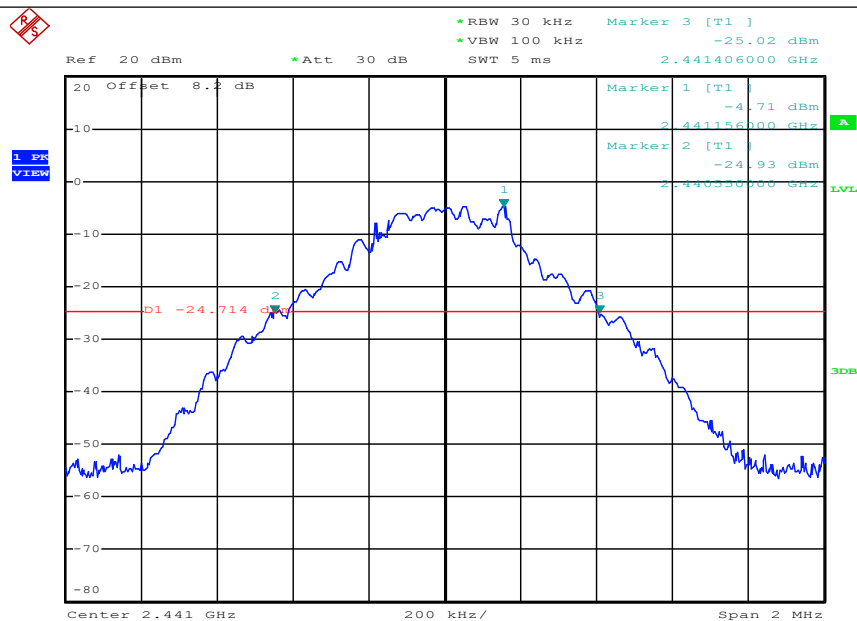
Test Graphs

GFSK/LCH



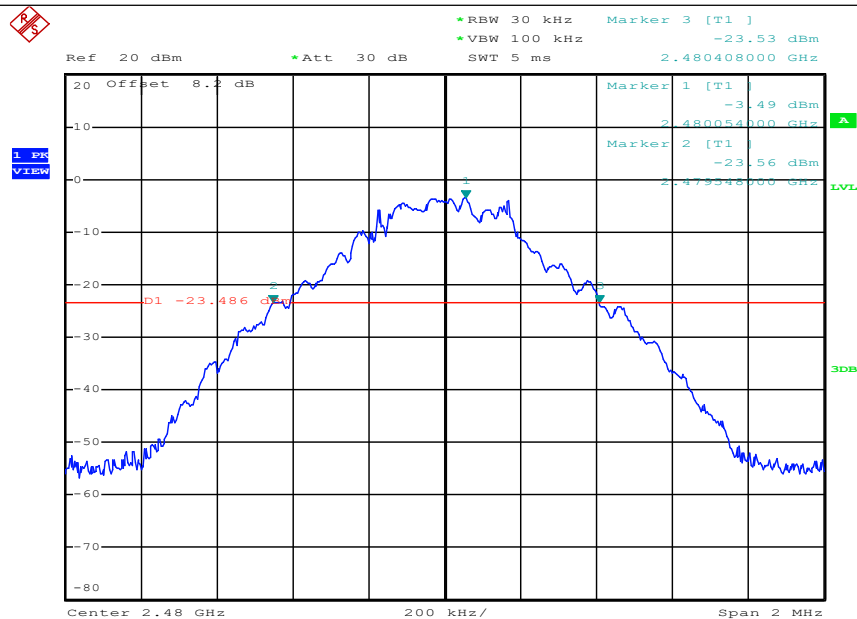
Date: 25.SEP.2019 22:00:23

GFSK/MCH

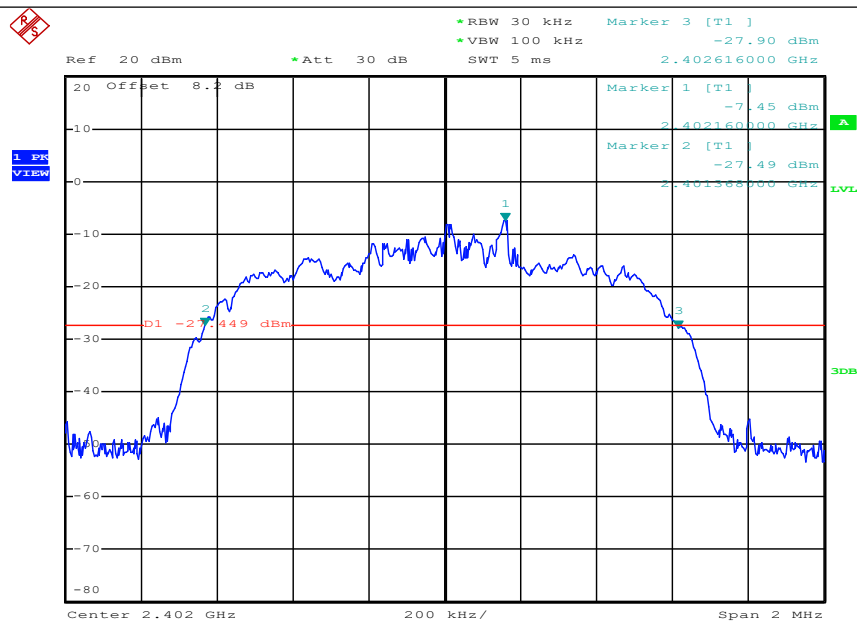


Date: 25.SEP.2019 22:03:05

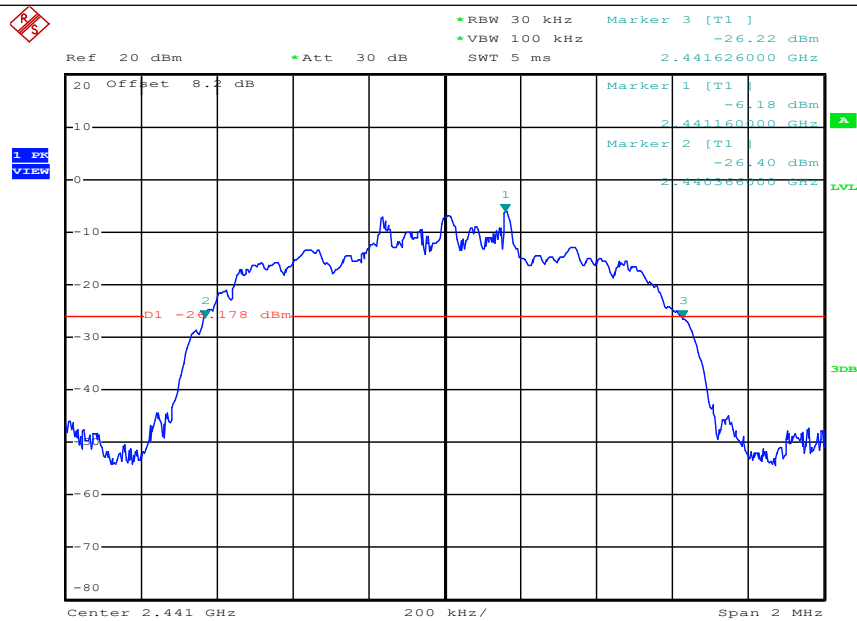
GFSK/HCH



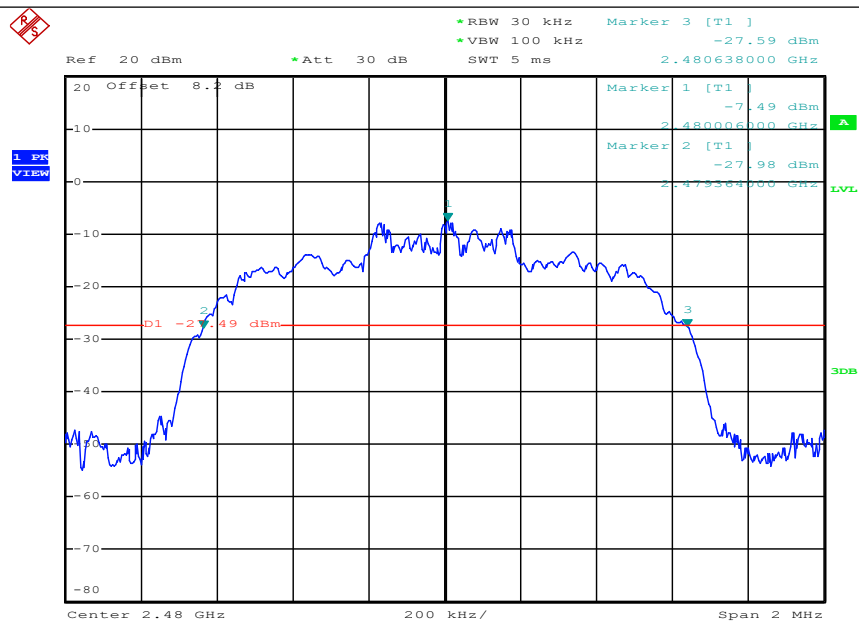
Date: 26.SEP.2019 09:07:54

$\pi/4$ DQPSK/LCH

Date: 26.SEP.2019 09:16:34

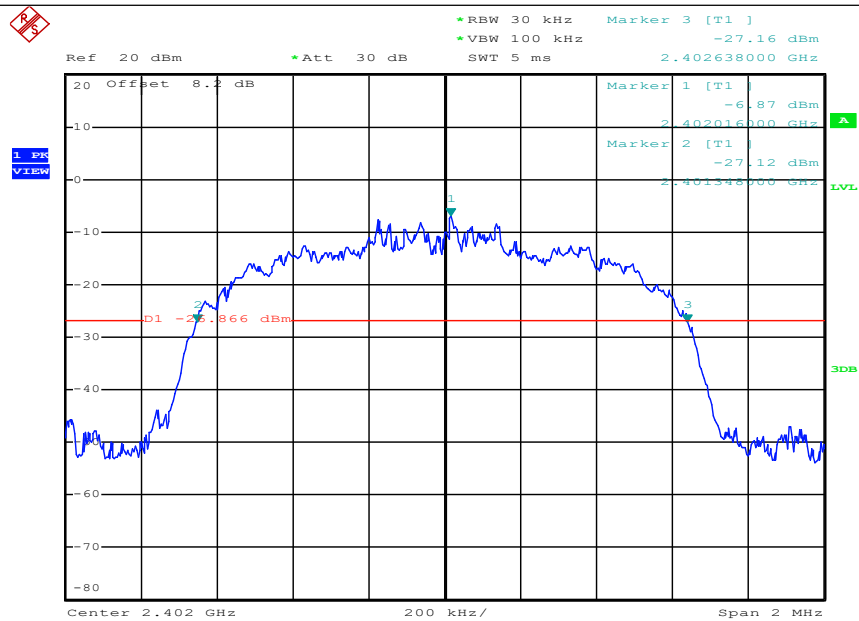
 $\pi/4$ DQPSK/MCH

Date: 26.SEP.2019 09:19:05

$\pi/4$ DQPSK/HCH

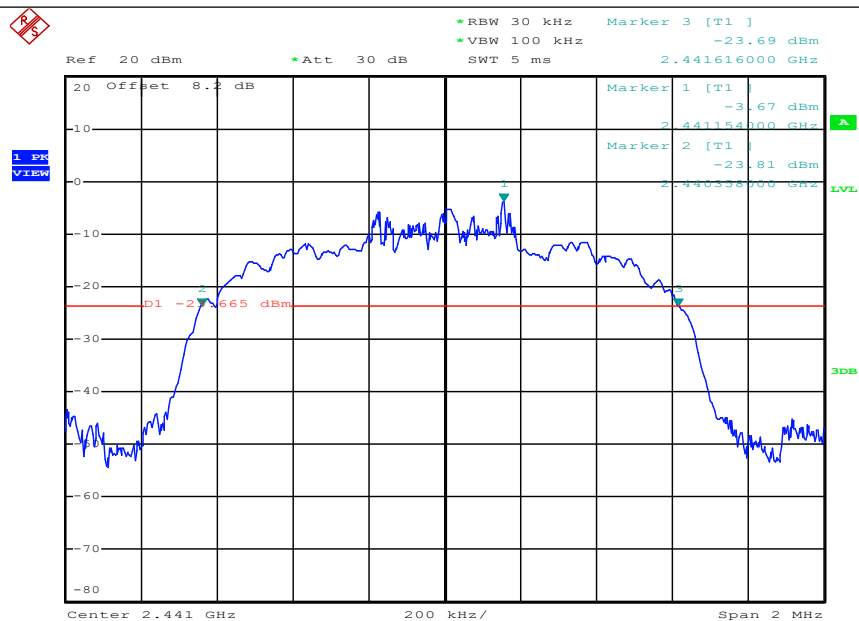
Date: 26.SEP.2019 09:20:47

8DPSK/LCH



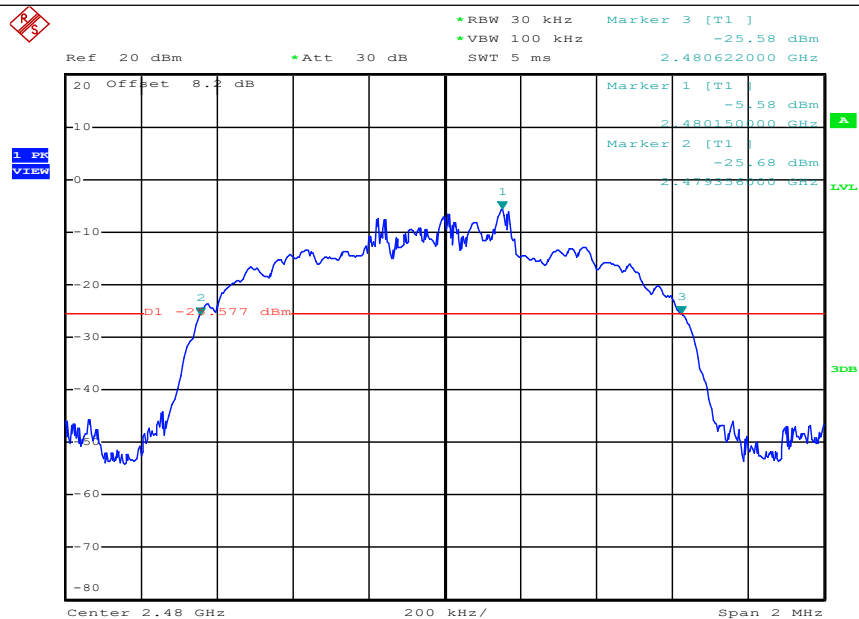
Date: 26.SEP.2019 09:29:08

8DPSK/MCH



Date: 26.SEP.2019 09:31:42

8DPSK/HCH



Date: 26.SEP.2019 09:33:30

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	1.324	0.860	PASS
	MCH	1.170	0.860	PASS
	HCH	1.150	0.860	PASS
$\pi/4$ DQPSK	LCH	1.018	0.849	PASS
	MCH	1.056	0.849	PASS
	HCH	0.940	0.849	PASS
8DPSK	LCH	1.268	0.860	PASS
	MCH	1.118	0.860	PASS
	HCH	1.248	0.860	PASS

Test Graphs

Ref 20 dBm Att 30 dB RBW 100 kHz Delta 1 [T1] -0.34 dB
VBW 300 kHz SWT 40 ms 1.324000000 MHz

20 Offset 8.2 dB

1 PK VIEW

Marker 1 [T1] -5.96 dBm 2.401821500 GHz

1

1

3dB

Start 2.4015 GHz 200 kHz/ Stop 2.4035 GHz

Ref 20 dBm Att 30 dB RBW 100 kHz Delta 1 [T1] 0.27 dB VBW 300 kHz 1.170000000 MHz SWT 5 ms

