

## Appendix A

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

Product Name: TWS earbuds

Trade Mark: N/A

Test Model: XO-9832

#### Environmental Conditions

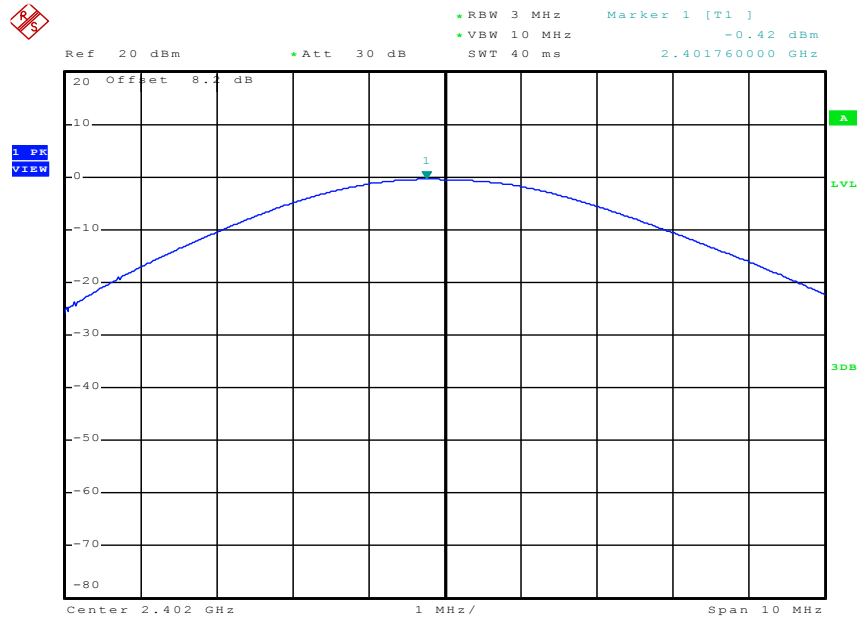
Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	100.0 kPa
Test Engineer:	JK zhou
Supervised by:	Wang.Chuang

#### A.1 Maximum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.420	30	PASS
	MCH	-0.050	30	PASS
	HCH	-0.330	30	PASS
$\pi/4$ DQPSK	LCH	0.280	21	PASS
	MCH	0.650	21	PASS
	HCH	0.410	21	PASS

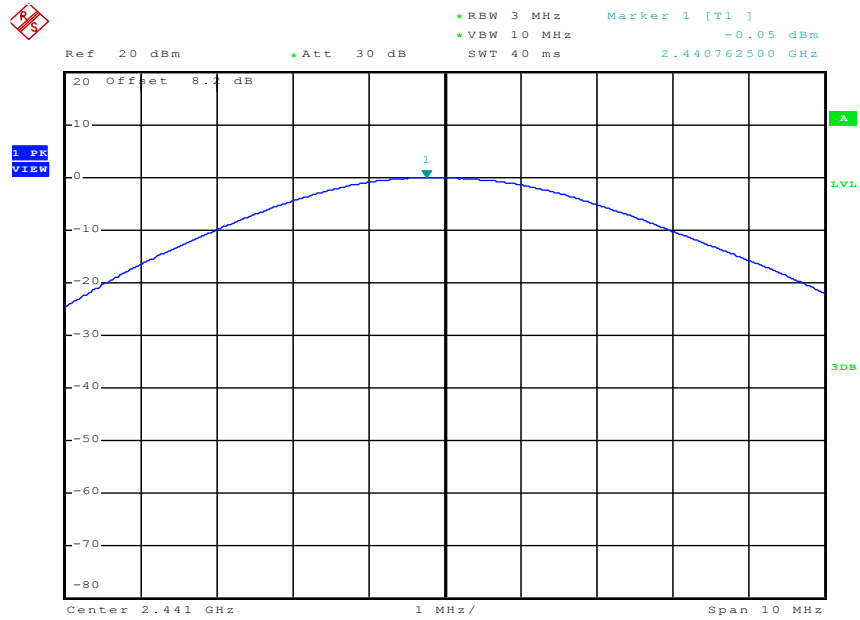
### Test Graphs

GFSK/LCH



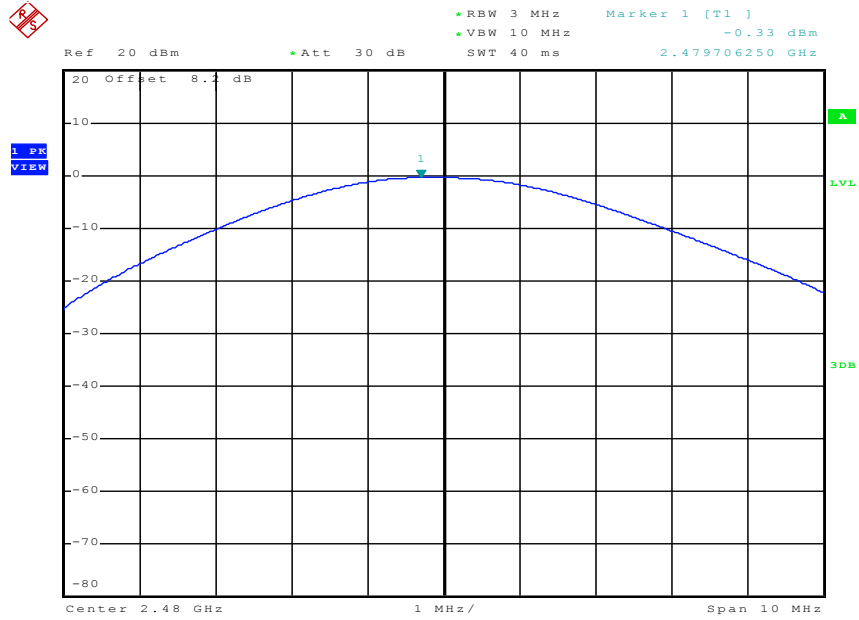
Date: 13 AUG 2019 21:06:33

GFSK/MCH



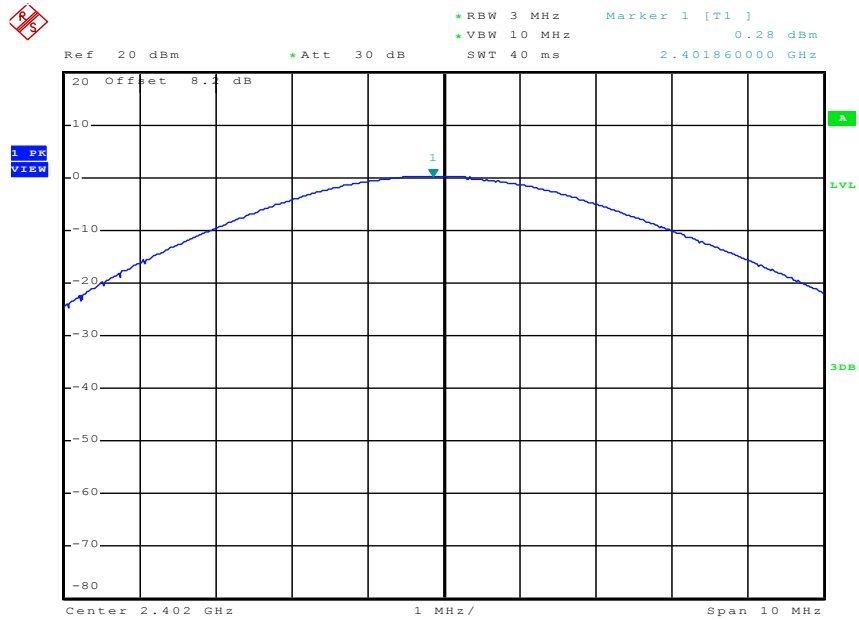
Date: 13 AUG 2019 21:15:00

GFSK/HCH



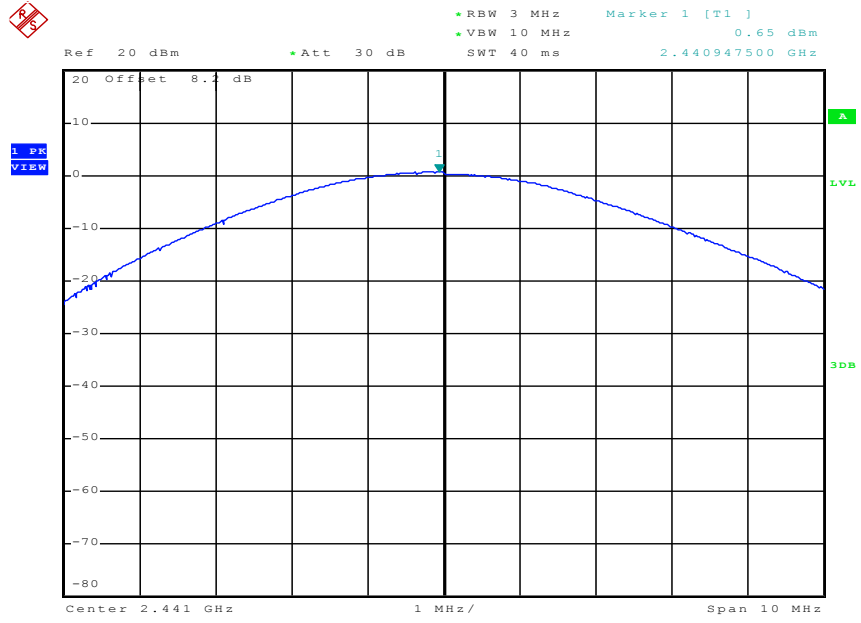
Date: 13 AUG 2019 21:16:52

$\pi/4$ DQPSK/LCH



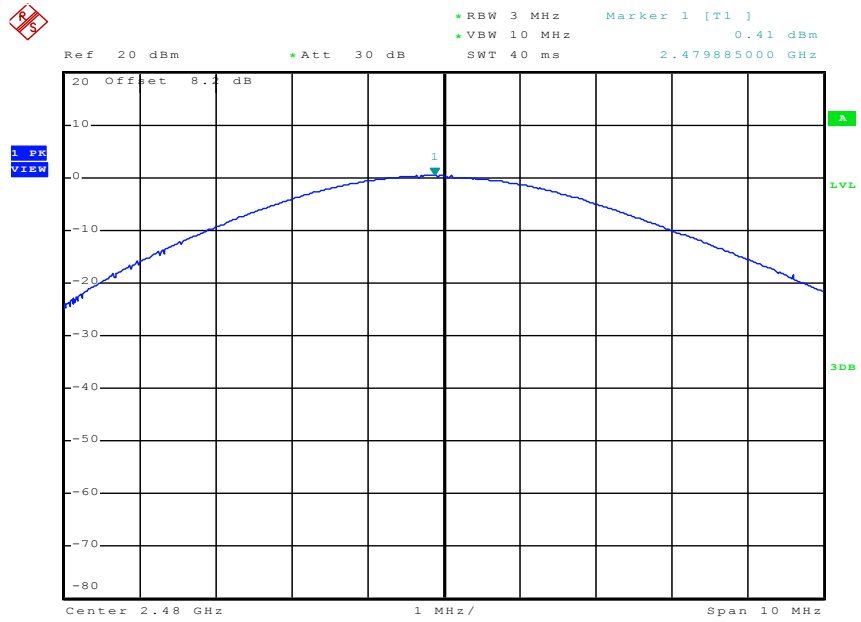
Date: 13 AUG 2019 21:19:35

$\pi/4$ DQPSK/MCH



Date: 13 AUG 2019 21:22:17

$\pi/4$ DQPSK/HCH



Date: 13 AUG 2019 21:24:07

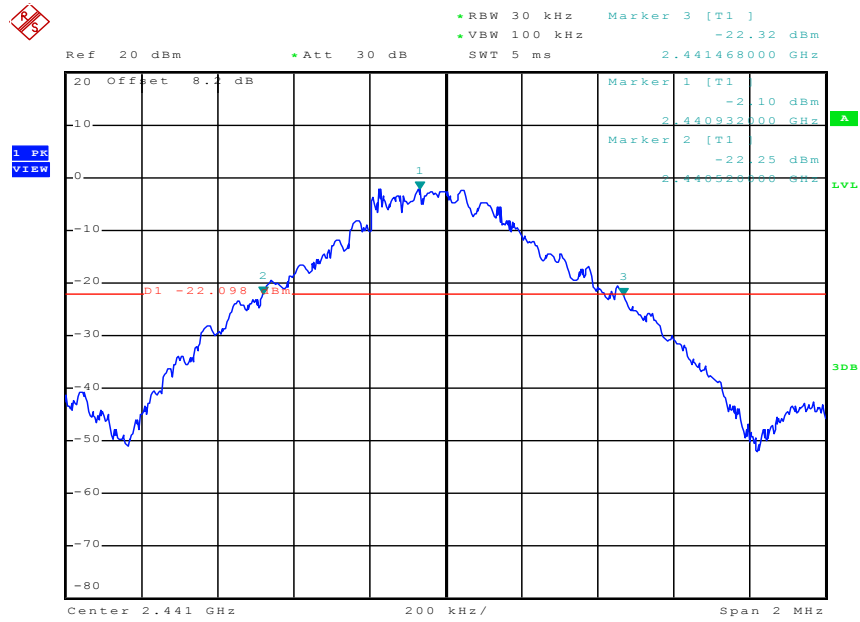
**A.2 20dB Bandwidth**

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.950	Not Specified	PASS
	MCH	0.948	Not Specified	PASS
	HCH	0.950	Not Specified	PASS
$\pi/4$ DQPSK	LCH	1.312	Not Specified	PASS
	MCH	1.314	Not Specified	PASS
	HCH	1.314	Not Specified	PASS

