

Appendix A

RF Test Data for BT V4.2(BDR/EDR) (Conducted Measurement)

Product Name: LED bluetooth controller

Trade Mark: N/A

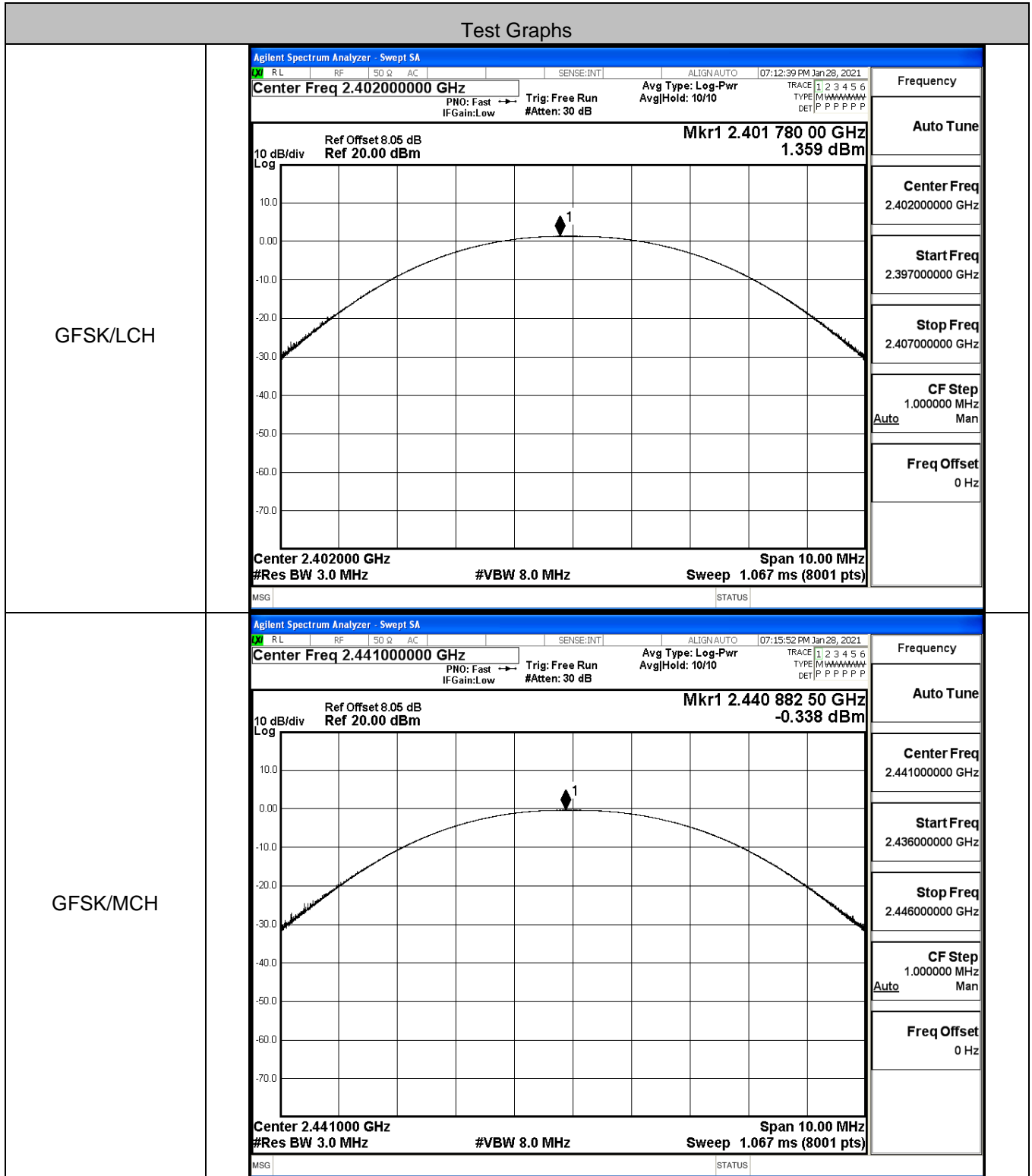
Test Model: 30MAC864WB

Environmental Conditions

Temperature:	24.6° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Ben Jin
Supervised by:	Li Huan

A.1 Maxmum Conducted Peak Output Power

Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
GFSK	LCH	1.359	21	PASS
	MCH	-0.338	21	PASS
	HCH	-2.257	21	PASS



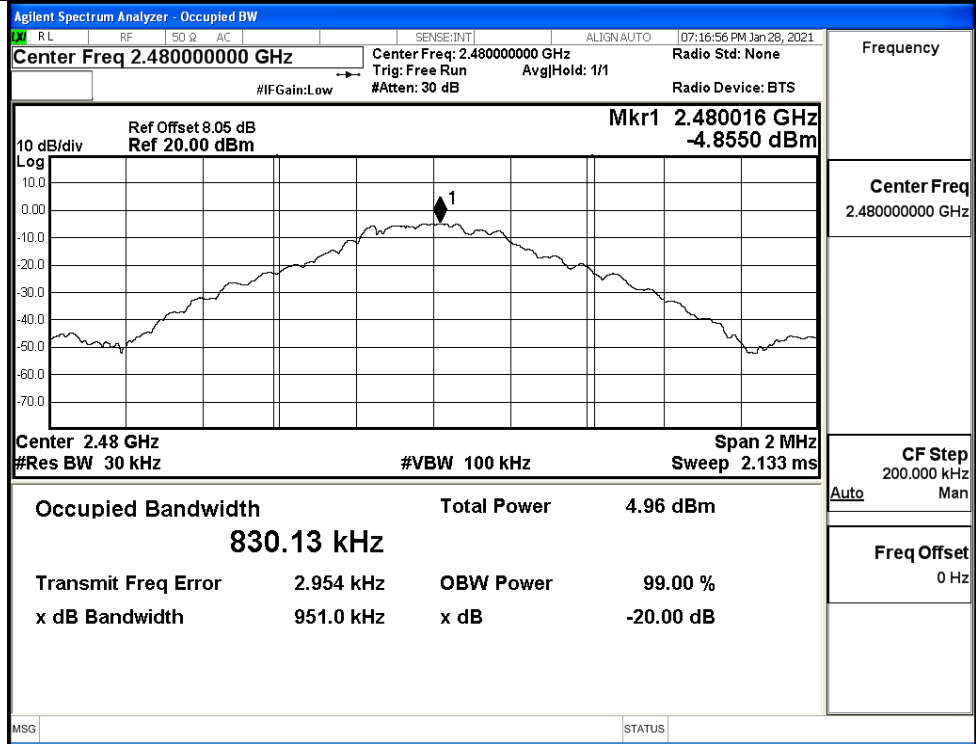
A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.9507	Not Specified	PASS
	MCH	0.9506	Not Specified	PASS
	HCH	0.9510	Not Specified	PASS