20 Off Set 8.2 dB

Marker 1 [T1] -5.30 dBm 2.44086000 GHz

1. SPAN VIEW

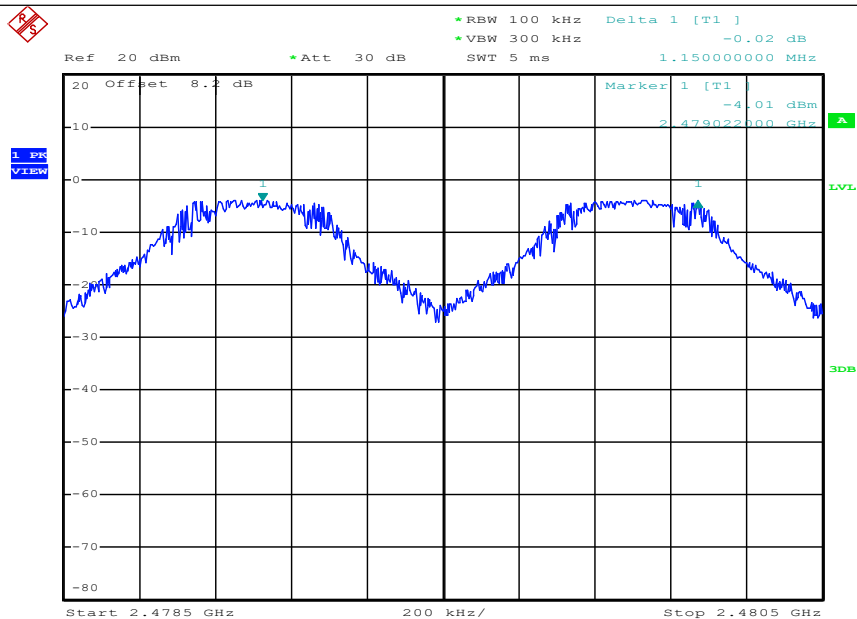
1

2

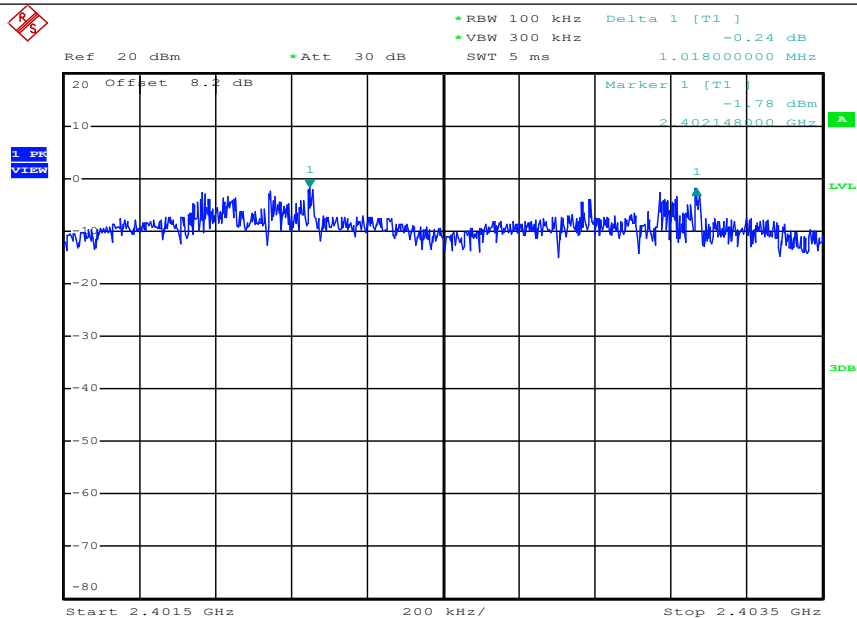
3dB

Start 2.4405 GHz 200 kHz/ Stop 2.4425 GHz

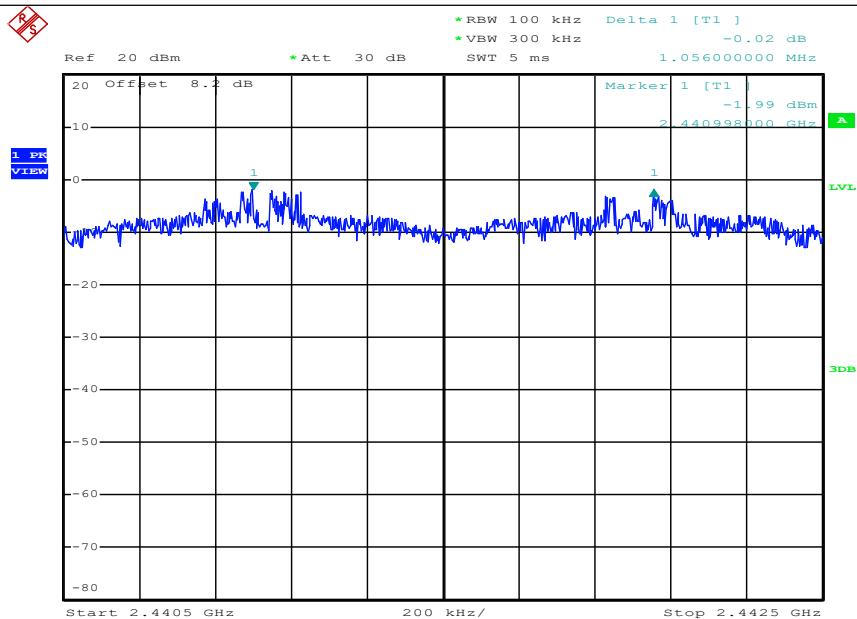
GFSK/HCH



Date: 25.SEP.2019 21:25:23

$\pi/4$ DQPSK/LCH

Date: 26.SEP.2019 10:05:24

 $\pi/4$ DQPSK/MCH

Date: 26.SEP.2019 10:07:33

Ref 20 dBm *Att 30 dB RBW 100 kHz Delta 1 [T1] VBW 300 kHz 1.36 dB SWT 5 ms 940.00000000 kHz

20 Offset 8.2 dB Marker 1 [T1] -5.62 dBm 2.479198000 GHz

1 [T1] -5.62 dBm 2.479198000 GHz

Start 2.4785 GHz 200 kHz/ Stop 2.4805 GHz

Ref 20 dBm * Att 30 dB * RBW 100 kHz Delta 1 [T1] 0.37 dB
 * VBW 300 kHz SWT 5 ms 1.26800000 MHz

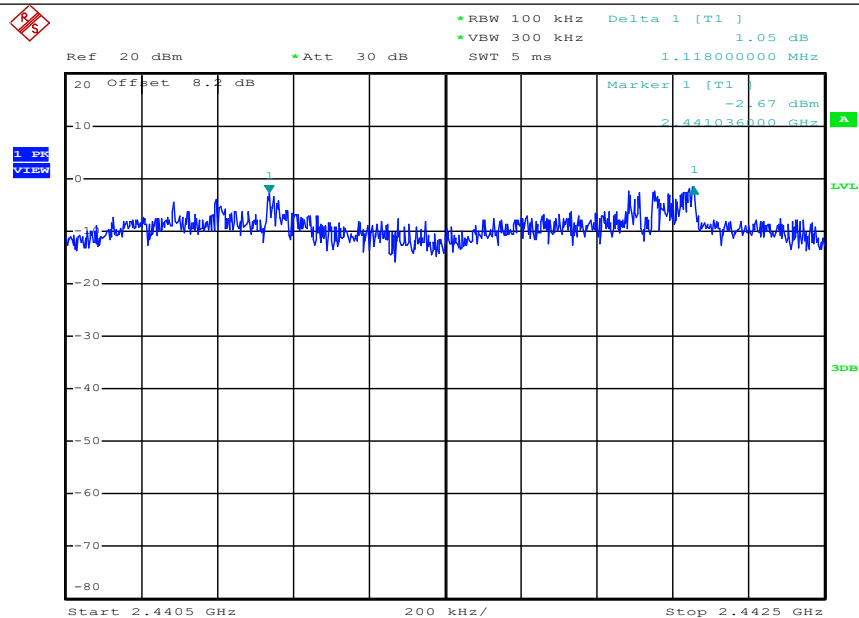
20 Offset 8.2 dB Marker 1 [T1] -4.26 dBm
 2 401260000 GHz

1 PK
 VIEW

Start 2.4015 GHz 200 kHz/ Stop 2.4035 GHz

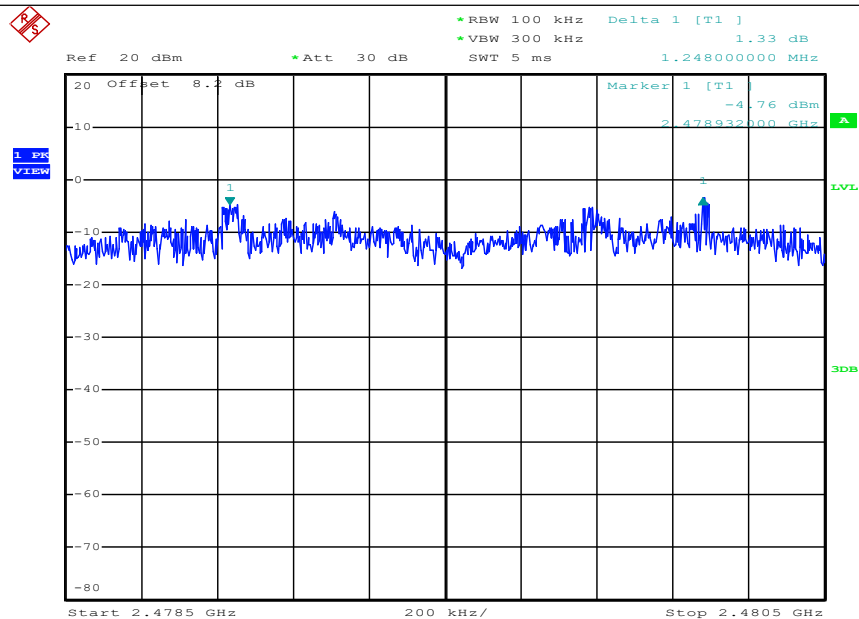
8DPSK/LCH

8DPSK/MCH



Date: 26.SEP.2019 10:04:05

8DPSK/HCH



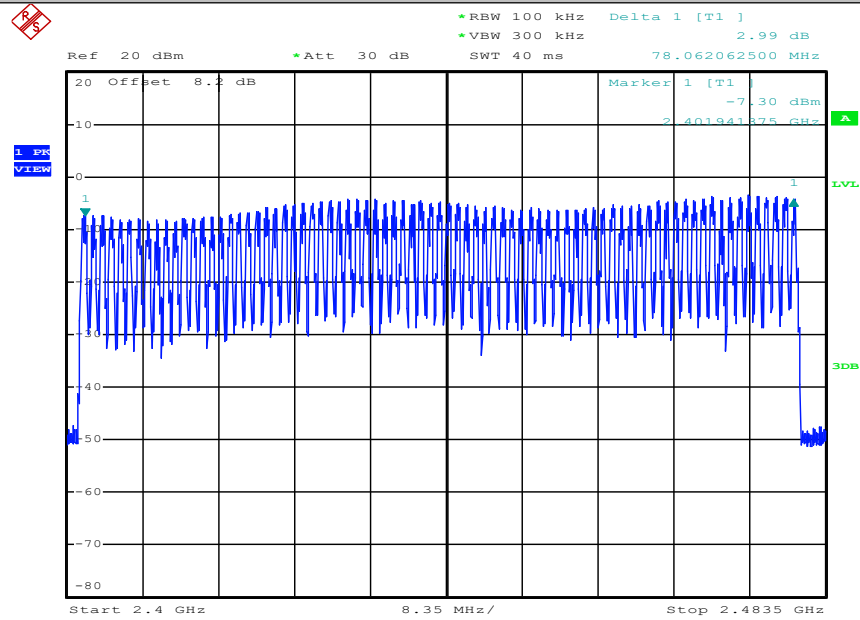
Date: 26.SEP.2019 09:57:29

A.4 Hopping Channel Number

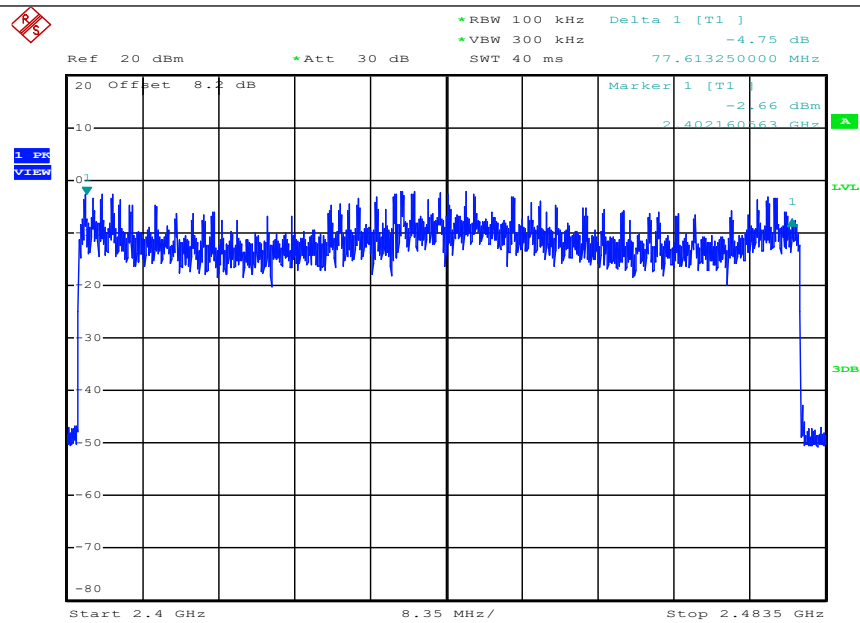
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS
8DPSK	Hop	79	>=15	PASS

Test Graphs

GFSK/Hop



Date: 25.SEP.2019 21:28:32

 $\pi/4$ DQPSK/Hop

Date: 26.SEP.2019 10:13:38

Ref 20 dBm *Att 30 dB RBW 100 kHz Delta 1 [T1] -0.21 dB
 VBW 300 kHz SWT 40 ms 77.769812500 MHz

20 Offset 8.2 dB Marker 1 [T1] -7.61 dBm
 2 402171000 GHz

1 PR
 VIEW

Start 2.4 GHz 8.35 MHz/ Stop 2.4835 GHz

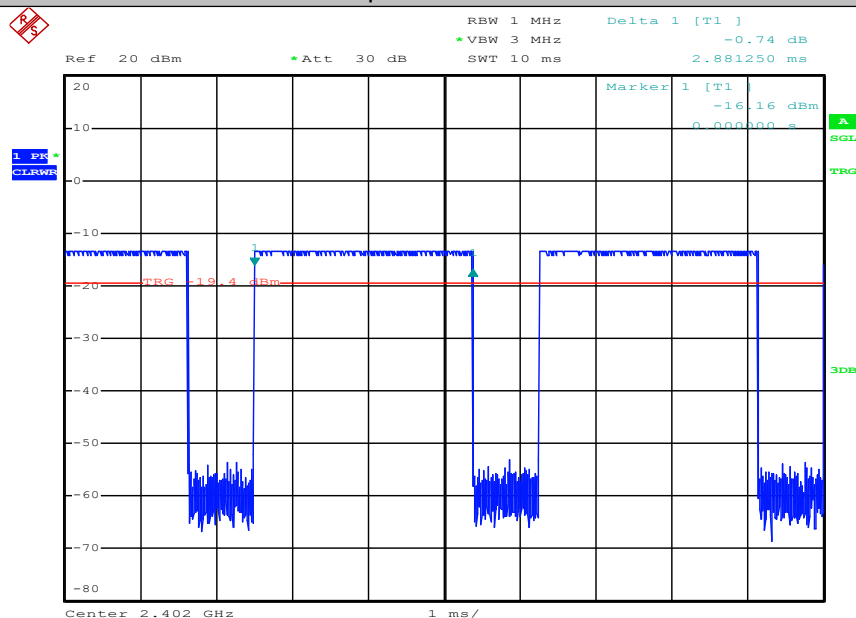
Date: 26.SEP.2019 10:01:06

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	2.886	106.7	0.308	0.4	PASS
	3DH5	MCH	2.886	106.7	0.308	0.4	PASS
	3DH5	HCH	2.885	106.7	0.308	0.4	PASS