**Test Graphs**

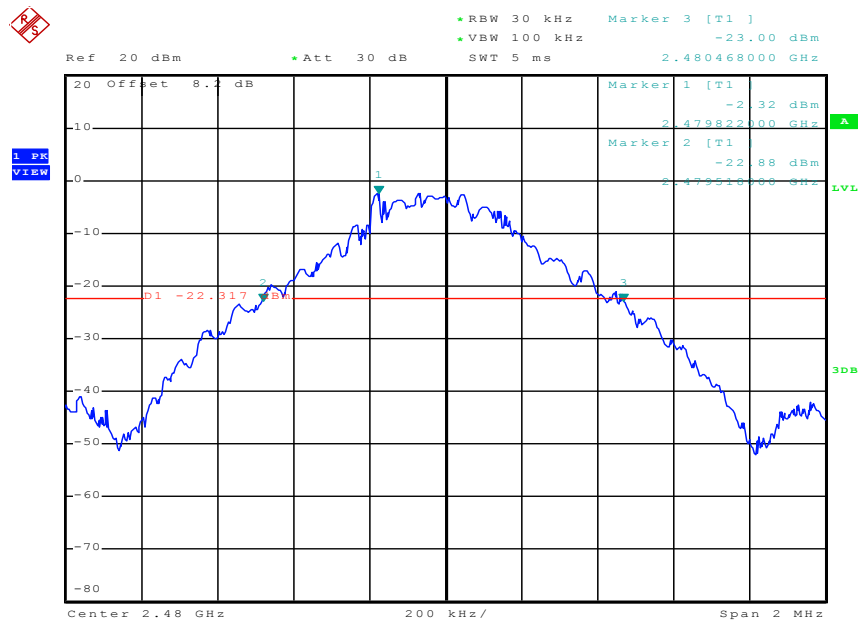


GFSK/MCH



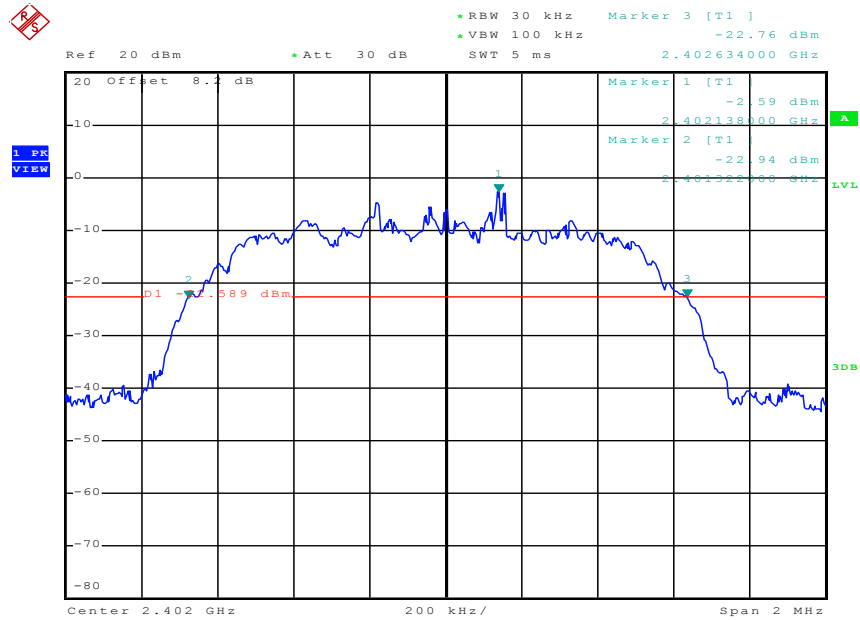
Date: 13 AUG 2019 21:14:24

GFSK/HCH



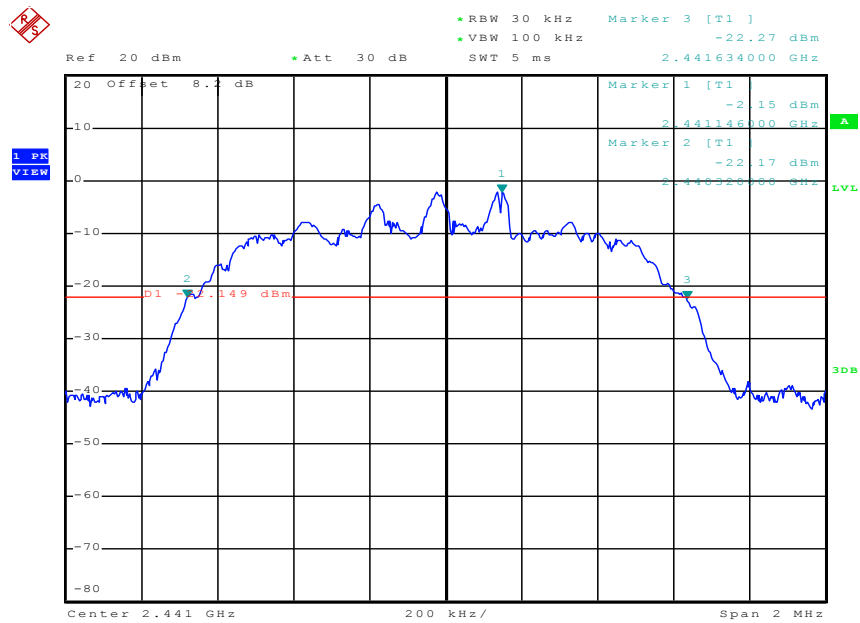
Date: 13 AUG 2019 21:16:16

$\pi/4$ DQPSK/LCH



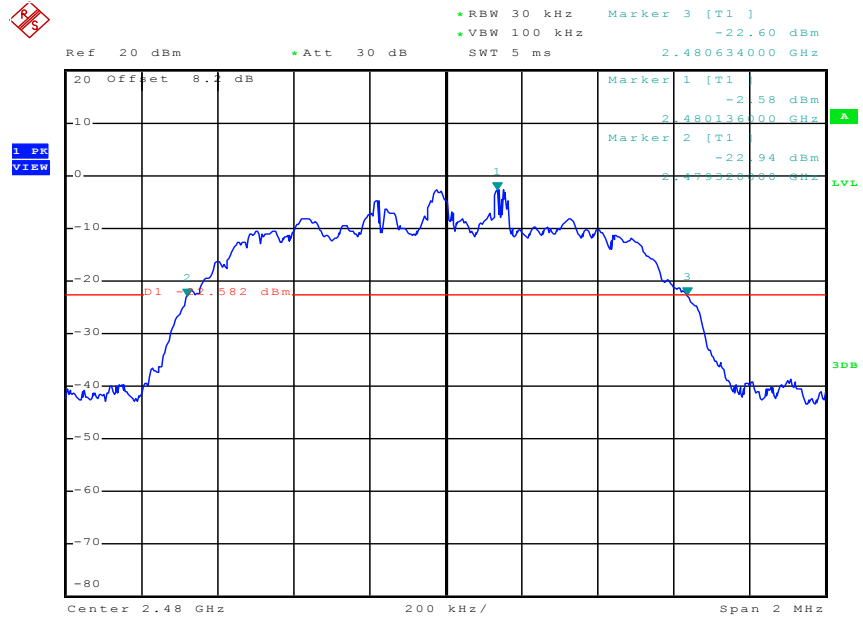
Date: 13 AUG 2019 21:18:59

$\pi/4$ DQPSK/MCH



Date: 13 AUG 2019 21:21:41

$\pi/4$ DQPSK/HCH

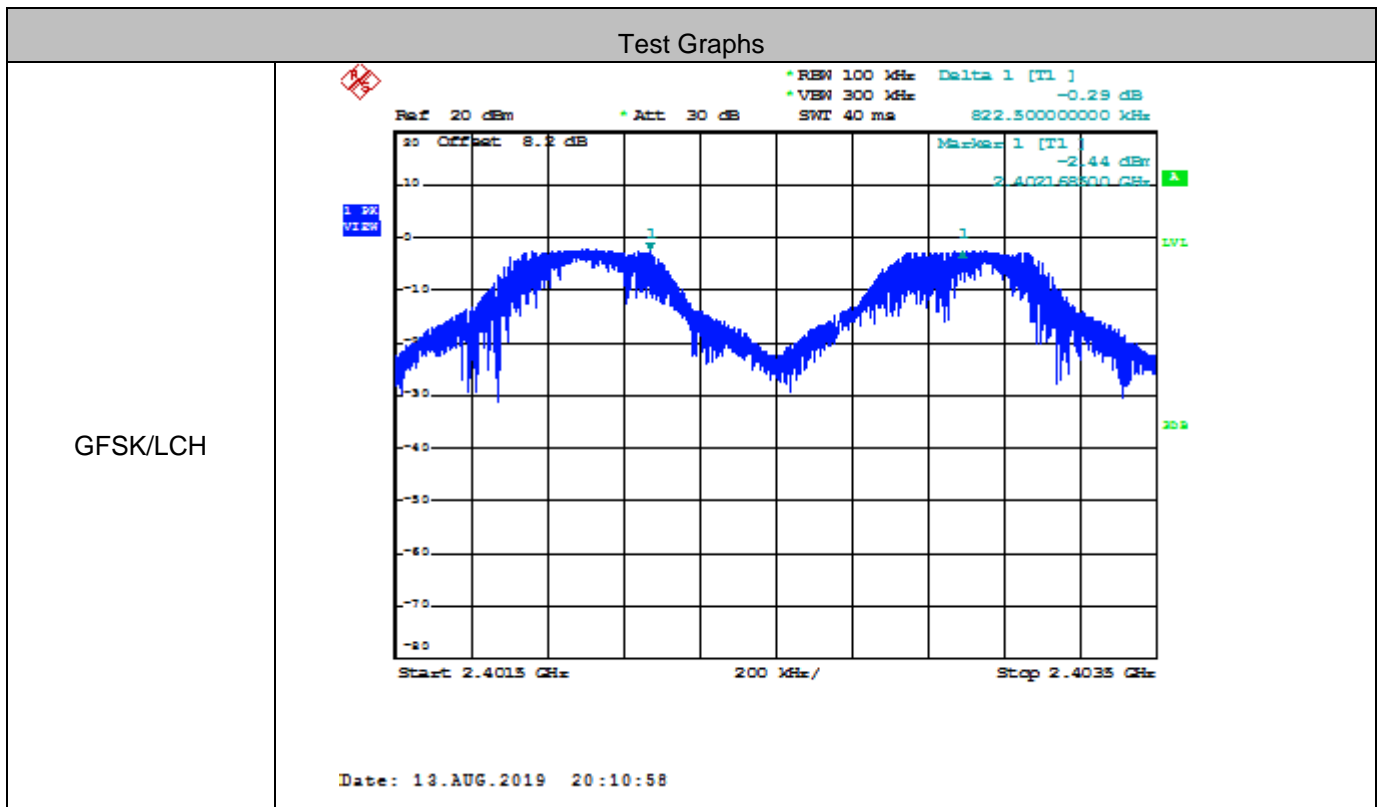


Date: 13 AUG 2019 21:23:31

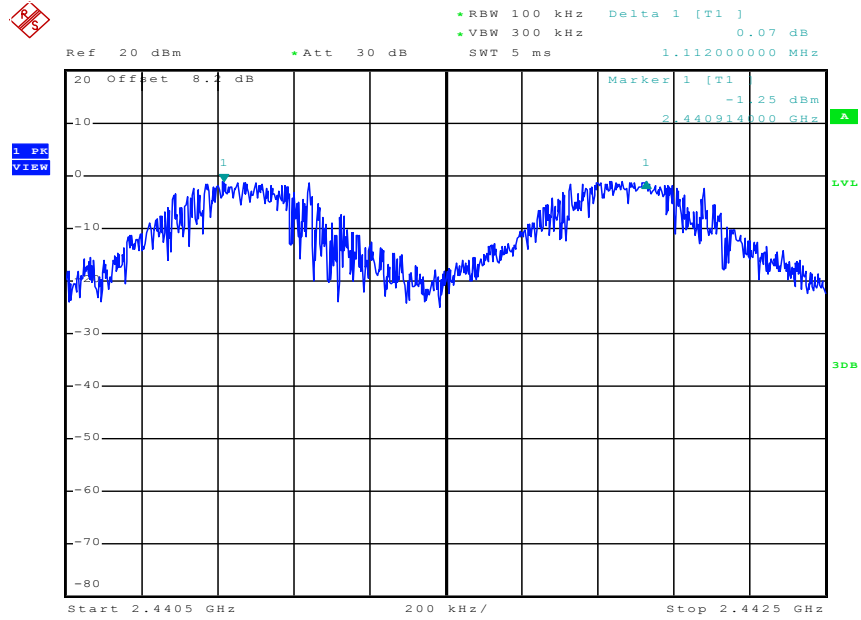


### A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.822	0.025	PASS
	MCH	1.112	0.025	PASS
	HCH	1.044	0.025	PASS
π/4DQPSK	LCH	0.838	0.025	PASS
	MCH	1.298	0.025	PASS
	HCH	0.778	0.025	PASS