Test Graphs

GFSK/LCH	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.40200000 GHz</p> <p>Mkr1 2.402018 GHz -1.1910 dBm</p> <p>Center 2.402 GHz #Res BW 30 kHz #VBW 100 kHz Span 2 MHz Sweep 2.133 ms</p> <p>Occupied Bandwidth 829.59 kHz Total Power 8.65 dBm</p> <p>Transmit Freq Error 2.137 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 950.7 kHz x dB -20.00 dB</p>	<p>Frequency</p> <p>Center Freq 2.40200000 GHz</p> <p>CF Step 200.000 kHz</p> <p>Freq Offset 0 Hz</p>
	GFSK/MCH	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.44100000 GHz</p> <p>Mkr1 2.44102 GHz -2.9098 dBm</p> <p>Center 2.441 GHz #Res BW 30 kHz #VBW 100 kHz Span 2 MHz Sweep 2.133 ms</p> <p>Occupied Bandwidth 830.23 kHz Total Power 6.90 dBm</p> <p>Transmit Freq Error 2.287 kHz OBW Power 99.00 %</p> <p>x dB Bandwidth 950.6 kHz x dB -20.00 dB</p>

GFSK/HCH



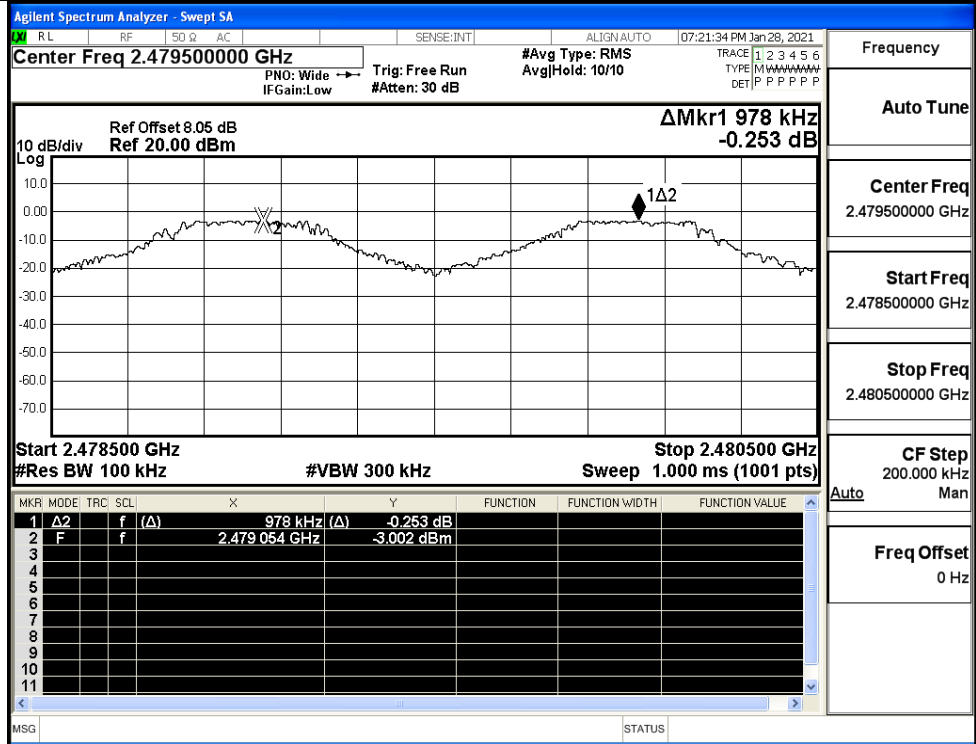
A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.989	0.634	PASS
	MCH	0.804	0.634	PASS
	HCH	0.978	0.634	PASS

Test Graphs

GFSK/LCH		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Frequency</td></tr> <tr><td>Auto Tune</td></tr> <tr><td>Center Freq 2.402500000 GHz</td></tr> <tr><td>Start Freq 2.401500000 GHz</td></tr> <tr><td>Stop Freq 2.403500000 GHz</td></tr> <tr><td>CF Step 200.000 kHz</td></tr> <tr><td>Auto Man</td></tr> <tr><td>Freq Offset 0 Hz</td></tr> </table>	Frequency	Auto Tune	Center Freq 2.402500000 GHz	Start Freq 2.401500000 GHz	Stop Freq 2.403500000 GHz	CF Step 200.000 kHz	Auto Man	Freq Offset 0 Hz
Frequency										
Auto Tune										
Center Freq 2.402500000 GHz										
Start Freq 2.401500000 GHz										
Stop Freq 2.403500000 GHz										
CF Step 200.000 kHz										
Auto Man										
Freq Offset 0 Hz										
GFSK/MCH		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Frequency</td></tr> <tr><td>Auto Tune</td></tr> <tr><td>Center Freq 2.441500000 GHz</td></tr> <tr><td>Start Freq 2.440500000 GHz</td></tr> <tr><td>Stop Freq 2.442500000 GHz</td></tr> <tr><td>CF Step 200.000 kHz</td></tr> <tr><td>Auto Man</td></tr> <tr><td>Freq Offset 0 Hz</td></tr> </table>	Frequency	Auto Tune	Center Freq 2.441500000 GHz	Start Freq 2.440500000 GHz	Stop Freq 2.442500000 GHz	CF Step 200.000 kHz	Auto Man	Freq Offset 0 Hz
Frequency										
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Start Freq 2.440500000 GHz										
Stop Freq 2.442500000 GHz										
CF Step 200.000 kHz										
Auto Man										
Freq Offset 0 Hz										

GFSK/HCH



A.4 Hopping Channel Number

Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
GFSK	Hop	79	>=15	PASS

Test Graphs

GFSK/Hop

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.441750000 GHz

Ref Offset 8.05 dB
Ref 20.00 dBm

ΔMkr1 77.958 MHz
-3.405 dB

Start 2.40000 GHz
#Res BW 100 kHz

Stop 2.48350 GHz
Sweep 8.000 ms (8001 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	Δ2	f	(Δ)	77.958 MHz (Δ)	-3.405 dB			
2	F	f		2.402025 GHz	0.614 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								