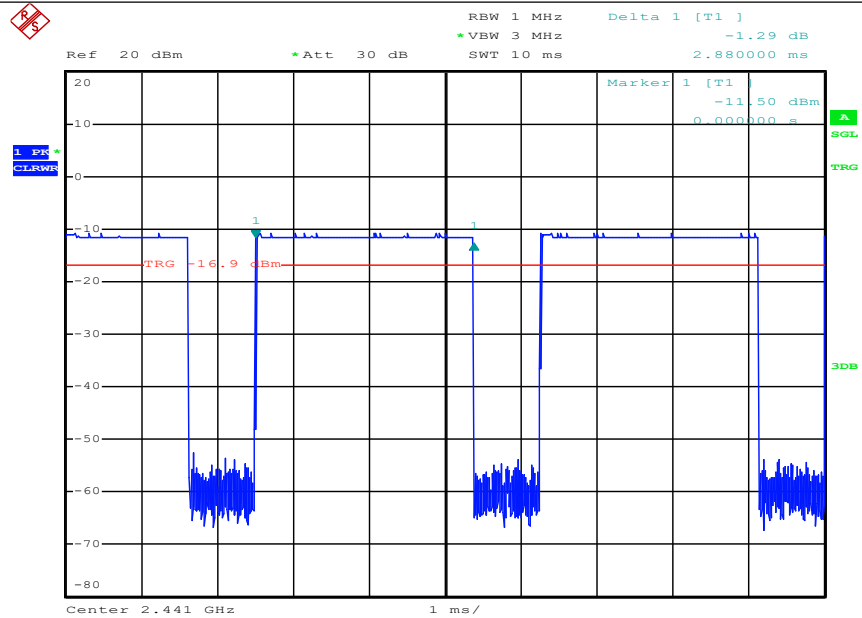
Test Graphs

GFSK_DH5/LCH



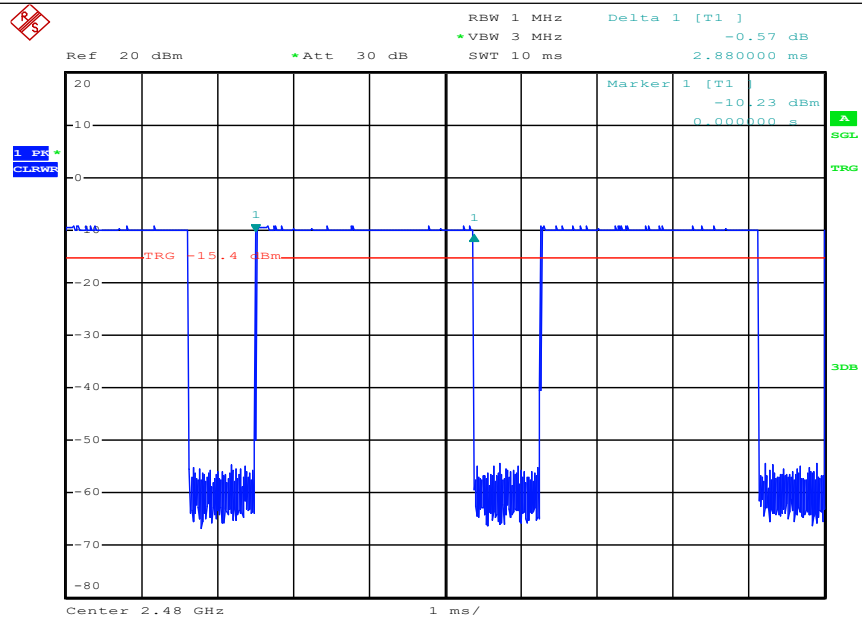
Date: 25.SEP.2019 22:00:45

GFSK_DH5/MCH



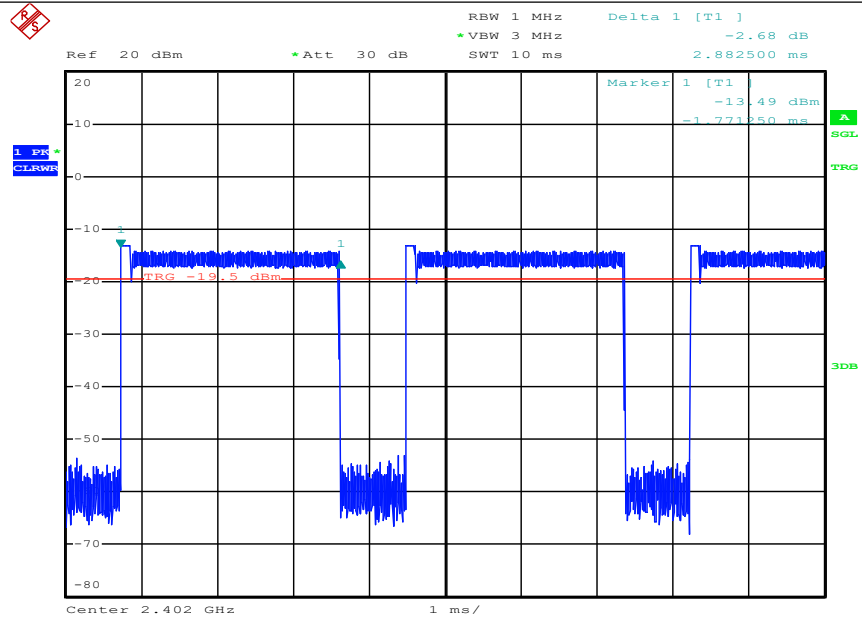
Date: 25.SEP.2019 22:03:26

GFSK_DH5/HCH



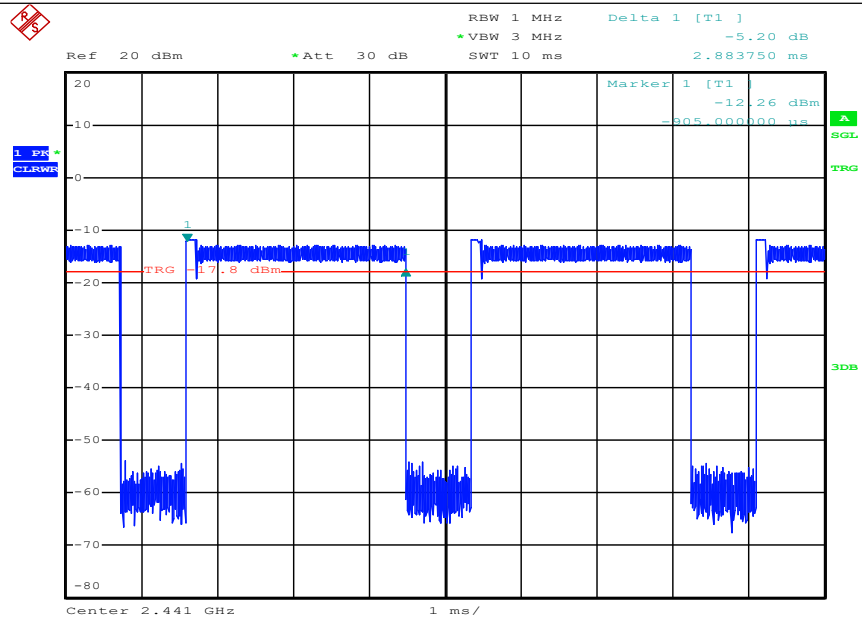
Date: 26.SEP.2019 09:08:16

$\pi/4$ DQPSK
_2DH5/LCH



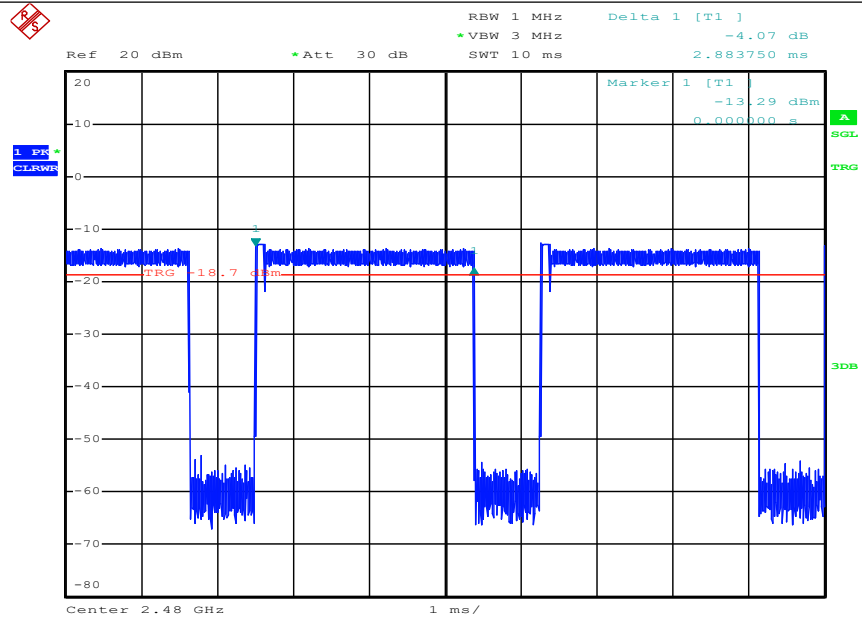
Date: 26.SEP.2019 09:16:55

$\pi/4$ DQPSK
_2DH5/MCH



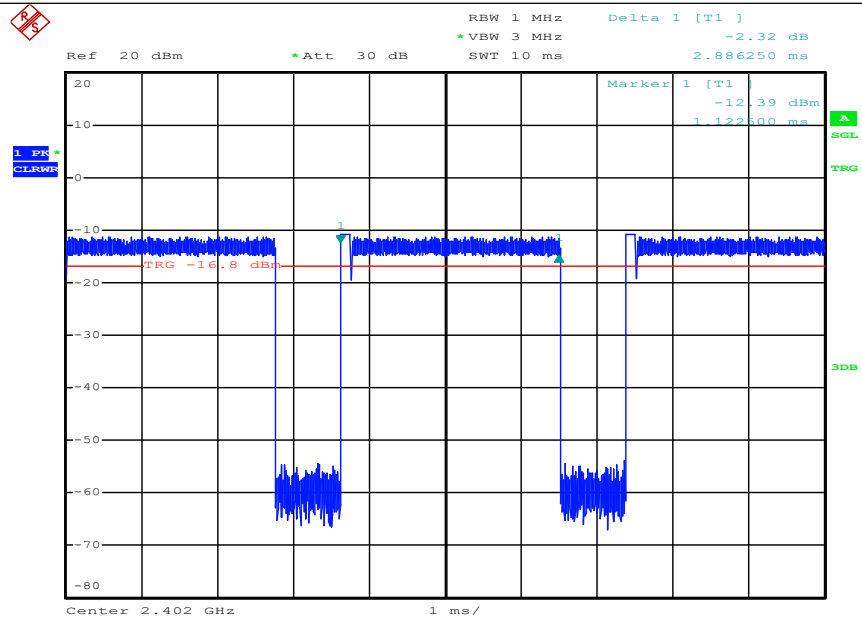
Date: 26.SEP.2019 09:19:26

$\pi/4$ DQPSK
_2DH5/HCH



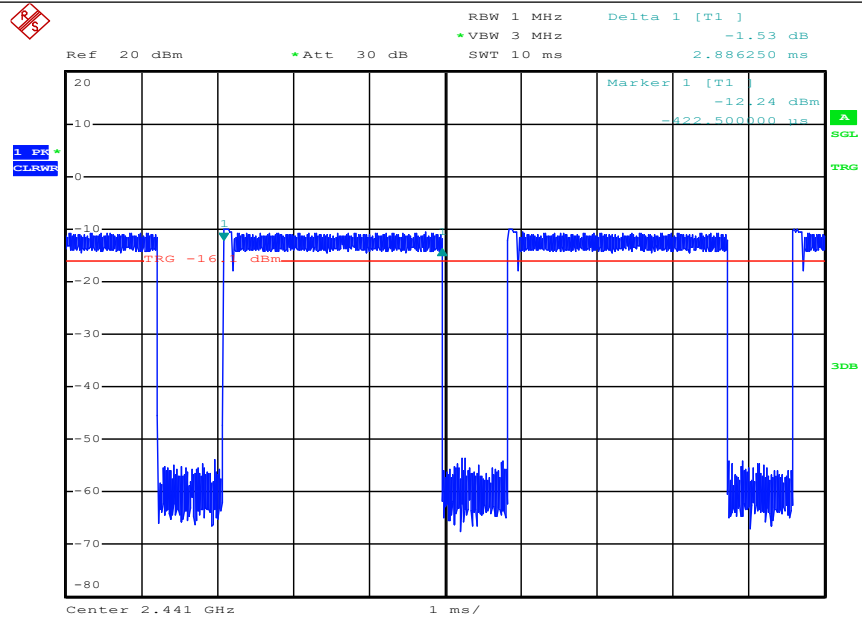
Date: 26.SEP.2019 09:26:29

8DPSK_3DH5/LCH



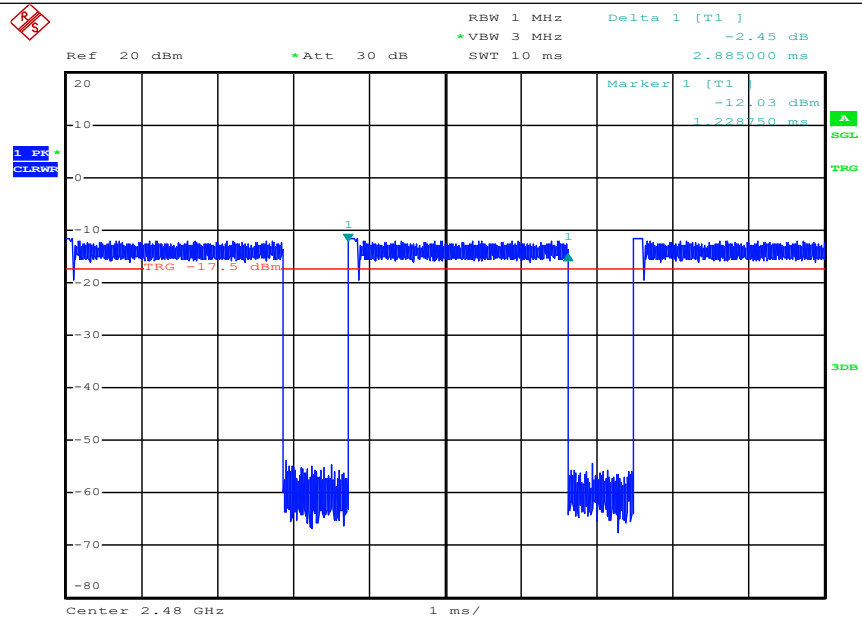
Date: 26.SEP.2019 09:29:30

8DPSK_3DH5/MCH



Date: 26.SEP.2019 09:32:03

8DPSK_3DH5/HCH



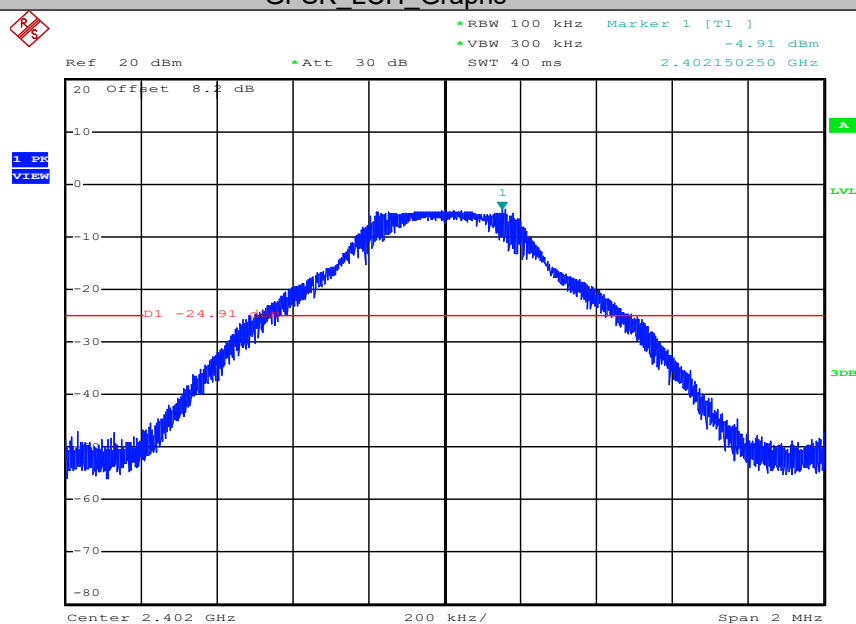
Date: 26.SEP.2019 09:33:51

A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-4.91	-32.080	-24.910	PASS
	MCH	-2.45	-31.590	-22.450	PASS
	HCH	-0.99	-31.910	-20.990	PASS
$\pi/4$ DQPSK	LCH	-5.08	-32.020	-25.080	PASS
	MCH	-3.29	-32.980	-23.290	PASS
	HCH	-4.06	-31.600	-24.060	PASS
8DPSK	LCH	-2.09	-32.760	-22.090	PASS
	MCH	-1.34	-32.550	-21.340	PASS
	HCH	-3.5	-32.710	-23.500	PASS

