

Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Smart Doorbell

Trade Mark: BOSMA

Test Model: Sentry Pro

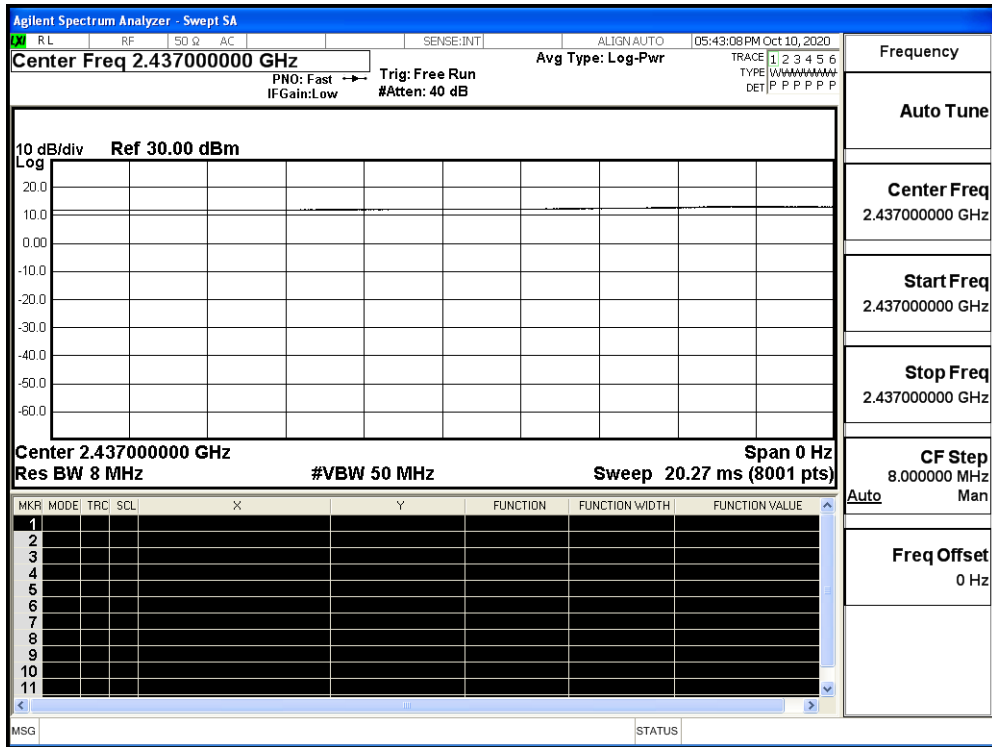
Environmental Conditions

Temperature:	23.2 ° C
Relative Humidity:	53.7%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Li Huan

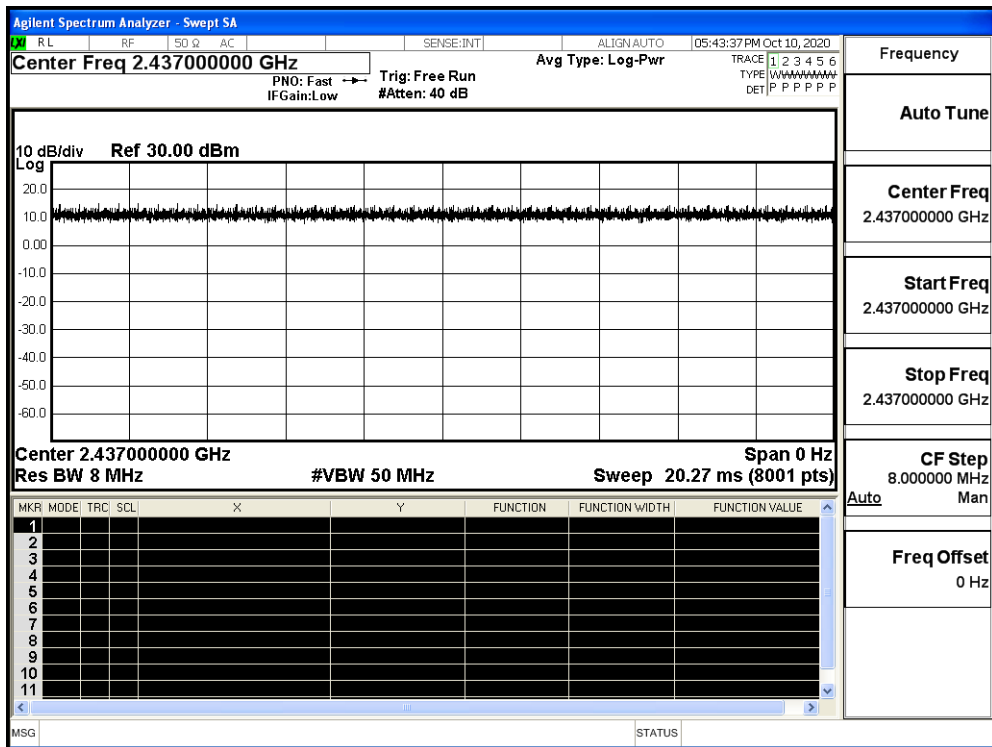
A.1 Duty Cycle

Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
11B	2437	Ant1	100	PASS
11G	2437	Ant1	100	PASS
11N20SISO	2437	Ant1	100	PASS
11N40SISO	2437	Ant1	100	PASS

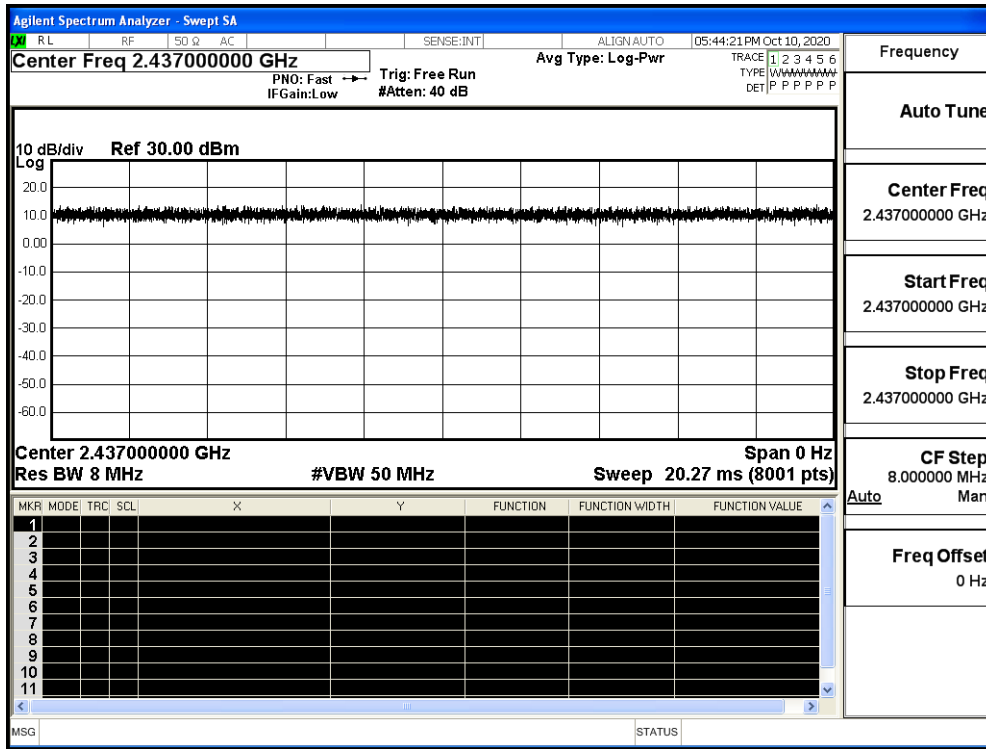
Duty Cycle_11B_2437_Ant1



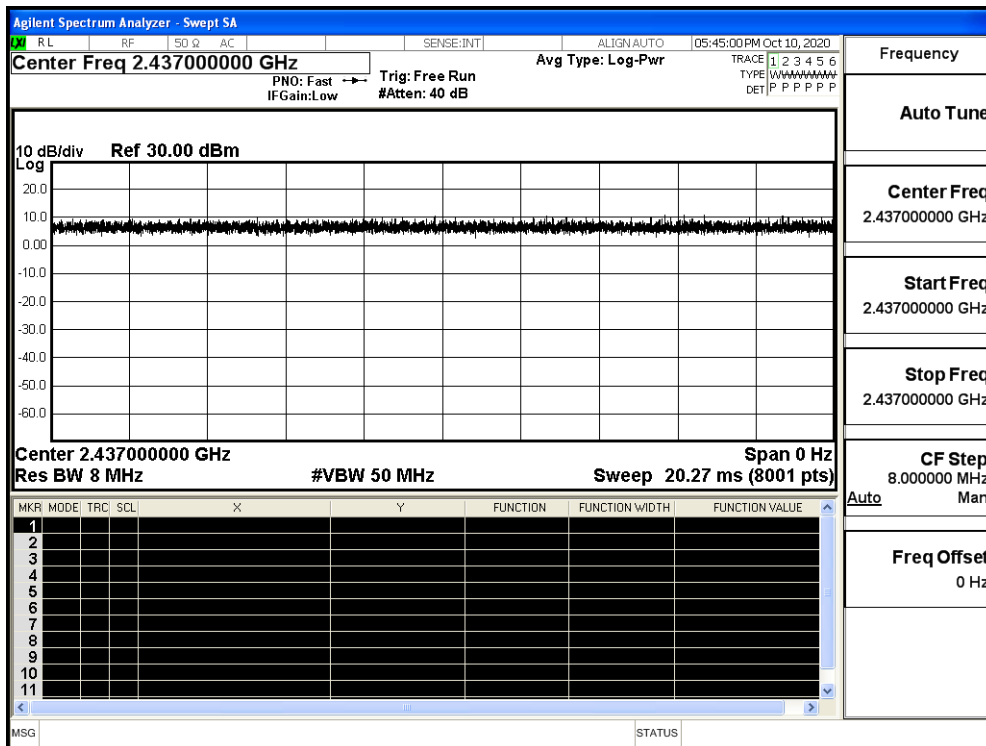
Duty Cycle_11G_2437_Ant1



Duty Cycle_11N20SISO_2437_Ant1



Duty Cycle_11N40SISO_2437_Ant1

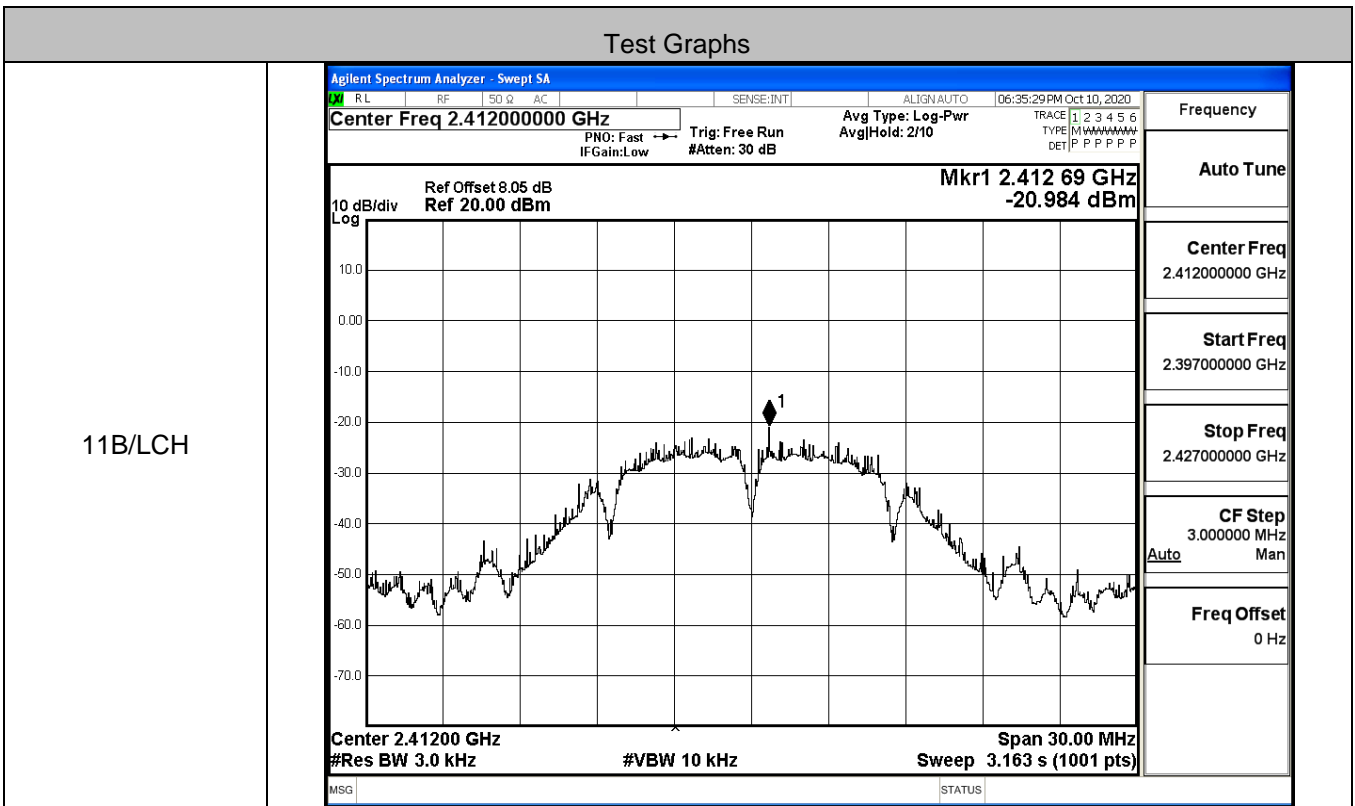


A.2 Maximum Conducted Output Power

Mode	Channel	Meas.Level [dBm]	Limit [dBm]	Verdict
11B	LCH	7.36	30	PASS
	MCH	7.46	30	PASS
	HCH	8.69	30	PASS
11G	LCH	10.94	30	PASS
	MCH	9.91	30	PASS
	HCH	9.06	30	PASS
11N20SISO	LCH	11.09	30	PASS
	MCH	10.07	30	PASS
	HCH	9.17	30	PASS
11N40SISO	LCH	10.83	30	PASS
	MCH	10.19	30	PASS
	HCH	9.59	30	PASS

A.3 Maximum Power Spectral Density

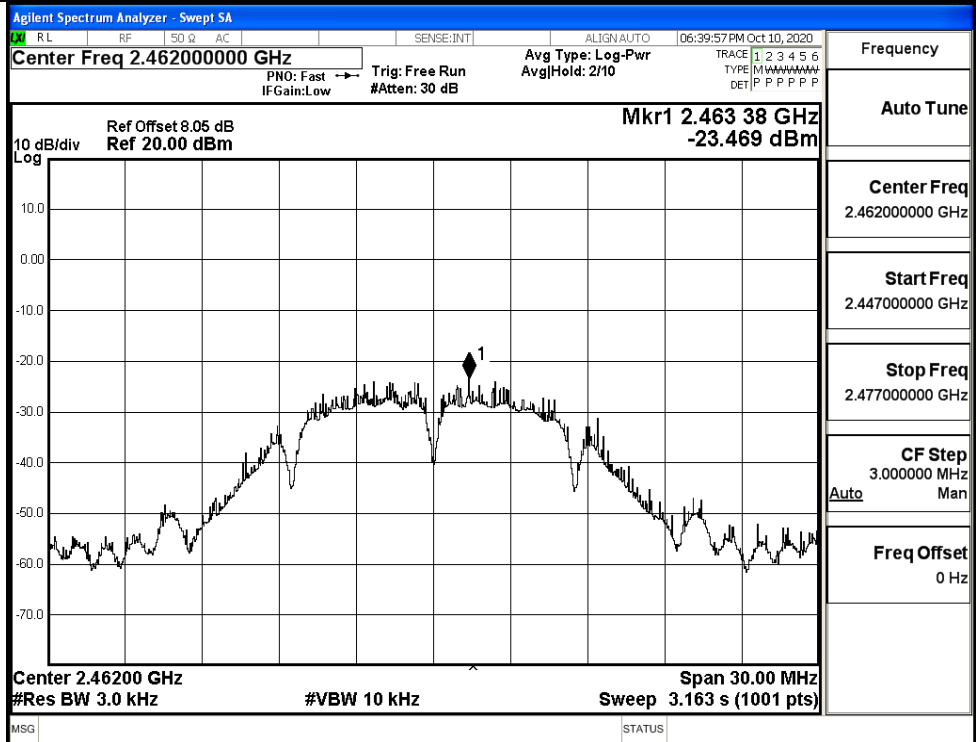
Mode	Channel	Meas.Level [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
11B	LCH	-20.984	8	PASS
	MCH	-23.963	8	PASS
	HCH	-23.469	8	PASS
11G	LCH	-24.739	8	PASS
	MCH	-25.569	8	PASS
	HCH	-26.610	8	PASS
11N20SISO	LCH	-24.946	8	PASS
	MCH	-25.427	8	PASS
	HCH	-26.407	8	PASS
11N40SISO	LCH	-26.198	8	PASS
	MCH	-27.204	8	PASS
	HCH	-28.688	8	PASS



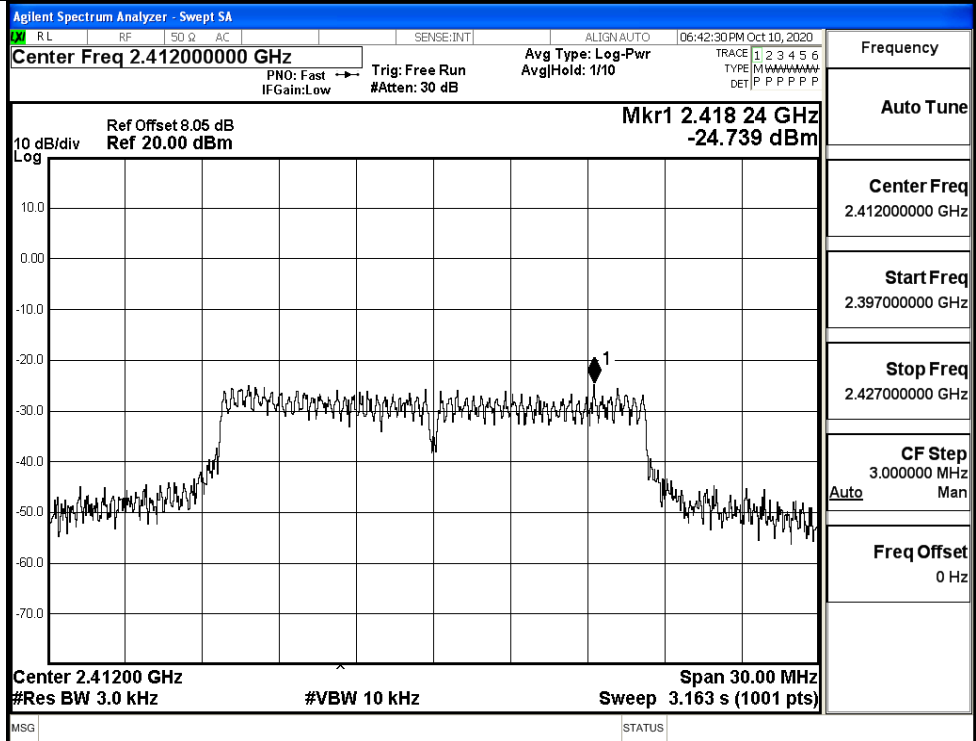
11B/MCH



11B/HCH

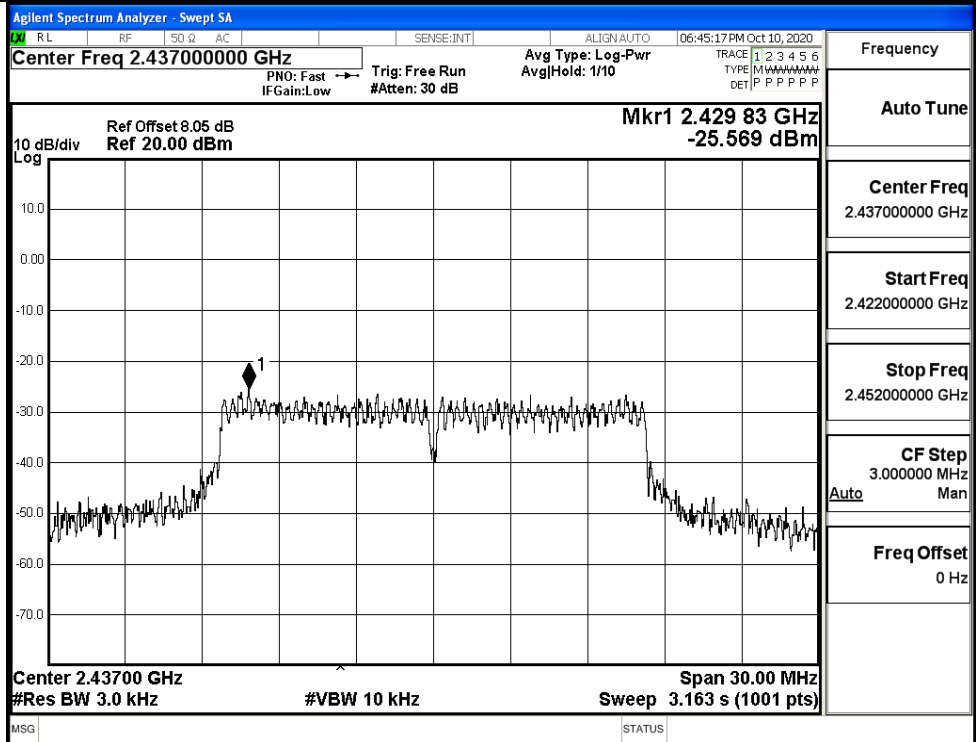


11G/LCH



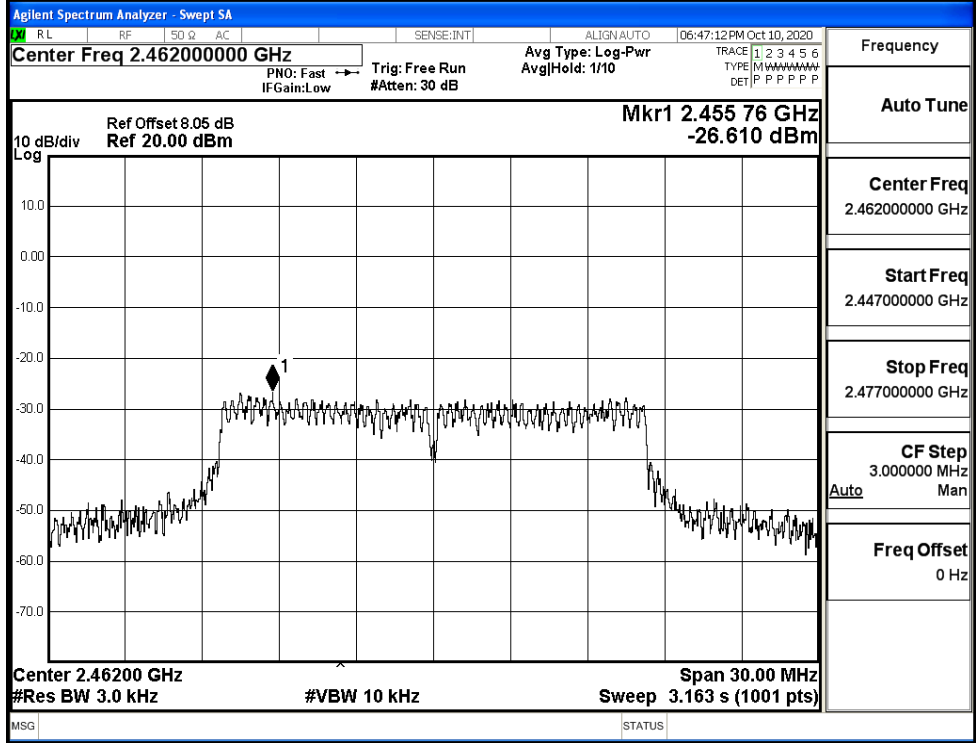
Frequency
Auto Tune
Center Freq 2.41200000 GHz
Start Freq 2.397000000 GHz
Stop Freq 2.427000000 GHz
CF Step 3.000000 MHz Auto Man
Freq Offset 0 Hz