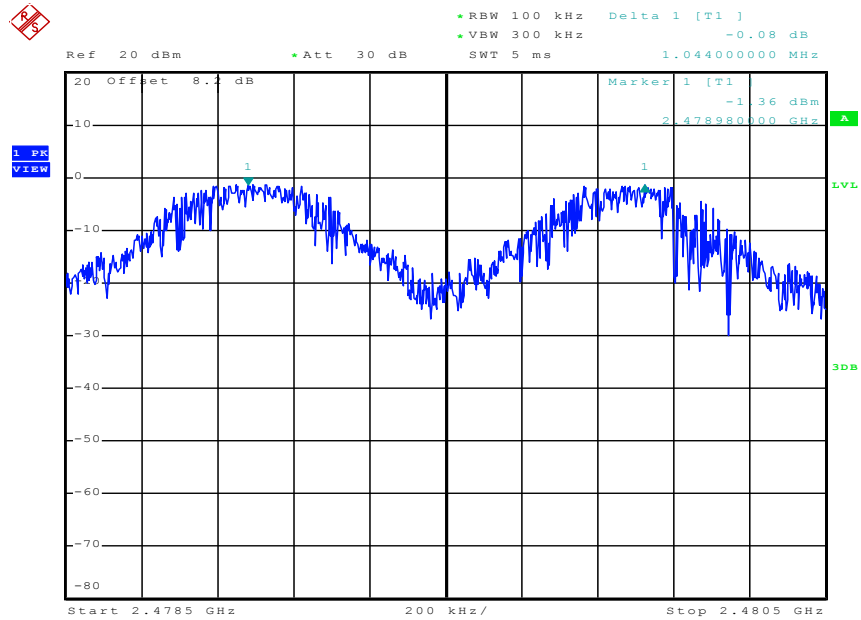


GFSK/MCH



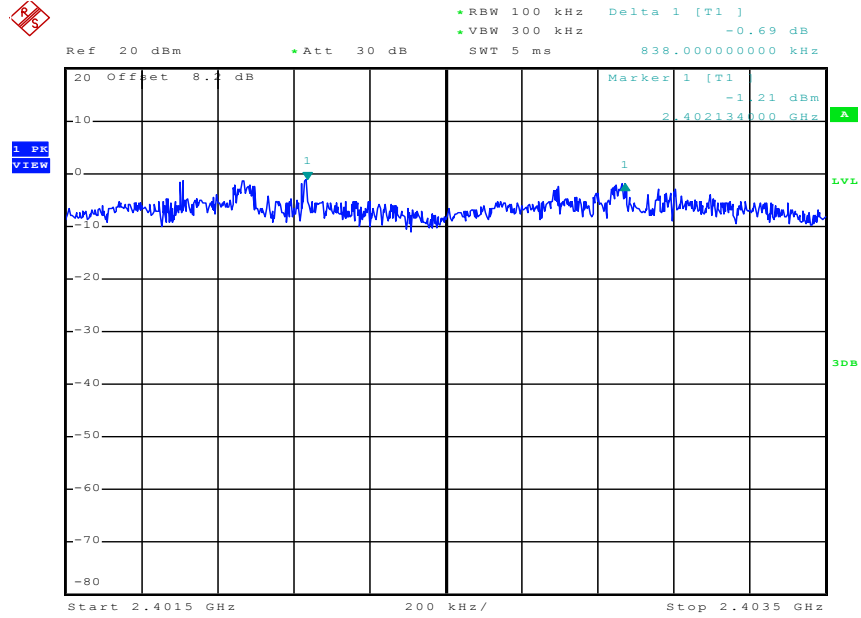
Date: 13 AUG 2019 20:13:37

GFSK/HCH



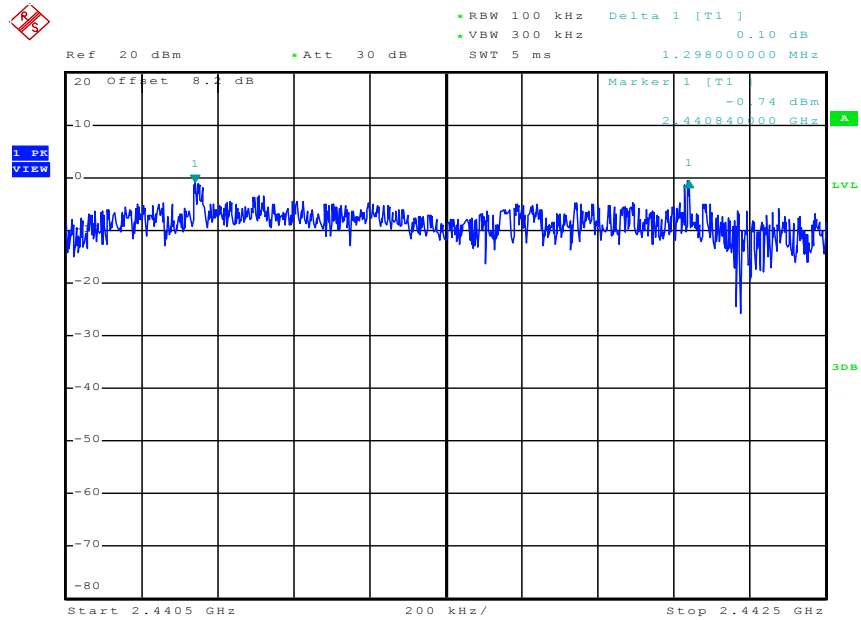
Date: 13 AUG 2019 20:14:01

$\pi/4$ DQPSK/LCH



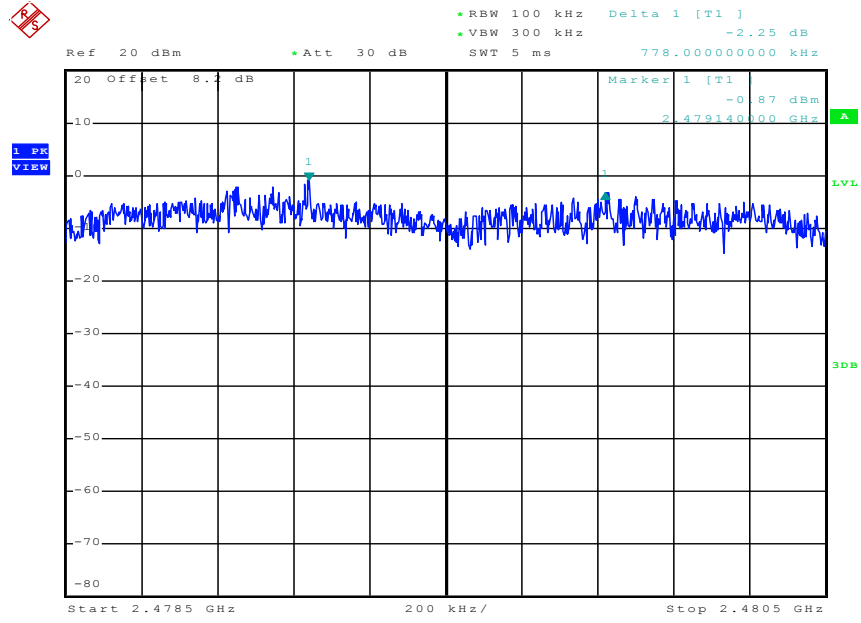
Date: 13 AUG 2019 20:24:02

$\pi/4$ DQPSK/MCH



Date: 13 AUG 2019 20:31:18

$\pi/4$ DQPSK/HCH



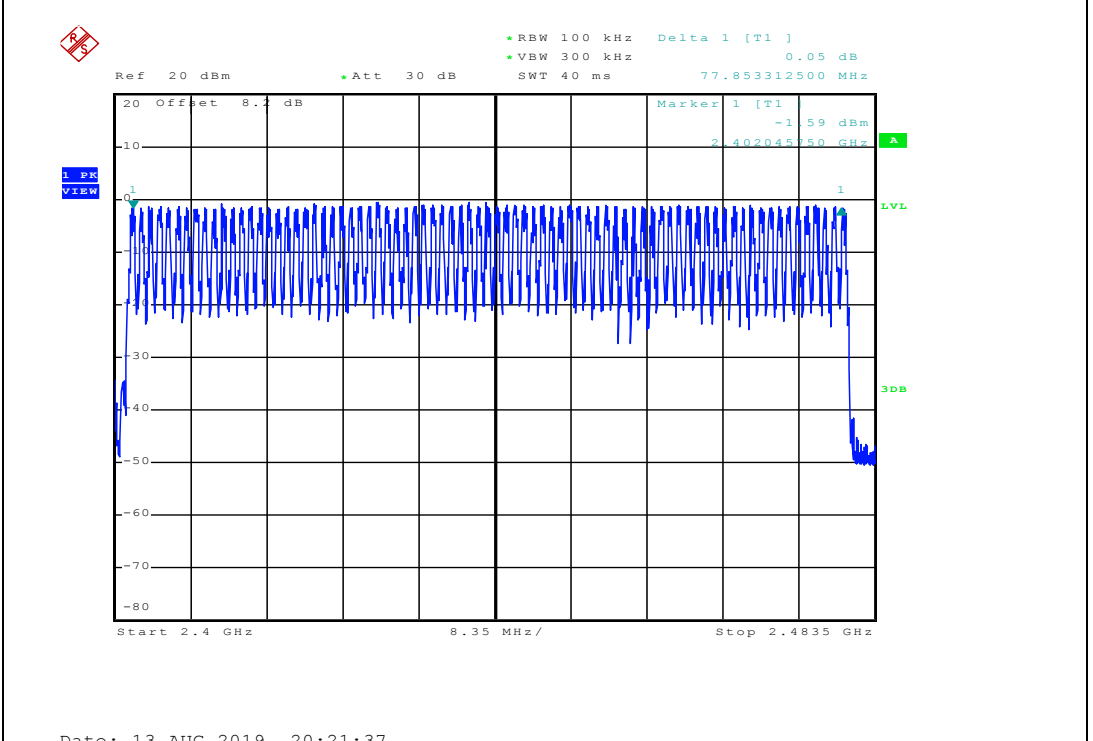
Date: 13 AUG 2019 20:31:45

### A.4 Hopping Channel Number

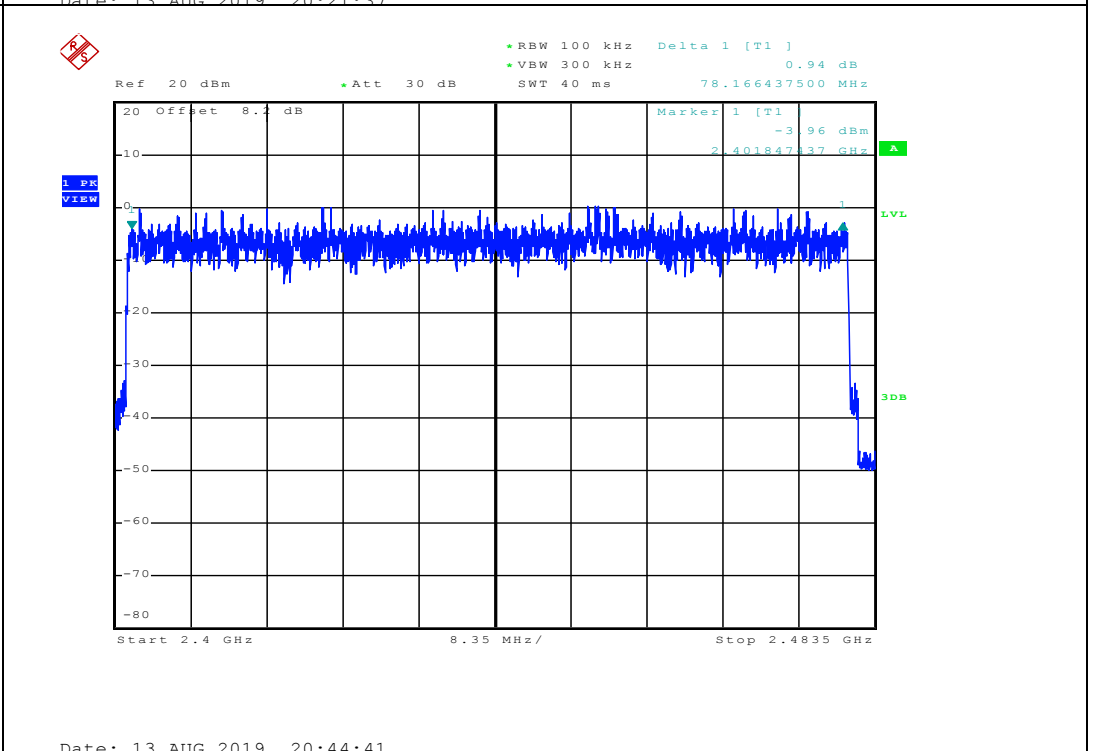
Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS
$\pi/4$ DQPSK	Hop	79	>=15	PASS