GFSK LCH_Graphs

Pref

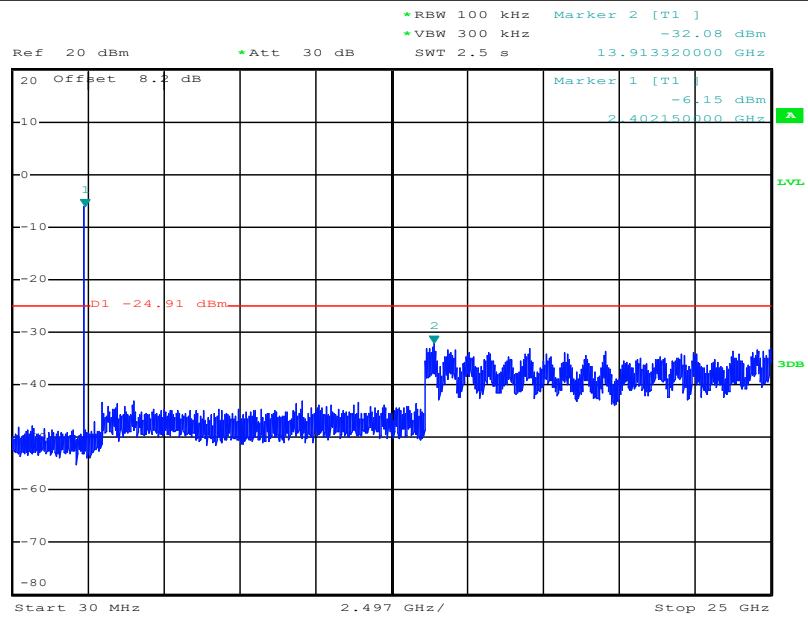


Date: 25.SEP.2019 22:01:30

P_{uw}



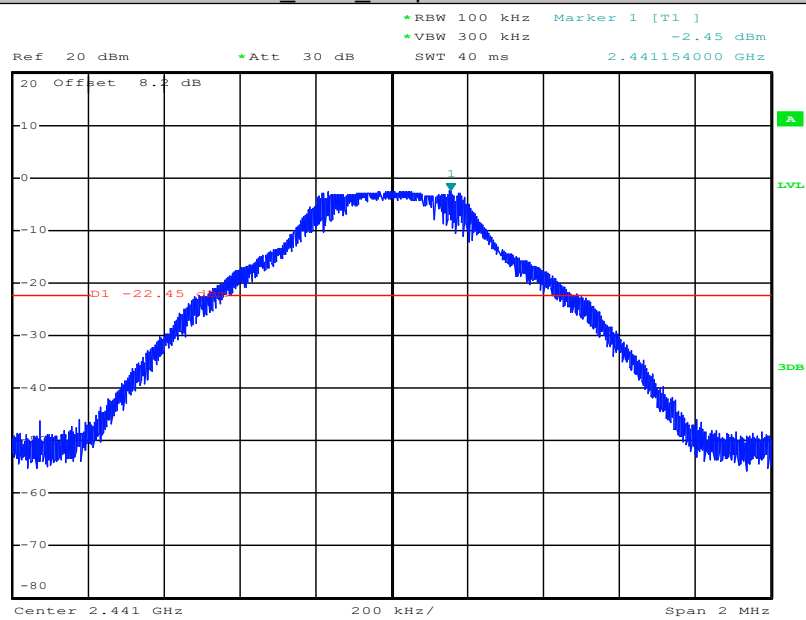
1. PR
VIEW



Date: 25.SEP.2019 22:01:44

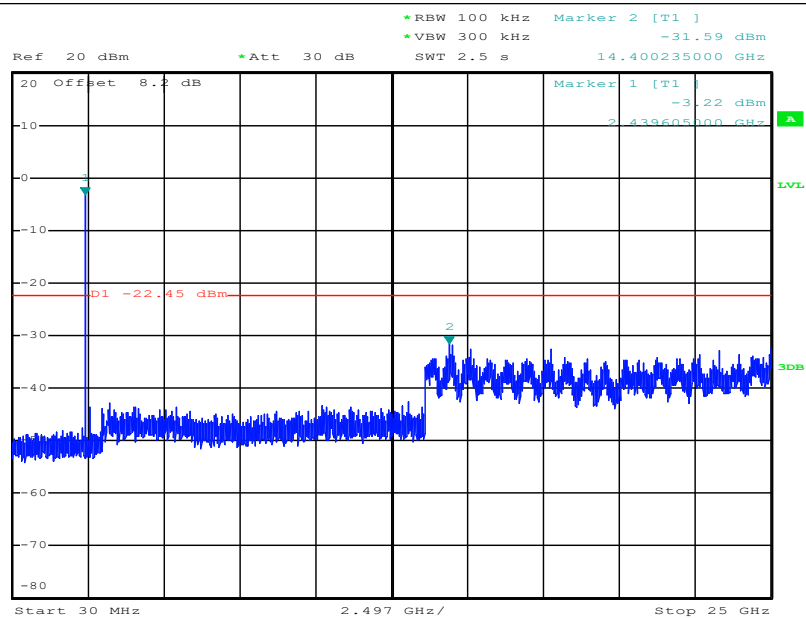
GFSK_MCH_Graphs

Pref

1 PR
VIEW

Date: 25.SEP.2019 22:03:54

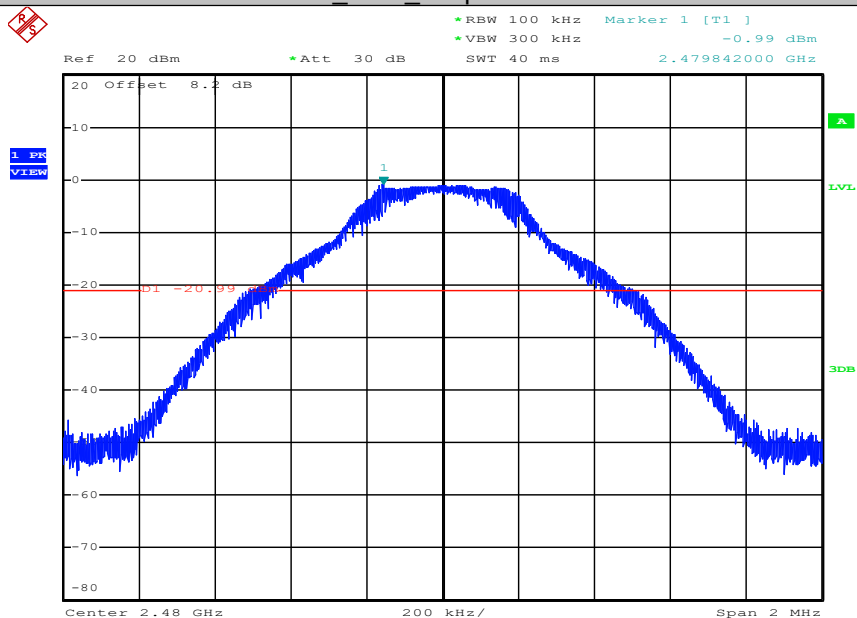
Puw

1 PR
VIEW

Date: 25.SEP.2019 22:04:09

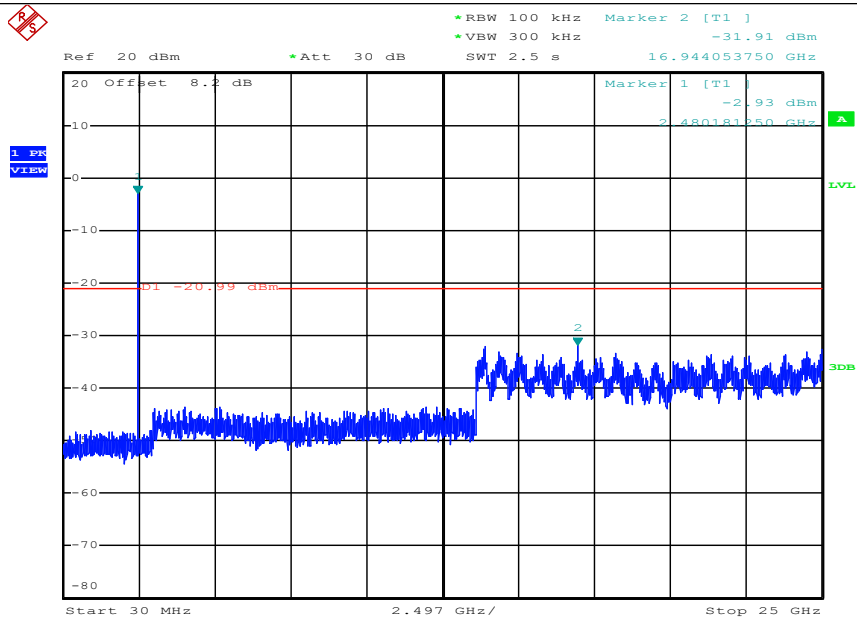
GFSK_HCH_Graphs

Pref



Date: 26.SEP.2019 09:09:01

Puw



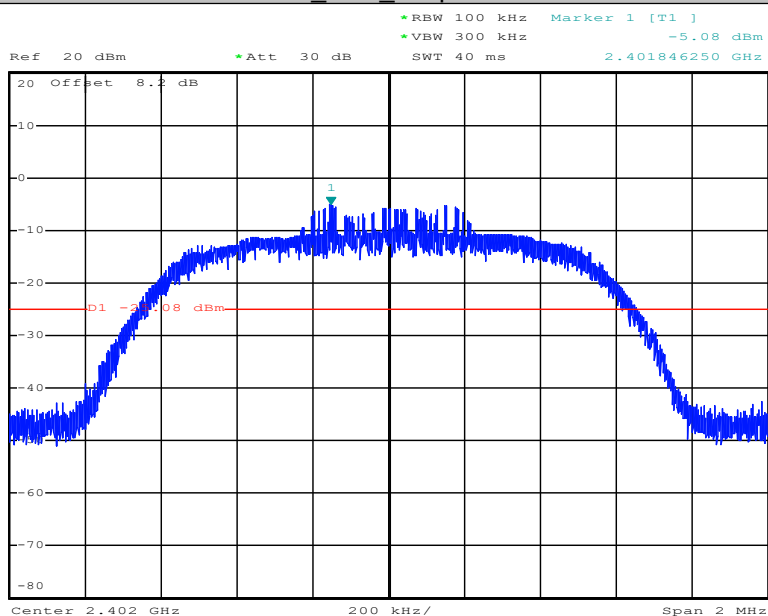
Date: 26.SEP.2019 09:09:15

$\pi/4$ DQPSK_LCH_Graphs

Pref



1 PR
VIEW

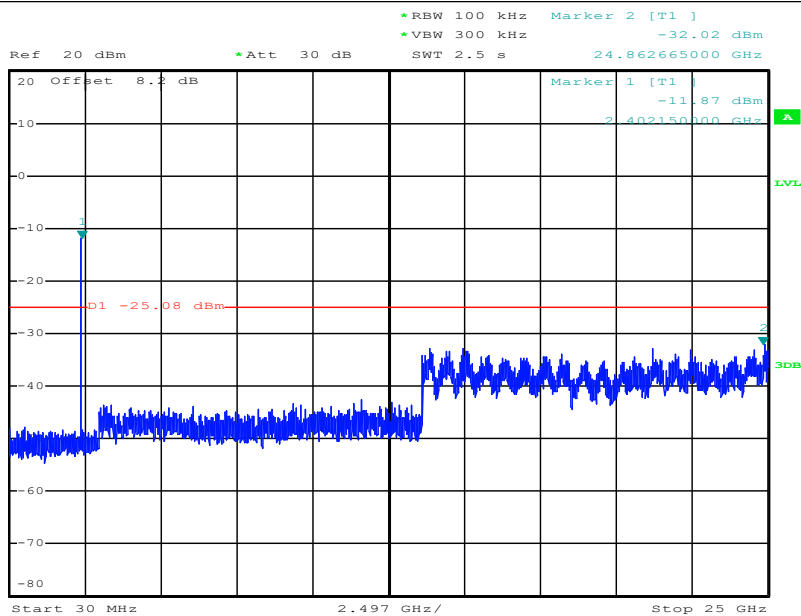


Date: 26.SEP.2019 09:17:39

Puw



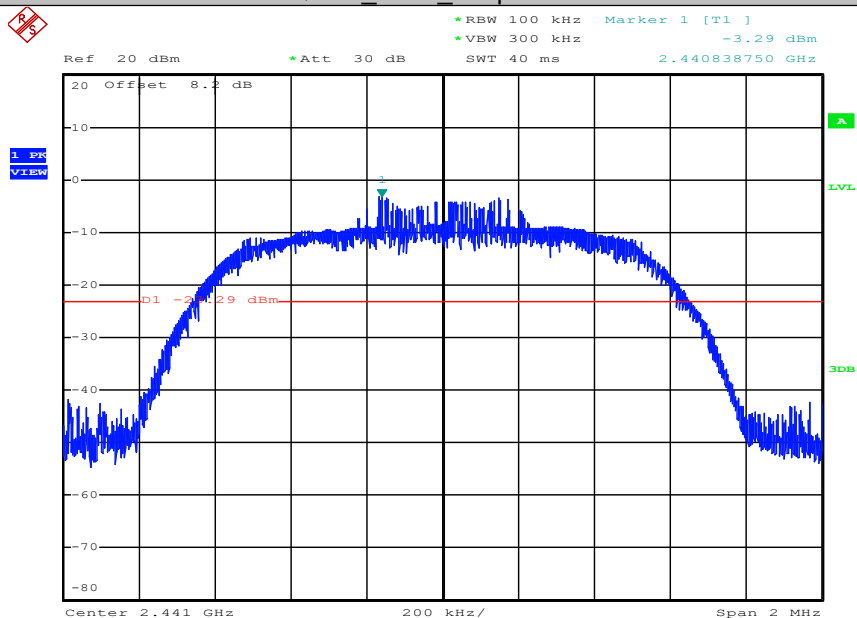
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VIEW