11G/MCH

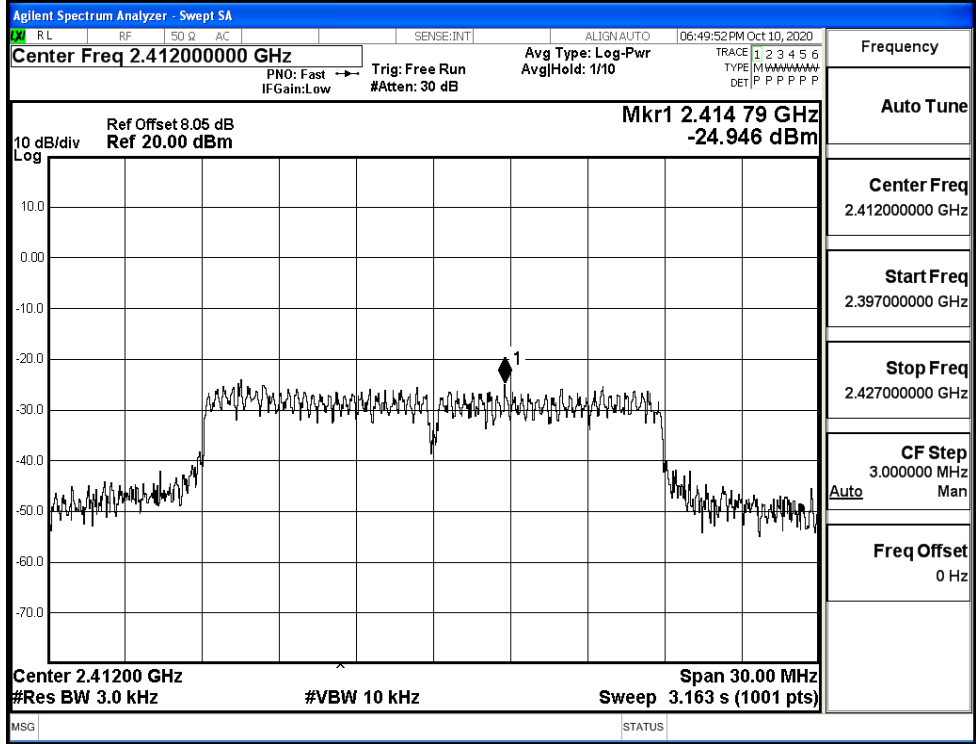


Frequency
Auto Tune
Center Freq 2.437000000 GHz
Start Freq 2.422000000 GHz
Stop Freq 2.452000000 GHz
CF Step 3.000000 MHz Auto Man
Freq Offset 0 Hz

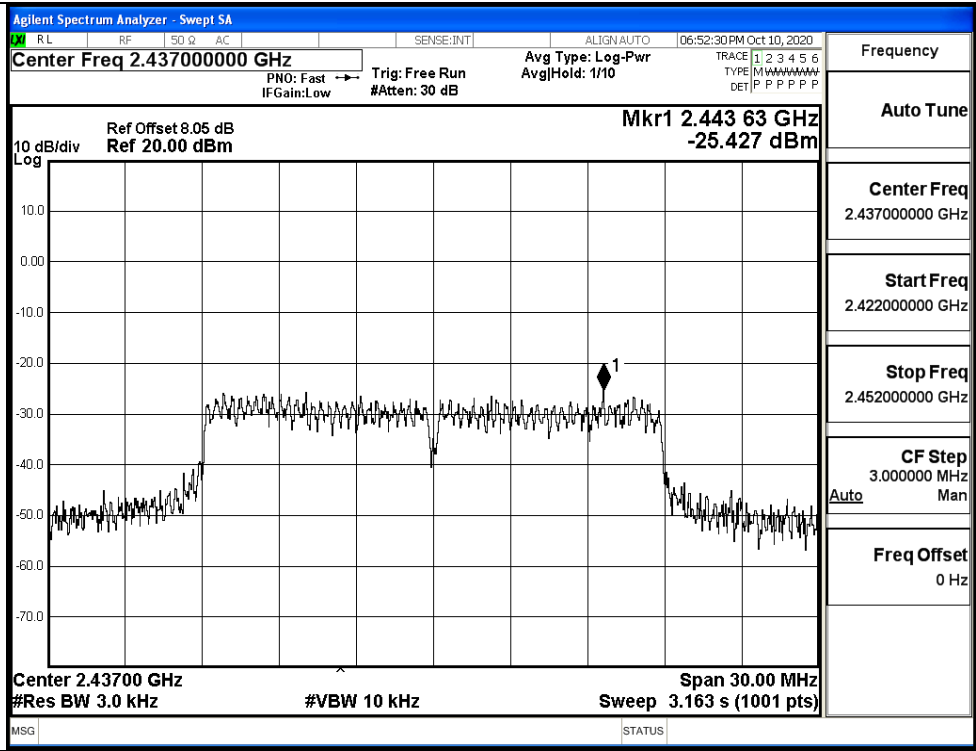
11G/HCH



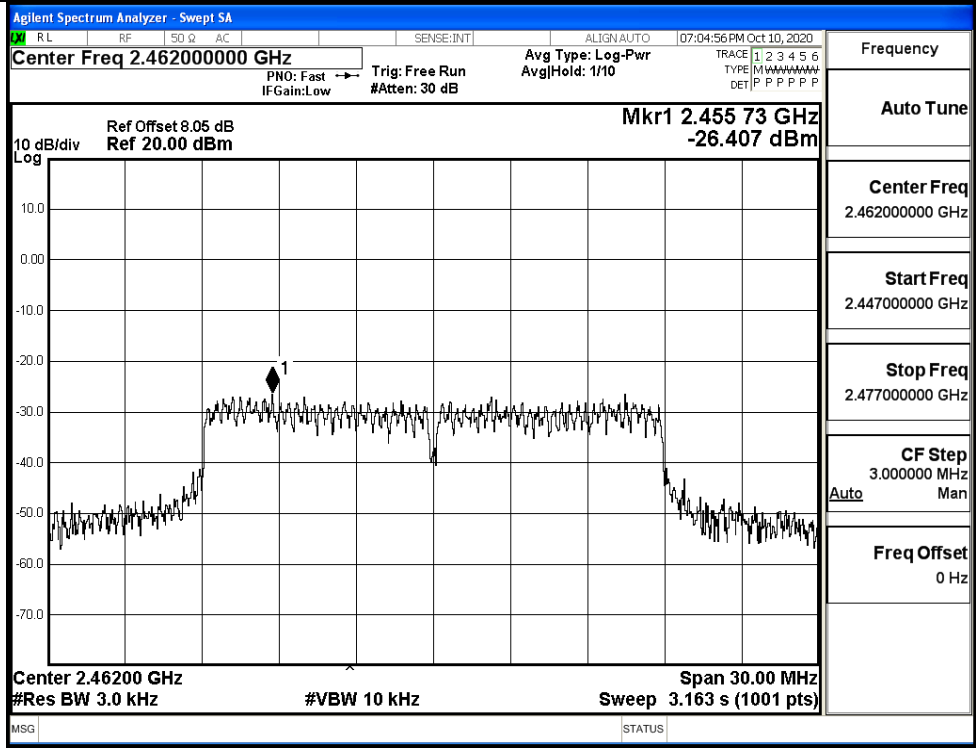
11N20SISO/LCH

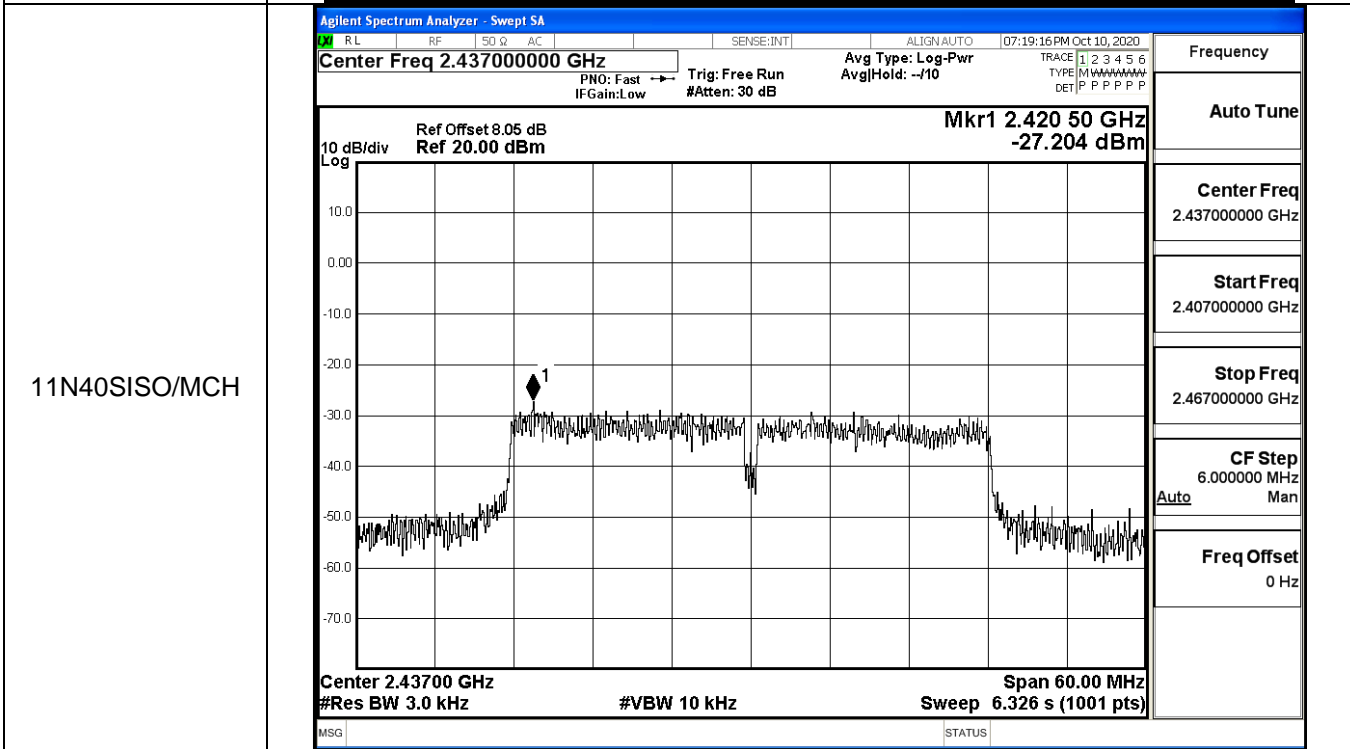
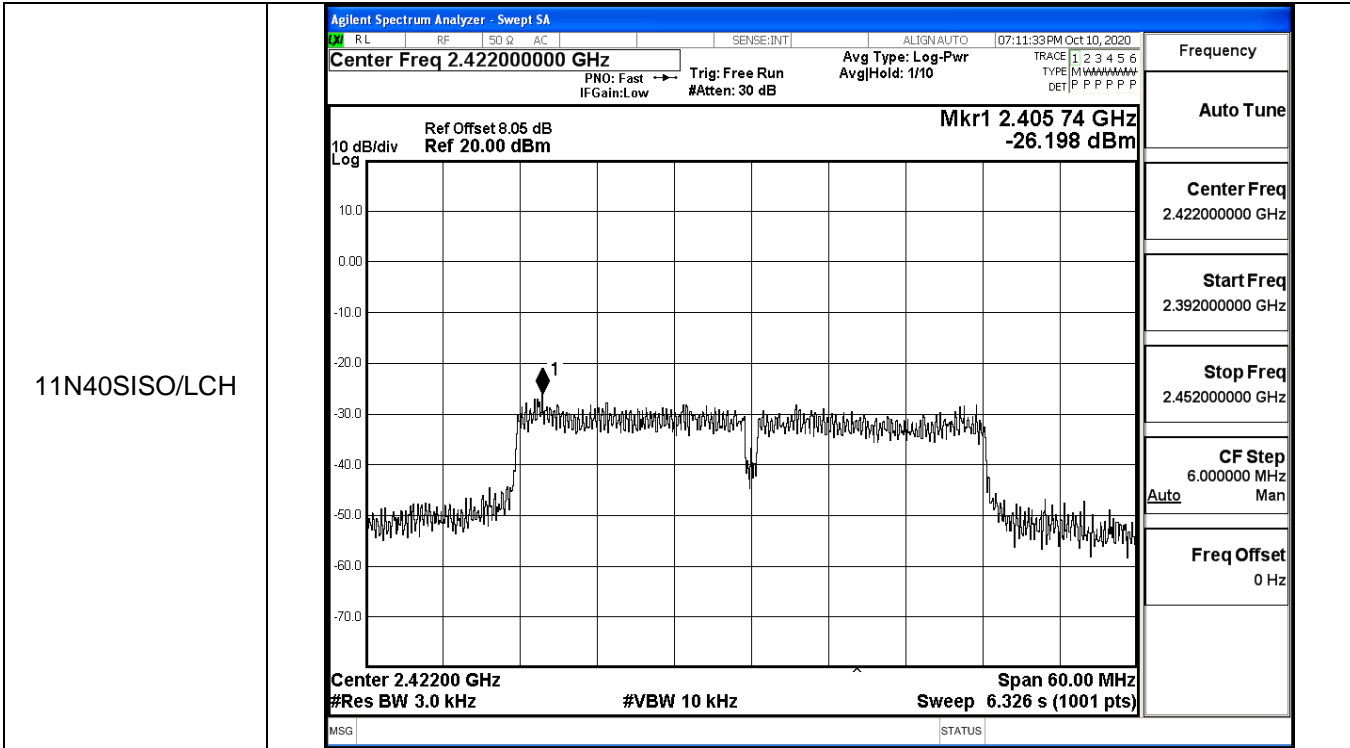