#### Test Graphs

GFSK/Hop

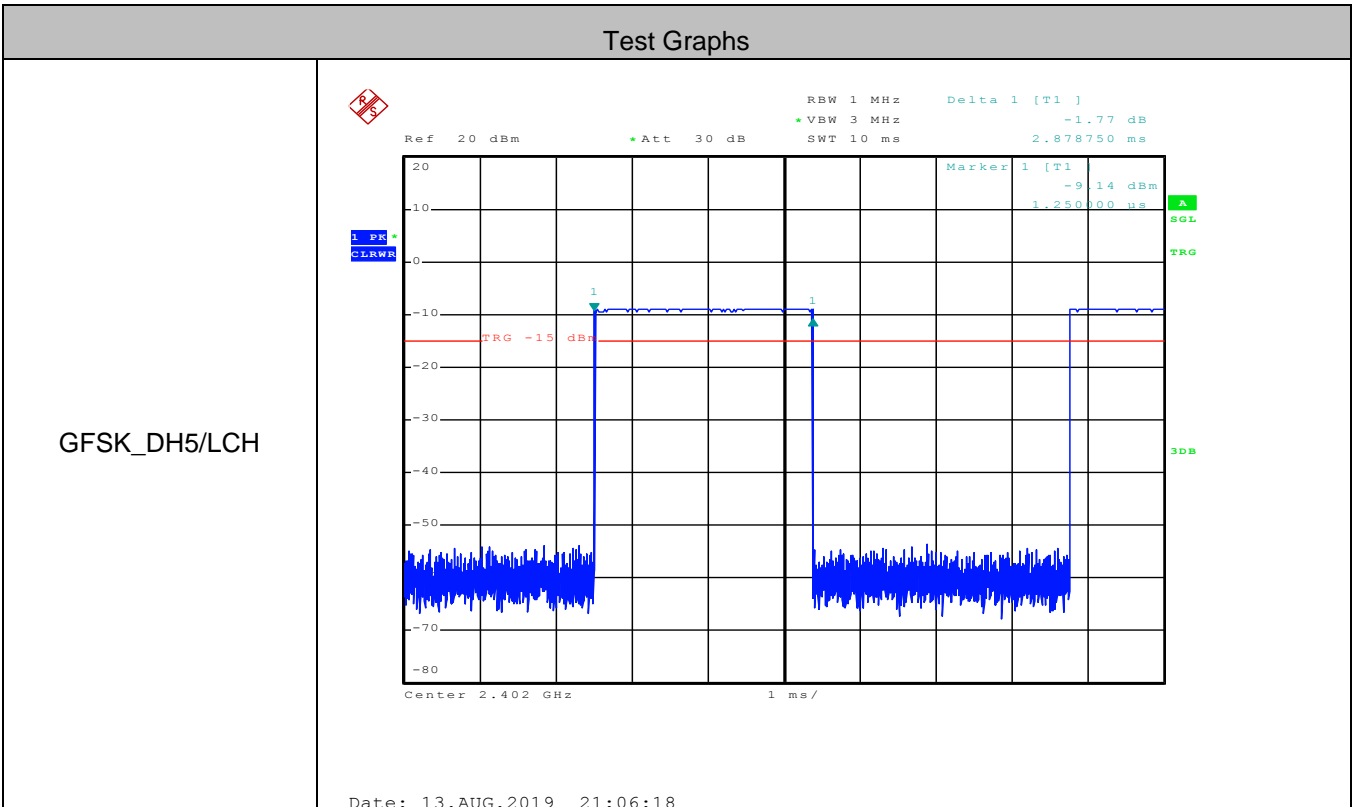


$\pi/4$ DQPSK/Hop

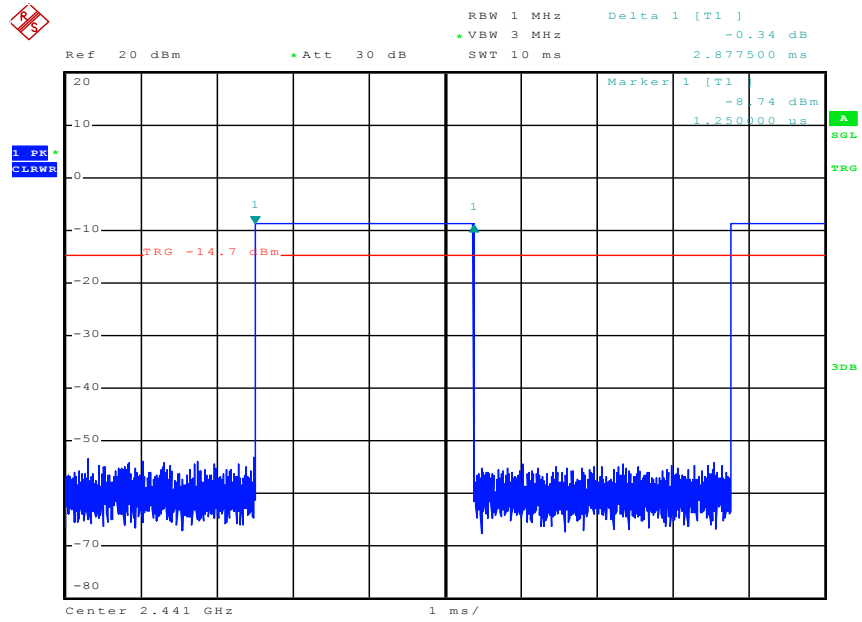


### A.5 Dwell Time

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	0.308	0.4	PASS
	2DH5	MCH	2.88	106.7	0.308	0.4	PASS
	2DH5	HCH	2.88	106.7	0.308	0.4	PASS