Frequency

Auto Tune

Center Freq
2.441750000 GHz

Start Freq
2.400000000 GHz

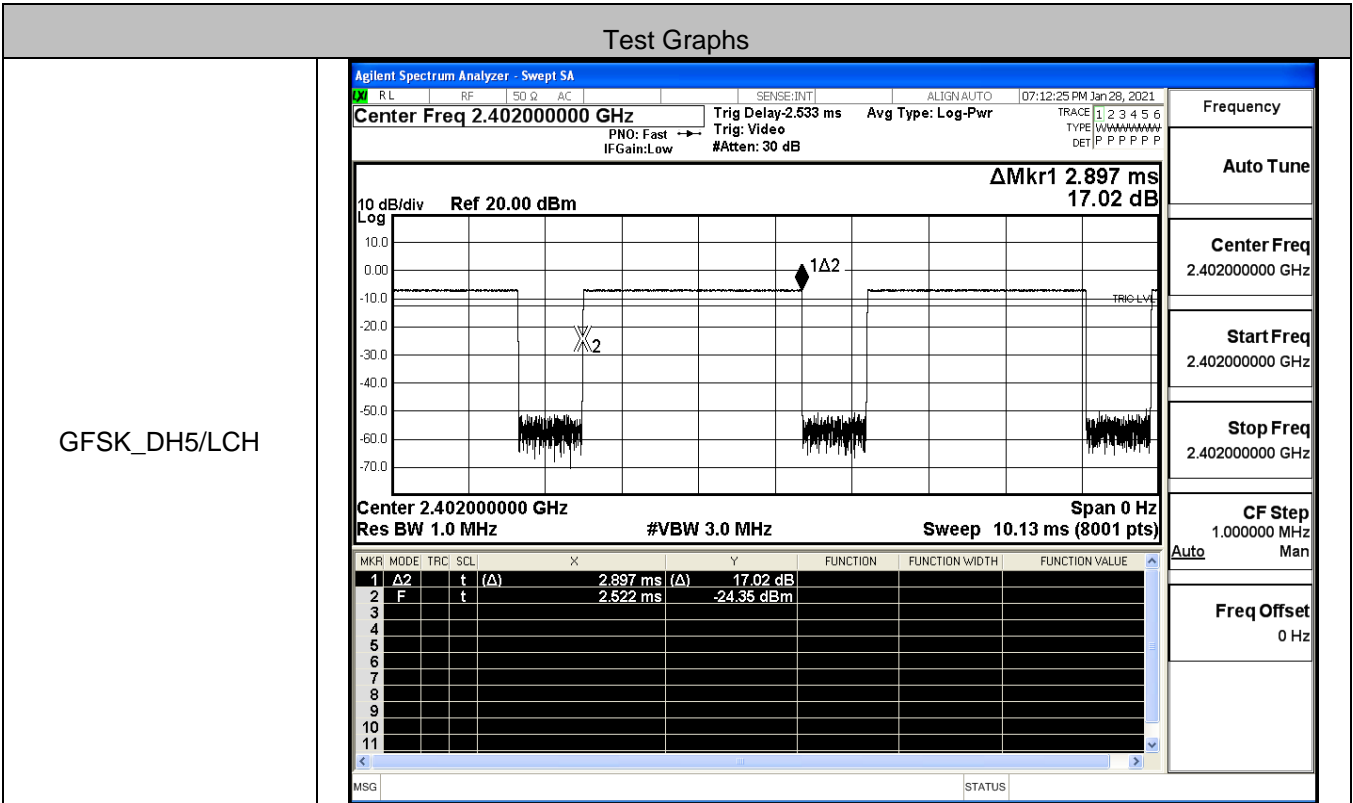
Stop Freq
2.483500000 GHz

CF Step
8.350000 MHz

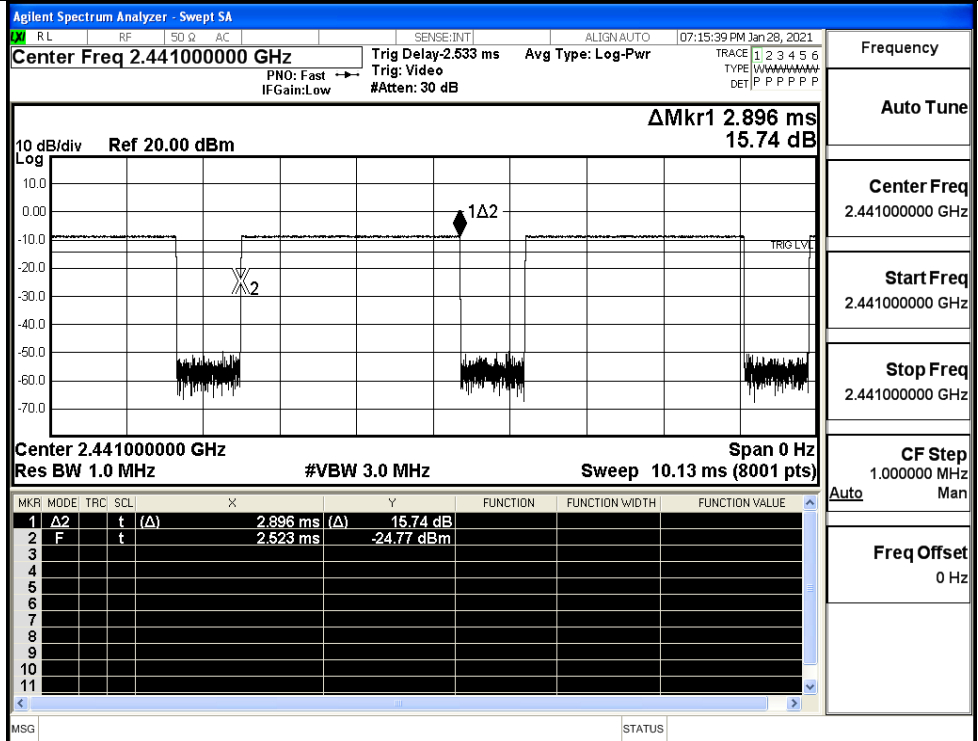
Freq Offset
0 Hz

A.5 Dwell Time

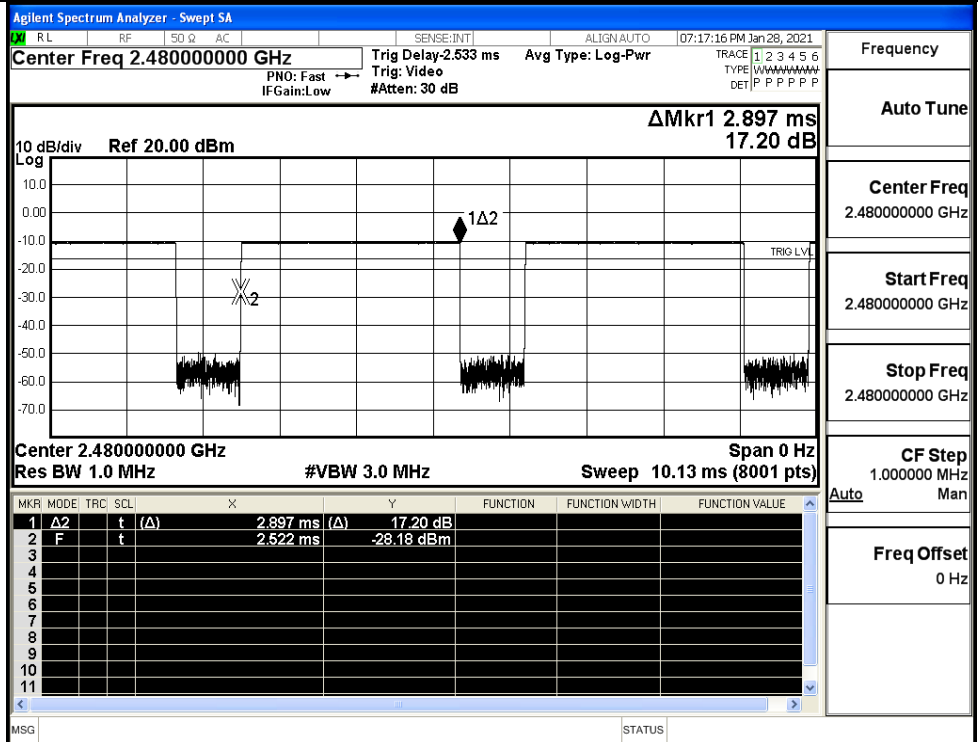
Mode	Packet	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
GFSK	DH5	LCH	2.9	106.7	0.309	0.4	PASS
	DH5	MCH	2.9	106.7	0.309	0.4	PASS
	DH5	HCH	2.9	106.7	0.309	0.4	PASS