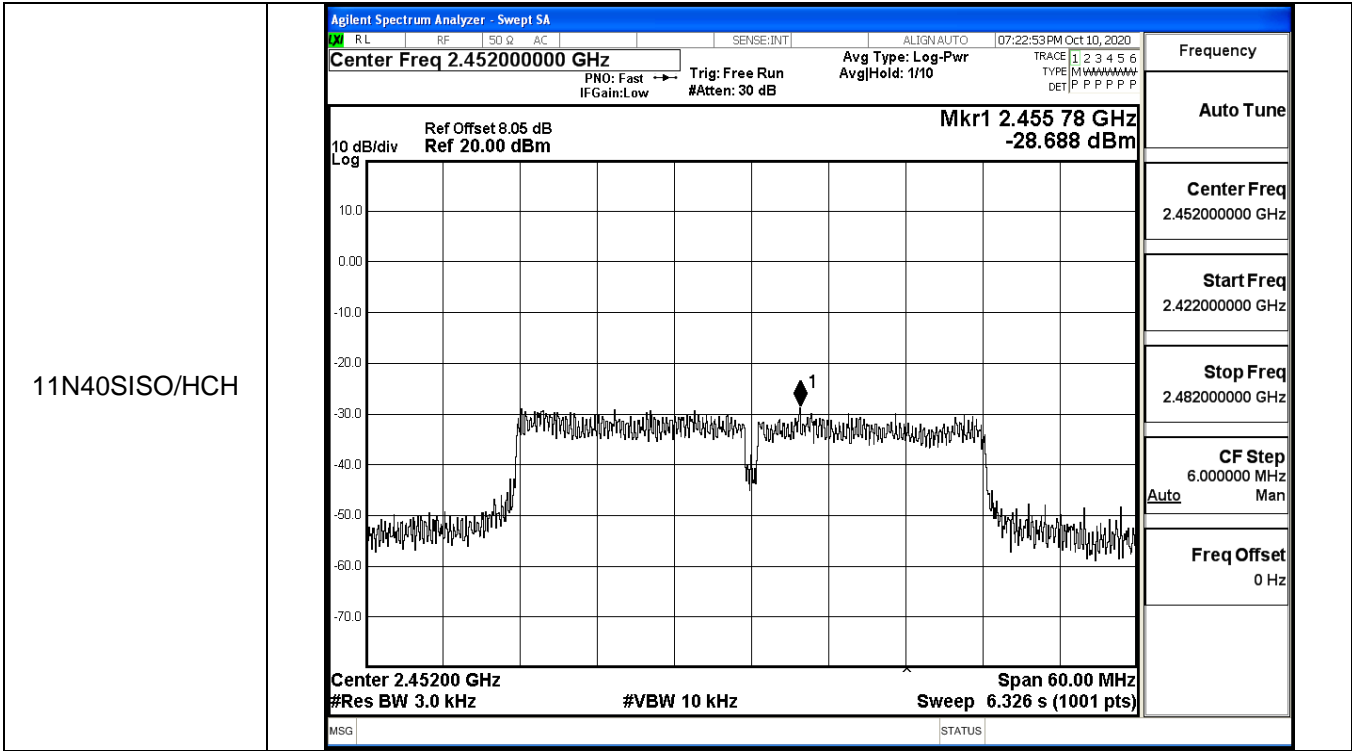
11N20SISO/MCH



11N20SISO/HCH

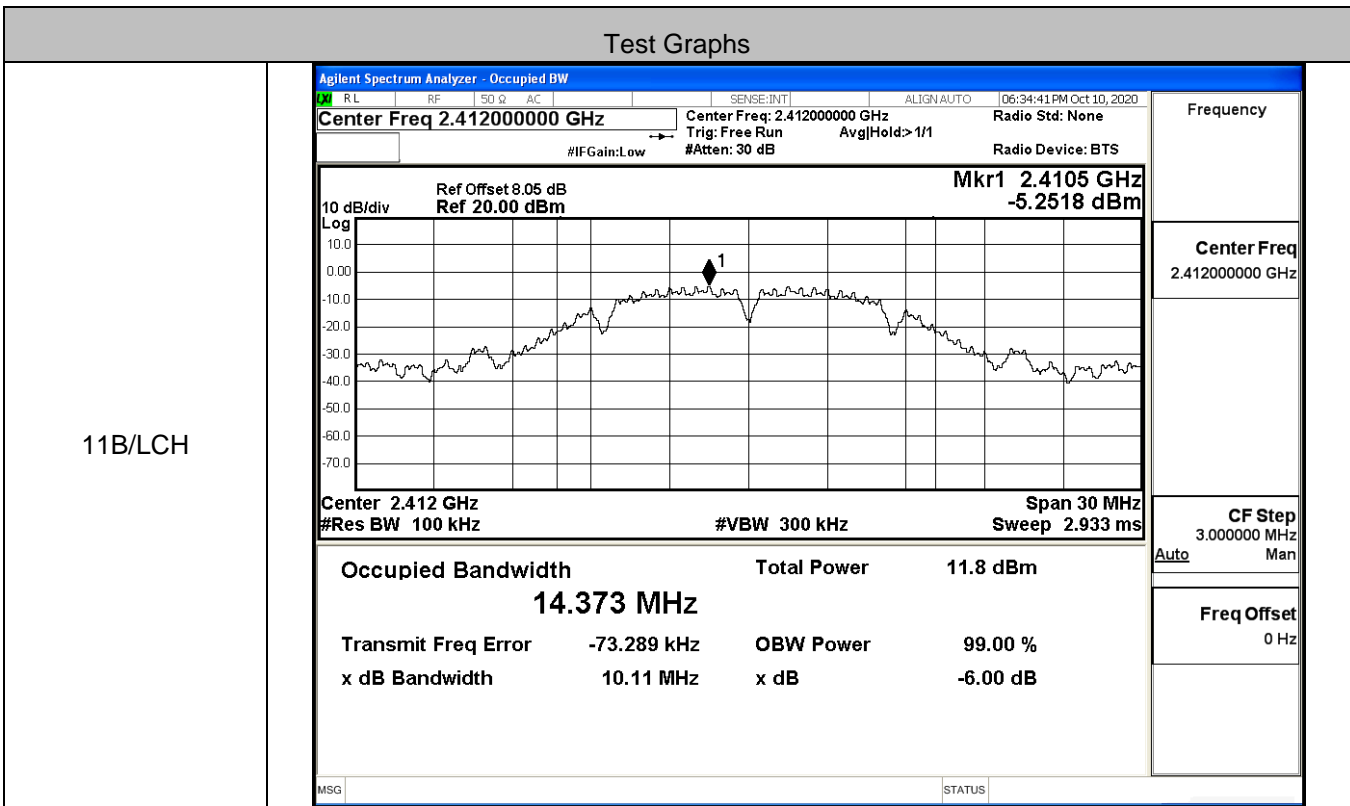






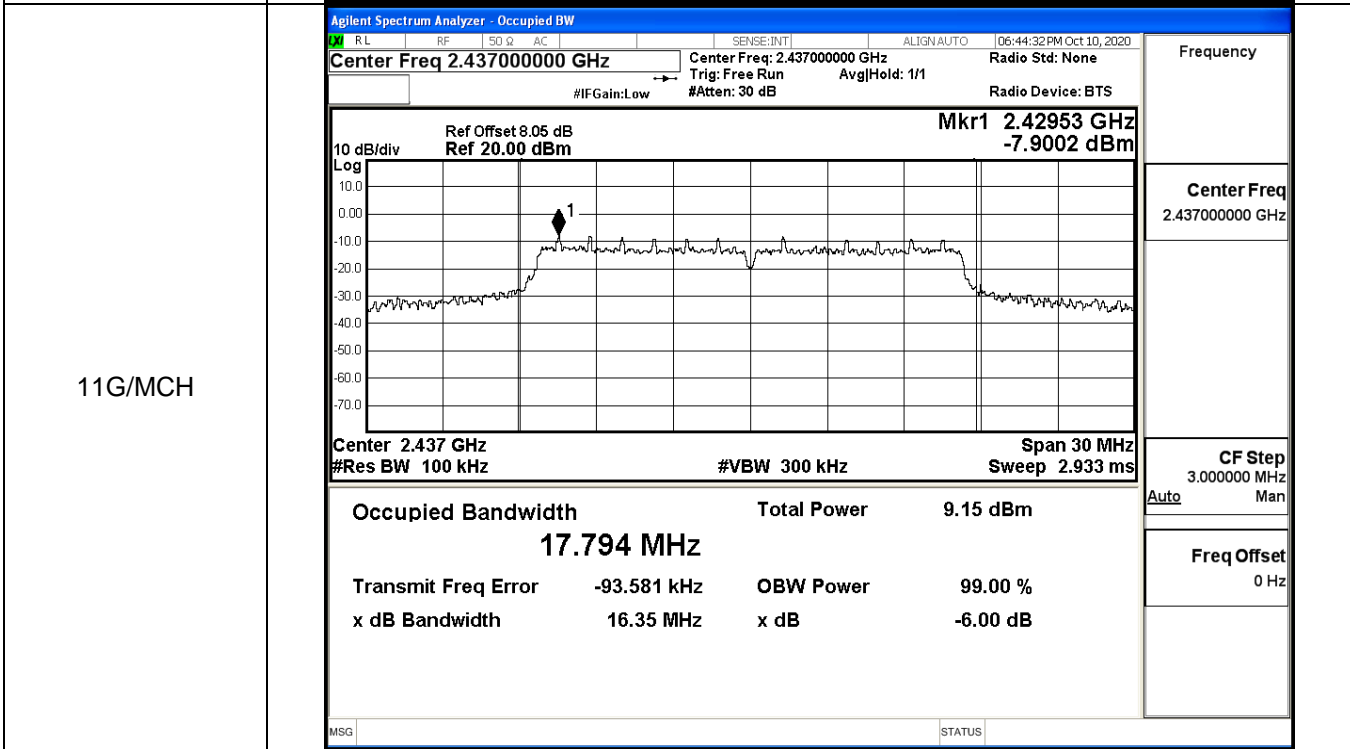
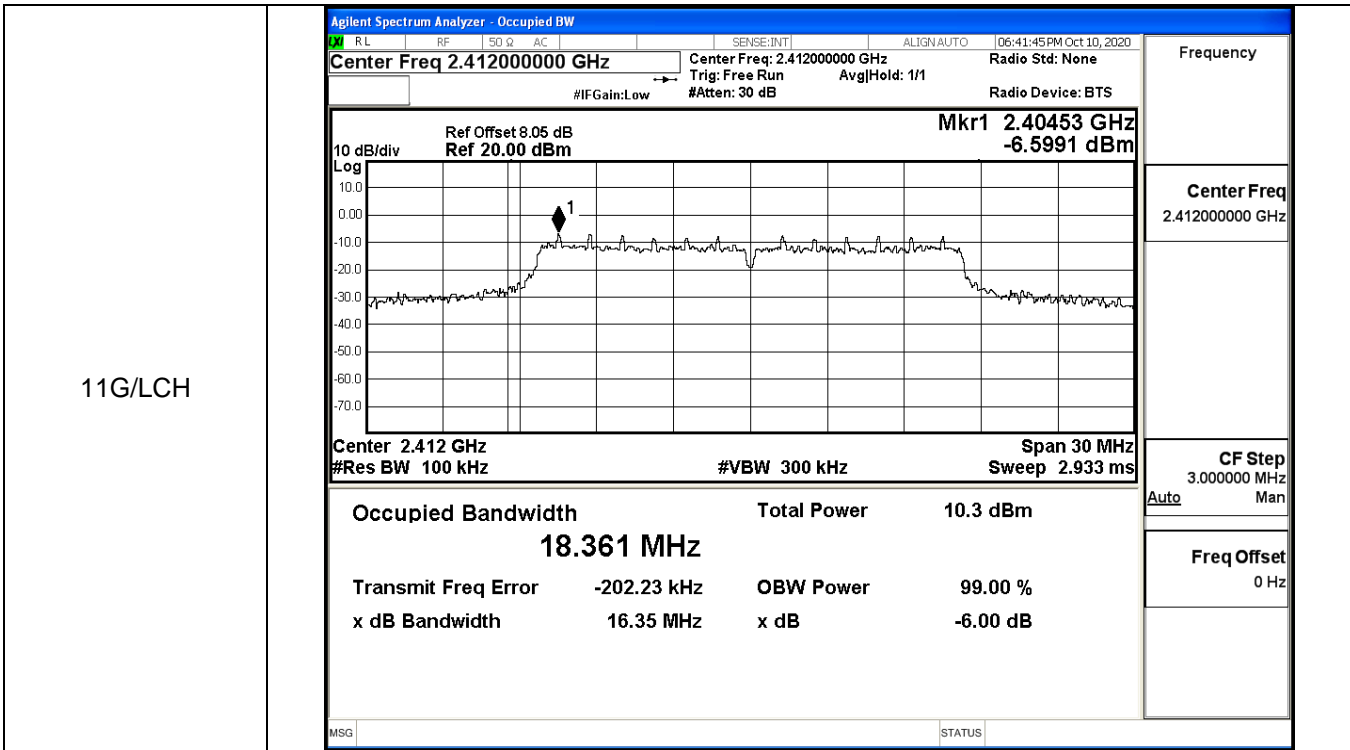
A.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
11B	LCH	10.11	≥0.5	PASS
	MCH	10.11	≥0.5	PASS
	HCH	10.11	≥0.5	PASS
11G	LCH	16.35	≥0.5	PASS
	MCH	16.35	≥0.5	PASS
	HCH	16.38	≥0.5	PASS
11N20SISO	LCH	17.01	≥0.5	PASS
	MCH	17.30	≥0.5	PASS
	HCH	17.08	≥0.5	PASS
11N40SISO	LCH	35.79	≥0.5	PASS
	MCH	35.80	≥0.5	PASS
	HCH	35.95	≥0.5	PASS

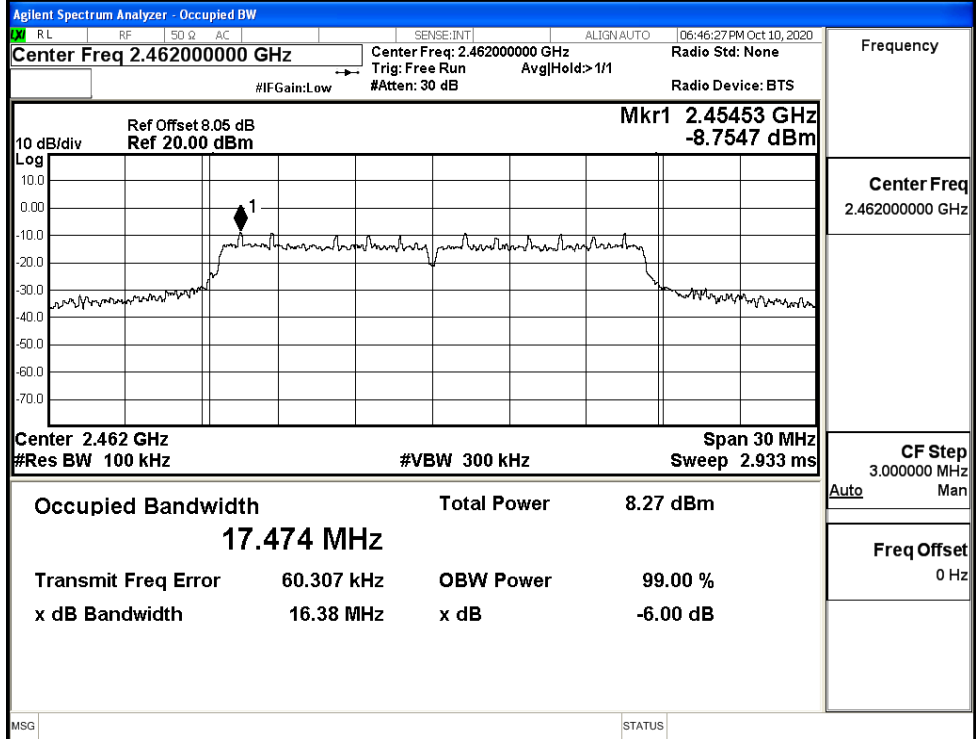


11B/MCH	Agilent Spectrum Analyzer - Occupied BW RL RF SQ AC SENSE:INT ALIGN AUTO 06:37:15PM Oct 10, 2020 Center Freq 2.43700000 GHz Center Freq: 2.43700000 GHz Radio Std: None Trig: Free Run Avg Hold: >1/1 #IFGain:Low #Atten: 30 dB Radio Device: BTS		Frequency
	10 dB/div Ref Offset 8.05 dB Mkr1 2.4355 GHz Ref 20.00 dBm -6.1400 dBm 		Center Freq 2.43700000 GHz
	Center 2.437 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms		CF Step 3.000000 MHz Auto Man
	Occupied Bandwidth Total Power 10.9 dBm 14.166 MHz Transmit Freq Error -43.914 kHz OBW Power 99.00 % x dB Bandwidth 10.11 MHz x dB -6.00 dB		Freq Offset 0 Hz

11B/HCH	Agilent Spectrum Analyzer - Occupied BW RL RF SQ AC SENSE:INT ALIGN AUTO 06:39:09PM Oct 10, 2020 Center Freq 2.46200000 GHz Center Freq: 2.46200000 GHz Radio Std: None Trig: Free Run Avg Hold: 1/1 #IFGain:Low #Atten: 30 dB Radio Device: BTS		Frequency
	10 dB/div Ref Offset 8.05 dB Mkr1 2.4605 GHz Ref 20.00 dBm -6.9791 dBm 		Center Freq 2.46200000 GHz
	Center 2.462 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms		CF Step 3.000000 MHz Auto Man
	Occupied Bandwidth Total Power 10.1 dBm 14.030 MHz Transmit Freq Error 12.364 kHz OBW Power 99.00 % x dB Bandwidth 10.11 MHz x dB -6.00 dB		Freq Offset 0 Hz

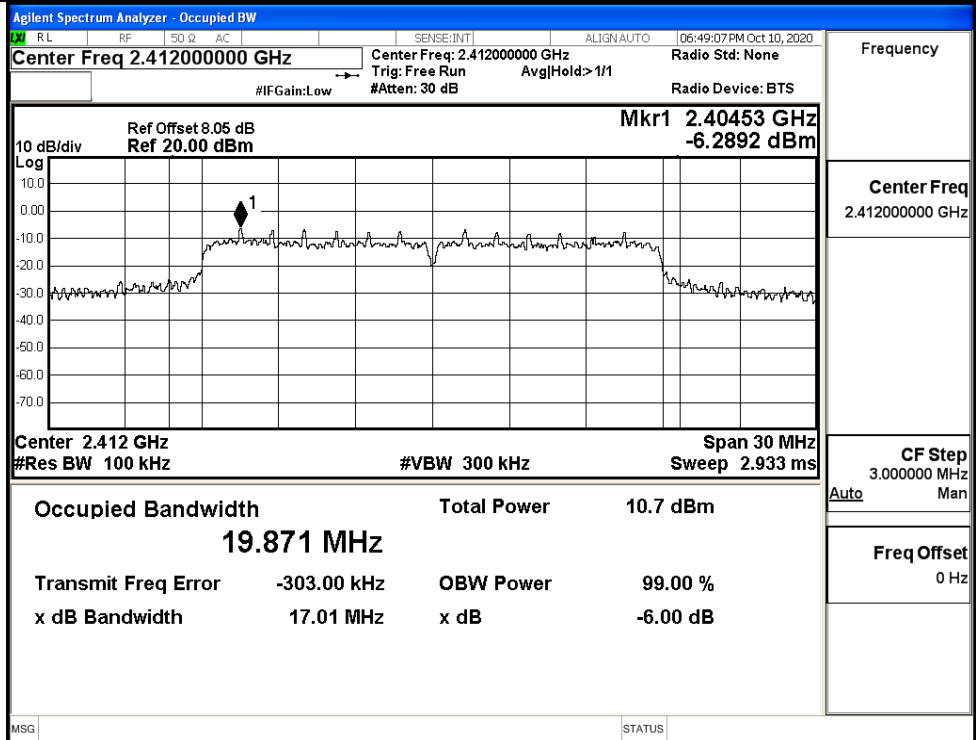


11G/HCH



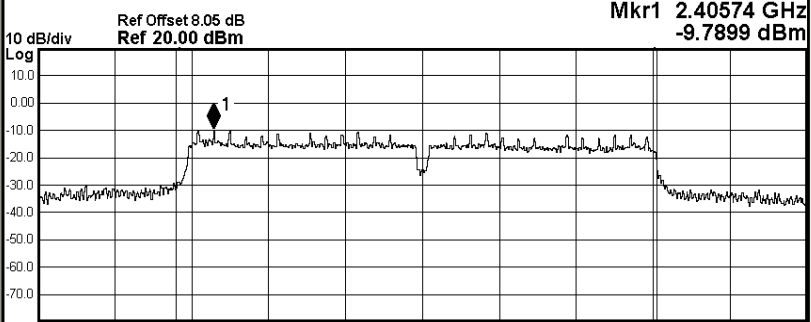
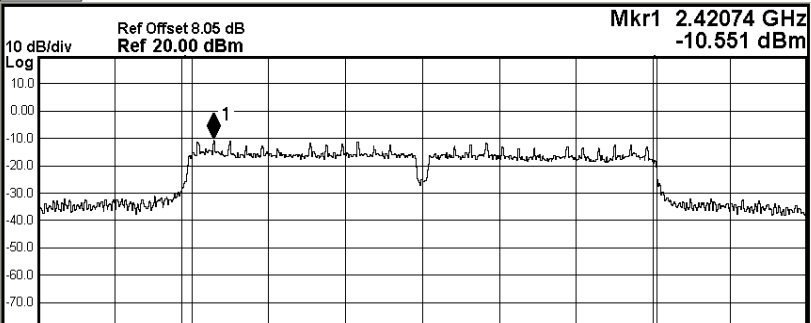
Frequency
Center Freq
2.46200000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz

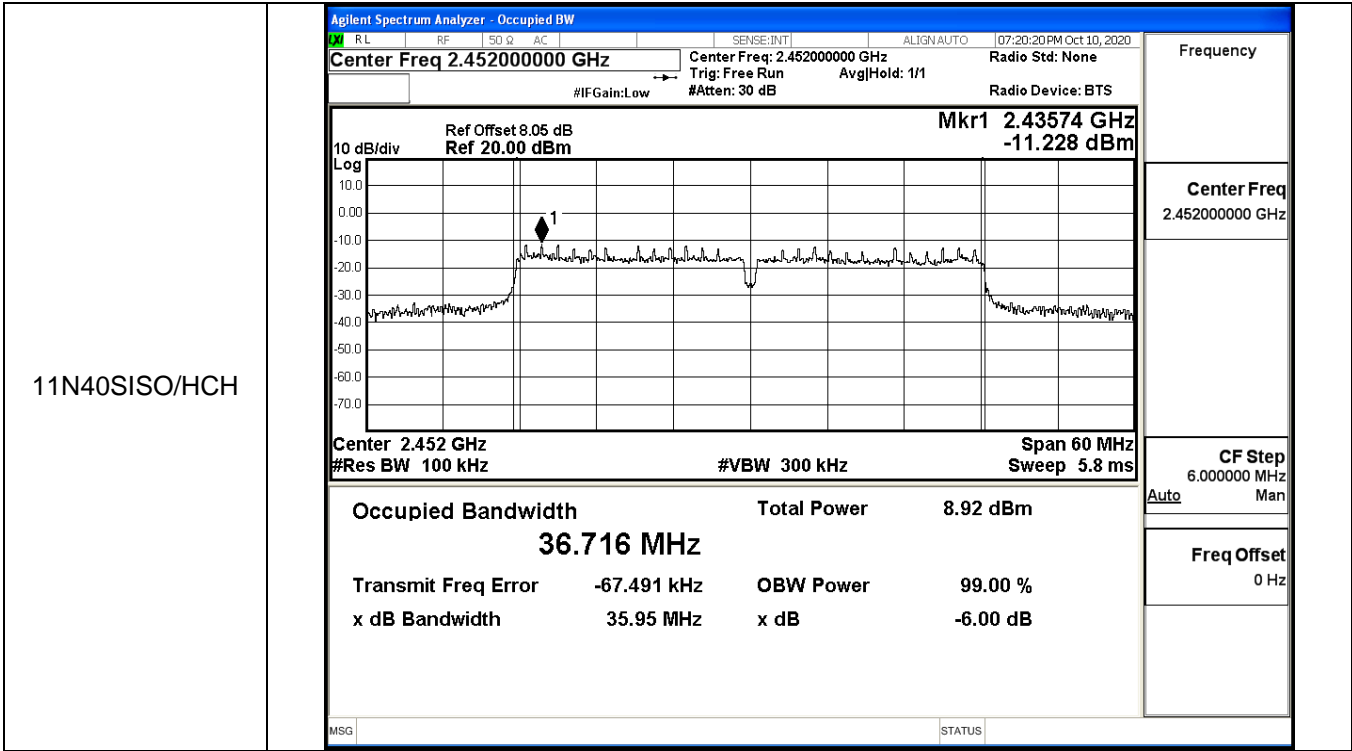
11N20SISO/LCH



Frequency
Center Freq
2.41200000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz

<p>11N20SISO/MCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>RL RF SO Q AC SENSE:INT ALIGN AUTO 06:51:45PM Oct 10, 2020</p> <p>Center Freq 2.43700000 GHz Center Freq: 2.43700000 GHz Radio Std: None Trig: Free Run AvgHold: 1/1 #IFGain:Low #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref Offset 8.05 dB Mkr1 2.43073 GHz Ref 20.00 dBm -7.9383 dBm</p> <p>Center 2.437 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 19.037 MHz Total Power 9.56 dBm</p> <p>Transmit Freq Error -146.14 kHz OBW Power 99.00 % x dB Bandwidth 17.30 MHz x dB -6.00 dB</p> <p>MSG STATUS</p>	<p>Frequency</p> <p>Center Freq 2.43700000 GHz</p> <p>CF Step 3.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
<p>11N20SISO/HCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>RL RF SO Q AC SENSE:INT ALIGN AUTO 07:04:10PM Oct 10, 2020</p> <p>Center Freq 2.46200000 GHz Center Freq: 2.46200000 GHz Radio Std: None Trig: Free Run AvgHold: 1/1 #IFGain:Low #Atten: 30 dB Radio Device: BTS</p> <p>10 dB/div Ref Offset 8.05 dB Mkr1 2.4545 GHz Ref 20.00 dBm -8.5310 dBm</p> <p>Center 2.462 GHz Span 30 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms</p> <p>Occupied Bandwidth 18.572 MHz Total Power 8.71 dBm</p> <p>Transmit Freq Error 88.984 kHz OBW Power 99.00 % x dB Bandwidth 17.08 MHz x dB -6.00 dB</p> <p>MSG STATUS</p>	<p>Frequency</p> <p>Center Freq 2.46200000 GHz</p> <p>CF Step 3.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>