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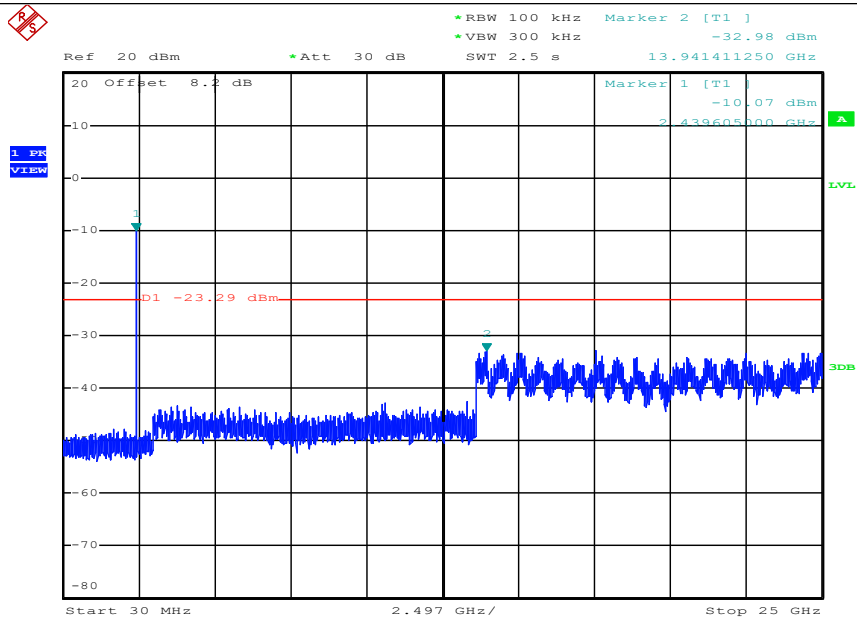
$\pi/4$ DQPSK_MCH_Graphs

Pref



Date: 26.SEP.2019 09:19:52

Puw



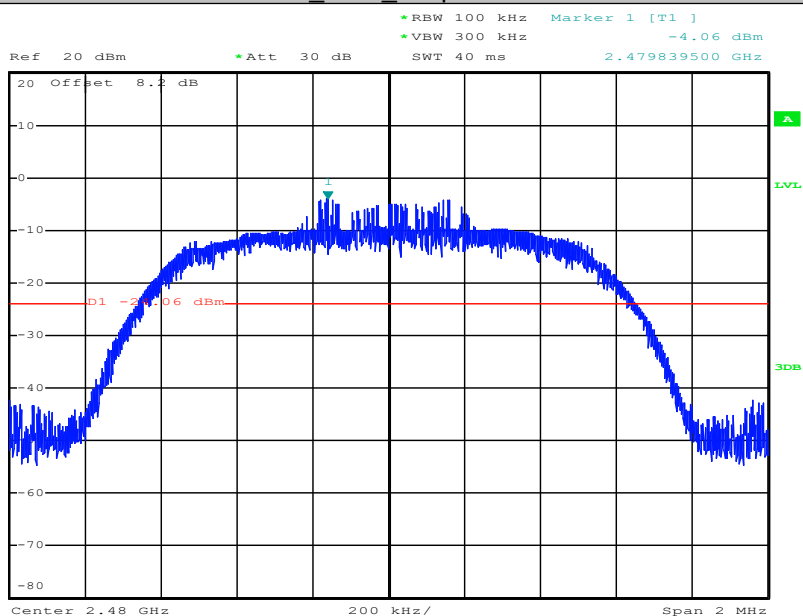
Date: 26.SEP.2019 09:20:06

$\pi/4$ DQPSK_HCH_Graphs

Pref



1 PR
VIEW

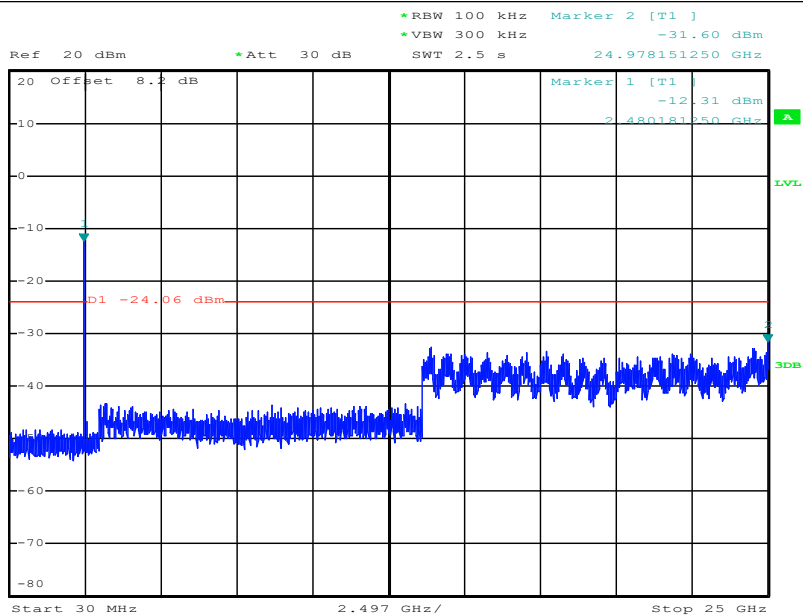


Date: 26.SEP.2019 09:27:14

Puw



1 PR
VIEW



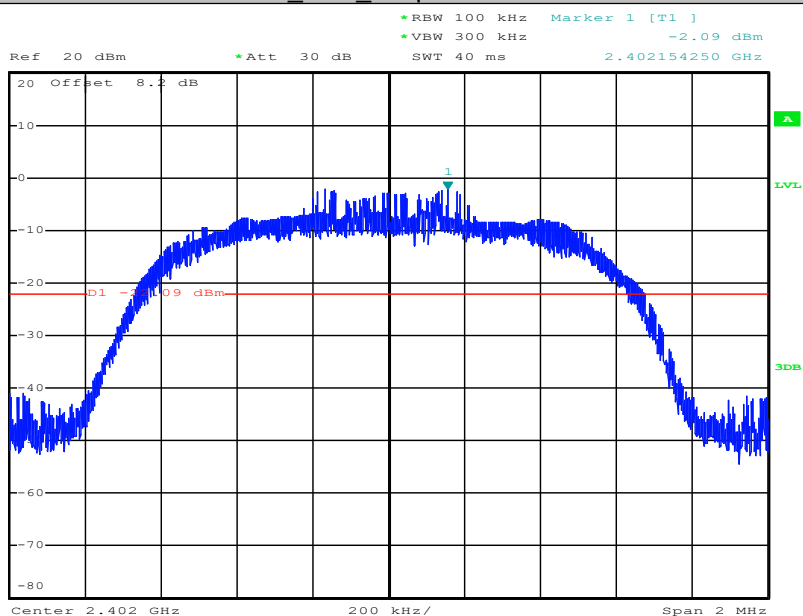
Date: 26.SEP.2019 09:27:29

8DPSK_LCH_Graphs

Pref



1 PR
VIEW

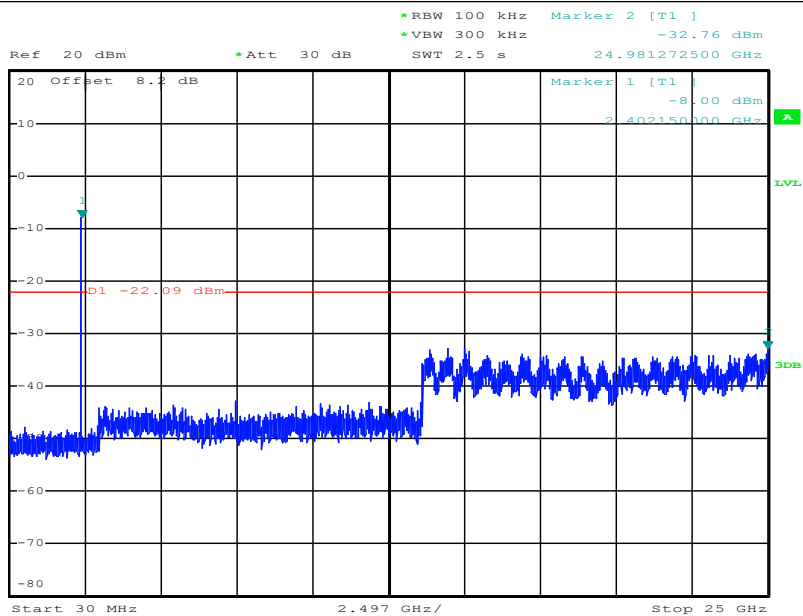


Date: 26.SEP.2019 09:30:14

Puw



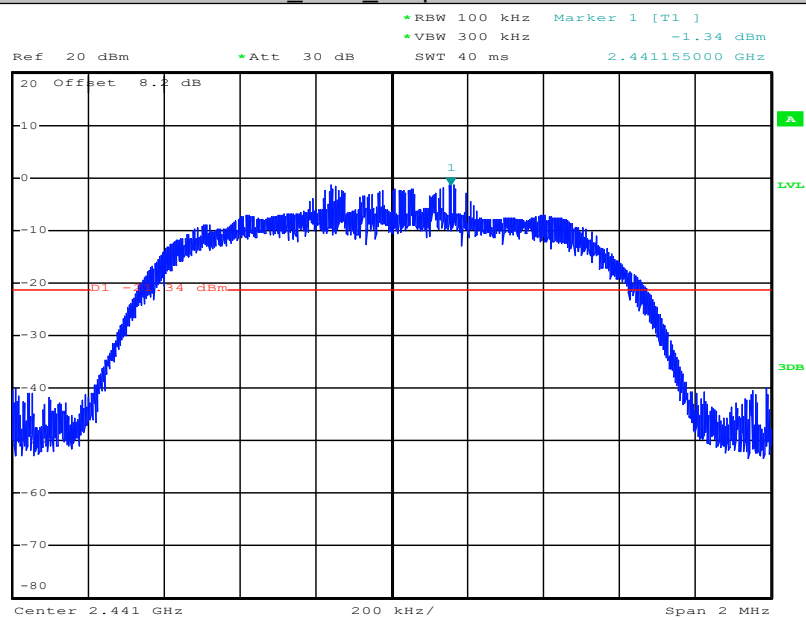
1 PR
VIEW



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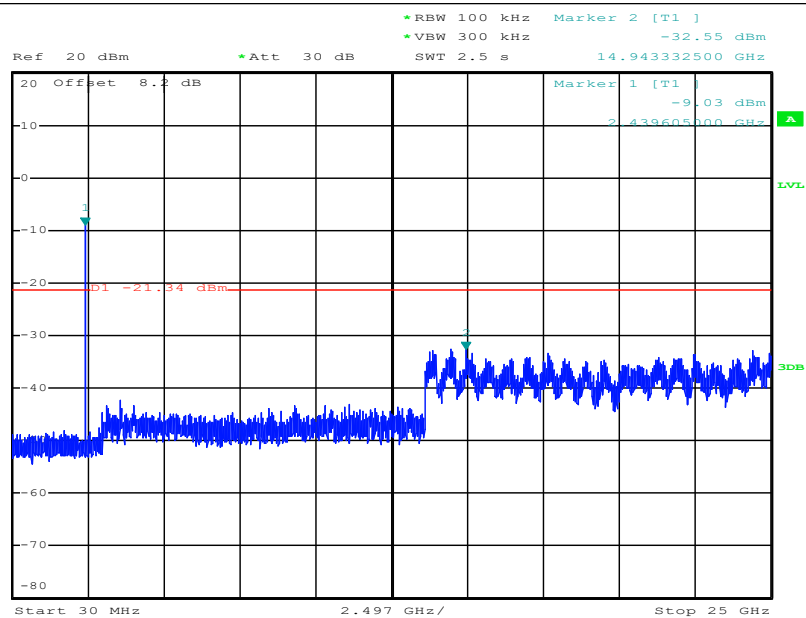
8DPSK_MCH_Graphs