GFSK_DH5/MCH

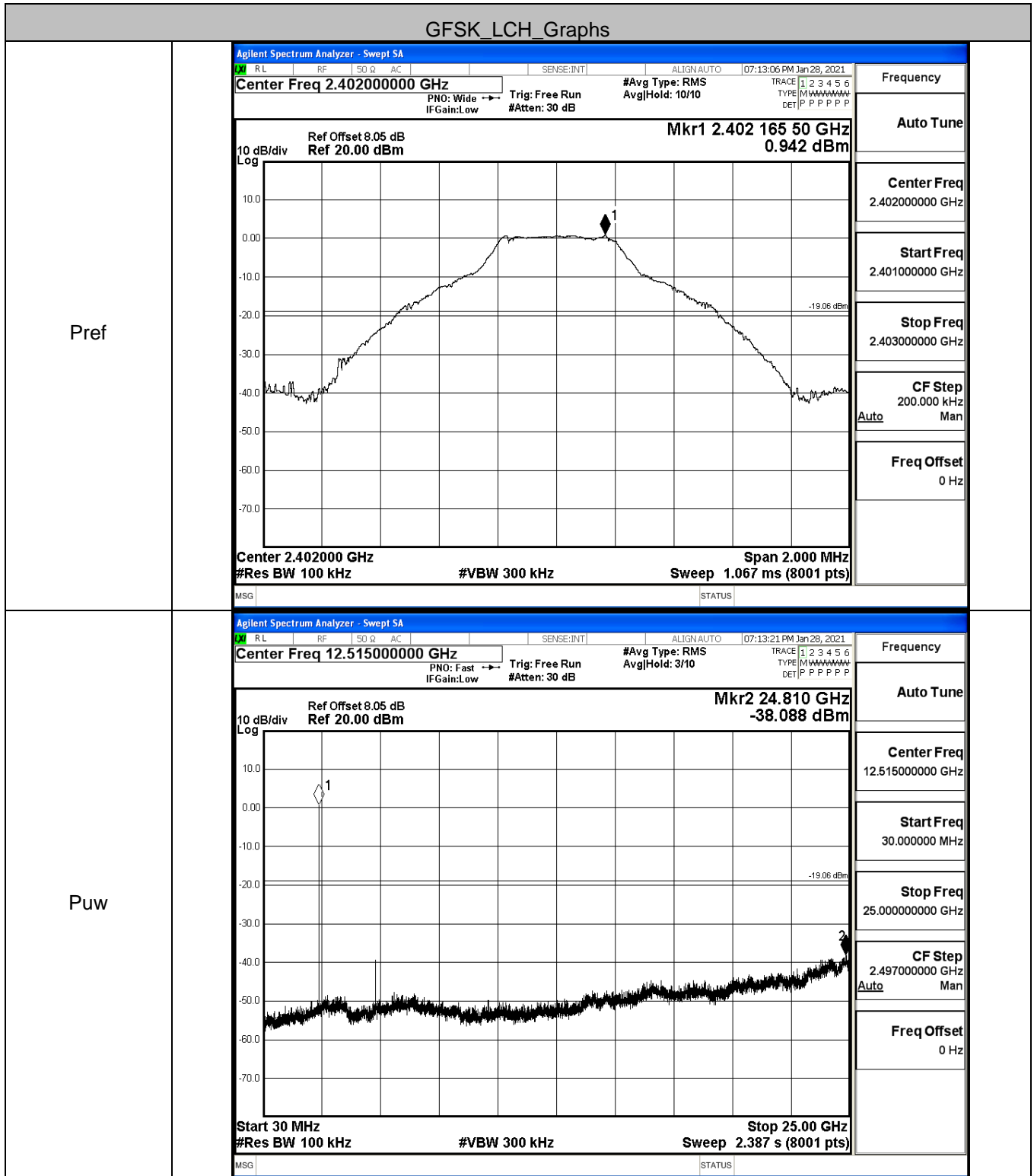


GFSK_DH5/HCH



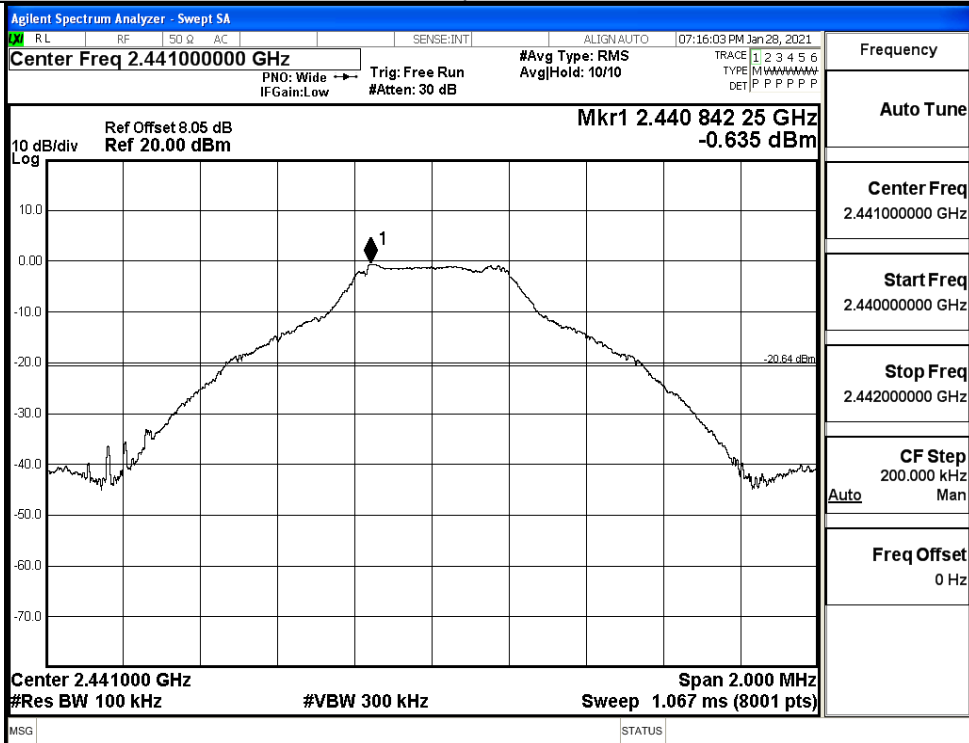
A.6 RF Conducted Spurious Emissions

Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	0.942	-38.088	-19.058	PASS
	MCH	-0.635	-37.811	-20.635	PASS
	HCH	-2.767	-37.081	-22.767	PASS