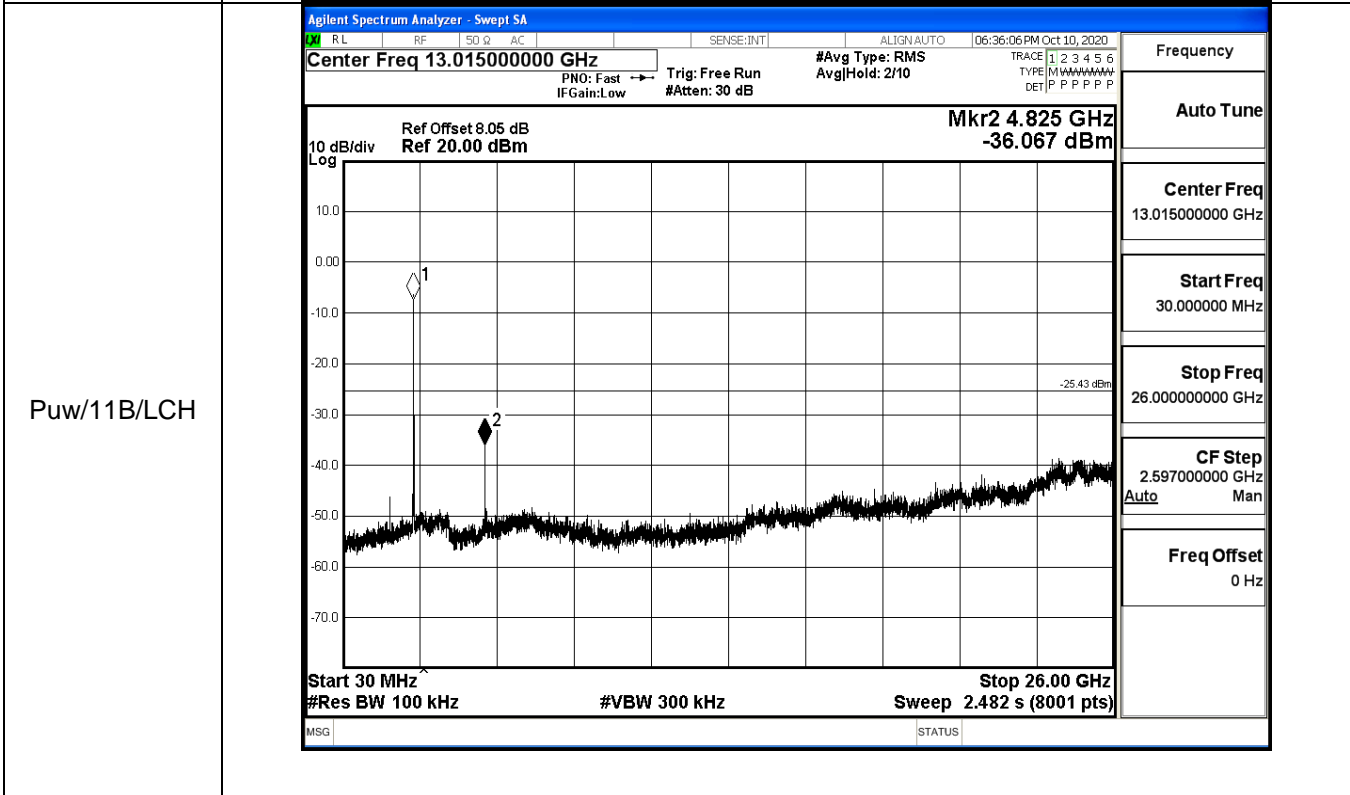
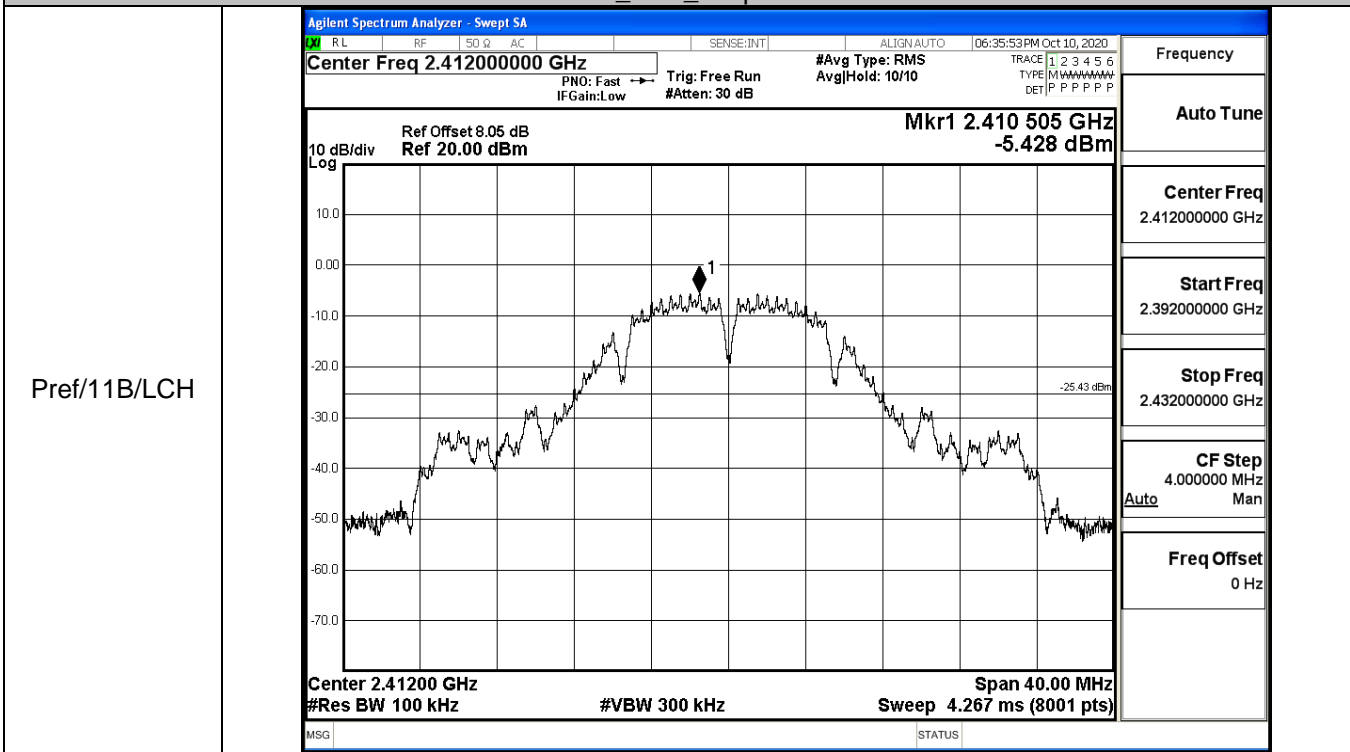
<p>11N40SISO/LCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>RL RF 50 Ω AC SENSE:INT ALIGN AUTO 07:09:08 PM Oct 10, 2020</p> <p>Center Freq 2.42200000 GHz Center Freq: 2.42200000 GHz Radio Std: None Trig: Free Run Avg Hold: 1/1 Radio Device: BTS #IFGain:Low #Atten: 30 dB</p> <p>10 dB/div Ref Offset 8.05 dB Mkr1 2.40574 GHz Ref 20.00 dBm -9.7899 dBm</p>  <p>Center 2.422 GHz Span 60 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 5.8 ms</p> <p>Occupied Bandwidth Total Power 10.2 dBm 37.489 MHz</p> <p>Transmit Freq Error -449.32 kHz OBW Power 99.00 % x dB Bandwidth 35.79 MHz x dB -6.00 dB</p> <p>MSG STATUS</p>	<p>Frequency</p> <p>Center Freq 2.42200000 GHz</p> <p>CF Step 6.000000 MHz Auto Man</p> <p>Freq Offset 0 Hz</p>
	<p>11N40SISO/MCH</p>	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>RL RF 50 Ω AC SENSE:INT ALIGN AUTO 07:18:32 PM Oct 10, 2020</p> <p>Center Freq 2.43700000 GHz Center Freq: 2.43700000 GHz Radio Std: None Trig: Free Run Avg Hold: 1/1 Radio Device: BTS #IFGain:Low #Atten: 30 dB</p> <p>10 dB/div Ref Offset 8.05 dB Mkr1 2.42074 GHz Ref 20.00 dBm -10.551 dBm</p>  <p>Center 2.437 GHz Span 60 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 5.8 ms</p> <p>Occupied Bandwidth Total Power 9.51 dBm 37.027 MHz</p> <p>Transmit Freq Error -222.00 kHz OBW Power 99.00 % x dB Bandwidth 35.80 MHz x dB -6.00 dB</p> <p>MSG STATUS</p>



A.5 RF Conducted Spurious Emissions

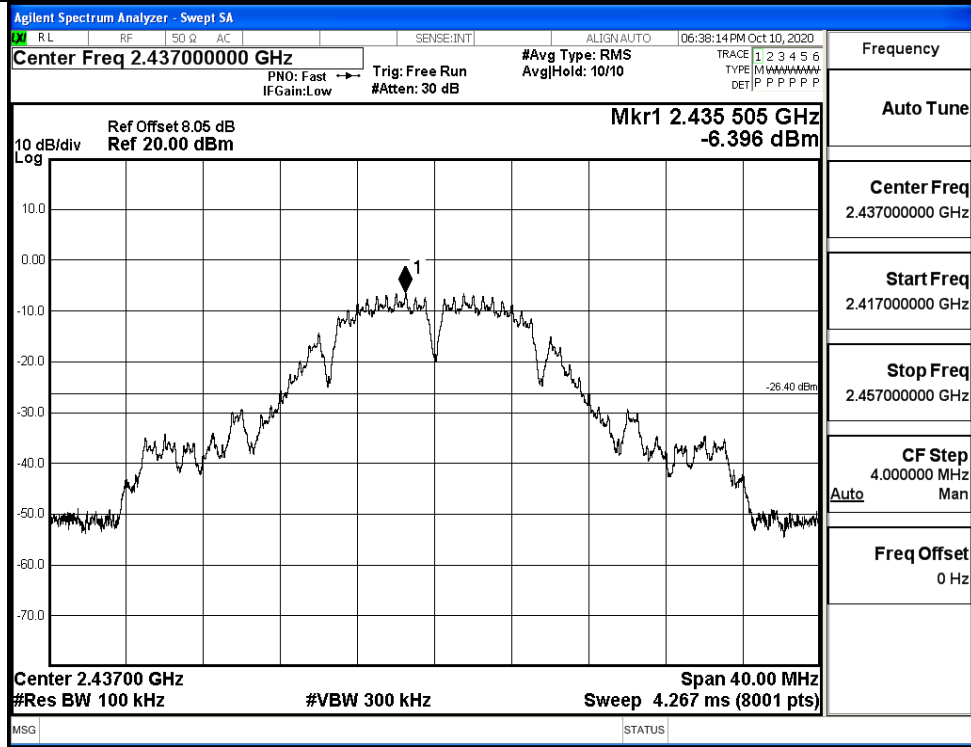
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
11B	LCH	-5.428	-36.067	-25.428	PASS
	MCH	-6.396	-35.680	-26.396	PASS
	HCH	-7.235	-37.274	-27.235	PASS
11G	LCH	-7.556	-38.222	-27.556	PASS
	MCH	-7.901	-38.481	-27.901	PASS
	HCH	-9.57	-37.484	-29.570	PASS
11N20 SISO	LCH	-6.591	-37.962	-26.591	PASS
	MCH	-8.09	-38.462	-28.090	PASS
	HCH	-8.637	-38.957	-28.637	PASS
11N40 SISO	LCH	-9.953	-37.634	-29.953	PASS
	MCH	-10.872	-37.836	-30.872	PASS
	HCH	-11.339	-38.162	-31.339	PASS

11B_LCH_Graphs

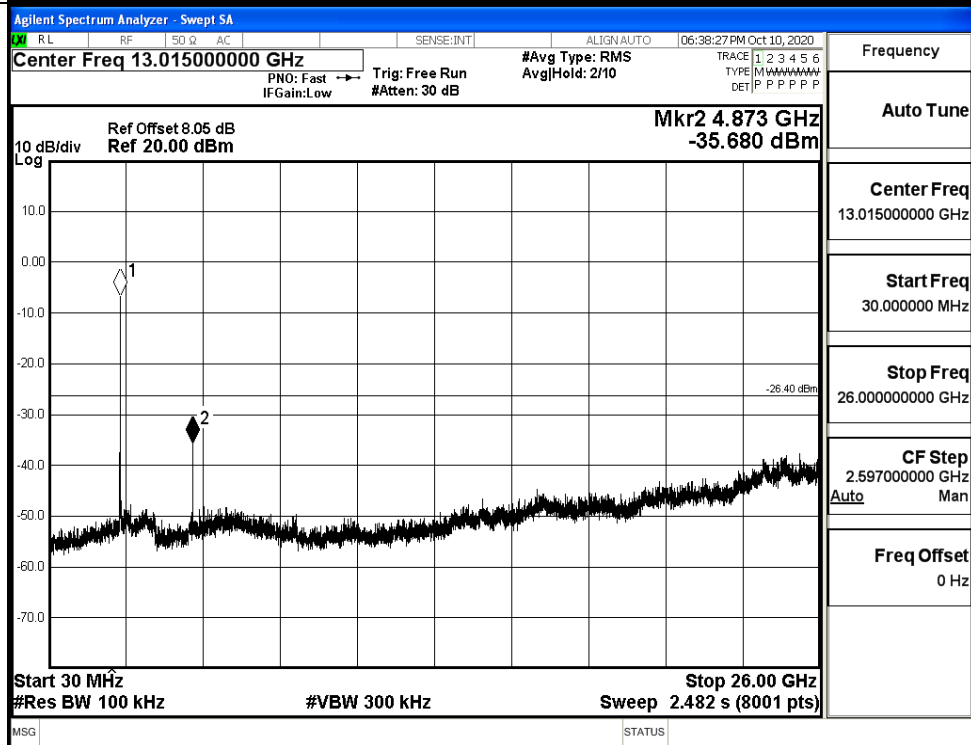


11B_MCH_Graphs

Pref/11B/MCH

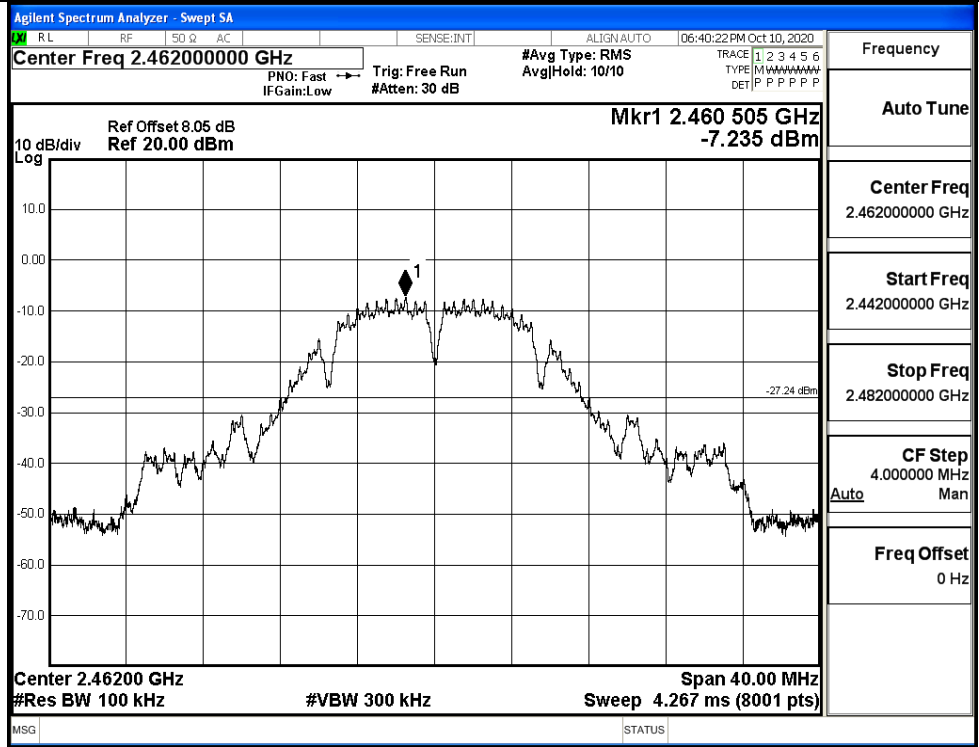


Puw/11B/MCH

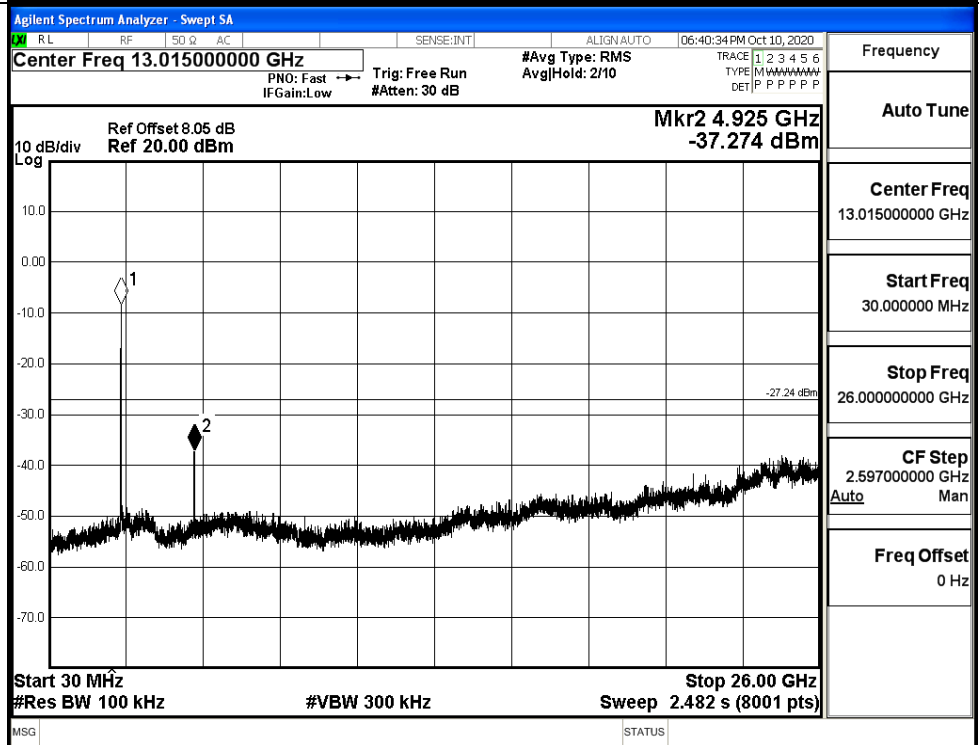


11B_HCH_Graphs

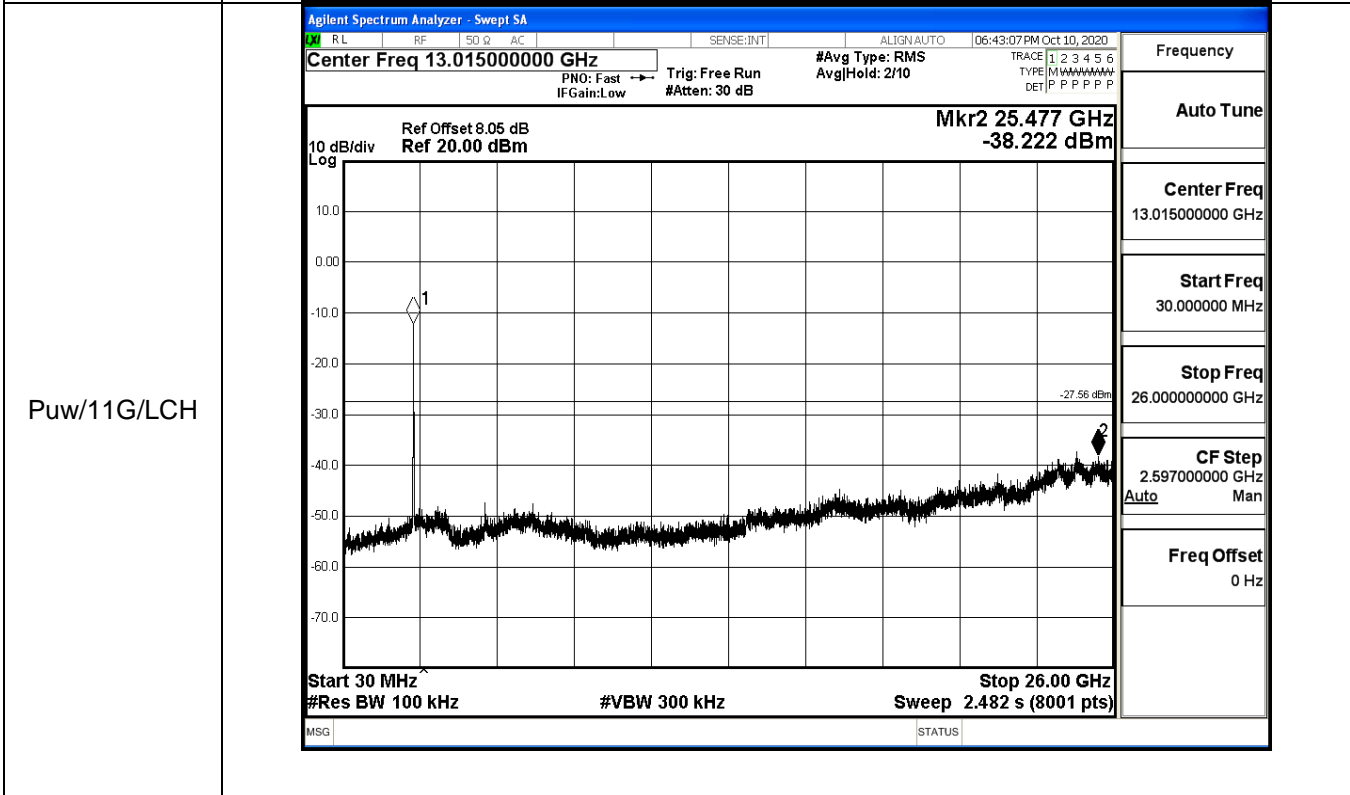
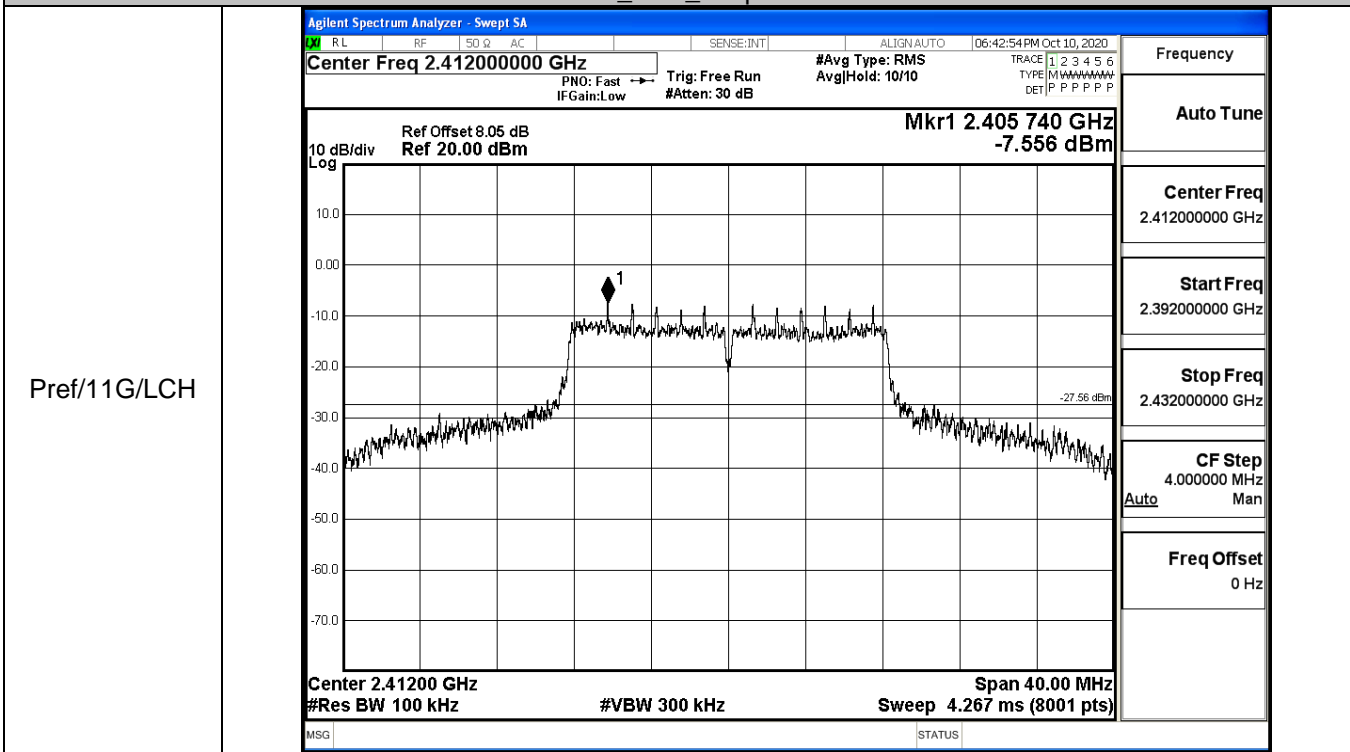
Pref/11B/HCH