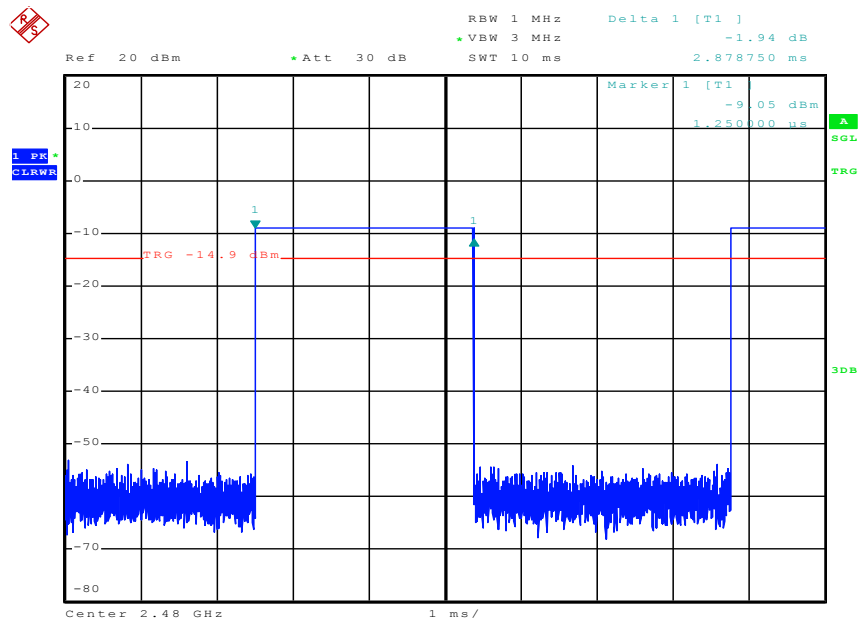


GFSK\_DH5/MCH



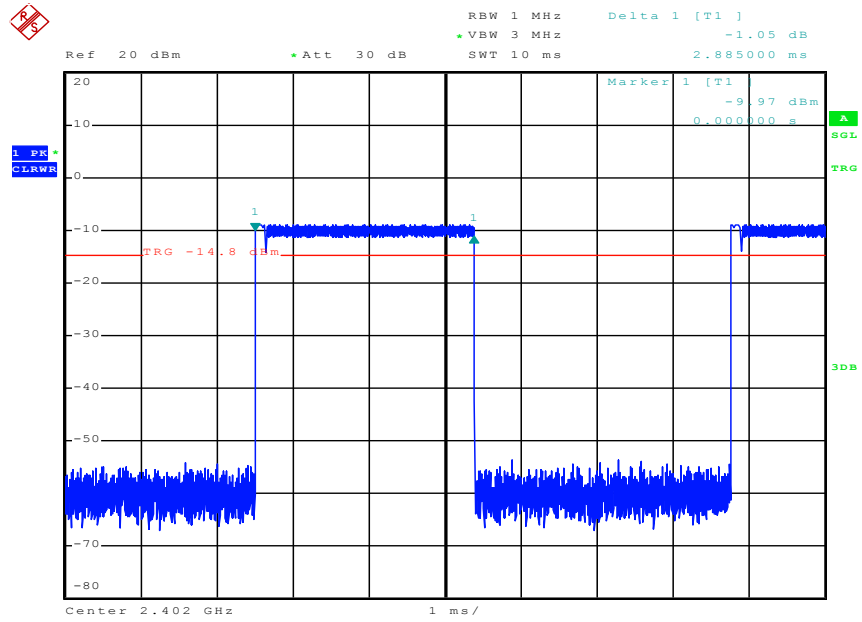
Date: 13 AUG 2019 21:14:45

GFSK\_DH5/HCH



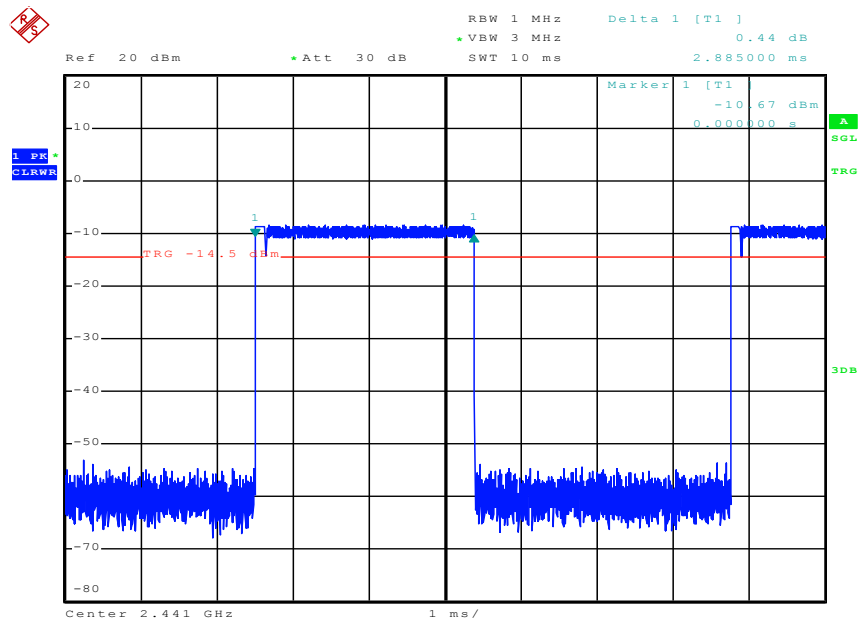
Date: 13 AUG 2019 21:16:37

$\pi/4$ DQPSK  
\_2DH5/LCH



Date: 13 AUG 2019 21:19:20

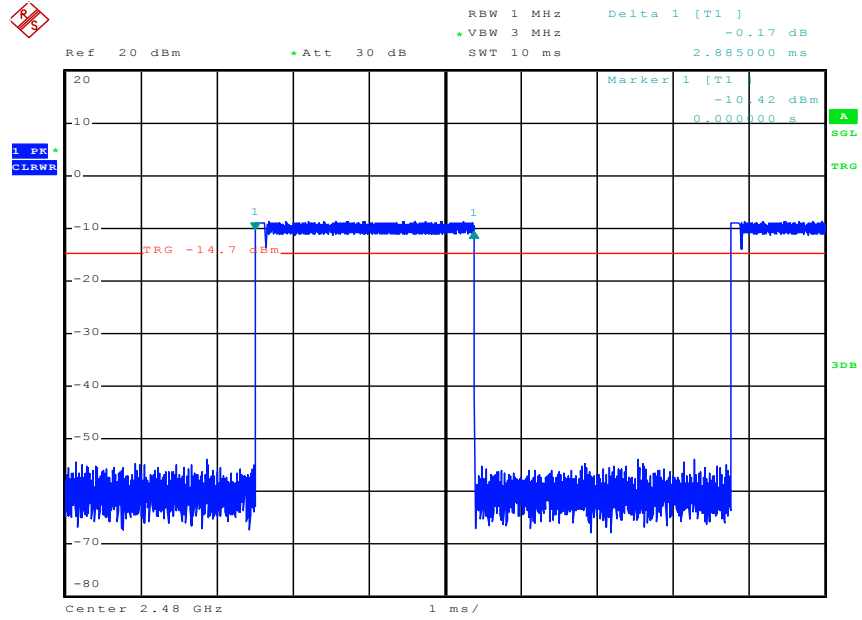
$\pi/4$ DQPSK  
\_2DH5/MCH



Date: 13 AUG 2019 21:22:02



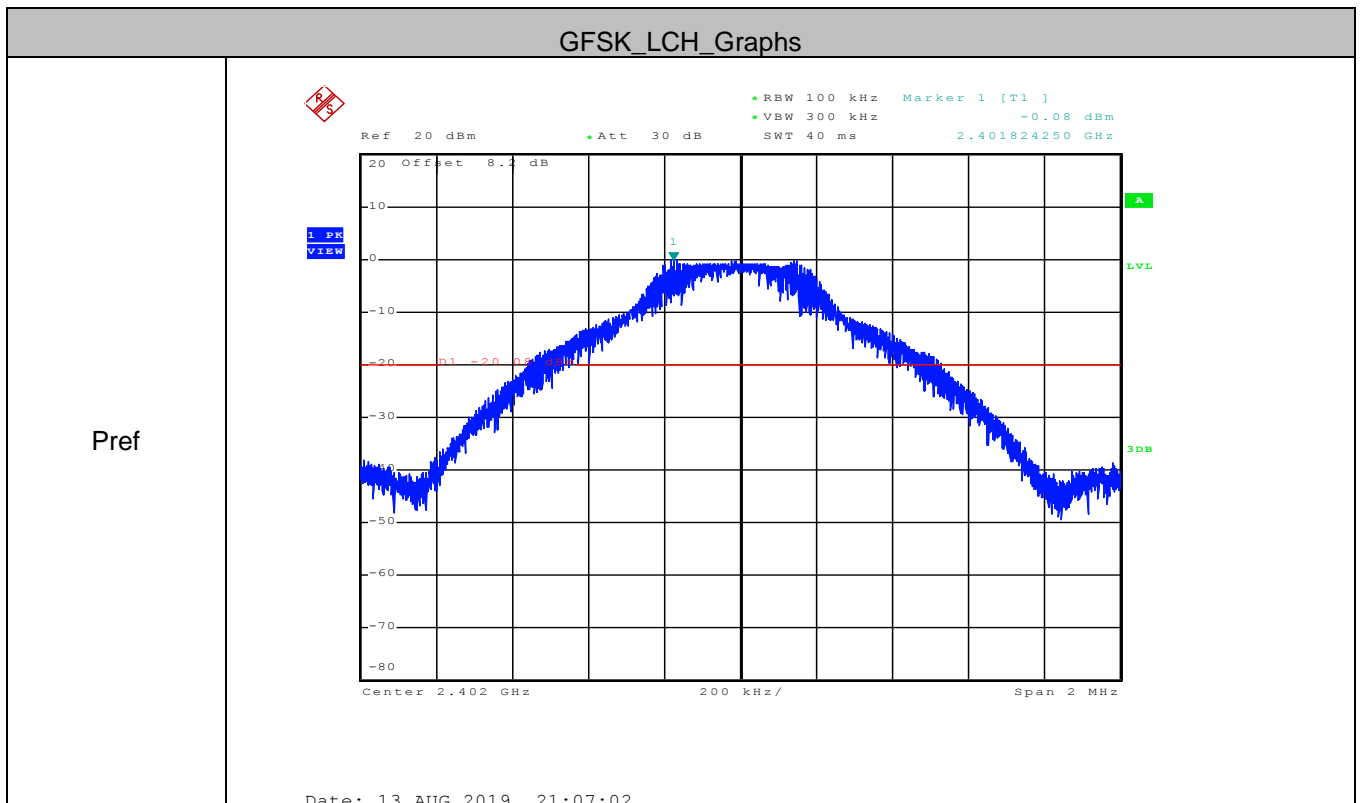
$\pi/4$ DQPSK  
\_2DH5/HCH



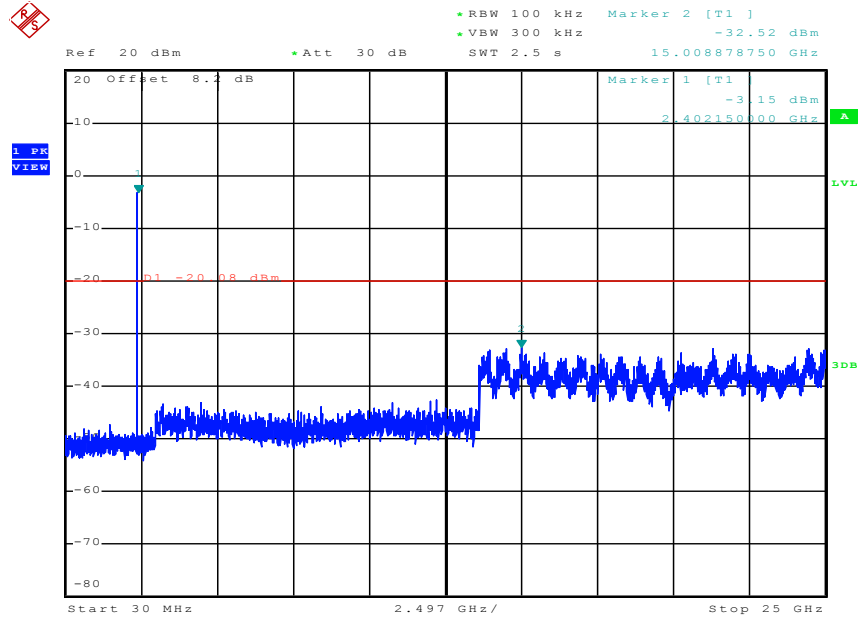
Date: 13 AUG 2019 21:23:52

### A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	-0.08	-32.520	-20.080	PASS
	MCH	0.18	-33.150	-19.820	PASS
	HCH	-0.17	-32.810	-20.170	PASS
$\pi/4$ DQPSK	LCH	-0.36	-32.650	-20.360	PASS
	MCH	0.18	-31.080	-19.820	PASS
	HCH	-0.1	-32.660	-20.100	PASS