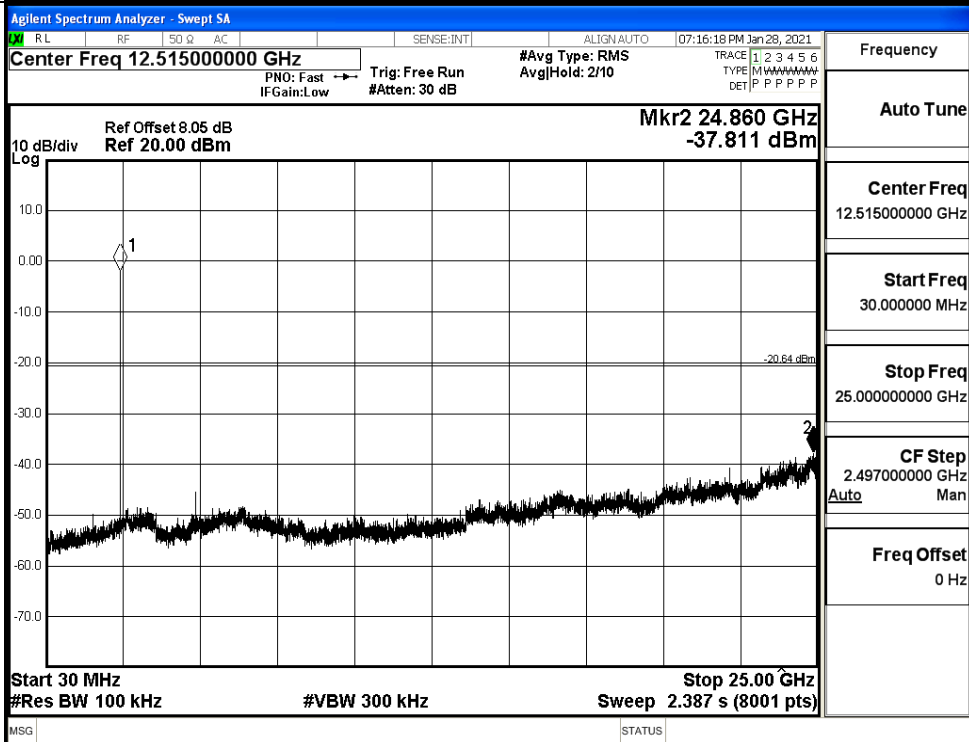


GFSK_MCH_Graphs

Pref

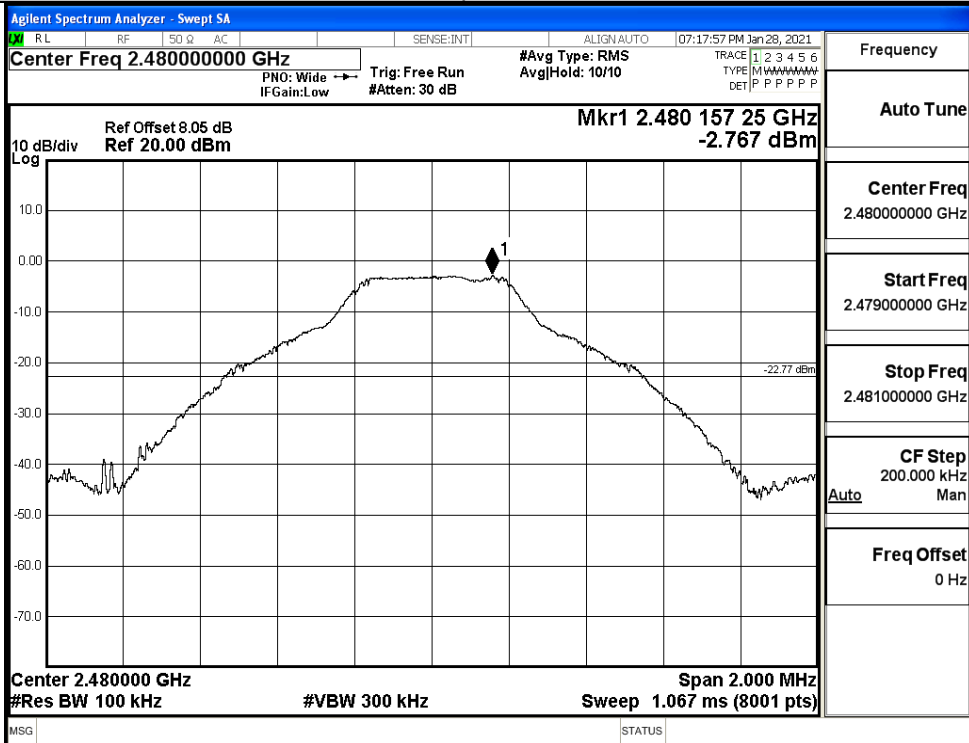


Puw

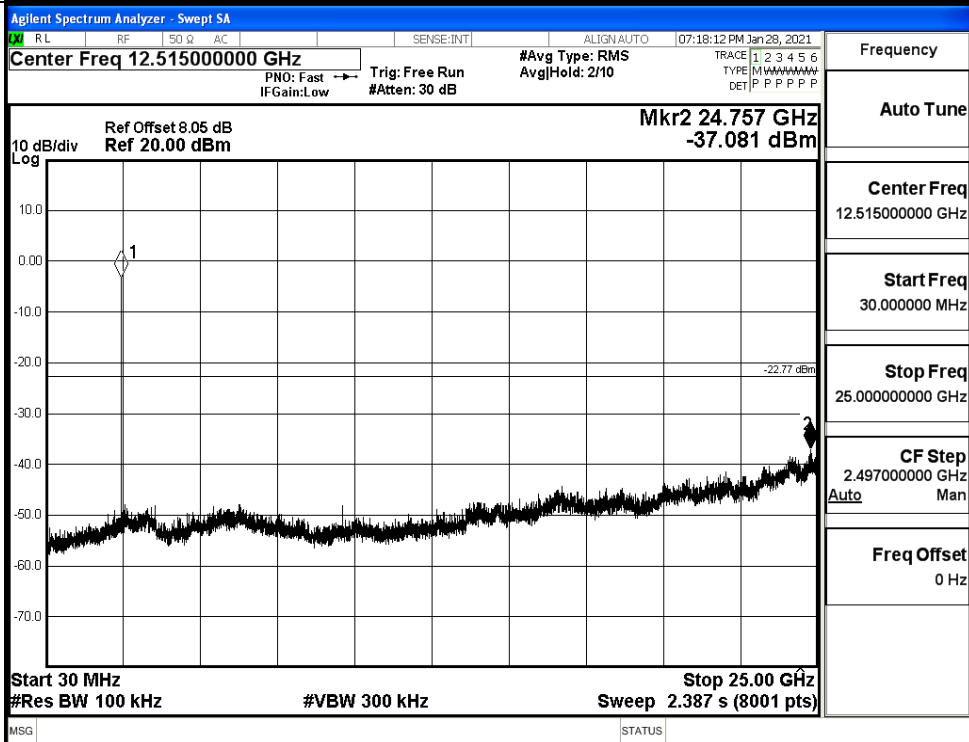


GFSK_HCH_Graphs

Pref



Puw

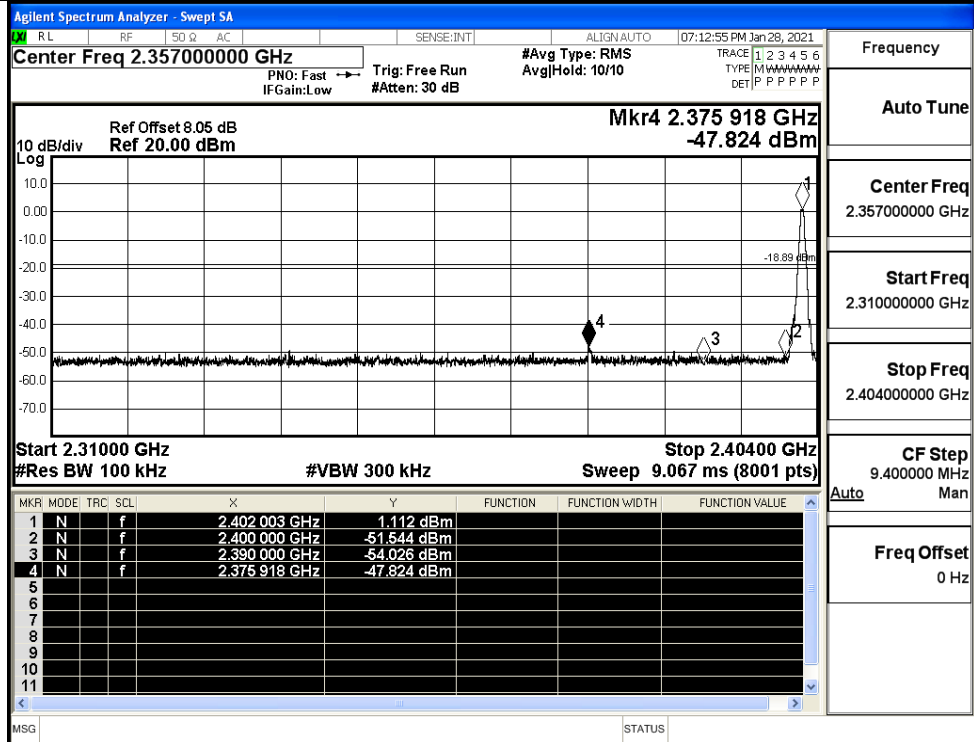


A.7 Band-edge for RF Conducted Emissions