Puw/11B/HCH

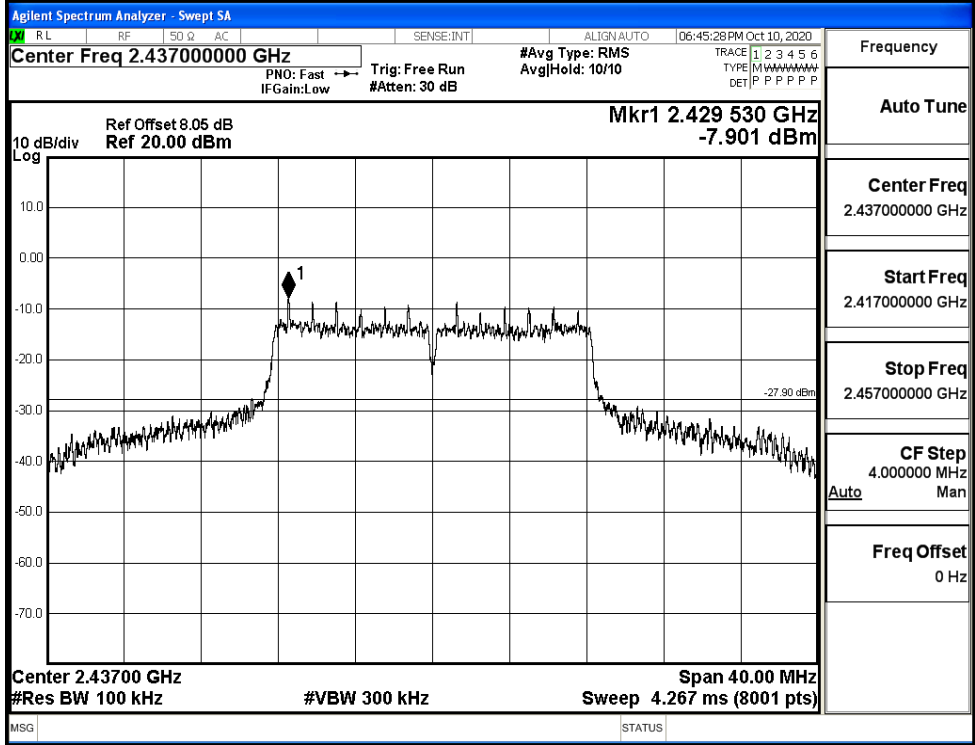


11G_LCH_Graphs

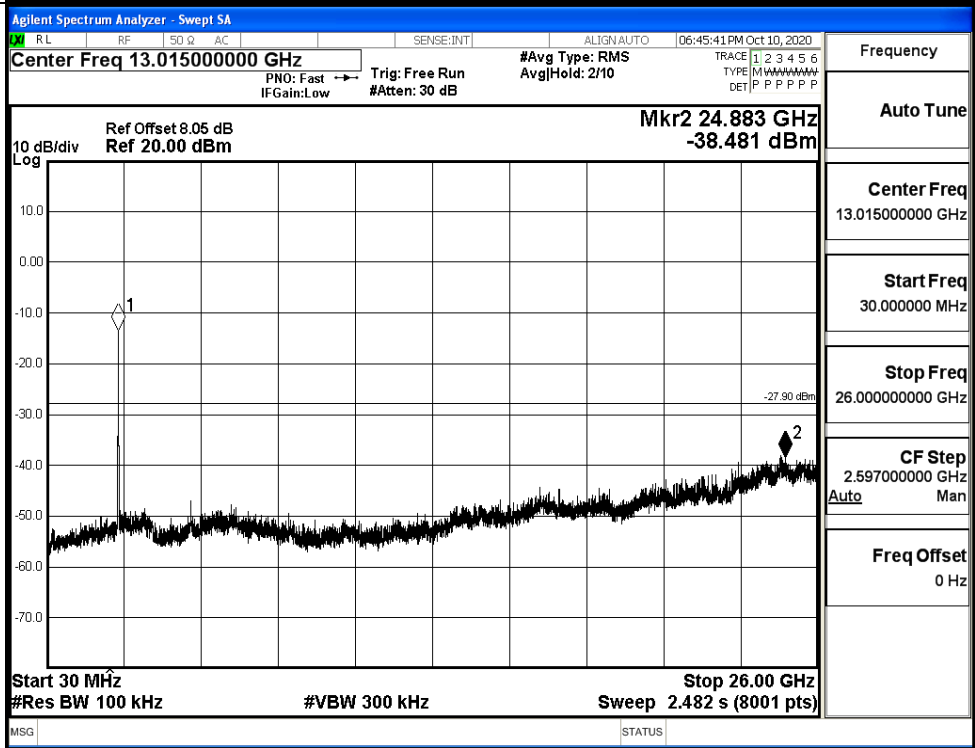


11G_MCH_Graphs

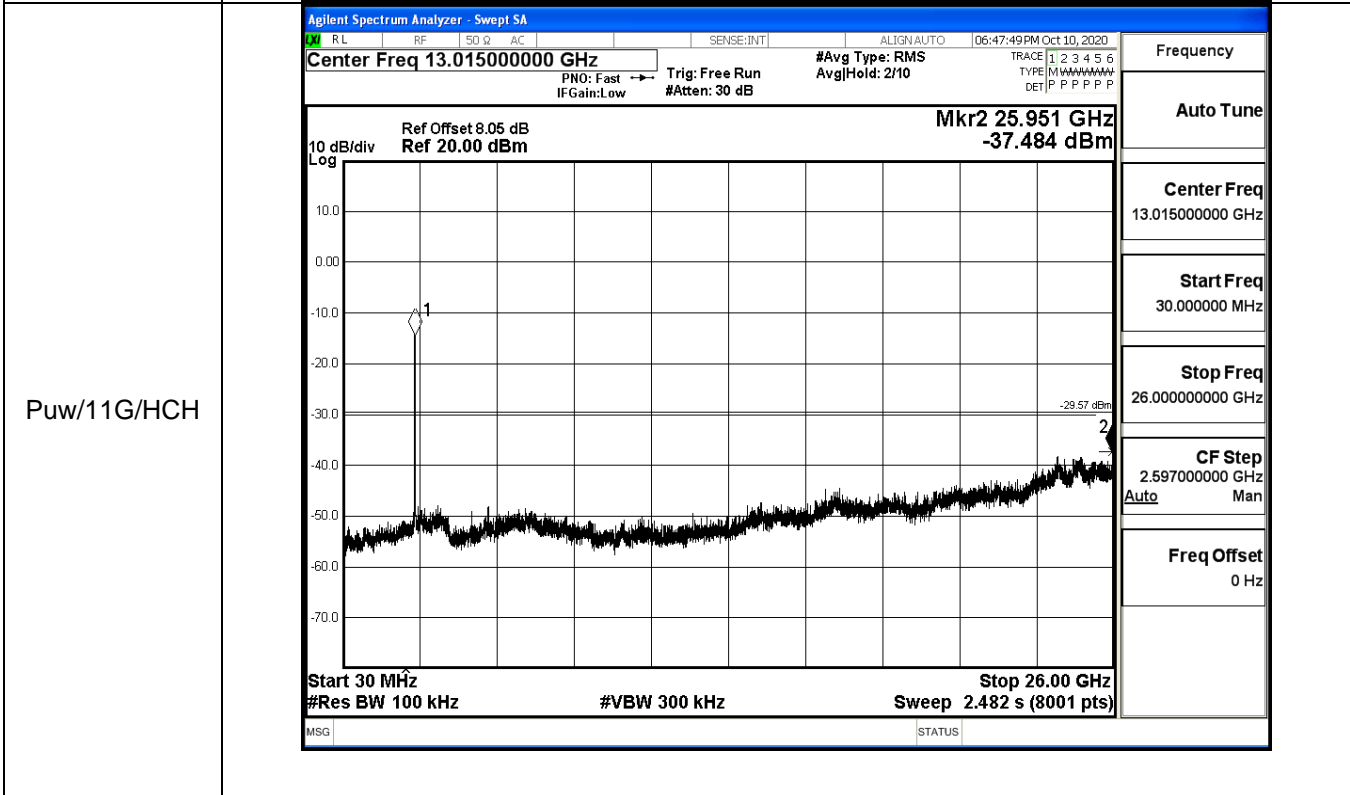
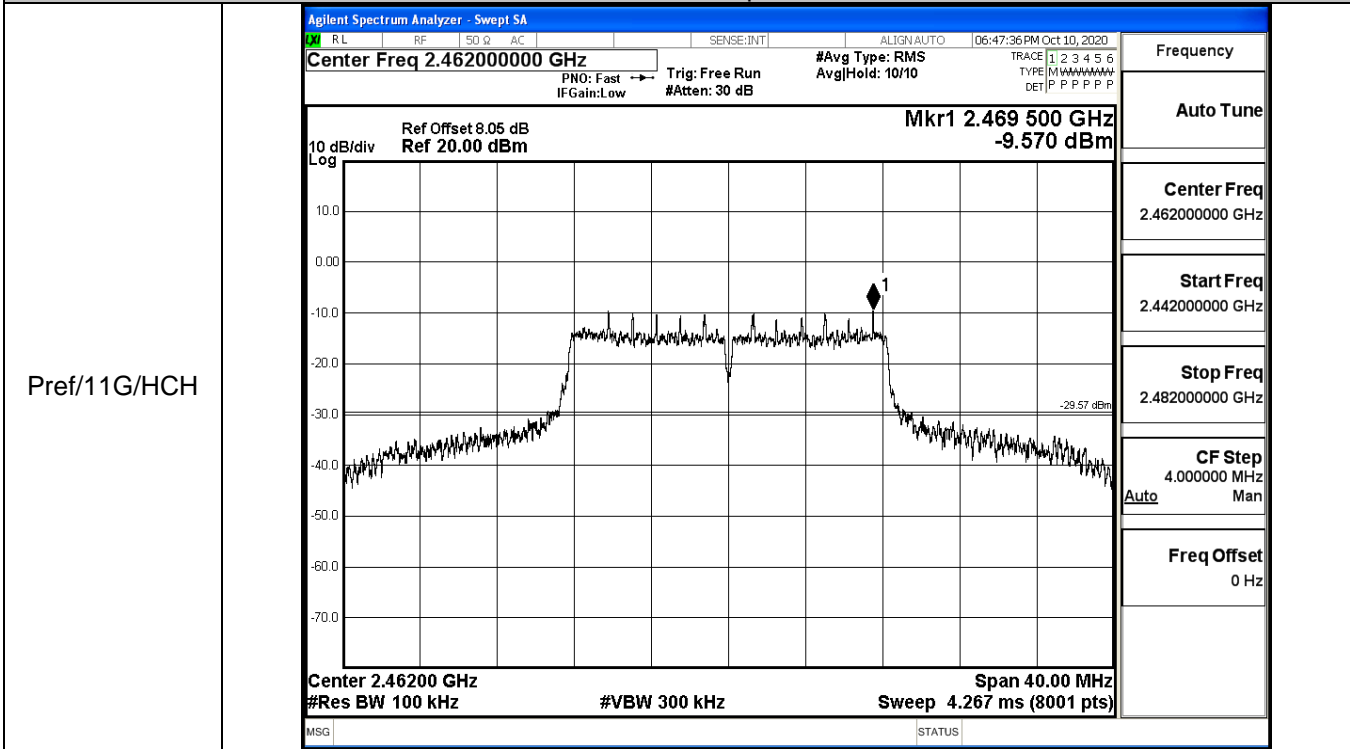
Pref/11G/MCH



Puw/11G/MCH

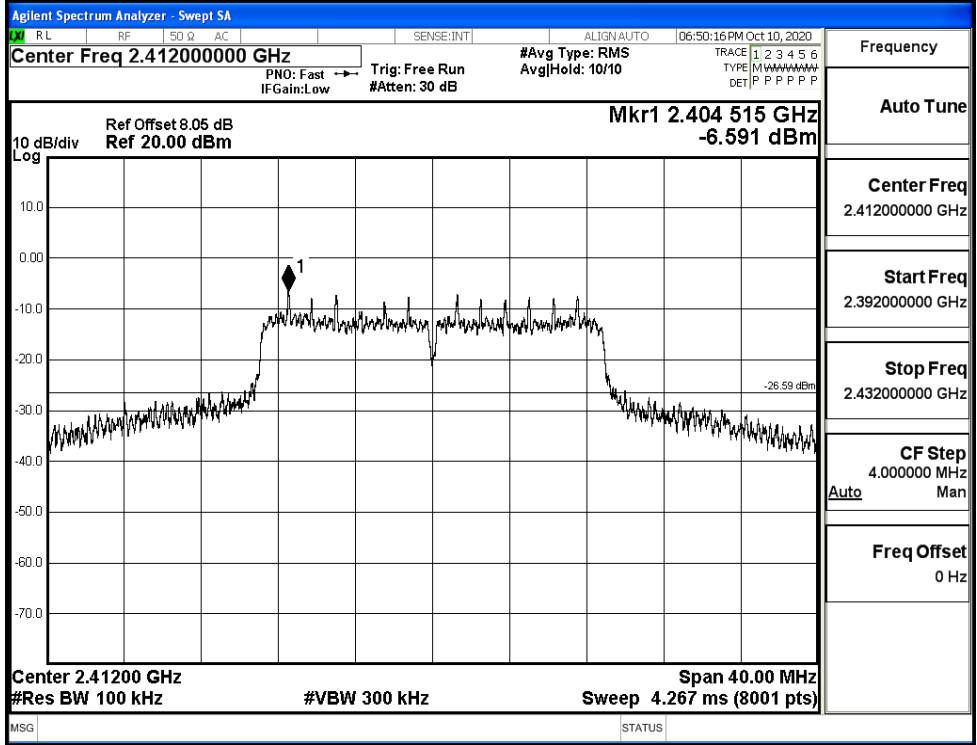


11G_HCH_Graphs

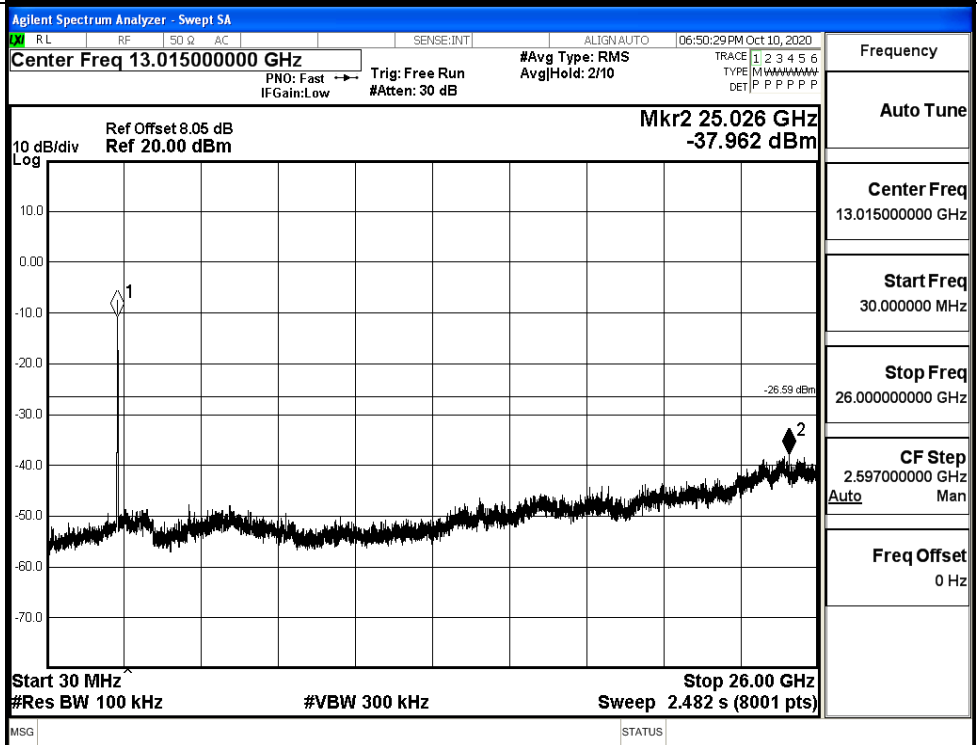


11N20SISO_LCH_Graphs

Pref/11N20SIS
O/LCH



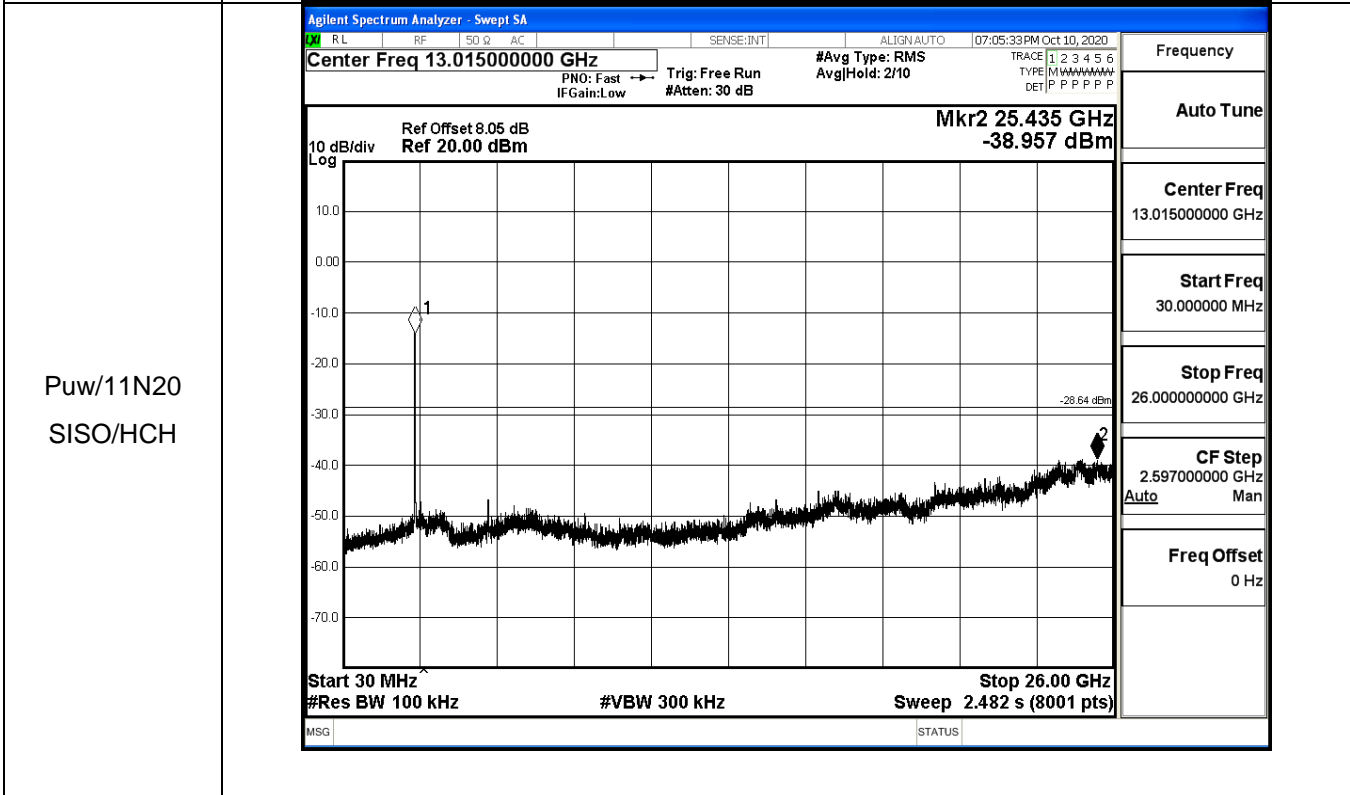
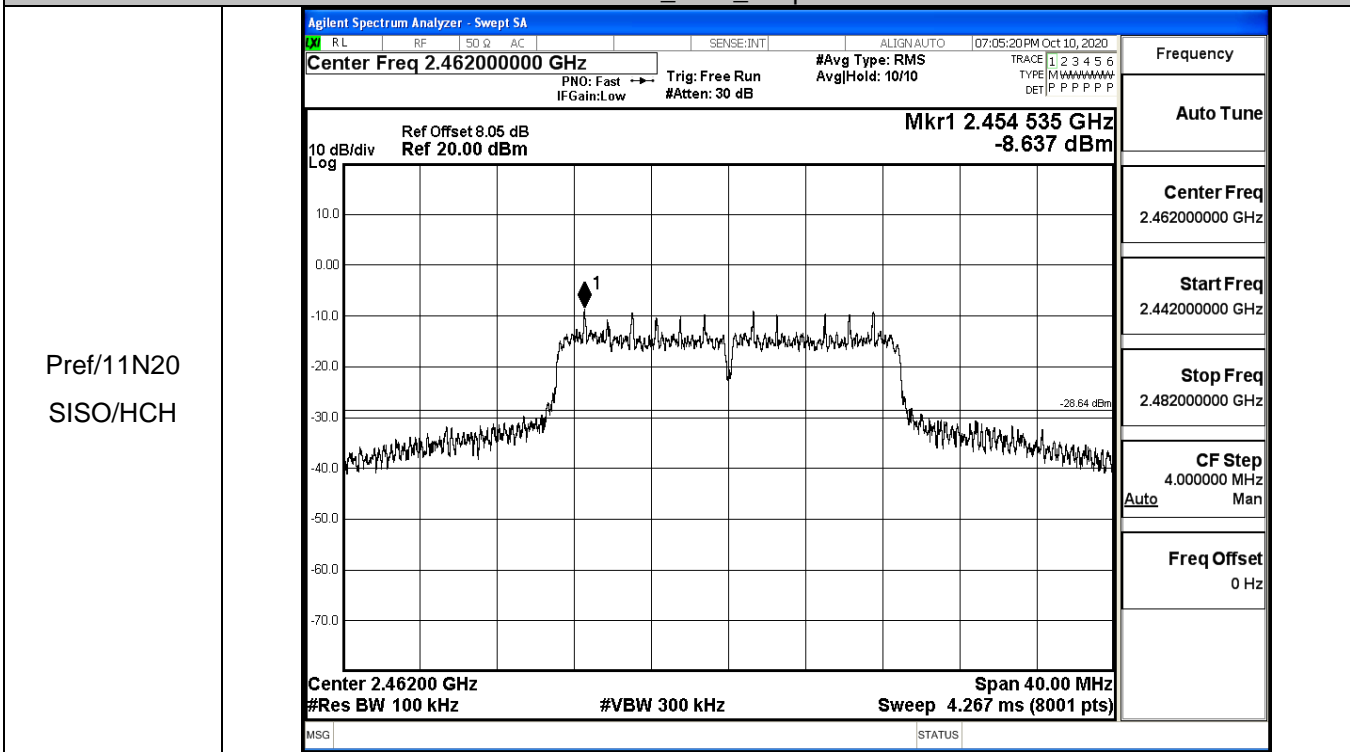
Puw/11N20
SISO/LCH