Pref

1 PR
VIEW

Date: 26.SEP.2019 09:32:31

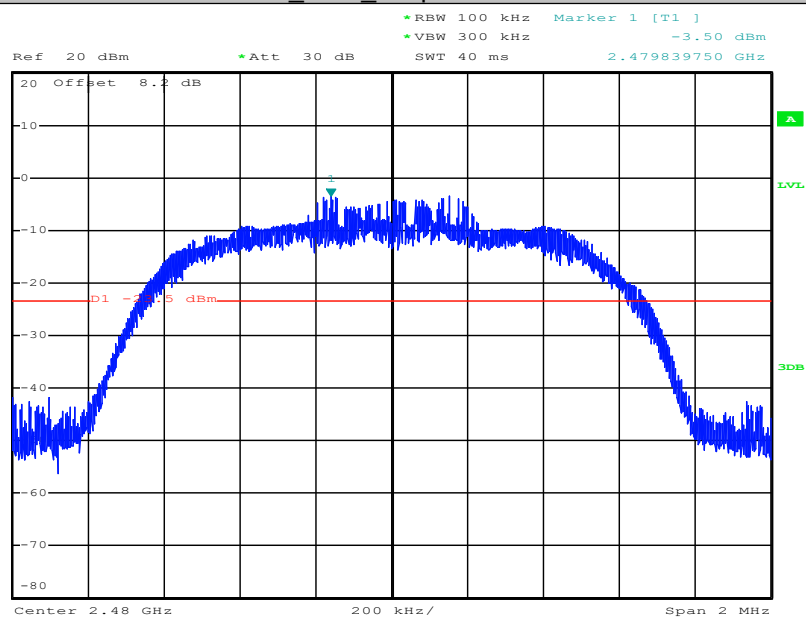
Puw

1 PR
VIEW

Date: 26.SEP.2019 09:32:45

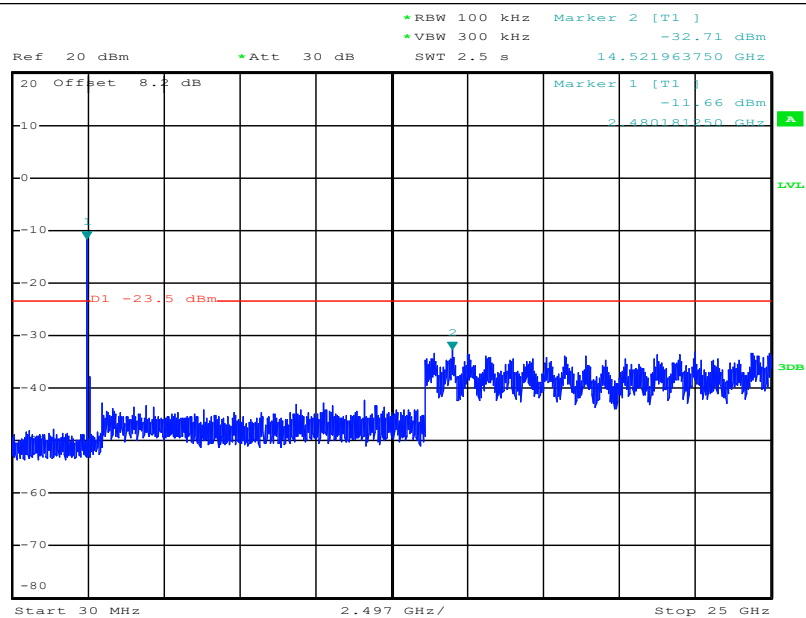
8DPSK_HCH_Graphs

Pref

1 PR
VIEW

Date: 26.SEP.2019 09:34:36

Puw

1 PR
VIEW

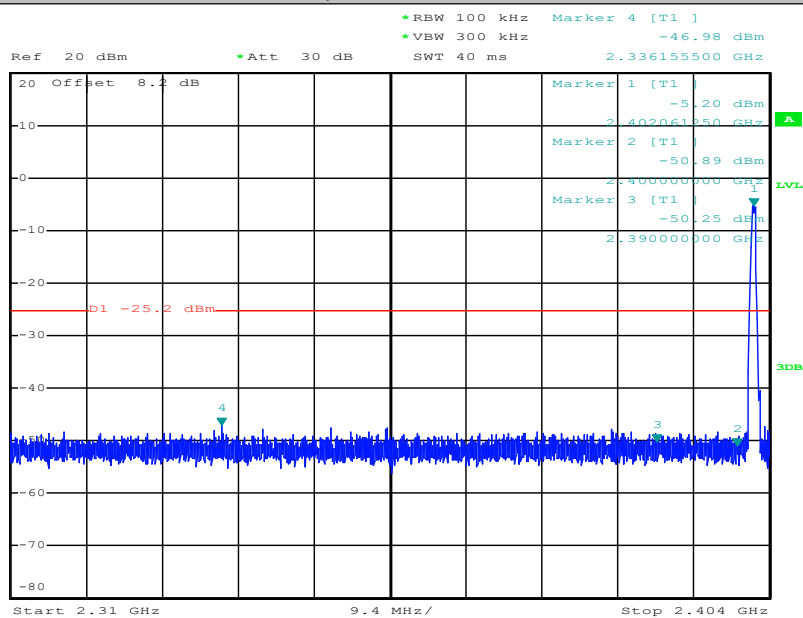
Date: 26.SEP.2019 09:34:51

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	-5.200	Off	-46.984	-25.2	PASS
			-5.160	On	-46.720	-25.16	PASS
	HCH	2480	-1.170	Off	-46.565	-21.17	PASS
			-3.520	On	-47.105	-23.52	PASS
$\pi/4$ DQPSK	LCH	2402	-10.360	Off	-45.741	-30.36	PASS
			-3.610	On	-46.817	-23.61	PASS
	HCH	2480	-4.320	Off	-47.411	-24.32	PASS
			-3.410	On	-46.503	-23.41	PASS
8DPSK	LCH	2402	-1.930	Off	-47.494	-21.93	PASS
			-3.490	On	-47.223	-23.49	PASS
	HCH	2480	-3.390	Off	-47.059	-23.39	PASS
			-3.760	On	-47.059	-23.76	PASS