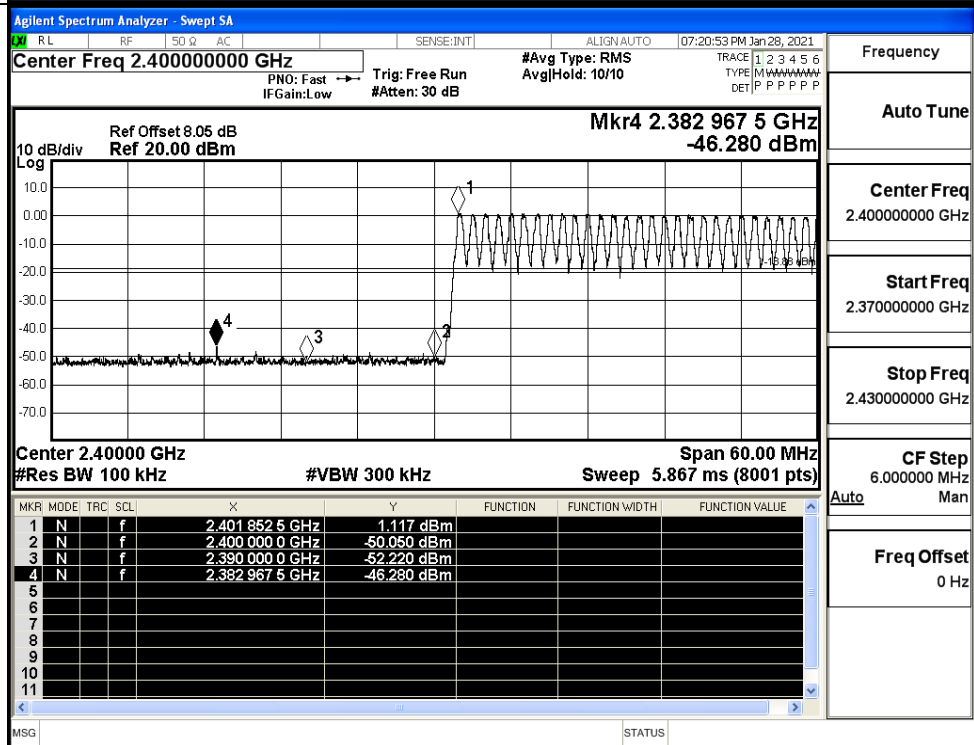
Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	2402	1.112	Off	-47.824	-18.89	PASS
			1.117	On	-46.280	-18.88	PASS
	HCH	2480	-2.633	Off	-49.904	-22.63	PASS
			-1.279	On	-48.606	-21.28	PASS