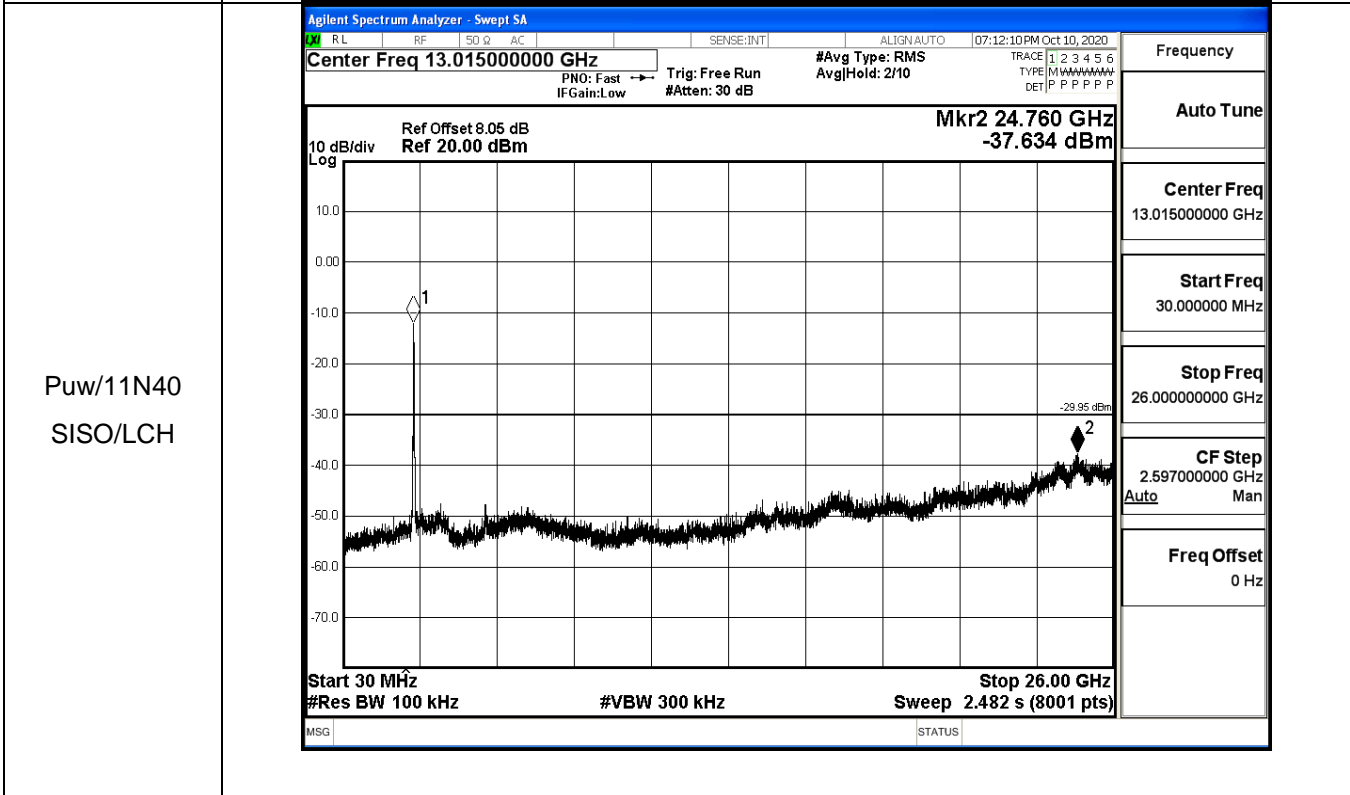
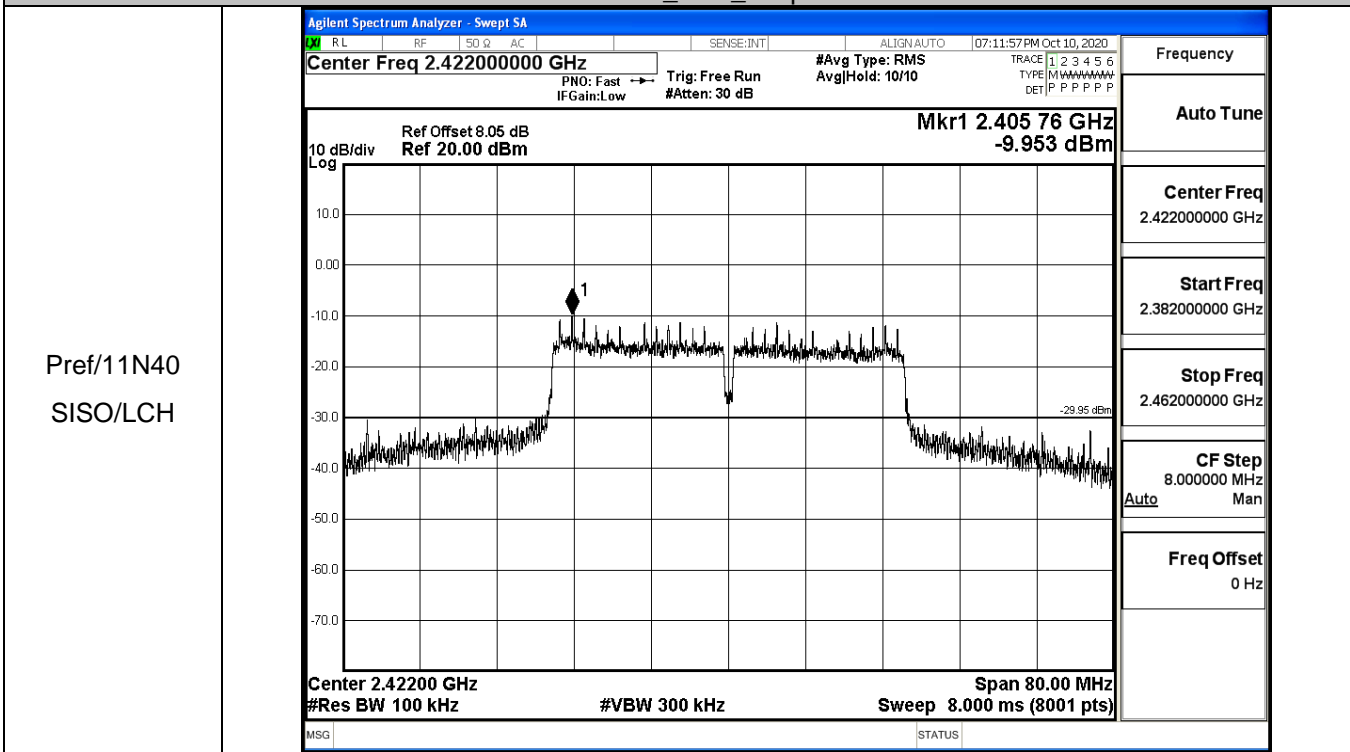
11N20SISO_MCH_Graphs

<p>Pref/11N20 SISO/MCH</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.43700000 GHz #Avg Type: RMS AvgHold: 10/10 Mkr1 2.429 550 GHz -8.090 dBm Ref Offset 8.05 dB Ref 20.00 dBm 10 dB/div Log Center 2.43700 GHz #Res BW 100 kHz #VBW 300 kHz Span 40.00 MHz Sweep 4.267 ms (8001 pts)</p>	<p>Frequency Auto Tune Center Freq 2.437000000 GHz Start Freq 2.417000000 GHz Stop Freq 2.457000000 GHz CF Step 4.000000 MHz Auto Man Freq Offset 0 Hz</p>
<p>Puw/11N20 SISO/MCH</p>	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 13.01500000 GHz #Avg Type: RMS AvgHold: 2/10 Mkr2 24.068 GHz -38.462 dBm Ref Offset 8.05 dB Ref 20.00 dBm 10 dB/div Log Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Stop 26.00 GHz Sweep 2.482 s (8001 pts)</p>	<p>Frequency Auto Tune Center Freq 13.015000000 GHz Start Freq 30.000000 MHz Stop Freq 26.000000000 GHz CF Step 2.597000000 GHz Auto Man Freq Offset 0 Hz</p>

11N20SISO_HCH_Graphs

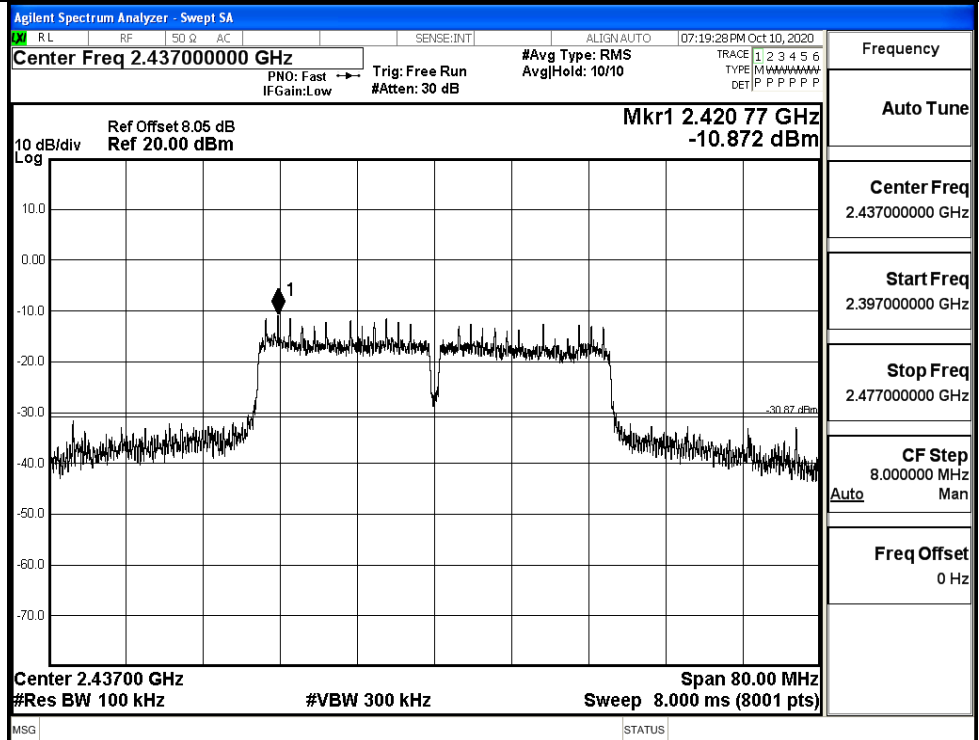


11N40SISO_LCH_Graphs

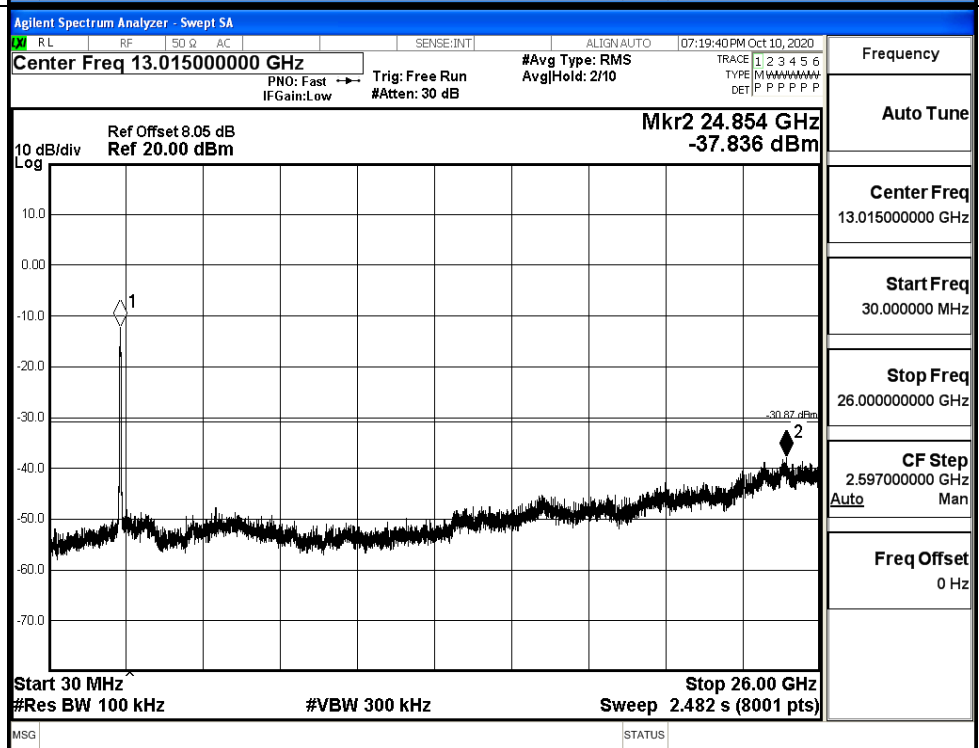


11N40SISO_MCH_Graphs

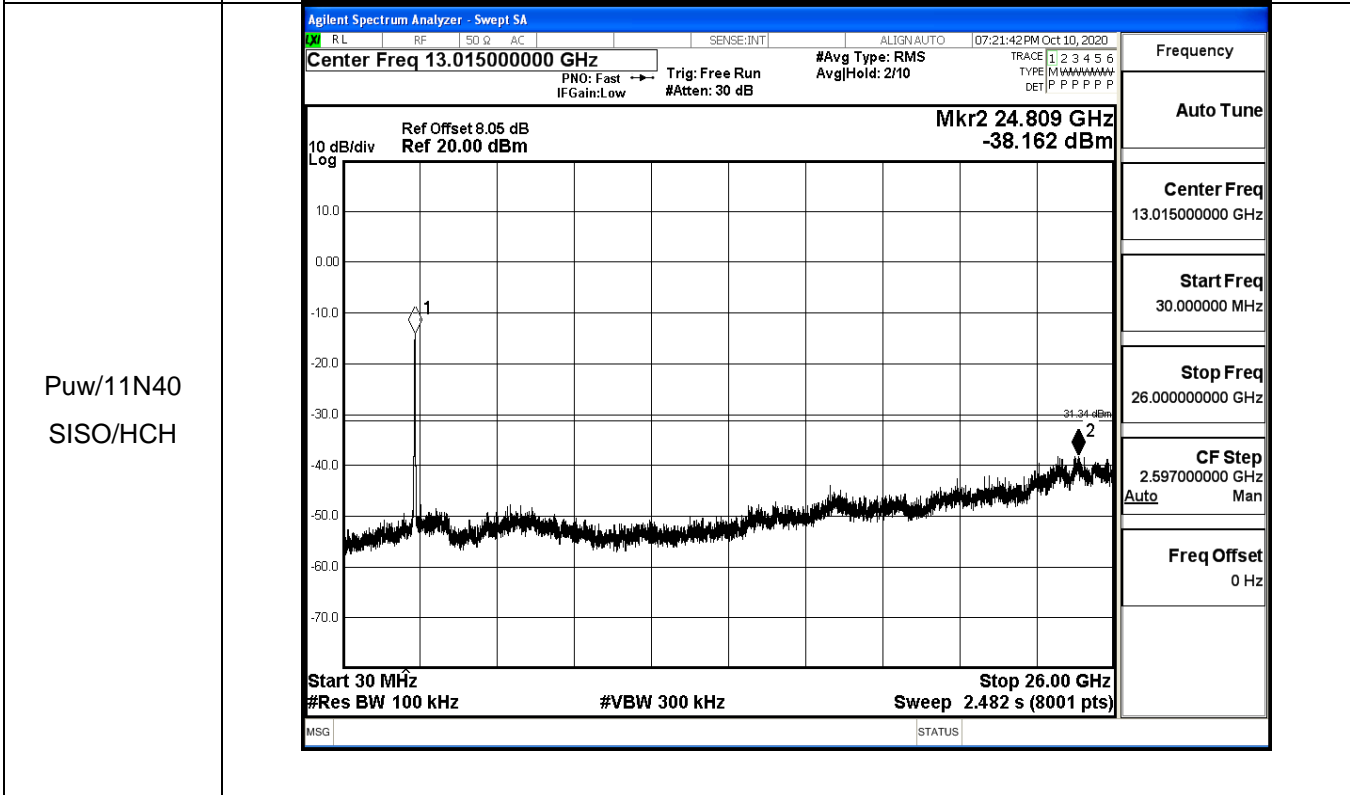
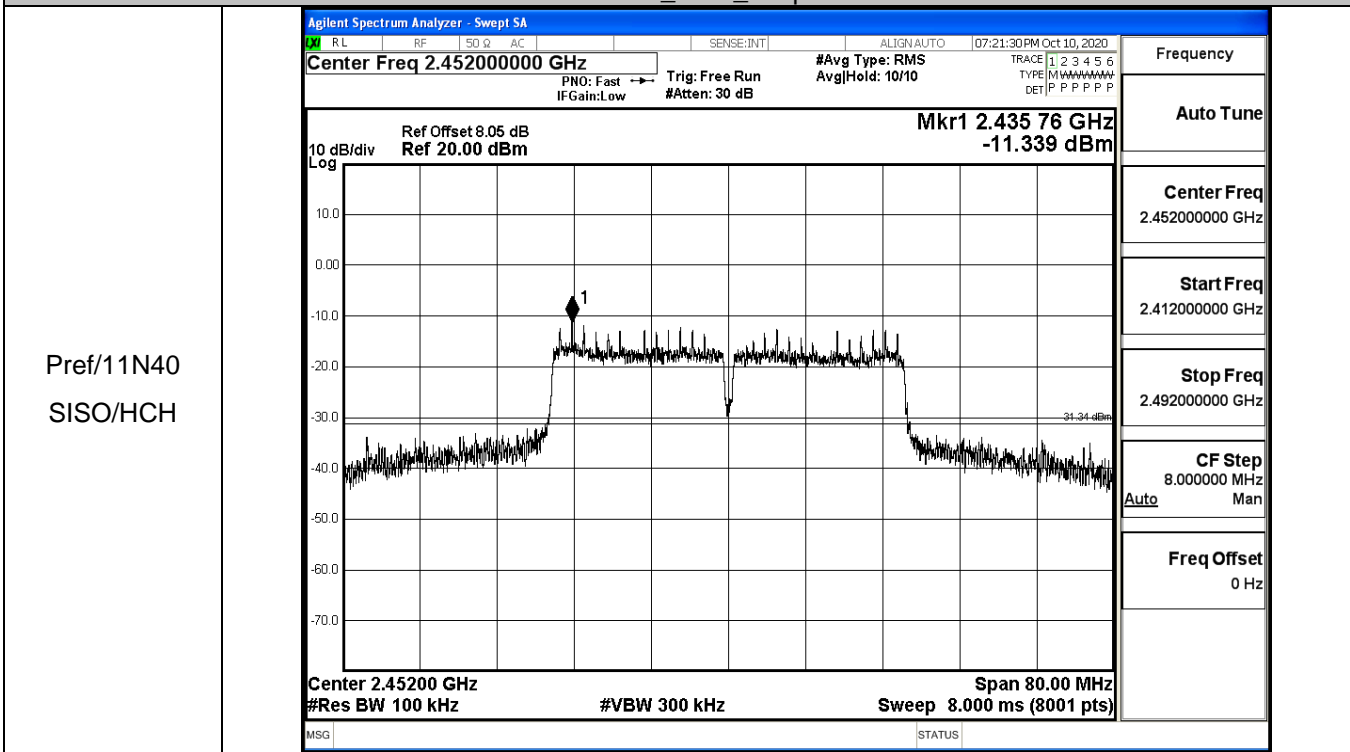
Pref/11N40
SISO/MCH