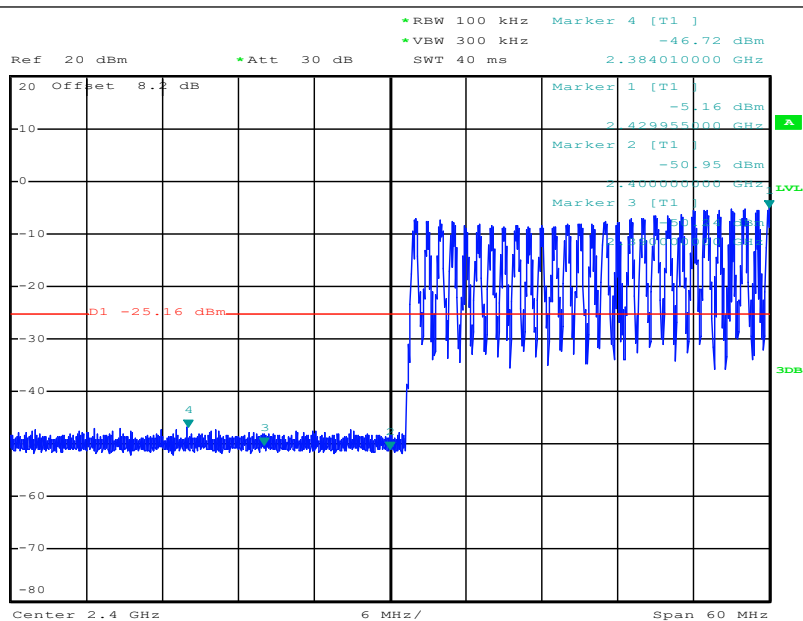
Test Graphs

GFSK/LCH/No Hop

1 PK
VIEW

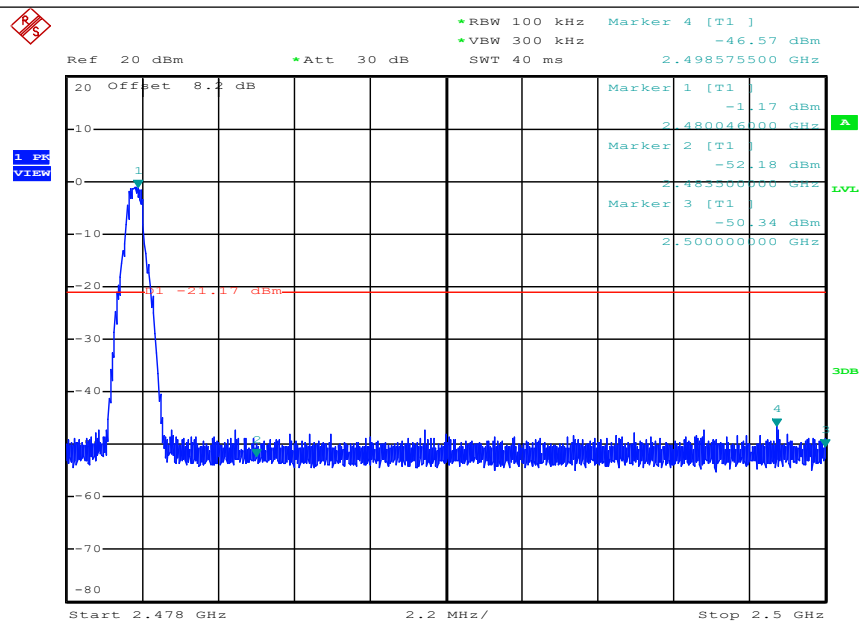
Date: 25.SEP.2019 22:01:17

GFSK/LCH/Hop

1 PK
VIEW

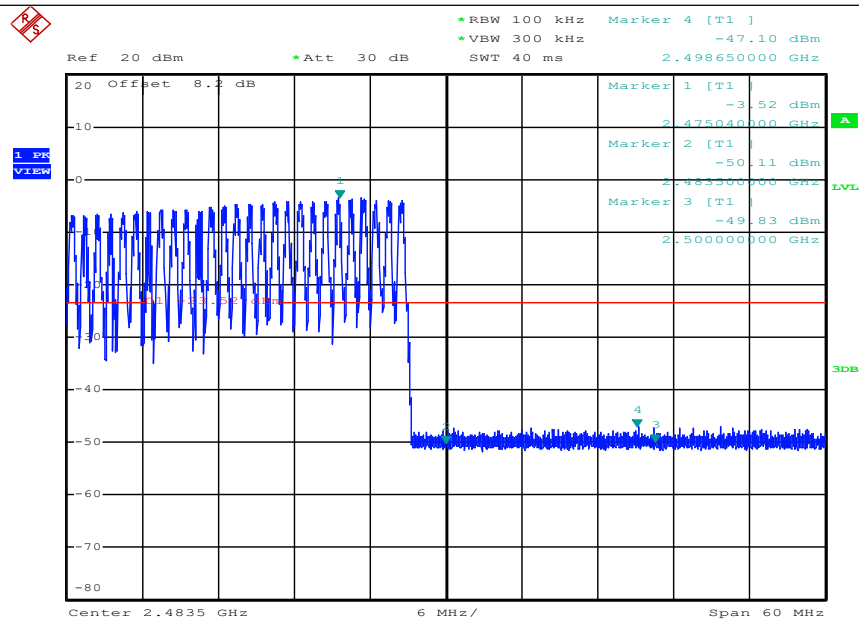
Date: 25.SEP.2019 21:23:39

GFSK/HCH/No Hop



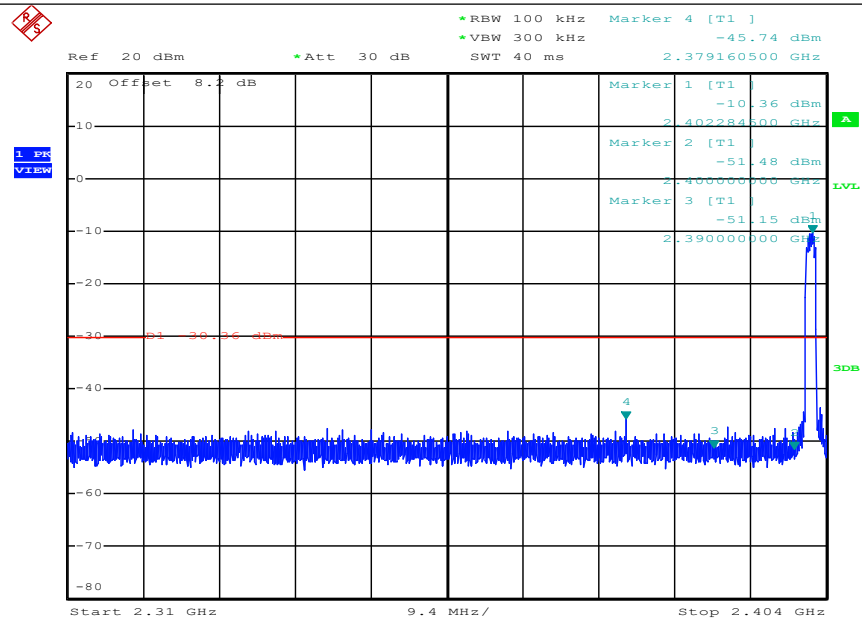
Date: 26.SEP.2019 09:08:48

GFSK/HCH/Hop



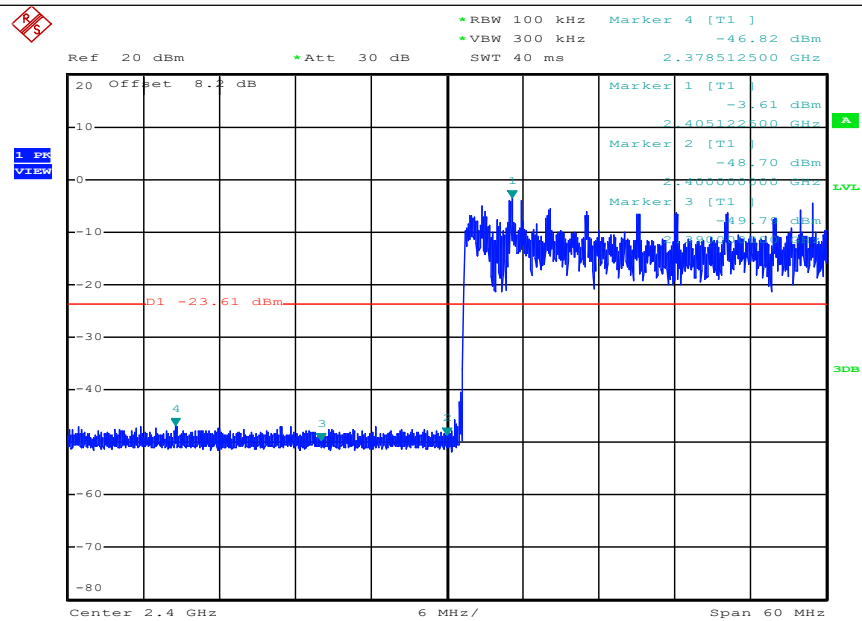
Date: 25.SEP.2019 21:26:49

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



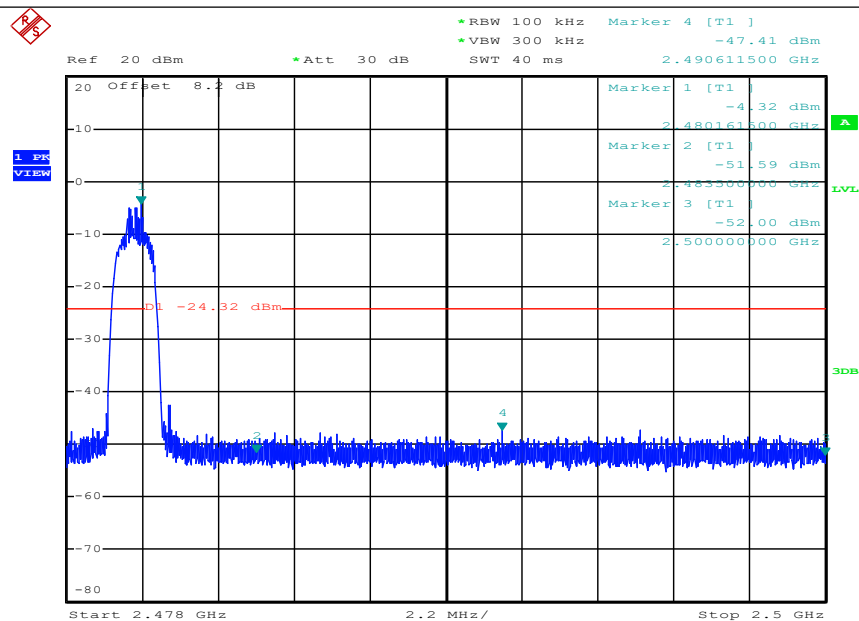
Date: 26.SEP.2019 09:17:26

$\pi/4$ DQPSK/LCH/Hop



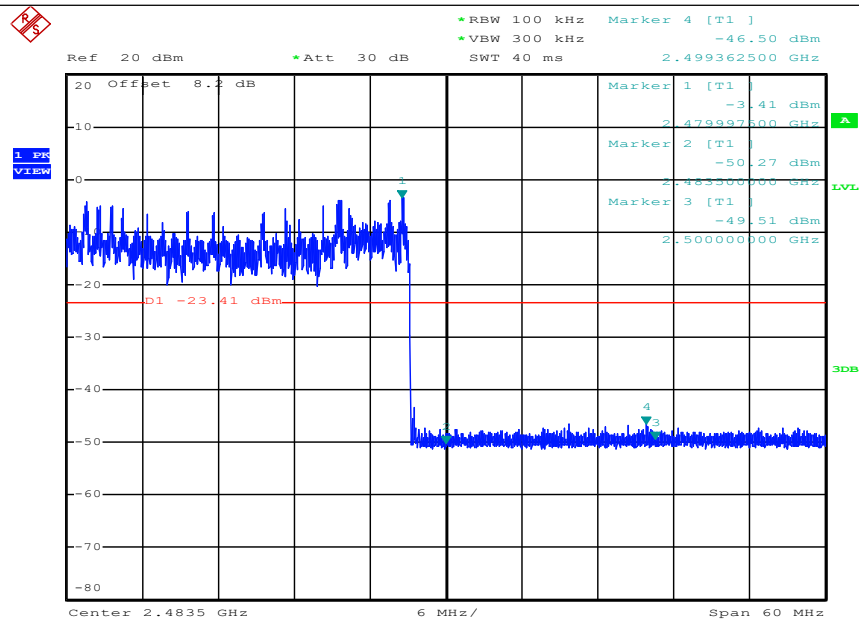
Date: 26.SEP.2019 10:06:58

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



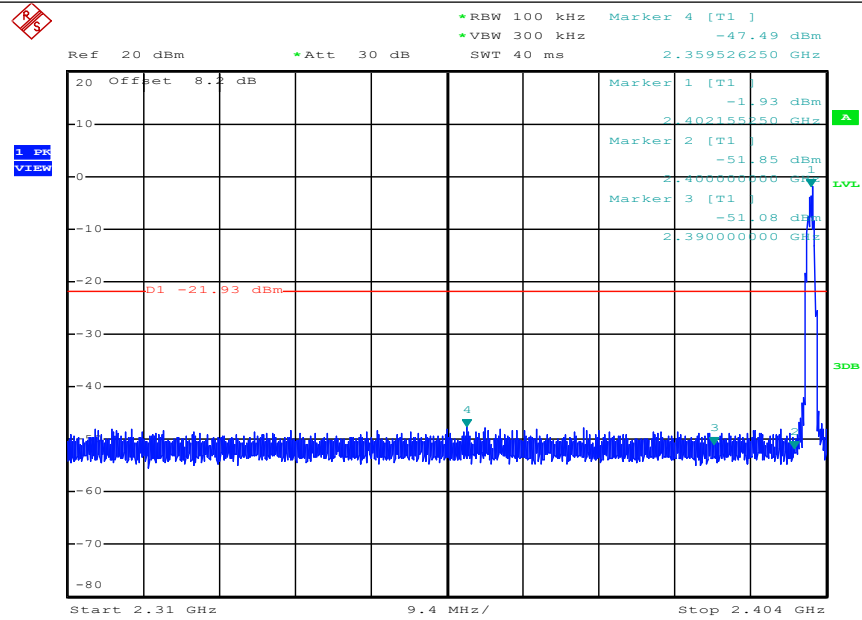
Date: 26.SEP.2019 09:27:01

$\pi/4$ DQPSK/HCH/Hop



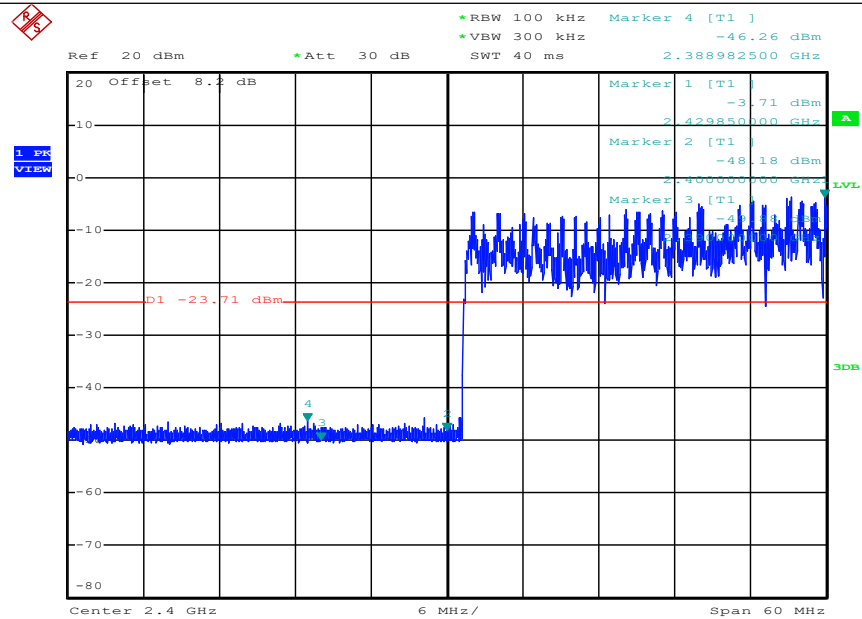
Date: 26.SEP.2019 10:10:35

8DPSK/LCH/No Hop



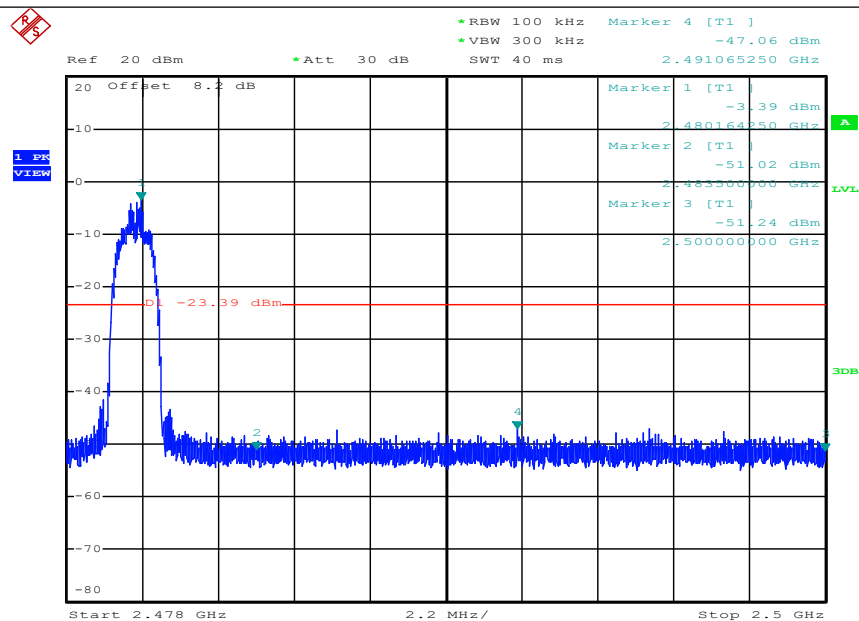
Date: 26.SEP.2019 09:30:01

8DPSK/LCH/Hop



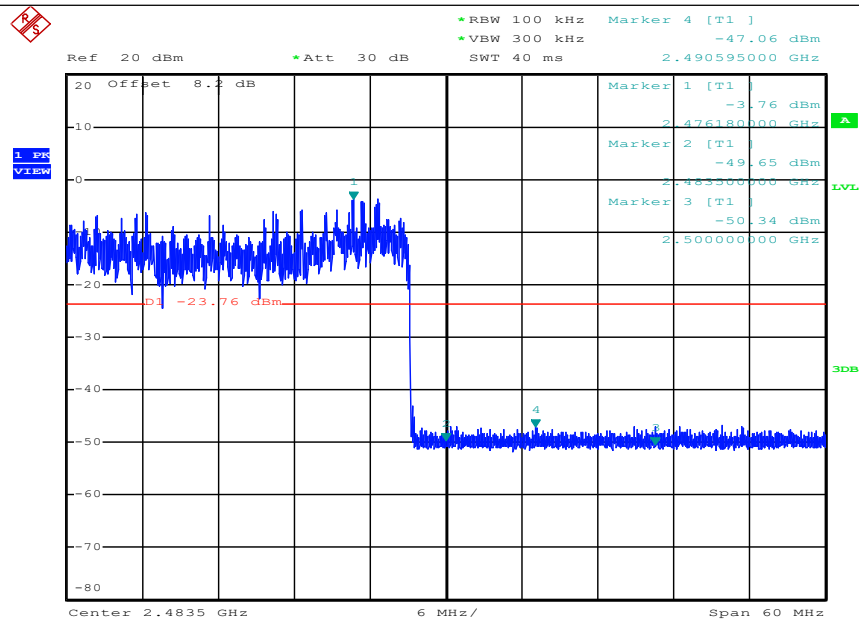
Date: 25.SEP.2019 21:48:20

8DPSK/HCH/No Hop



Date: 26.SEP.2019 09:34:23

8DPSK/HCH/Hop

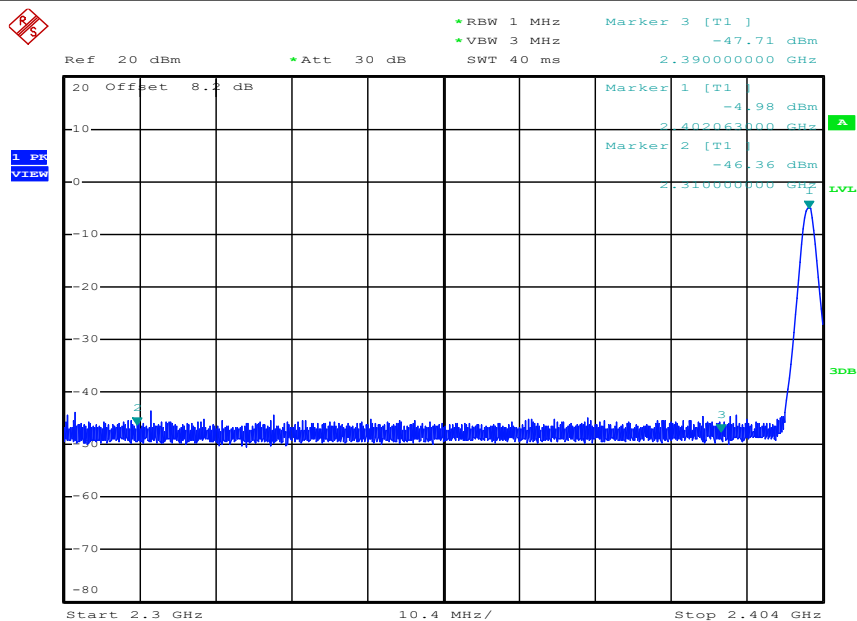


Date: 26.SEP.2019 09:59:05

A.8 Restrict-band band-edge measurements

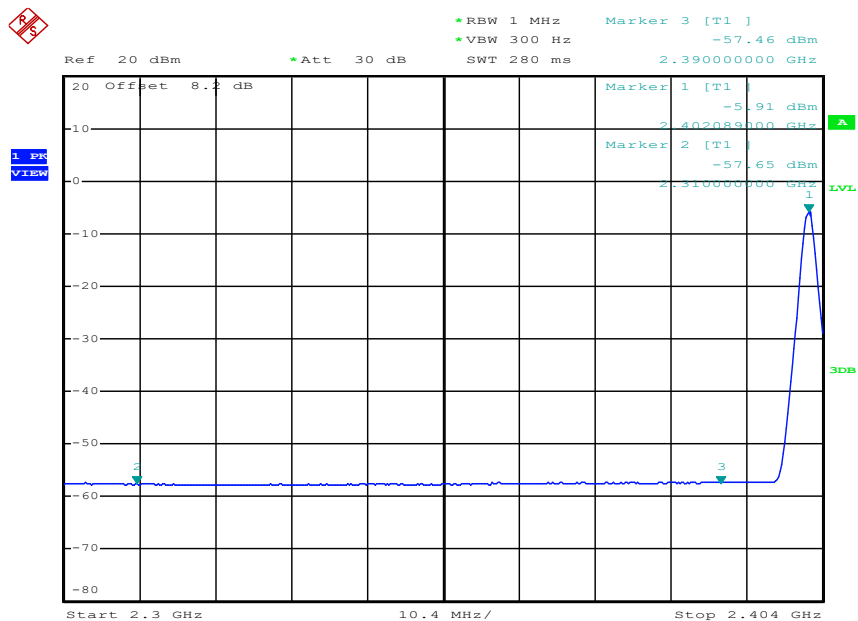
Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-46.36	2.0	0	48.90	PEAK	74	PASS
	Off	2310.0	-57.65	2.0	0	37.61	AV	54	PASS
	Off	2390.0	-47.71	2.0	0	47.55	PEAK	74	PASS
	Off	2390.0	-57.46	2.0	0	37.80	AV	54	PASS
	Off	2483.5	-40.39	2.0	0	54.87	PEAK	74	PASS
	Off	2483.5	-43.69	2.0	0	51.57	AV	54	PASS
	Off	2500.0	-47.33	2.0	0	47.93	PEAK	74	PASS
	Off	2500.0	-57.89	2.0	0	37.37	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-48.39	2.0	0	46.87	PEAK	74	PASS
	Off	2310.0	-57.50	2.0	0	37.76	AV	54	PASS
	Off	2390.0	-48.93	2.0	0	46.33	PEAK	74	PASS
	Off	2390.0	-57.30	2.0	0	37.96	AV	54	PASS
	Off	2483.5	-42.86	2.0	0	52.40	PEAK	74	PASS
	Off	2483.5	-49.34	2.0	0	45.92	AV	54	PASS
	Off	2500.0	-47.96	2.0	0	47.30	PEAK	74	PASS
	Off	2500.0	-57.99	2.0	0	37.27	AV	54	PASS
8DPSK	Off	2310.0	-49.57	2.0	0	45.69	PEAK	74	PASS
	Off	2310.0	-57.60	2.0	0	37.66	AV	54	PASS
	Off	2390.0	-48.58	2.0	0	46.68	PEAK	74	PASS
	Off	2390.0	-57.39	2.0	0	37.87	AV	54	PASS
	Off	2483.5	-43.38	2.0	0	51.88	PEAK	74	PASS
	Off	2483.5	-48.67	2.0	0	46.59	AV	54	PASS
	Off	2500.0	-48.70	2.0	0	46.56	PEAK	74	PASS
	Off	2500.0	-57.99	2.0	0	37.27	AV	54	PASS