Test Graphs

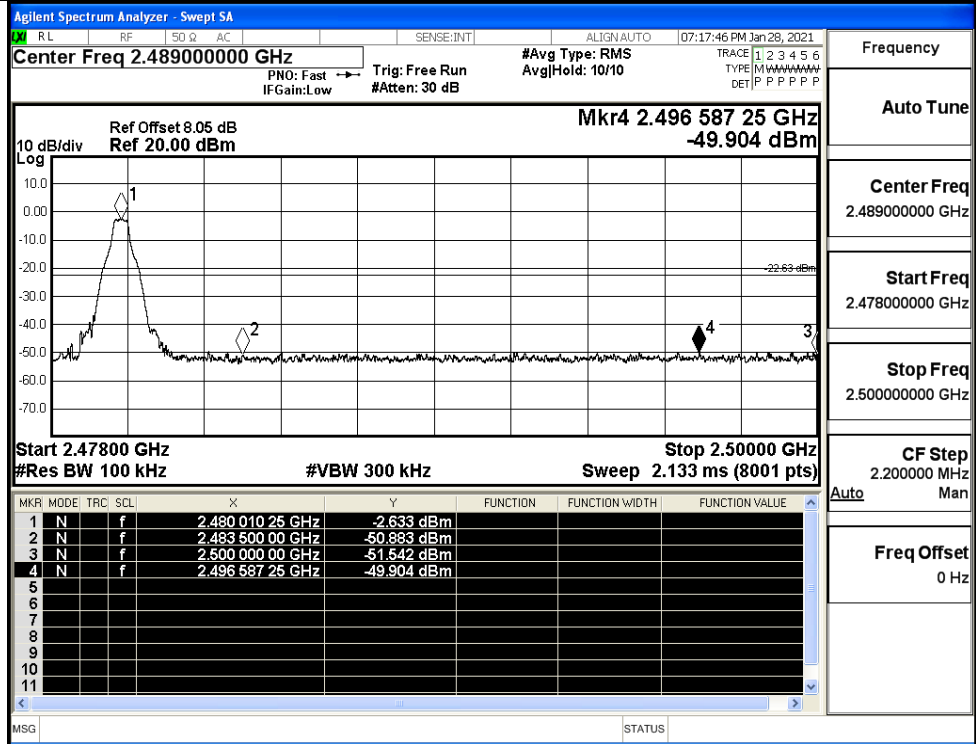
GFSK/LCH/No Hop



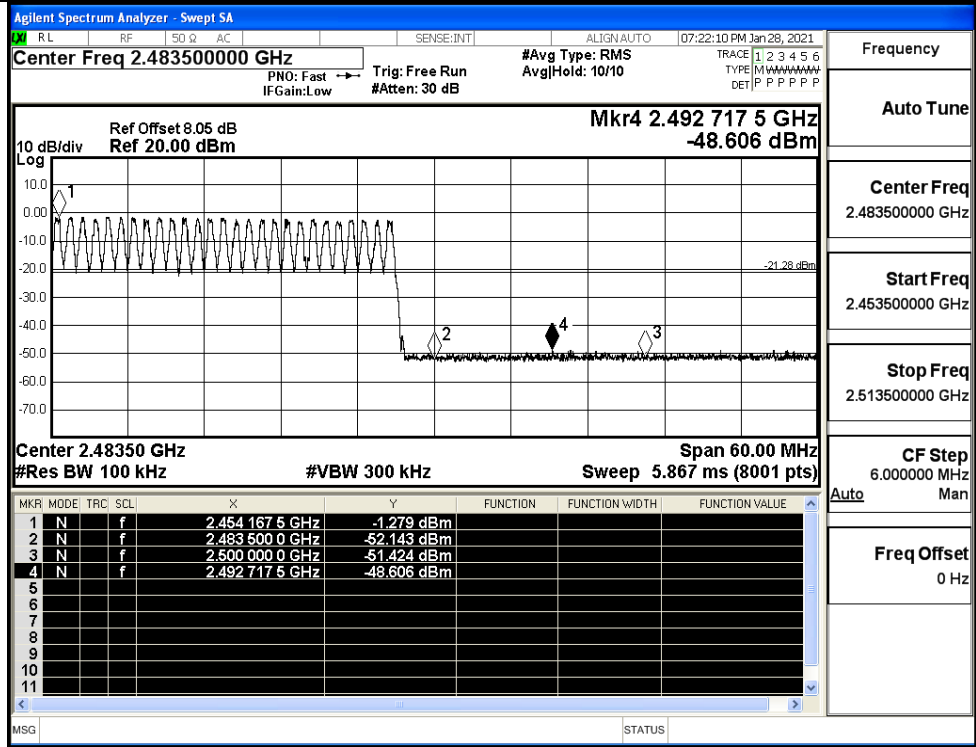
GFSK/LCH/Hop



GFSK/HCH/No Hop



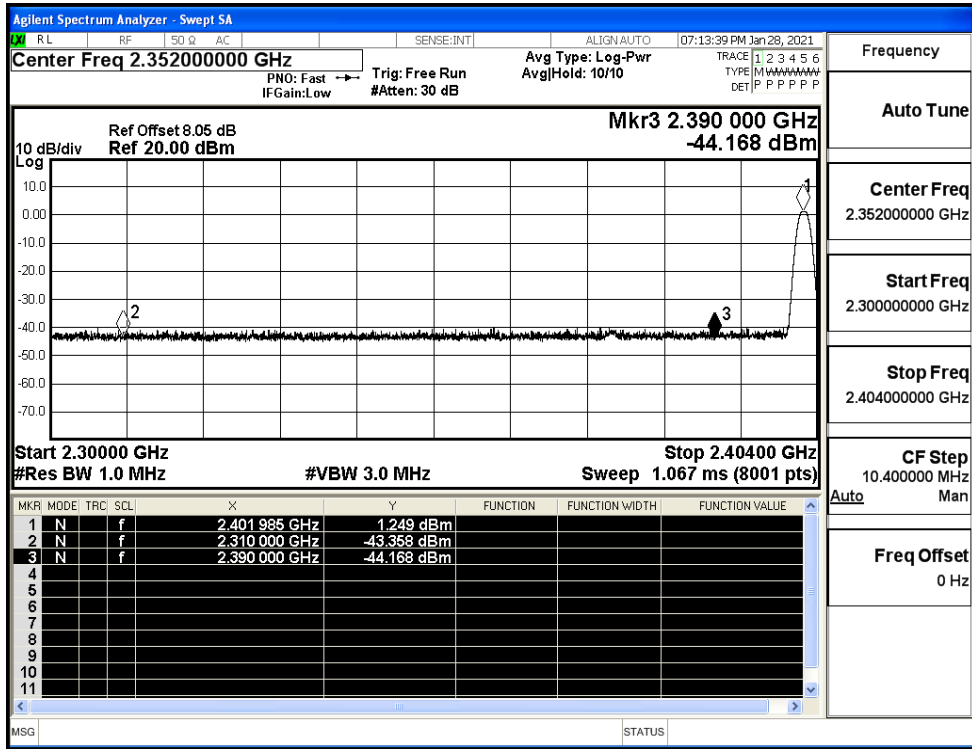
GFSK/HCH/Hop



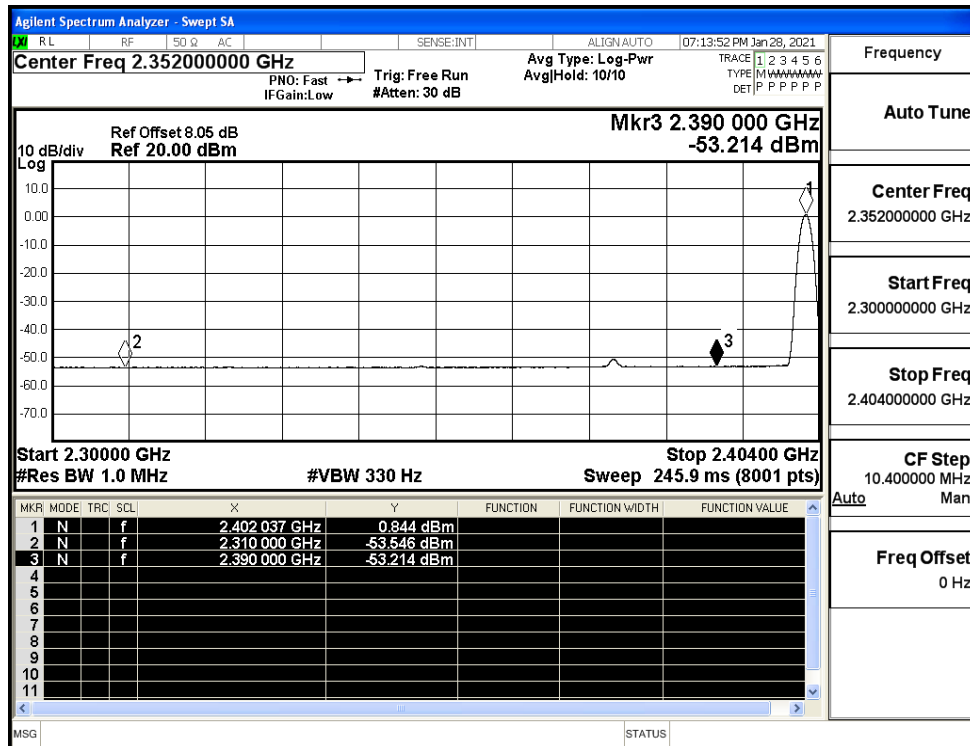
A.8 Restrict-band band-edge measurements

Test Mode	Hopping	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdict
GFSK	Off	2310.0	-43.36	2.0	0	53.90	PEAK	74	PASS
	Off	2310.0	-53.55	2.0	0	43.71	AV	54	PASS
	Off	2390.0	-44.17	2.0	0	53.09	PEAK	74	PASS