Puw/11N40
SISO/MCH

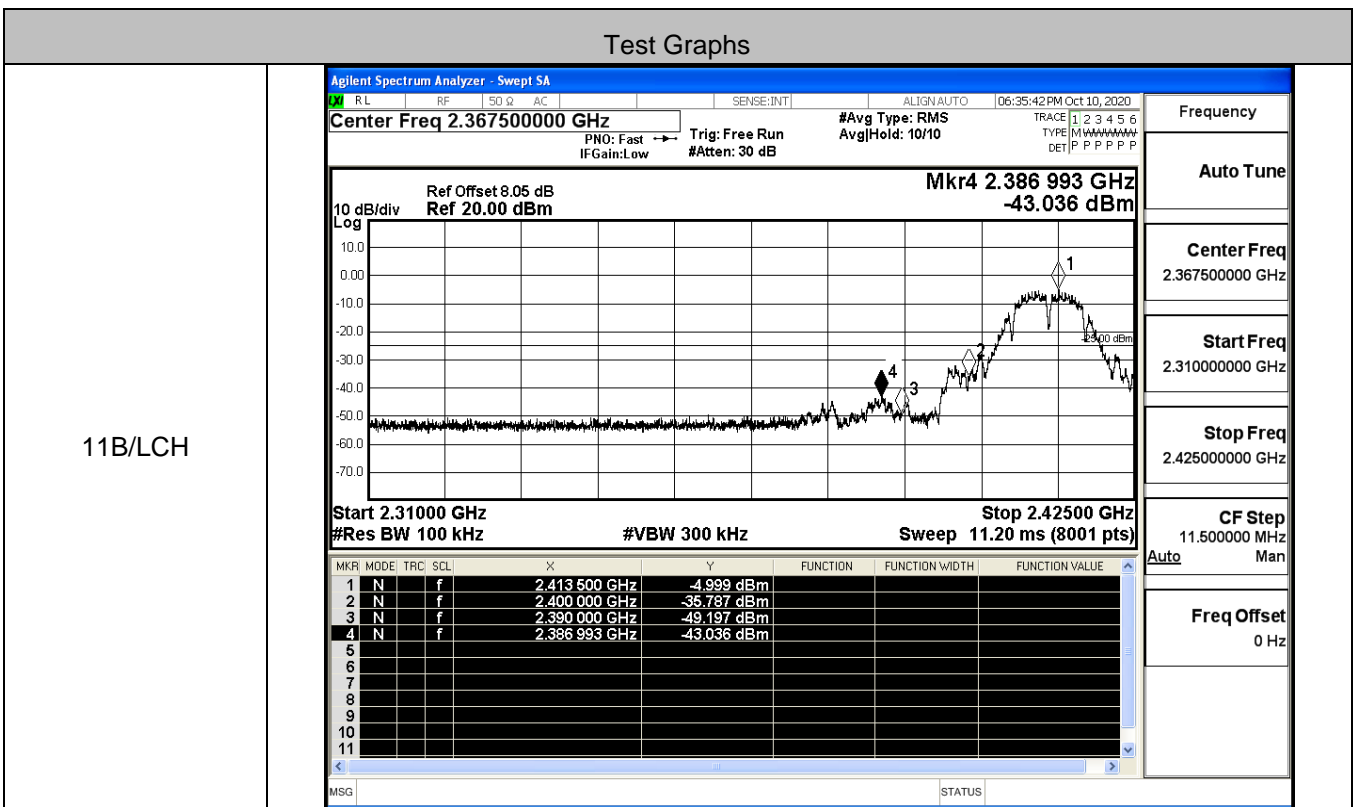


11N40SISO_HCH_Graphs

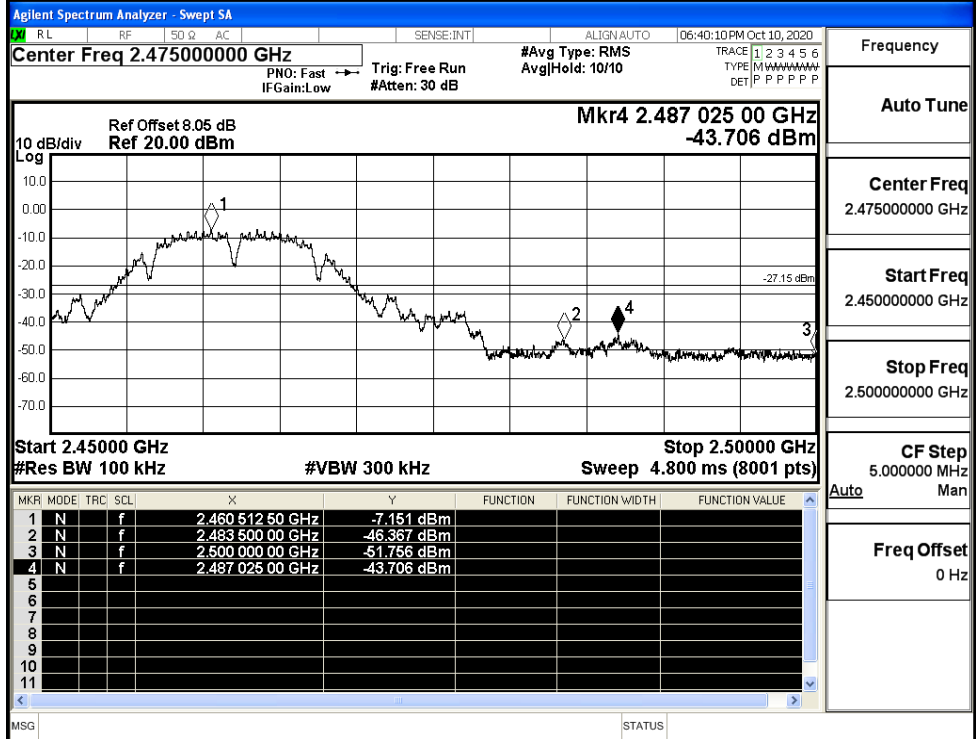


A.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	-4.999	-43.036	-25	PASS
	HCH	-7.151	-43.706	-27.15	PASS
11G	LCH	-7.120	-40.364	-27.12	PASS
	HCH	-9.029	-41.714	-29.03	PASS
11N20SISO	LCH	-7.508	-36.912	-27.51	PASS
	HCH	-9.148	-38.151	-29.15	PASS
11N40SISO	LCH	-10.232	-31.605	-30.23	PASS
	HCH	-11.738	-33.734	-31.74	PASS

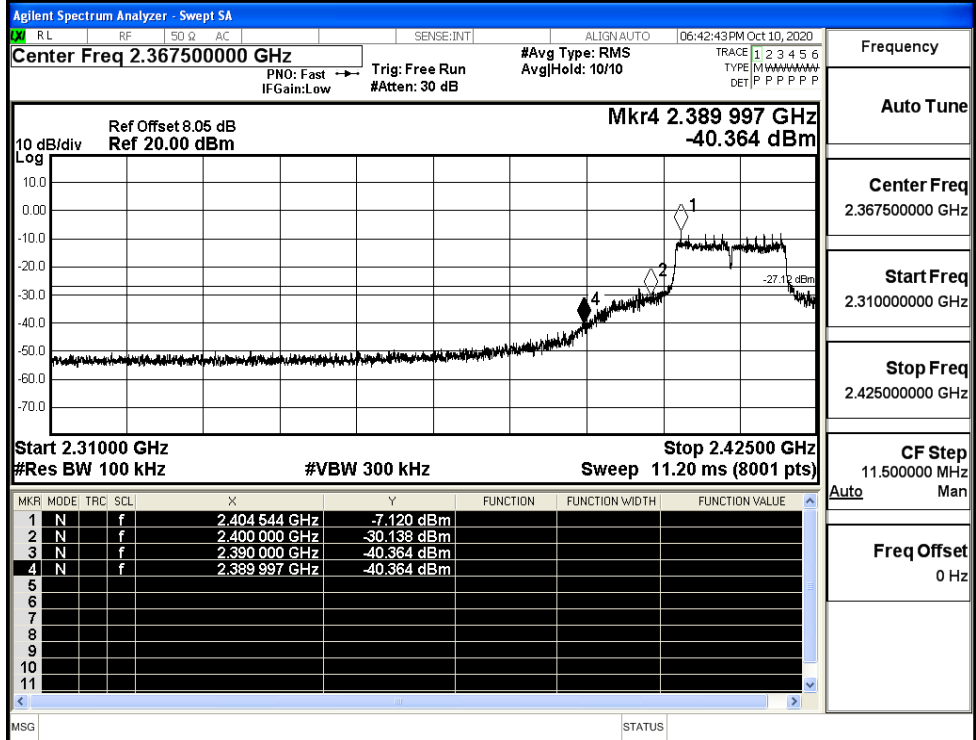


11B/HCH



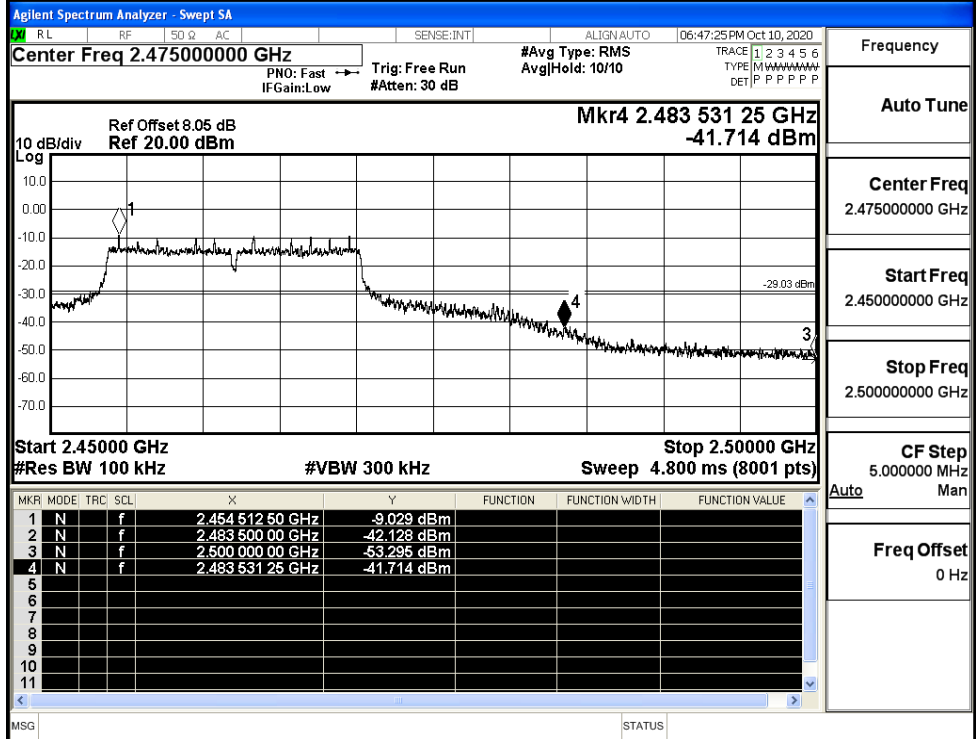
Frequency	2.47500000 GHz
Auto Tune	
Center Freq	2.47500000 GHz
Start Freq	2.45000000 GHz
Stop Freq	2.50000000 GHz
CF Step	5.000000 MHz
Freq Offset	0 Hz

11G/LCH



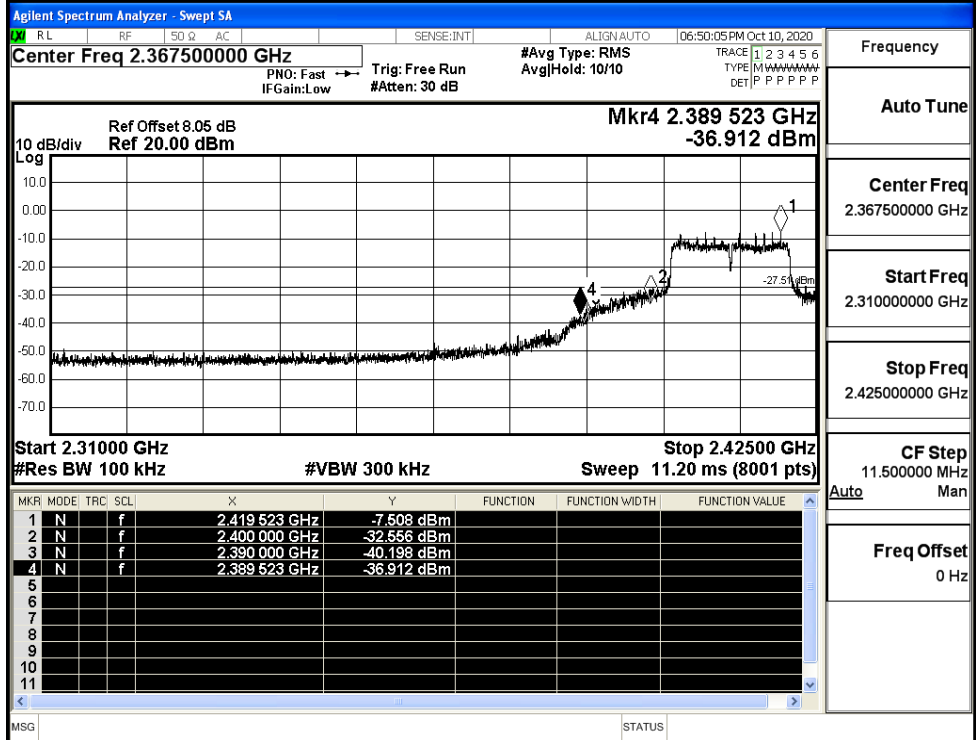
Frequency	2.36750000 GHz
Auto Tune	
Center Freq	2.36750000 GHz
Start Freq	2.31000000 GHz
Stop Freq	2.42500000 GHz
CF Step	11.500000 MHz
Freq Offset	0 Hz

11G/HCH



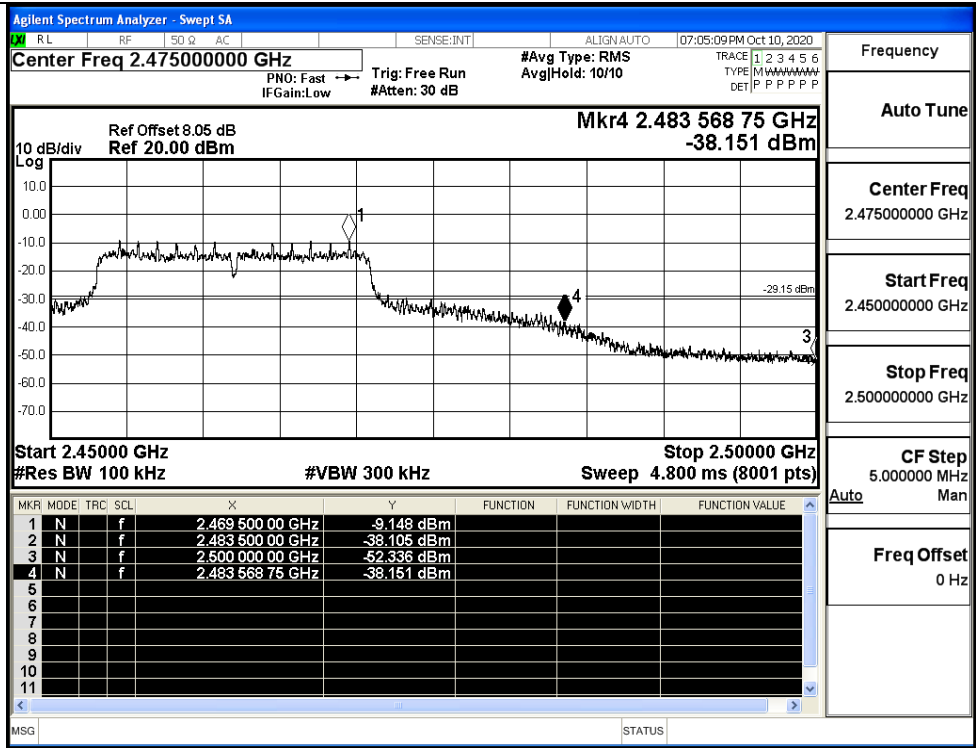
Frequency	2.475000000 GHz
Auto Tune	
Center Freq	2.475000000 GHz
Start Freq	2.450000000 GHz
Stop Freq	2.500000000 GHz
CF Step	5.000000 MHz
Freq Offset	0 Hz

11N20SISO/LCH

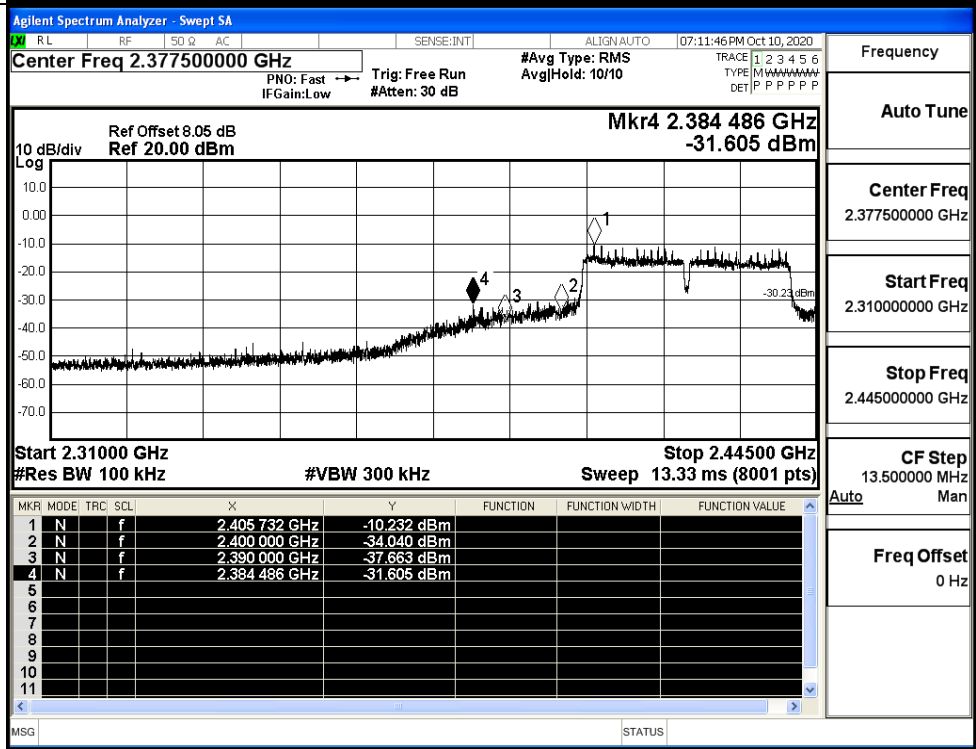


Frequency	2.367500000 GHz
Auto Tune	
Center Freq	2.367500000 GHz
Start Freq	2.310000000 GHz
Stop Freq	2.425000000 GHz
CF Step	11.500000 MHz
Freq Offset	0 Hz

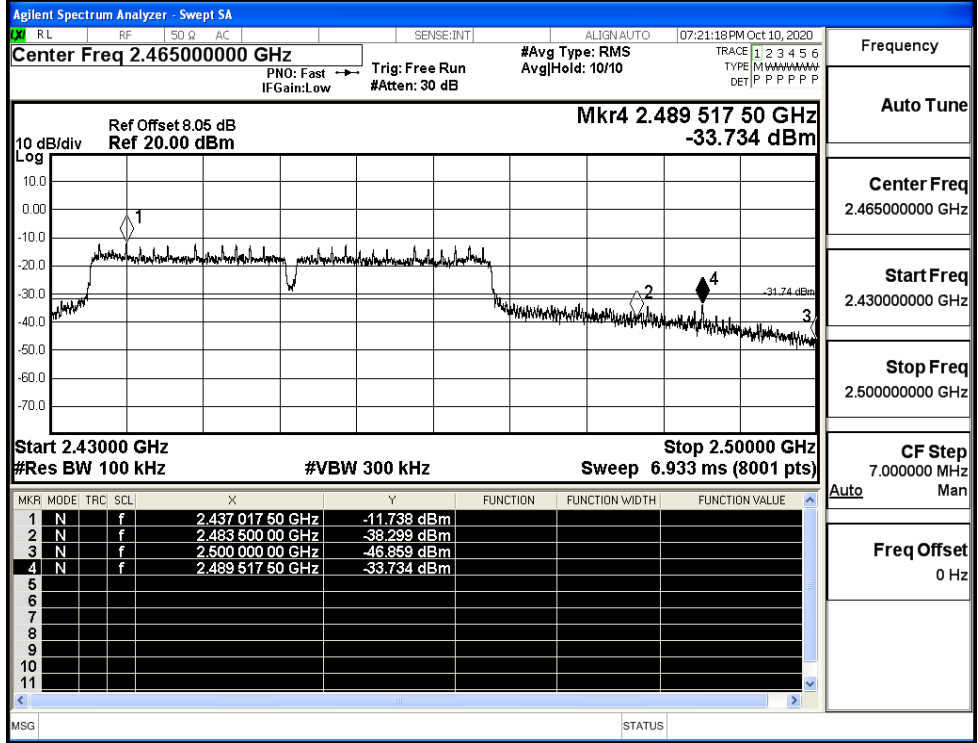
11N20SISO/HCH



11N40SISO/LCH



11N40SISO/HCH



Frequency

Auto Tune

Center Freq
2.46500000 GHz

Start Freq
2.43000000 GHz

Stop Freq
2.50000000 GHz

CF Step
7.000000 MHz

Auto Man

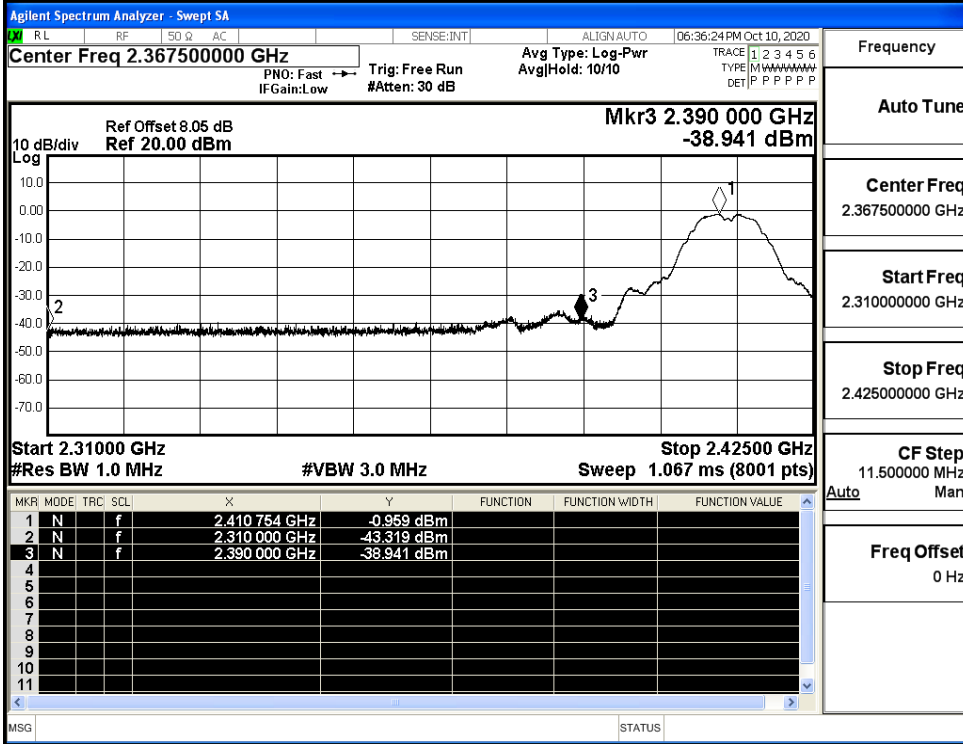
Freq Offset
0 Hz

A.7 Restrict-band band-edge measurements

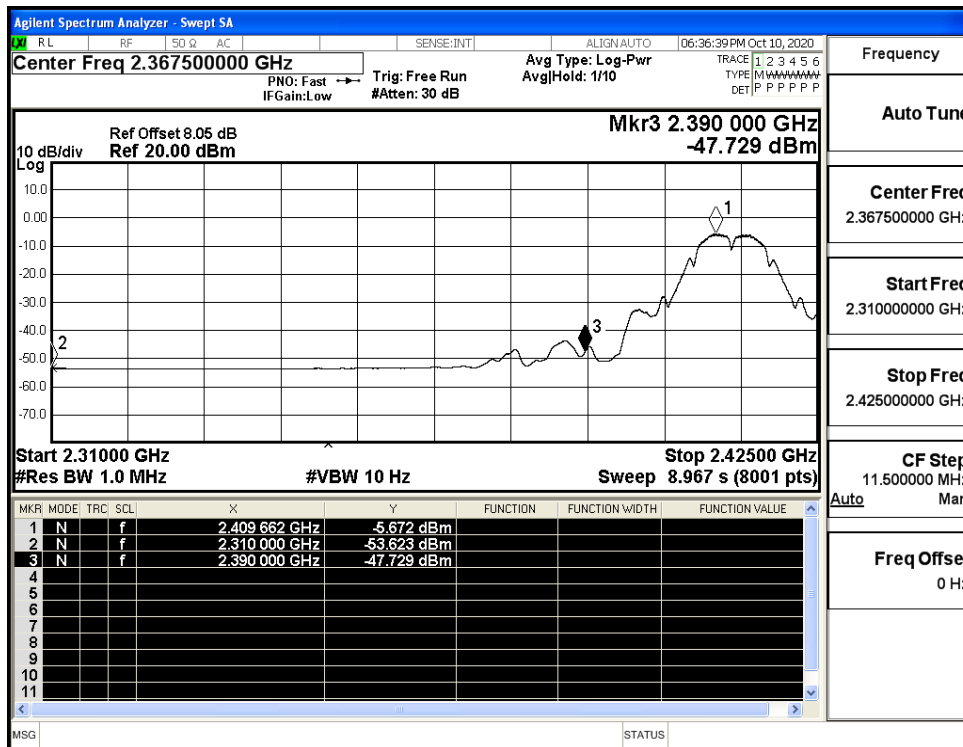
Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBu V/m]	Verdict
11B	2412	Ant1	2310.0	-43.32	3.0	0	54.94	PEAK	74	PASS
	2412	Ant1	2310.0	-53.62	3.0	0	44.64	AV	54	PASS
	2412	Ant1	2390.0	-38.94	3.0	0	59.32	PEAK	74	PASS
	2412	Ant1	2390.0	-47.73	3.0	0	50.53	AV	54	PASS
	2462	Ant1	2483.5	-39.66	3.0	0	58.6	PEAK	74	PASS
	2462	Ant1	2483.5	-47.92	3.0	0	50.34	AV	54	PASS
	2462	Ant1	2500.0	-42.72	3.0	0	55.54	PEAK	74	PASS
	2462	Ant1	2500.0	-52.59	3.0	0	45.67	AV	54	PASS
11G	2412	Ant1	2310.0	-42.38	3.0	0	55.88	PEAK	74	PASS
	2412	Ant1	2310.0	-53.49	3.0	0	44.77	AV	54	PASS
	2412	Ant1	2390.0	-27.49	3.0	0	70.77	PEAK	74	PASS
	2412	Ant1	2390.0	-44.57	3.0	0	53.69	AV	54	PASS
	2462	Ant1	2483.5	-31.11	3.0	0	67.15	PEAK	74	PASS
	2462	Ant1	2483.5	-46.31	3.0	0	51.95	AV	54	PASS
	2462	Ant1	2500.0	-40.24	3.0	0	58.02	PEAK	74	PASS
	2462	Ant1	2500.0	-52.03	3.0	0	46.23	AV	54	PASS
11N20 SISO	2412	Ant1	2310.0	-42.35	3.0	0	55.91	PEAK	74	PASS
	2412	Ant1	2310.0	-53.51	3.0	0	44.75	AV	54	PASS
	2412	Ant1	2390.0	-24.88	3.0	0	73.38	PEAK	74	PASS
	2412	Ant1	2390.0	-44.71	3.0	0	53.55	AV	54	PASS
	2462	Ant1	2483.5	-27.99	3.0	0	70.27	PEAK	74	PASS
	2462	Ant1	2483.5	-44.98	3.0	0	53.28	AV	54	PASS
	2462	Ant1	2500.0	-41.30	3.0	0	56.96	PEAK	74	PASS
	2462	Ant1	2500.0	-51.78	3.0	0	46.48	AV	54	PASS
11N40 SISO	2422	Ant1	2310.0	-43.37	3.0	0	54.89	PEAK	74	PASS
	2422	Ant1	2310.0	-53.43	3.0	0	44.83	AV	54	PASS