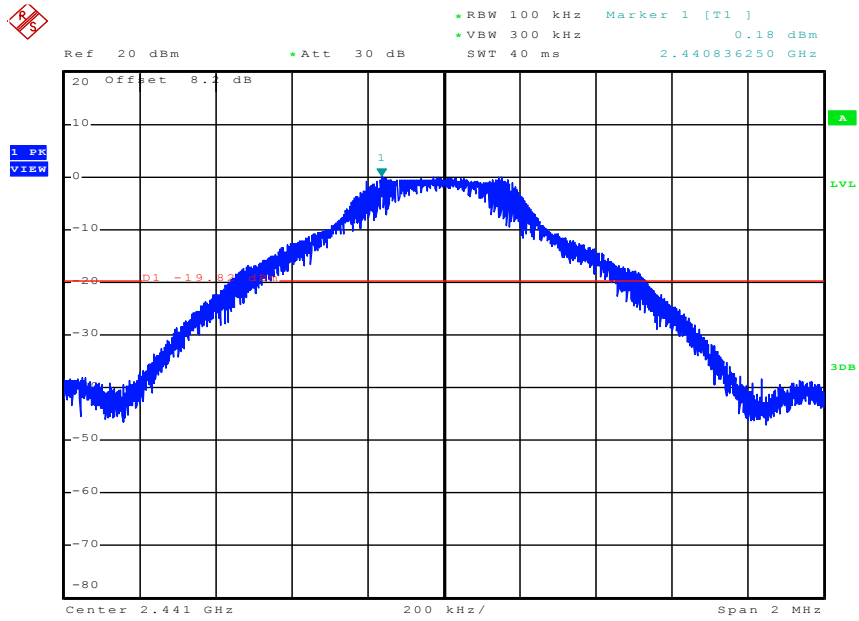
P<sub>uw</sub>



Date: 13 AUG 2019 21:07:16

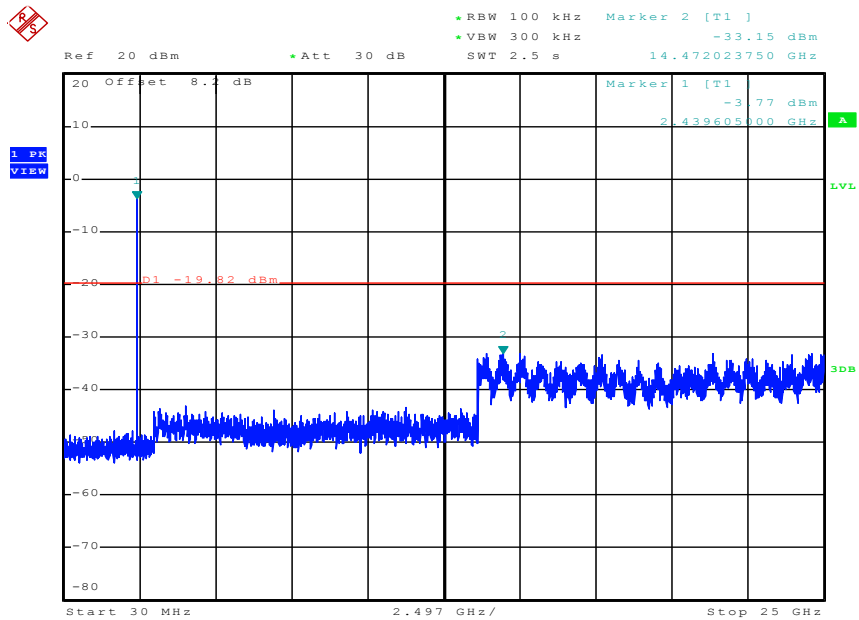
### GFSK\_MCH\_Graphs

Pref



Date: 13 AUG 2019 21:15:13

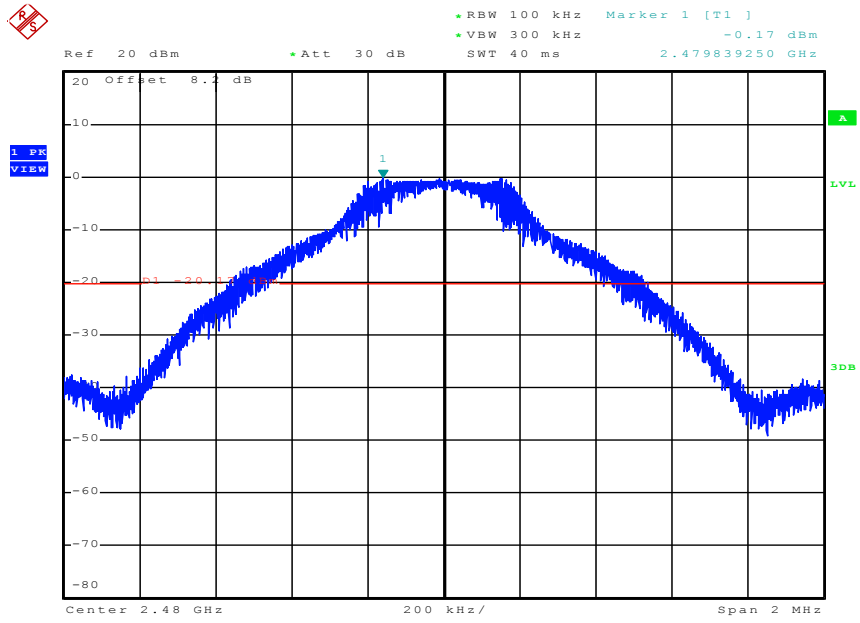
Puw



Date: 13 AUG 2019 21:15:27

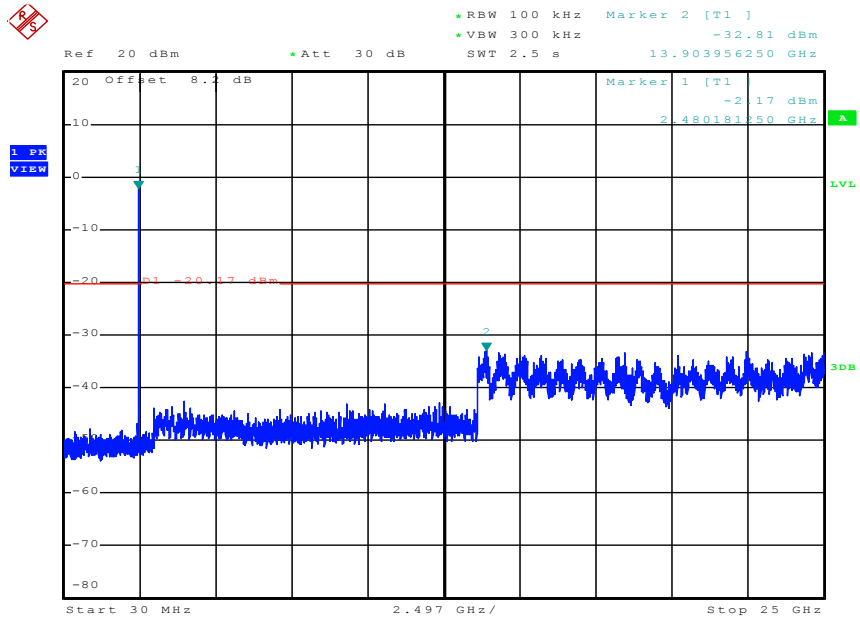
### GFSK\_HCH\_Graphs

Pref



Date: 13 AUG 2019 21:17:21

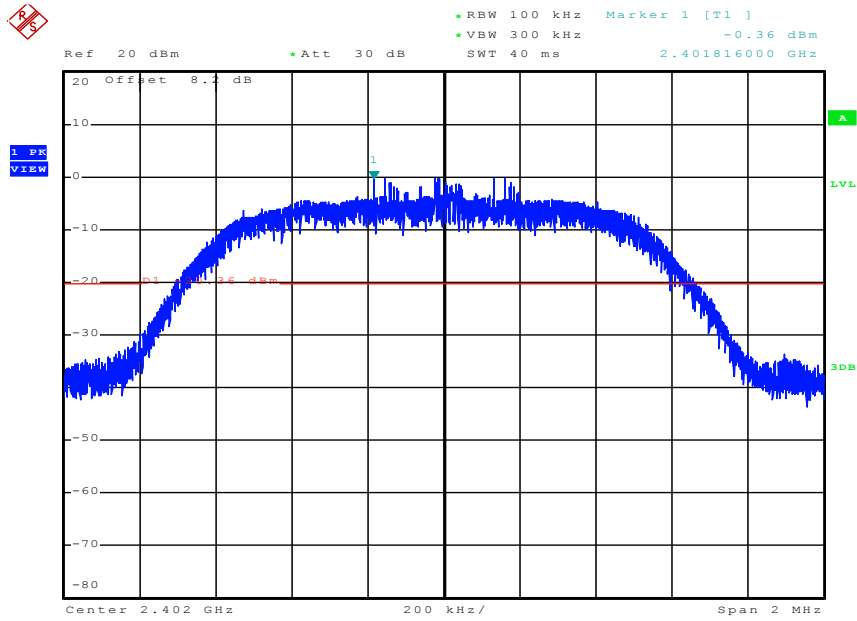
Puw



Date: 13 AUG 2019 21:17:35

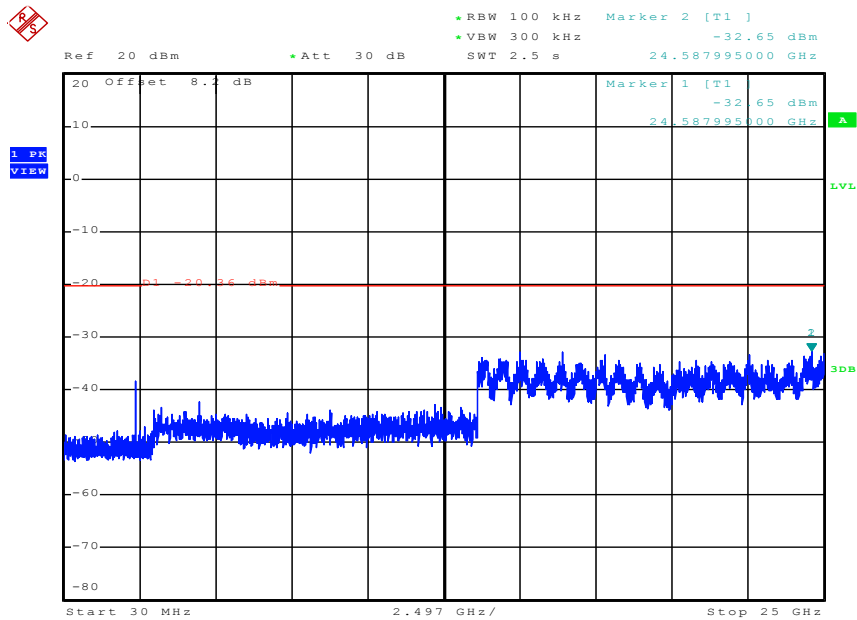
$\pi/4$ DQPSK\_LCH\_Graphs

Pref



Date: 13 AUG 2019 21:20:04

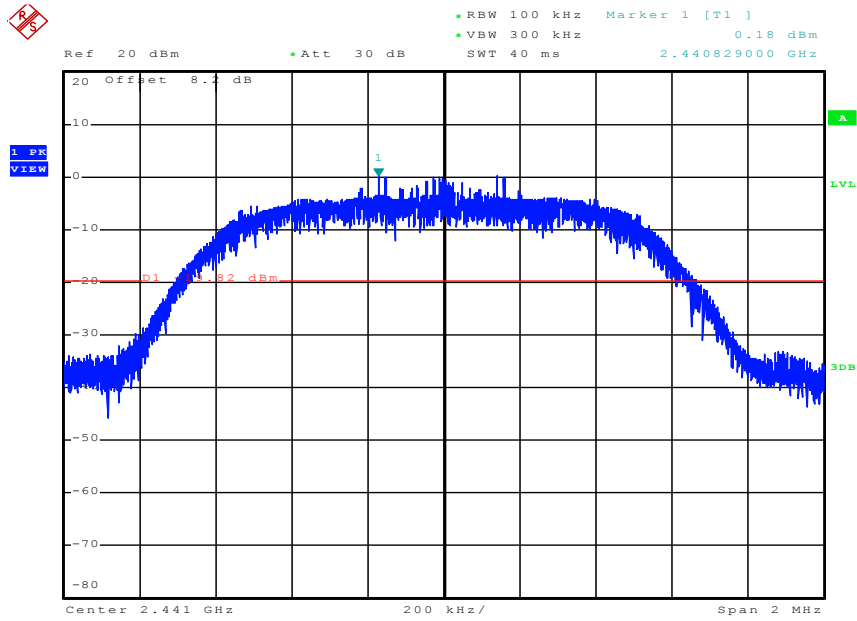
Puw



Date: 13 AUG 2019 21:20:18

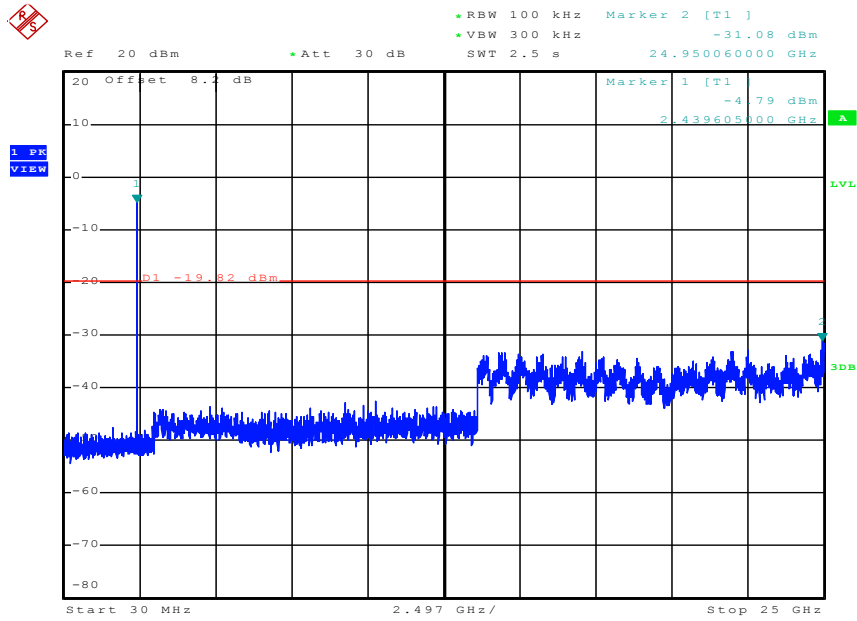
$\pi/4$ DQPSK\_MCH\_Graphs

Pref



Date: 13 AUG 2019 21:22:29

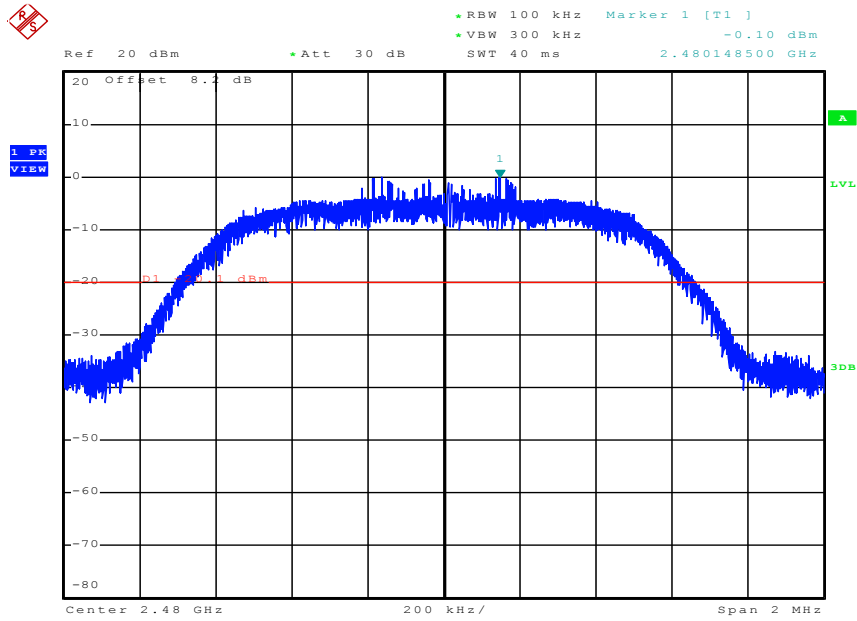
Puw



Date: 13 AUG 2019 21:22:44

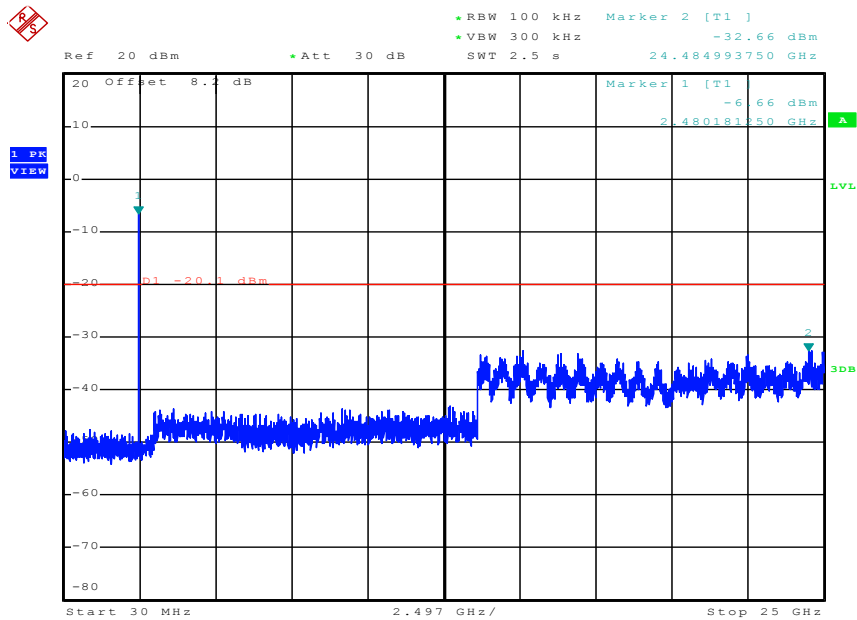
$\pi/4$ DQPSK\_HCH\_Graphs

Pref



Date: 13 AUG 2019 21:24:36

Puw



Date: 13 AUG 2019 21:24:51

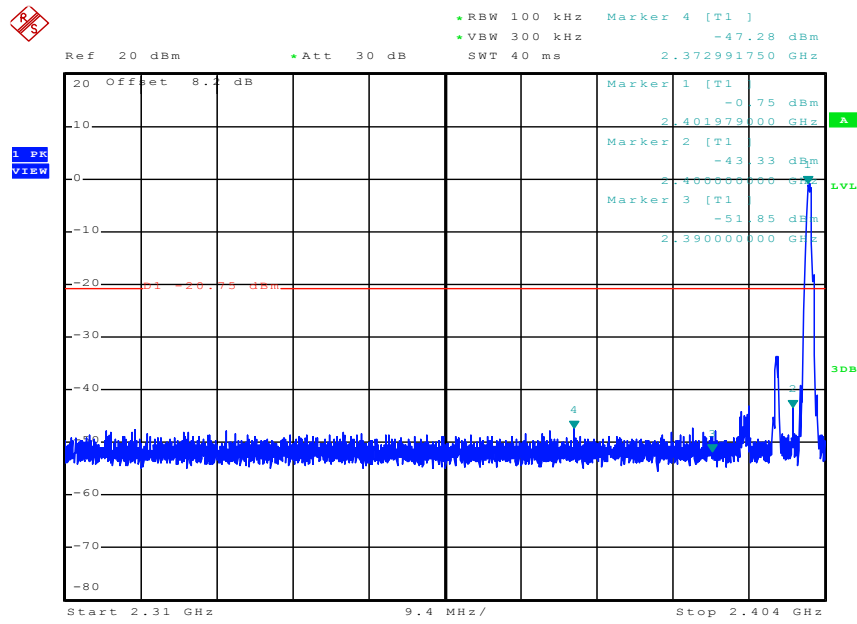


## A.7 Band-edge for RF Conducted Emissions

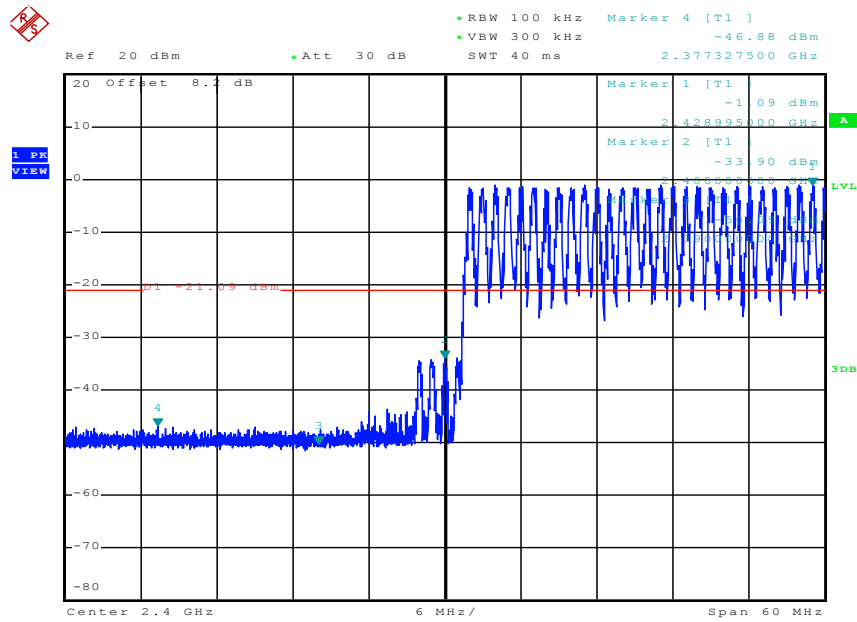
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	-0.750	Off	-47.278	-20.75	PASS
			-1.090	On	-46.878	-21.09	PASS
	HCH	2480	-0.350	Off	-43.137	-20.35	PASS
			-0.660	On	-45.669	-20.66	PASS
$\pi/4$ DQPSK	LCH	2402	-0.260	Off	-47.952	-20.26	PASS
			-0.830	On	-46.065	-20.83	PASS
	HCH	2480	-0.690	Off	-43.887	-20.69	PASS
			-0.820	On	-46.601	-20.82	PASS