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



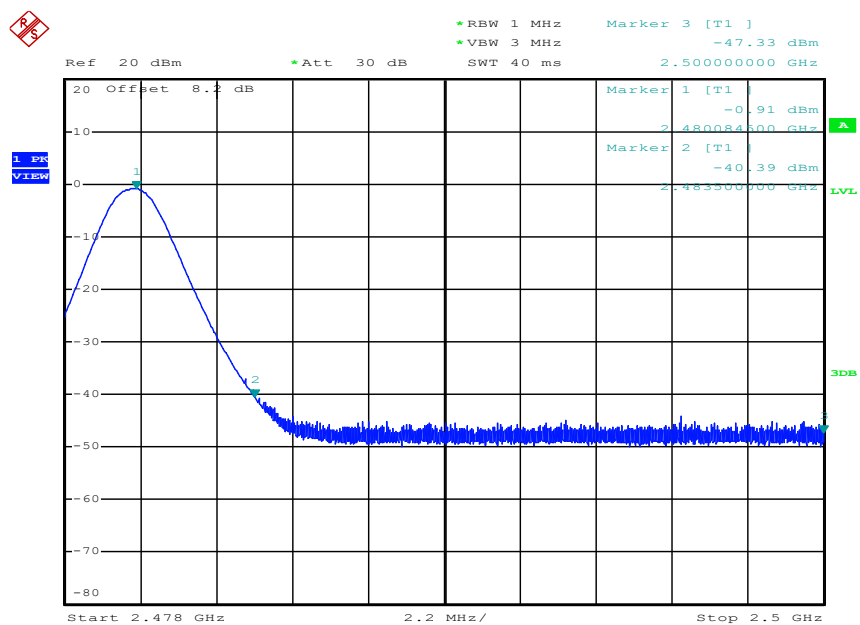
Date: 25.SEP.2019 22:02:03

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



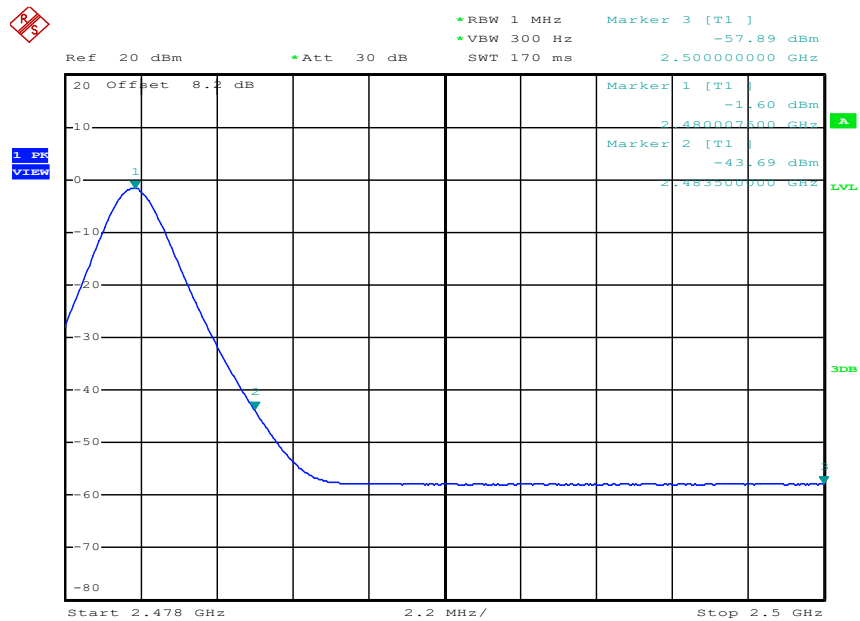
Date: 25.SEP.2019 22:02:16

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

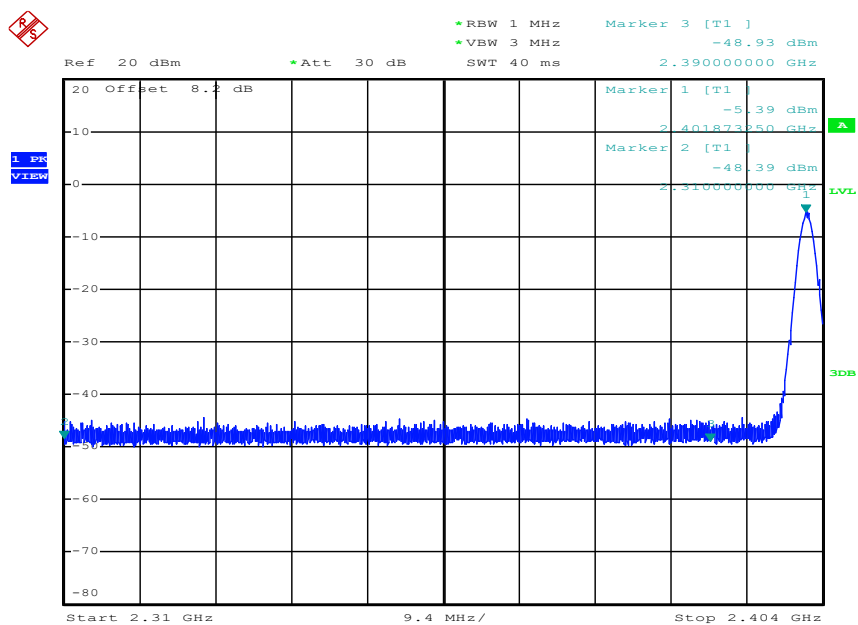


Date: 26.SEP.2019 09:09:34

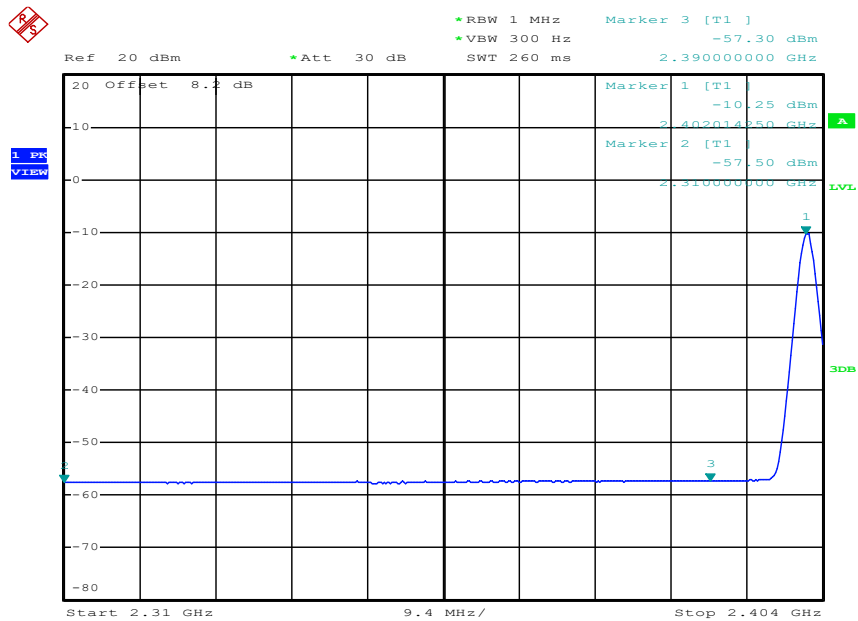
Restrict-band band-edge measurements_Hopping Off_ GFSK_Average (High Channel)



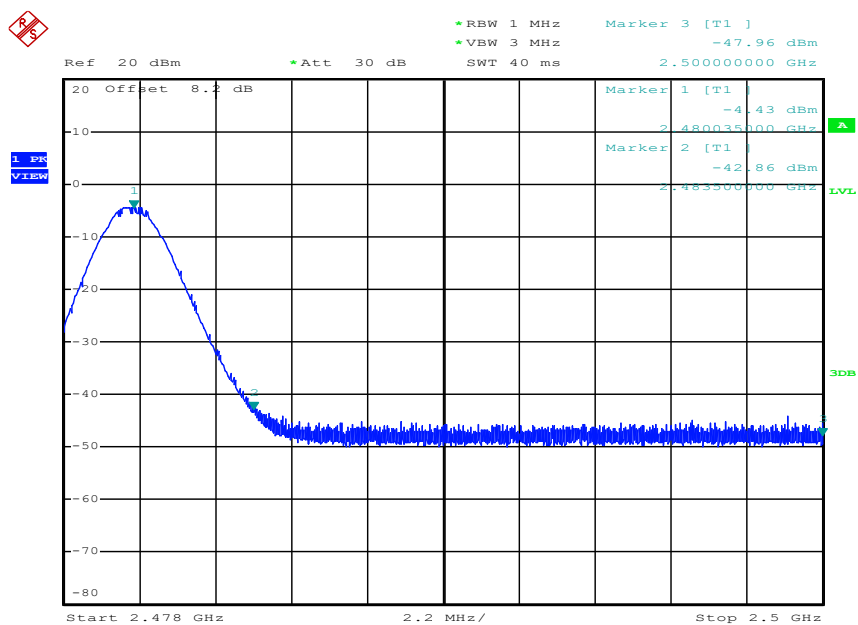
Date: 26.SEP.2019 09:09:47

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

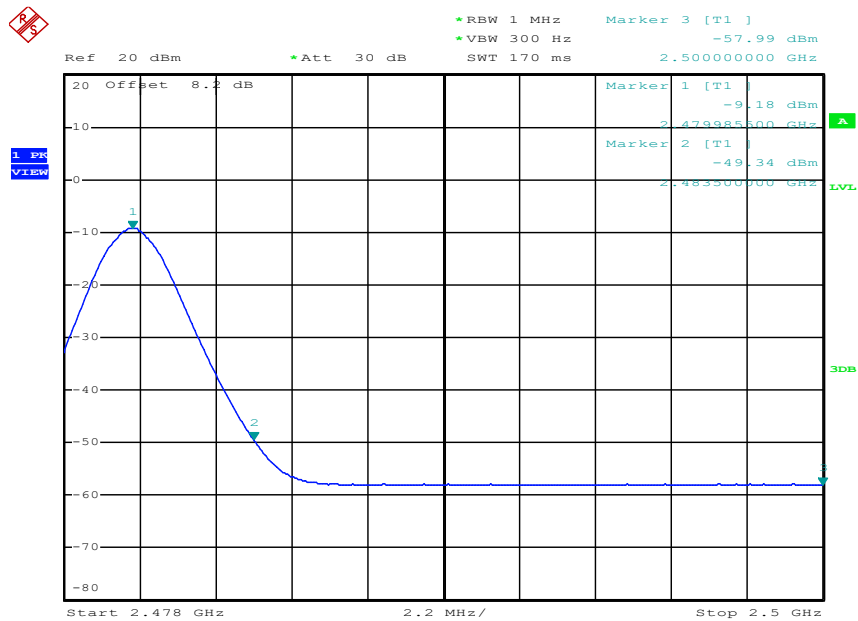
Date: 26.SEP.2019 09:18:13

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

Date: 26.SEP.2019 09:18:26

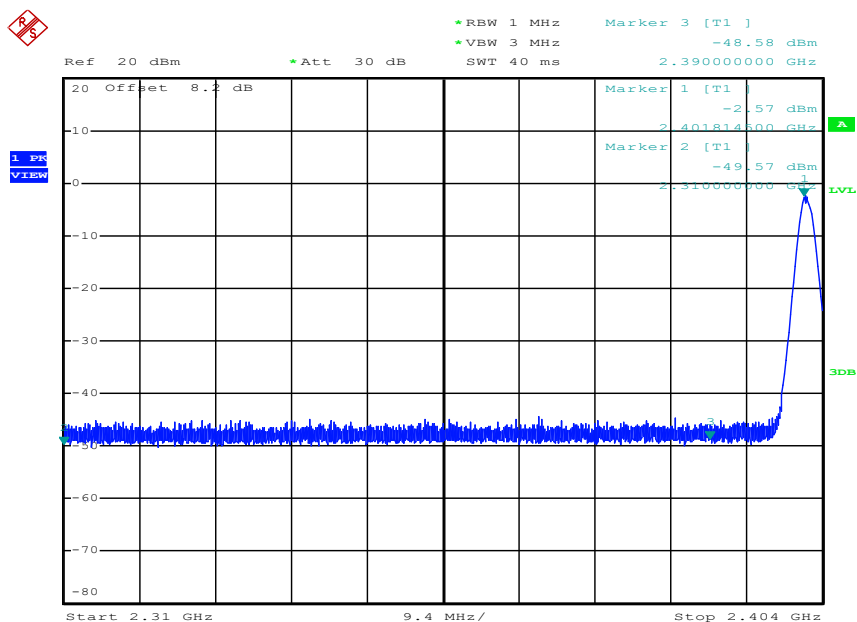
Restrict-band band-edge measurements_Hopping Off $\pi/4$ -DQPSK_PEAK (High Channel)

Date: 26.SEP.2019 09:27:48

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

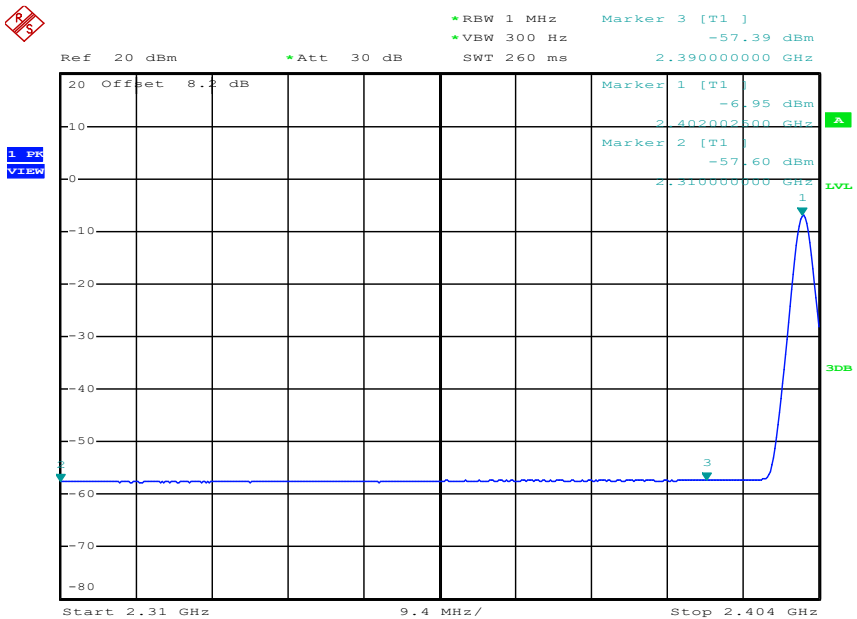
Date: 26.SEP.2019 09:28:01

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



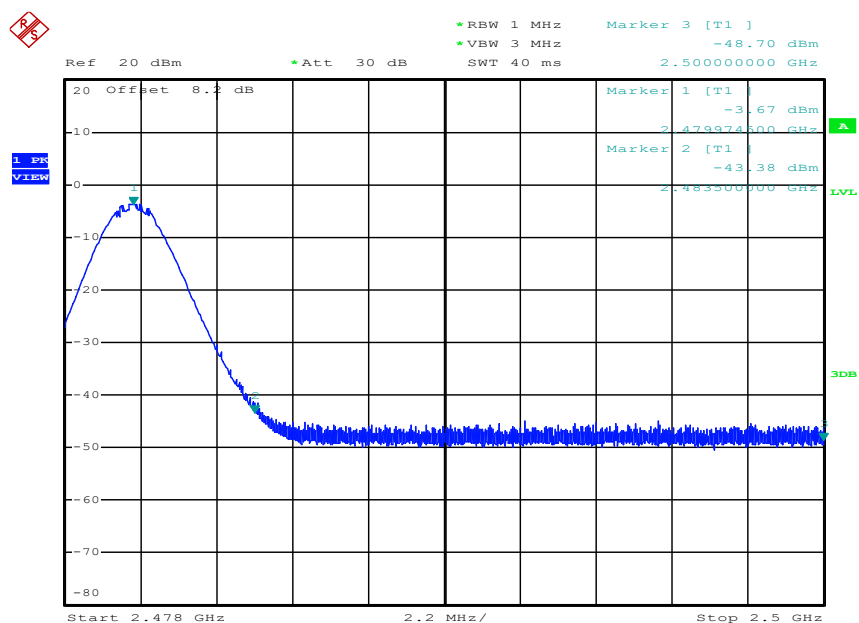
Date: 26.SEP.2019 09:30:48

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



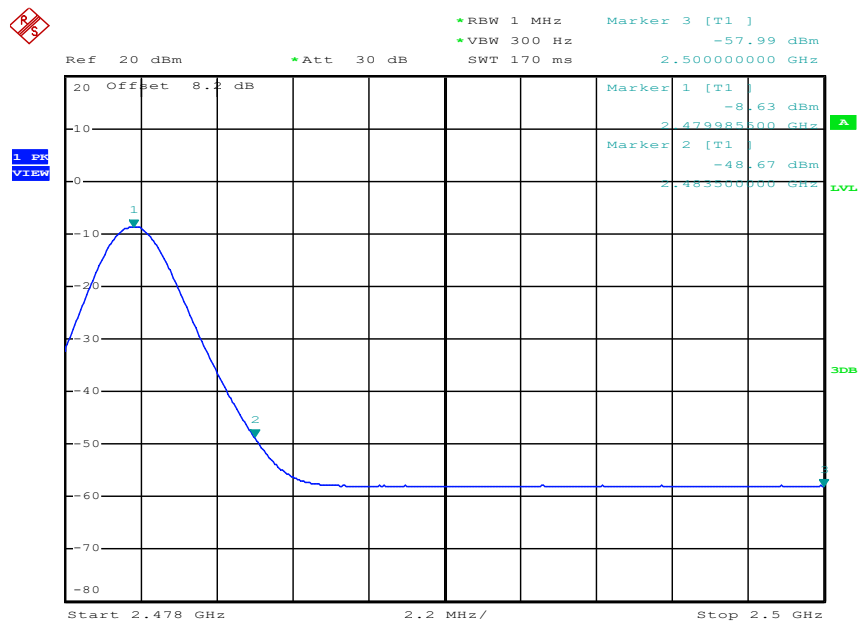
Date: 26.SEP.2019 09:31:01

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



Date: 26.SEP.2019 09:35:10

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



Date: 26.SEP.2019 09:35:23