	Off	2390.0	-53.21	2.0	0	45.04	AV	54	PASS
	Off	2483.5	-42.31	2.0	0	54.95	PEAK	74	PASS
	Off	2483.5	-52.46	2.0	0	44.80	AV	54	PASS
	Off	2500.0	-42.25	2.0	0	55.01	PEAK	74	PASS
	Off	2500.0	-52.53	2.0	0	44.73	AV	54	PASS

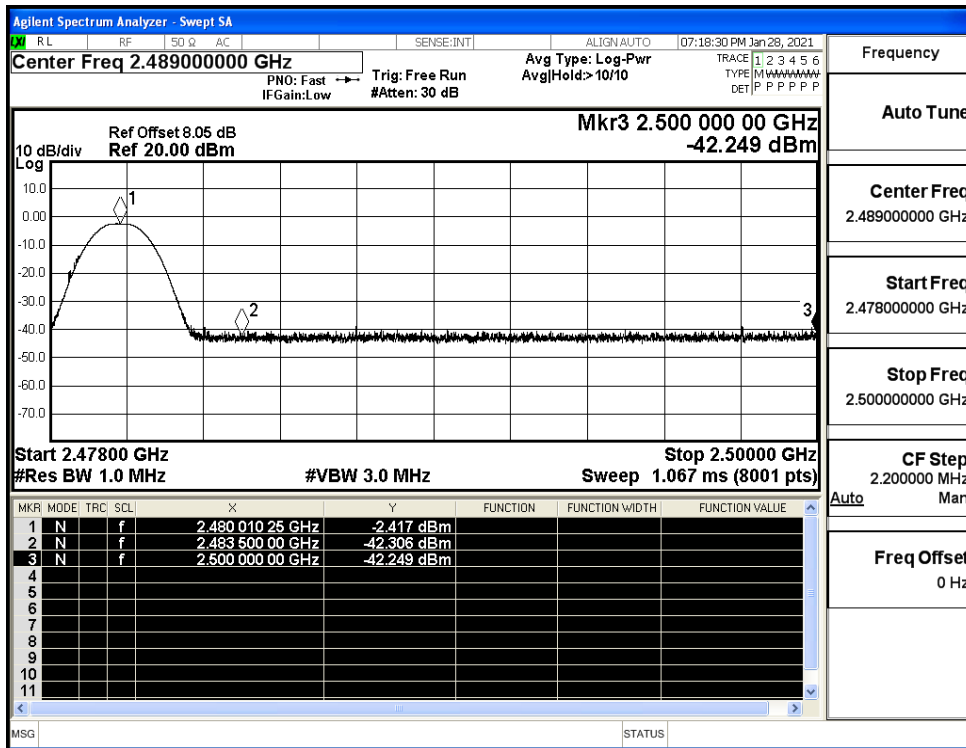
Restrict-band band-edge measurements_Hopping Off_GFSK_PEAK (Low Channel)



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



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



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