Test Graphs

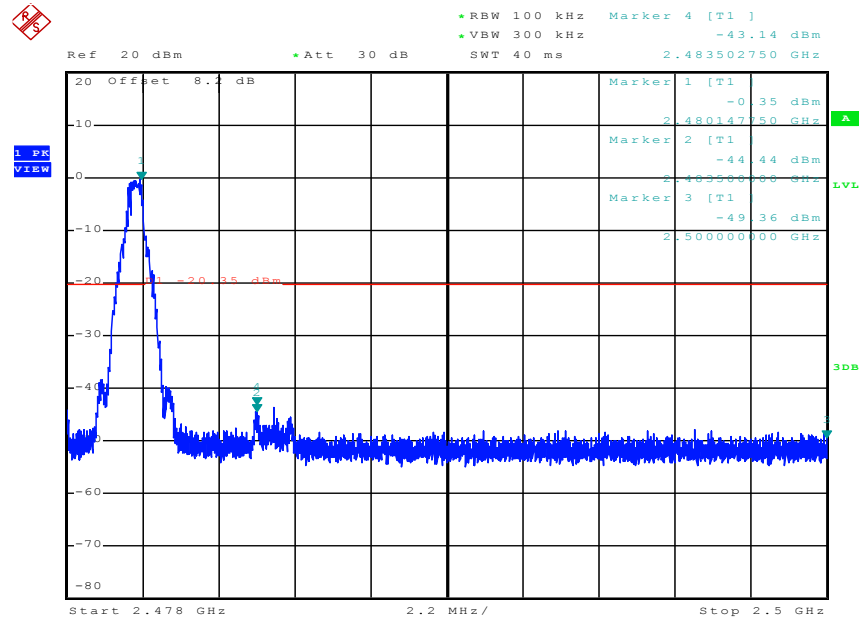
GFSK/LCH/No Hop



GFSK/LCH/Hop

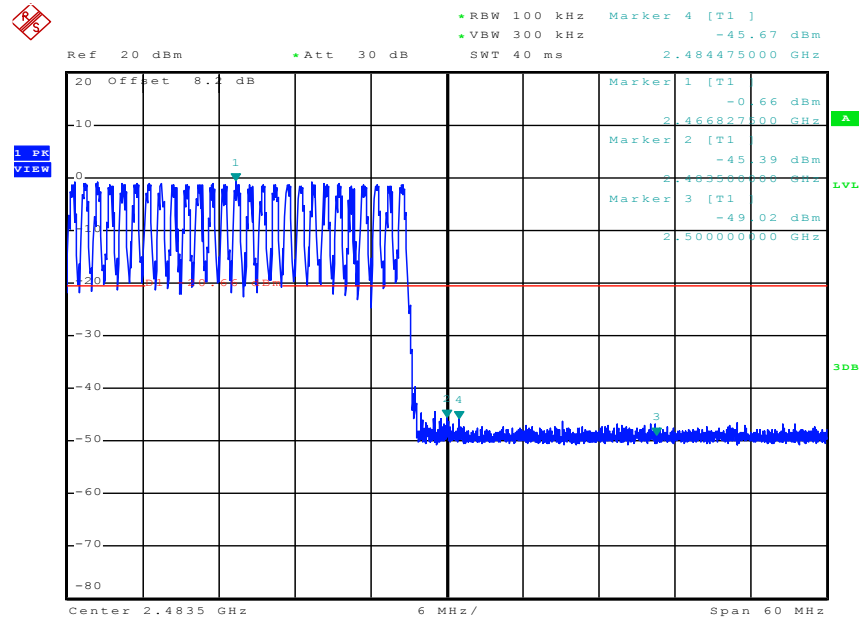


GFSK/HCH/No Hop



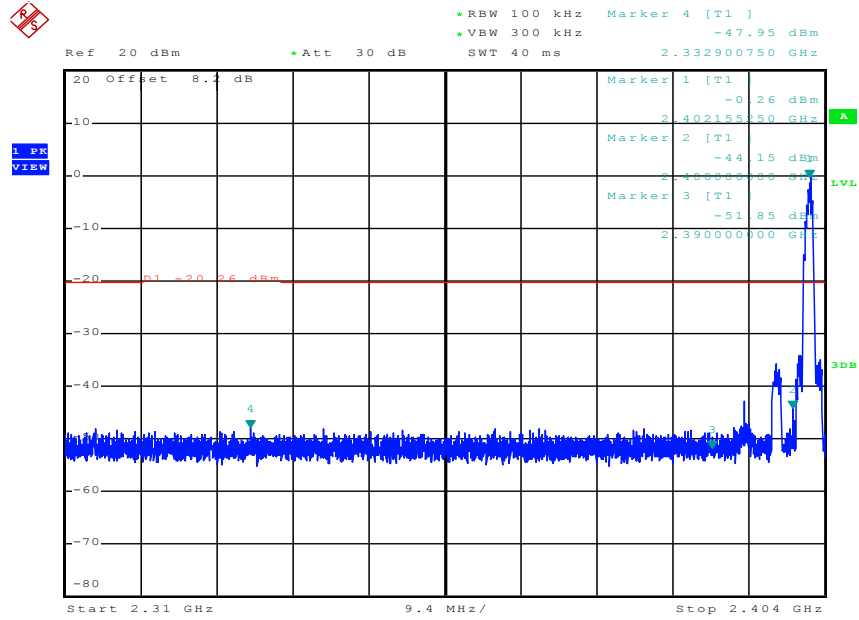
Date: 13 AUG. 2019 21:17:08

GFSK/HCH/Hop



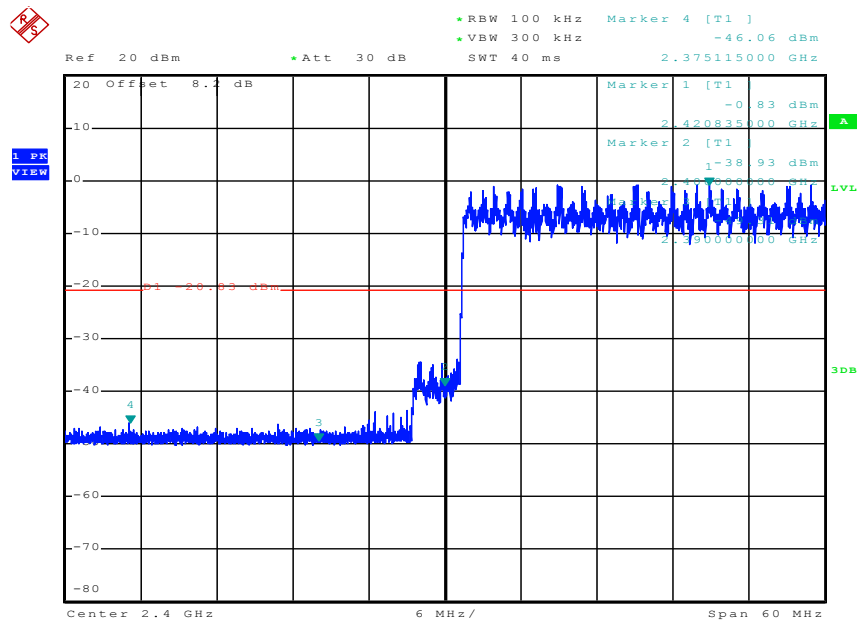
Date: 13 AUG. 2019 20:18:31

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



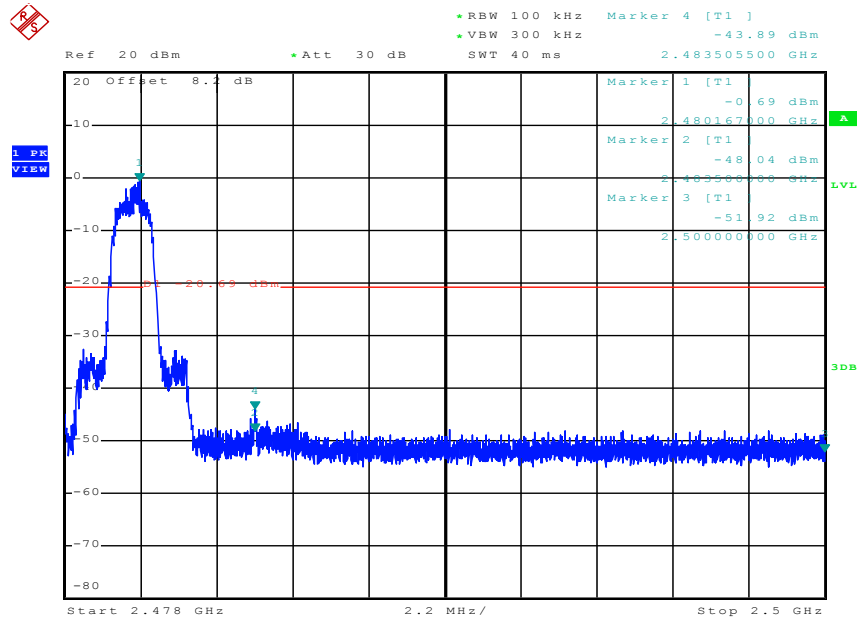
Date: 13 AUG 2019 21:19:51

$\pi$ /4DQPSK/LCH/Hop



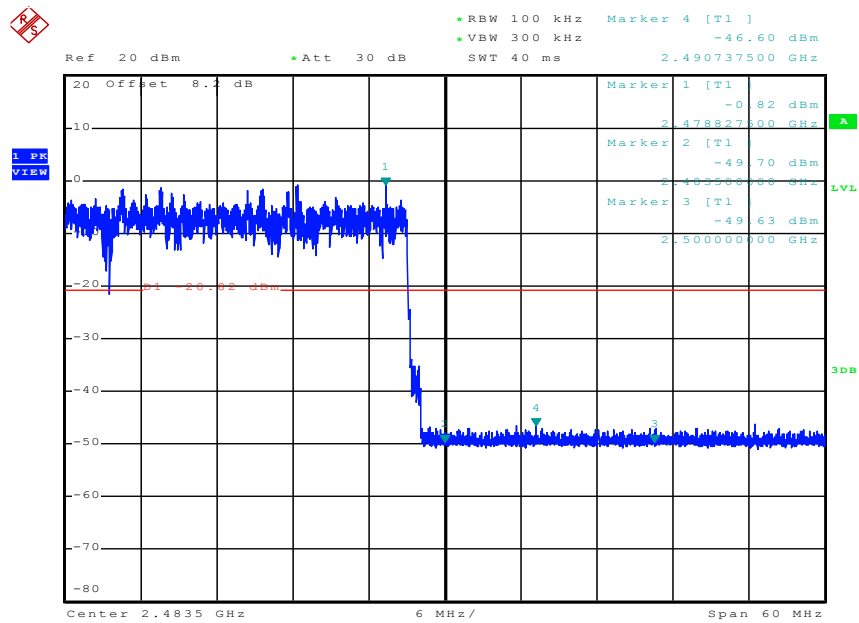
Date: 13 AUG 2019 20:30:51

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



Date: 13 AUG 2019 21:24:23

$\pi$ /4DQPSK/HCH/Hop

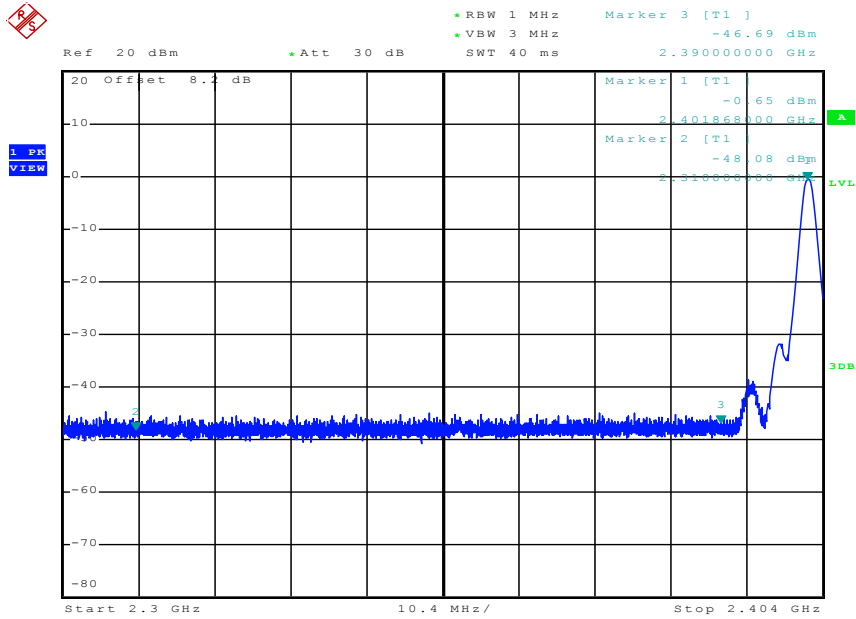


Date: 13 AUG 2019 20:35:22

## A.8 Restrict-band band-edge measurements

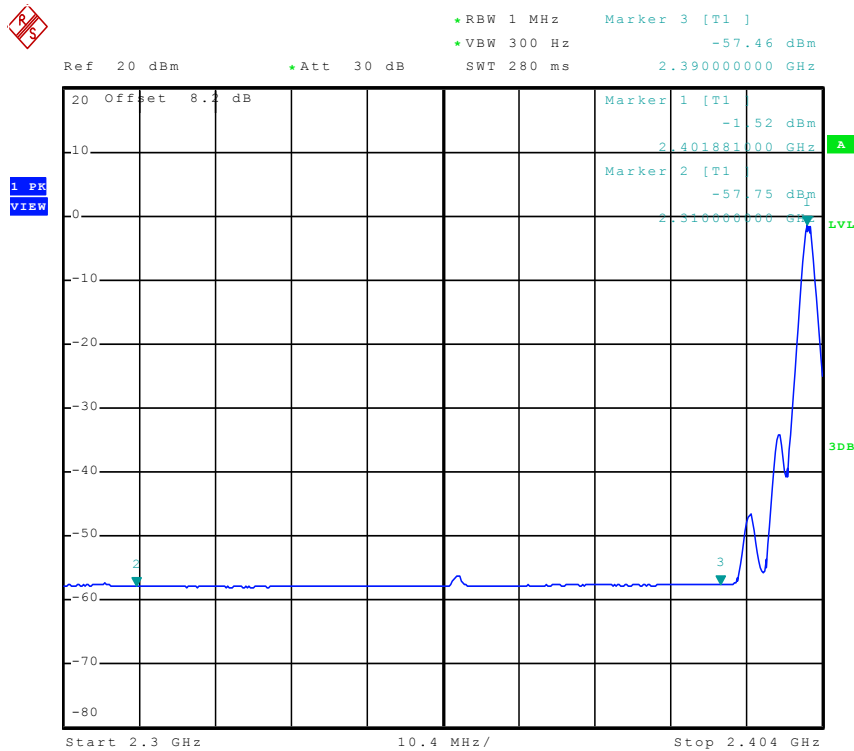
Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-48.08	2.0	0	47.18	PEAK	74	PASS
	Off	2310.0	-57.75	2.0	0	37.51	AV	54	PASS
	Off	2390.0	-46.69	2.0	0	48.57	PEAK	74	PASS
	Off	2390.0	-57.46	2.0	0	37.80	AV	54	PASS
	Off	2483.5	-38.02	2.0	0	57.24	PEAK	74	PASS
	Off	2483.5	-43.30	2.0	0	51.96	AV	54	PASS
	Off	2500.0	-48.66	2.0	0	46.60	PEAK	74	PASS
	Off	2500.0	-57.73	2.0	0	37.53	AV	54	PASS
$\pi/4$ DQPSK	Off	2310.0	-48.23	2.0	0	47.03	PEAK	74	PASS
	Off	2310.0	-57.85	2.0	0	37.41	AV	54	PASS
	Off	2390.0	-47.25	2.0	0	48.01	PEAK	74	PASS
	Off	2390.0	-57.49	2.0	0	37.77	AV	54	PASS
	Off	2483.5	-37.10	2.0	0	58.16	PEAK	74	PASS
	Off	2483.5	-43.96	2.0	0	51.30	AV	54	PASS
	Off	2500.0	-48.48	2.0	0	46.78	PEAK	74	PASS
	Off	2500.0	-57.88	2.0	0	37.38	AV	54	PASS

Restrict-band band-edge measurements\_Hopping Off\_GFSK\_PEAK (Low Channel)



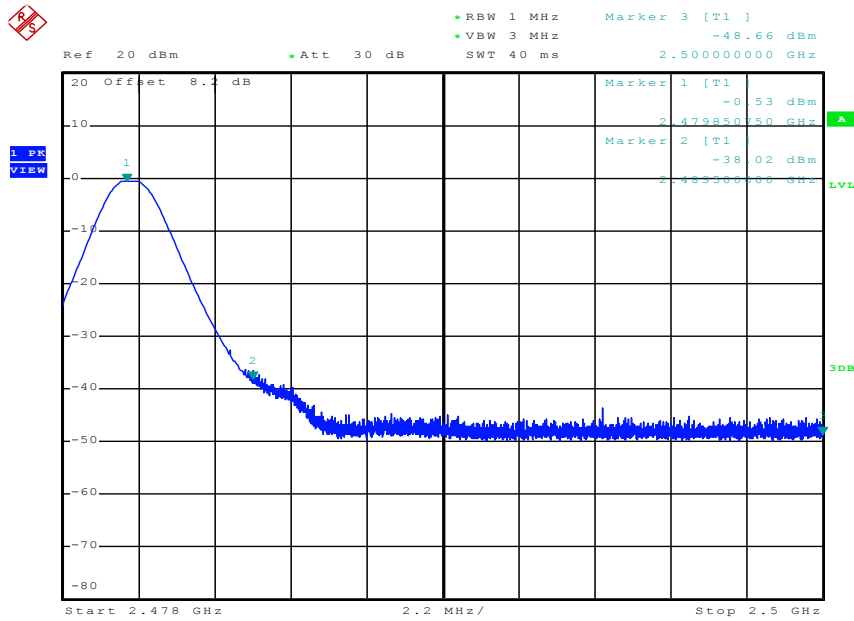
Date: 13.AUG.2019 21:07:35

Restrict-band band-edge measurements\_Hopping Off\_GFSK\_Average (Low Channel)



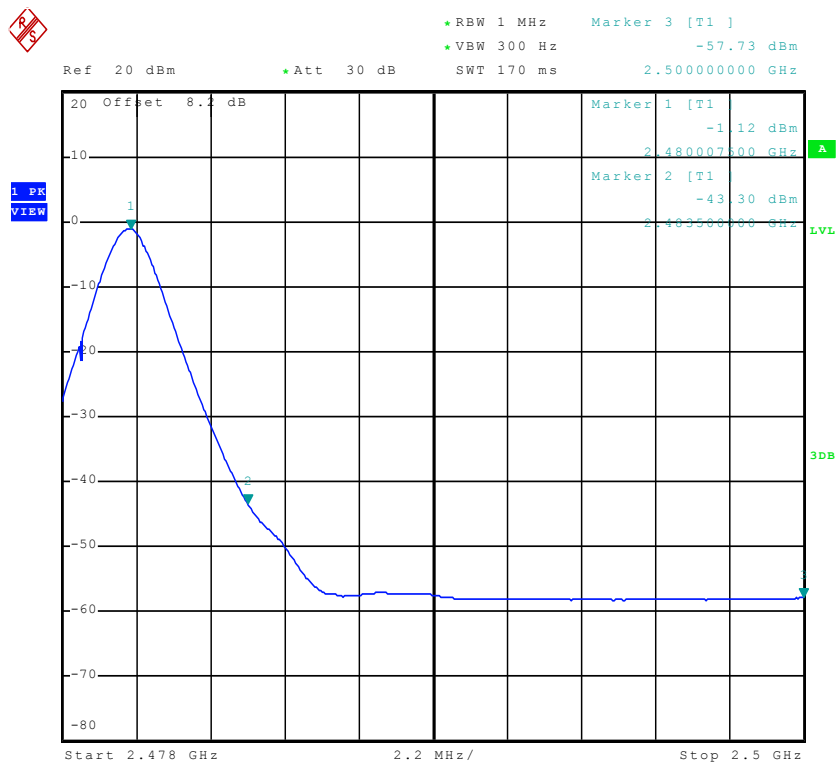
Date: 13.AUG.2019 21:07:48

Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_PEAK (High Channel)



Date: 13.AUG.2019 21:17:54

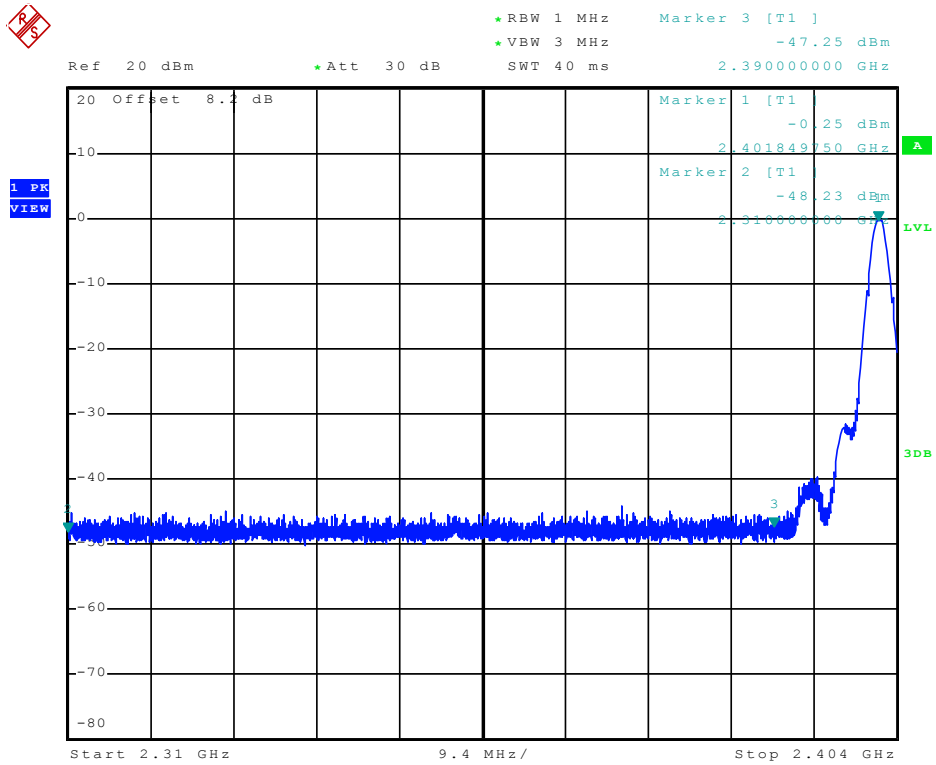
Restrict-band band-edge measurements\_Hopping Off\_ GFSK\_Average (High Channel)



Date: 13.AUG.2019 21:18:07

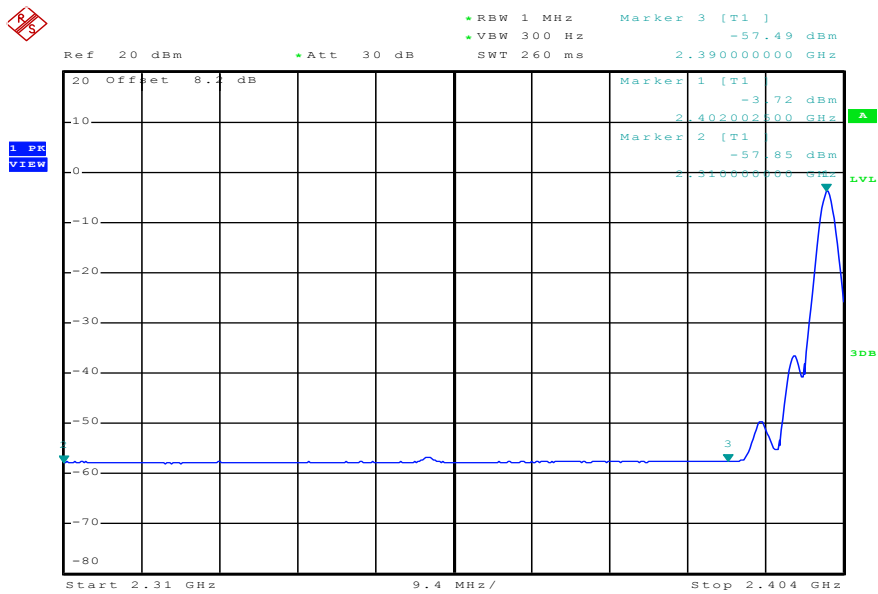


Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (Low Channel)



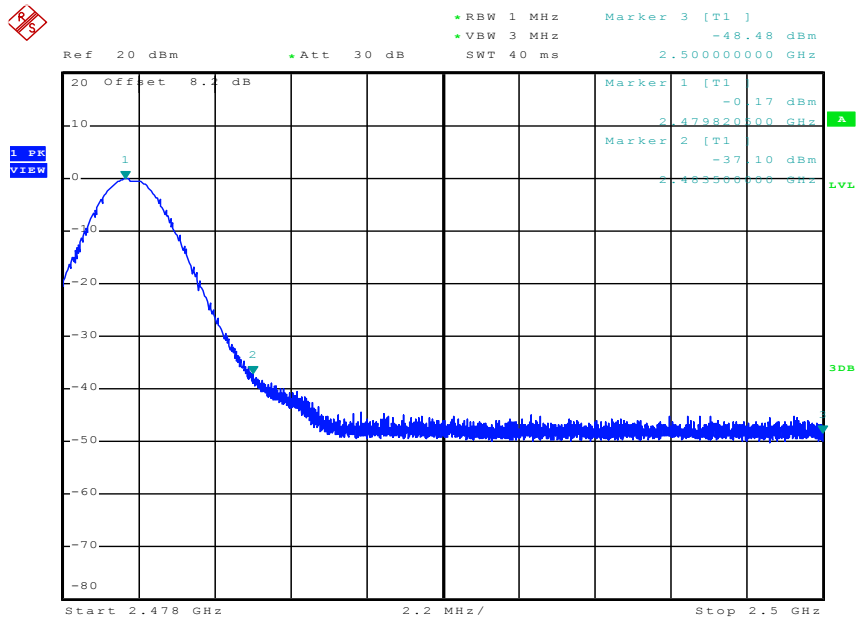
Date: 13 AUG 2019 21:20:37

Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (Low Channel)



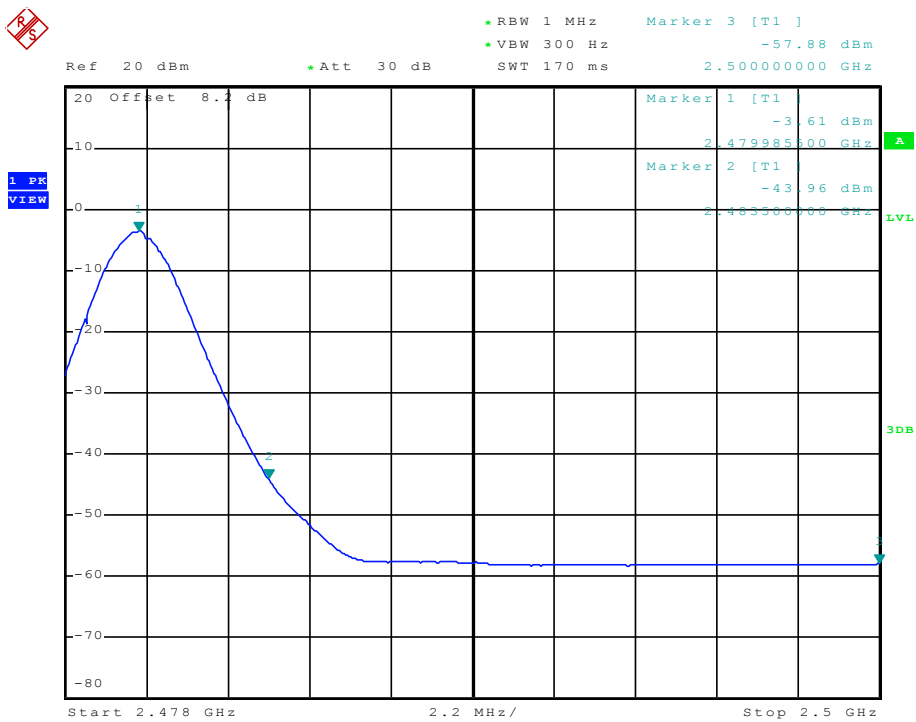
Date: 13.AUG.2019 21:20:50

Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_PEAK (High Channel)



Date: 13.AUG.2019 21:25:09

Restrict-band band-edge measurements\_Hopping Off\_π/4-DQPSK\_Average (High Channel)



Date: 13.AUG.2019 21:25:22