	2422	Ant1	2390.0	-27.58	3.0	0	70.68	PEAK	74	PASS
	2422	Ant1	2390.0	-44.73	3.0	0	53.53	AV	54	PASS
	2452	Ant1	2483.5	-28.49	3.0	0	69.77	PEAK	74	PASS
	2452	Ant1	2483.5	-45.07	3.0	0	53.19	AV	54	PASS
	2452	Ant1	2500.0	-34.47	3.0	0	63.79	PEAK	74	PASS
	2452	Ant1	2500.0	-48.68	3.0	0	49.58	AV	54	PASS

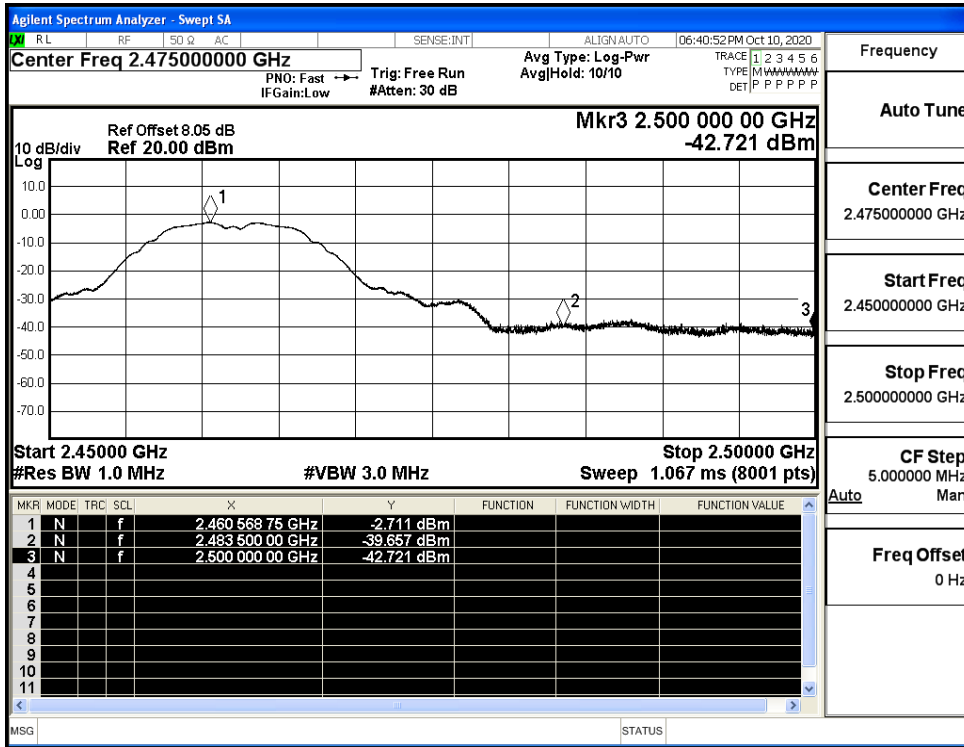
Restrict-band band-edge measurements_11B_2412_Ant1_PEAK



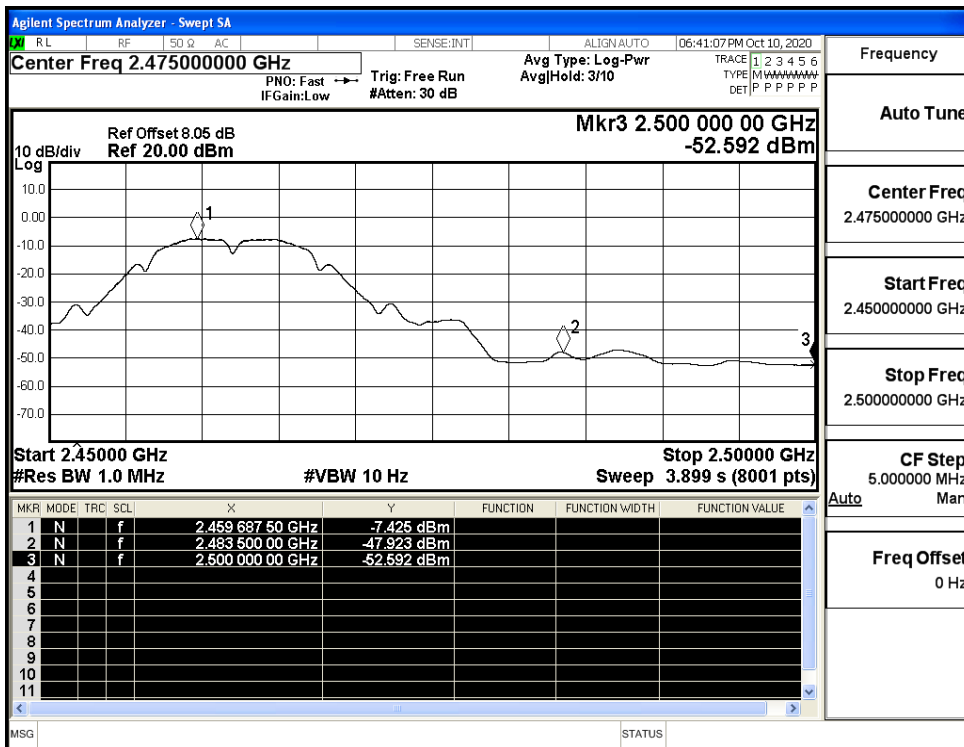
Restrict-band band-edge measurements_11B_2412_Ant1_AV



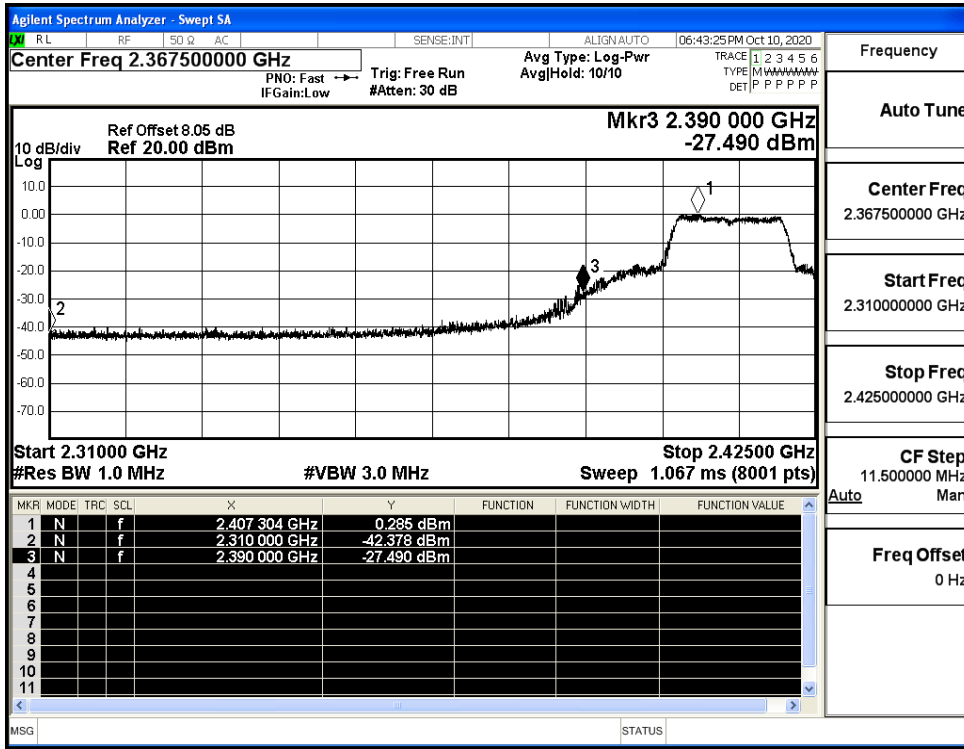
Restrict-band band-edge measurements_11B_2462_Ant1_PEAK



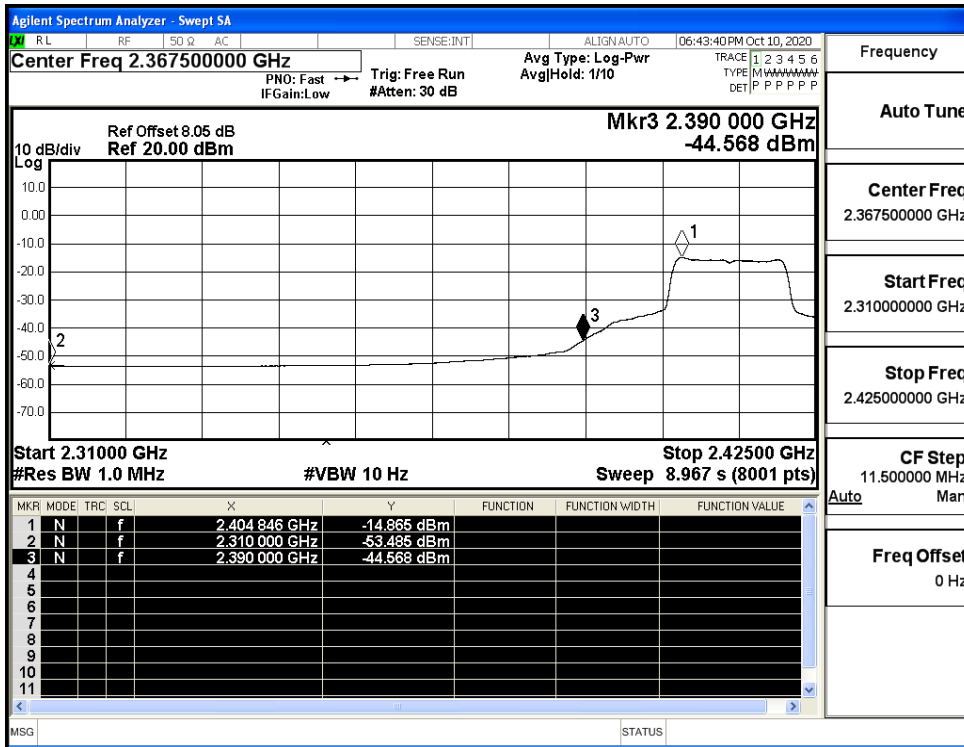
Restrict-band band-edge measurements_11B_2462_Ant1_AV



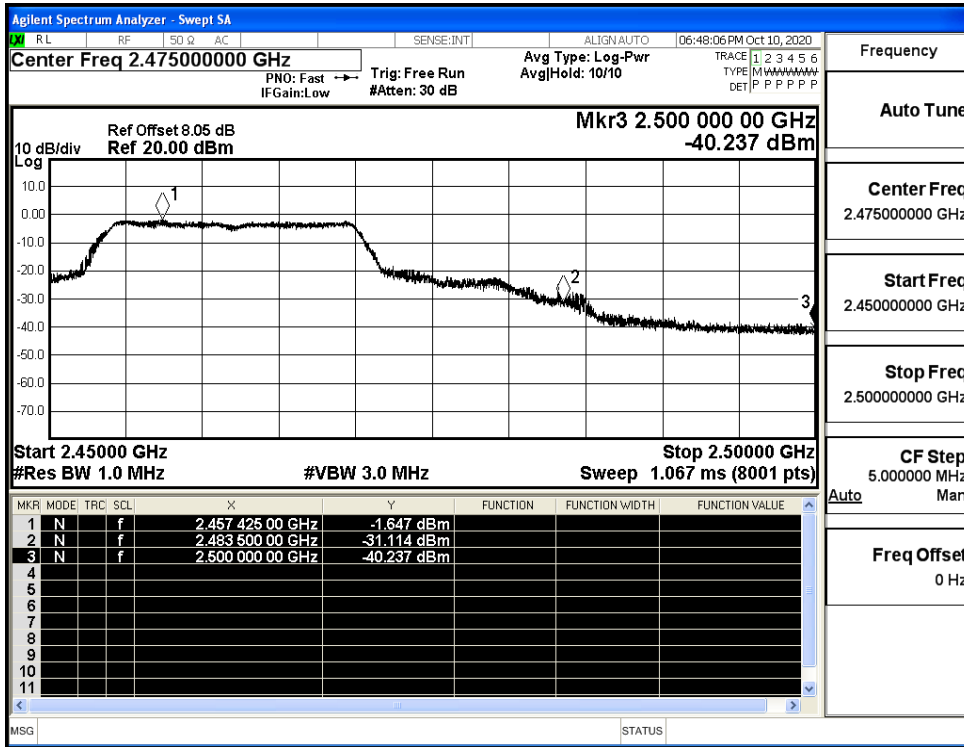
Restrict-band band-edge measurements_11G_2412_Ant1_PEAK



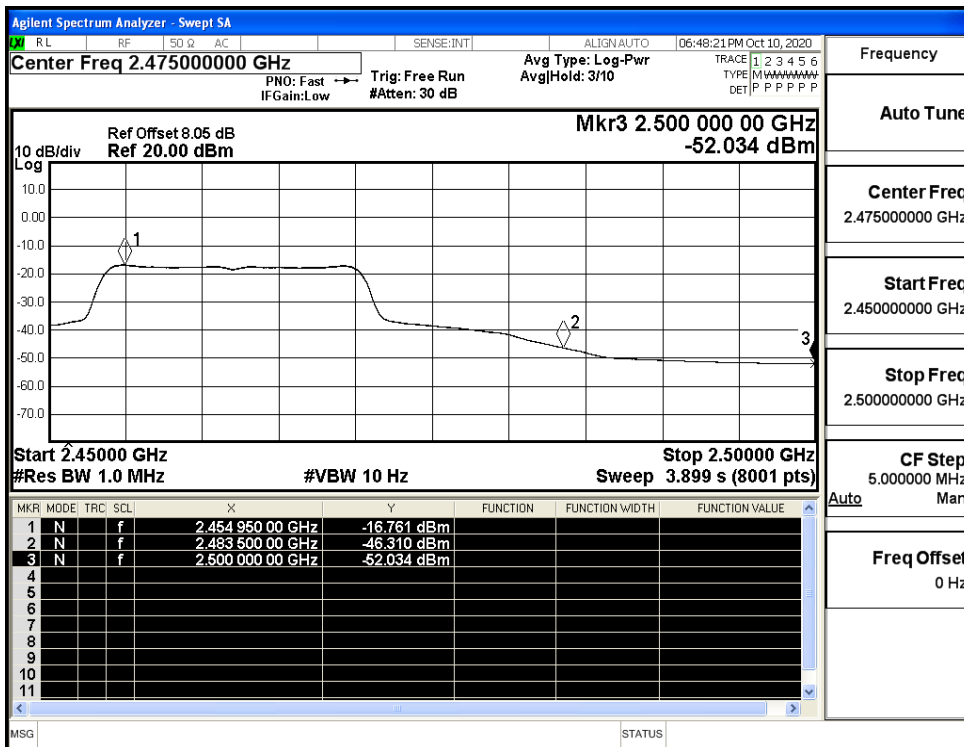
Restrict-band band-edge measurements_11G_2412_Ant1_AV



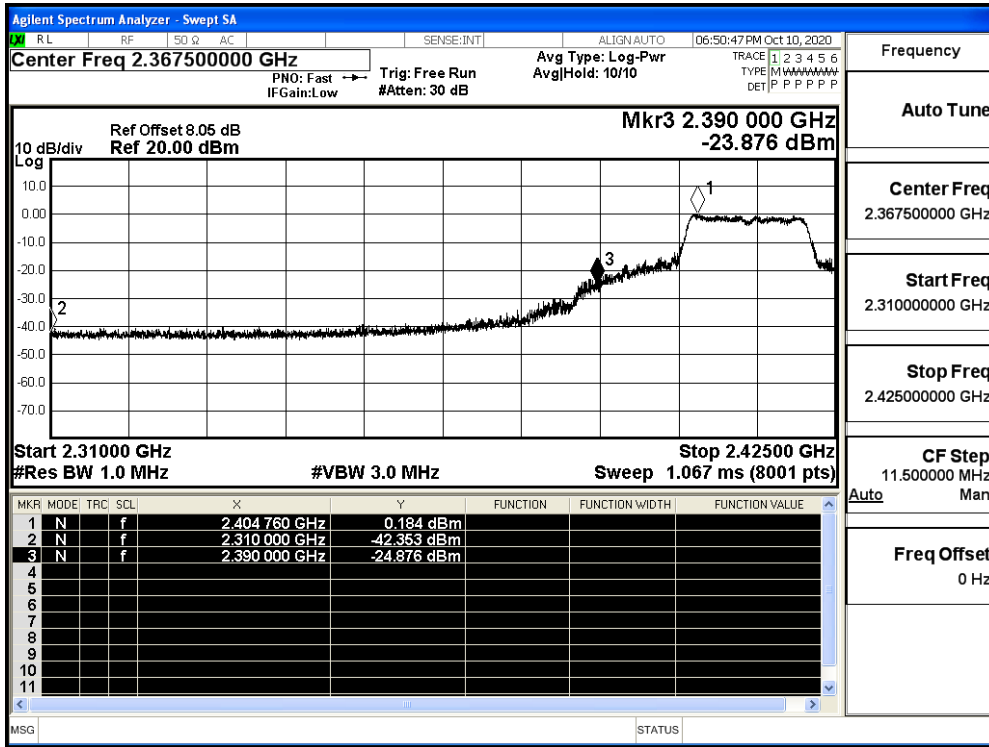
Restrict-band band-edge measurements_11G_2462_Ant1_PEAK



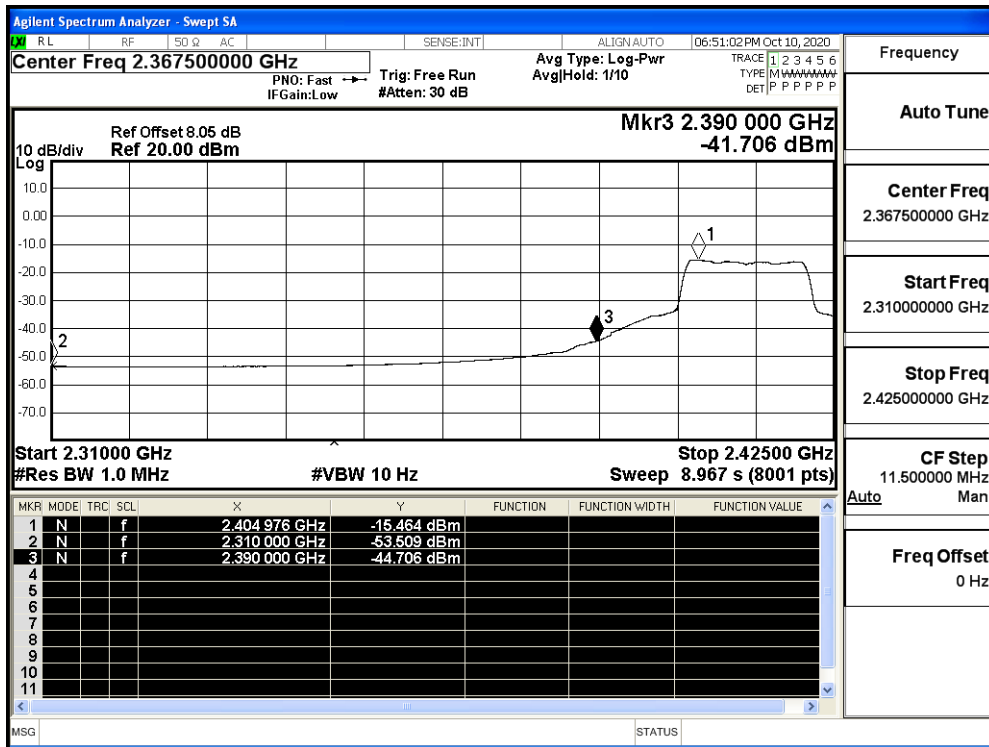
Restrict-band band-edge measurements_11G_2462_Ant1_AV



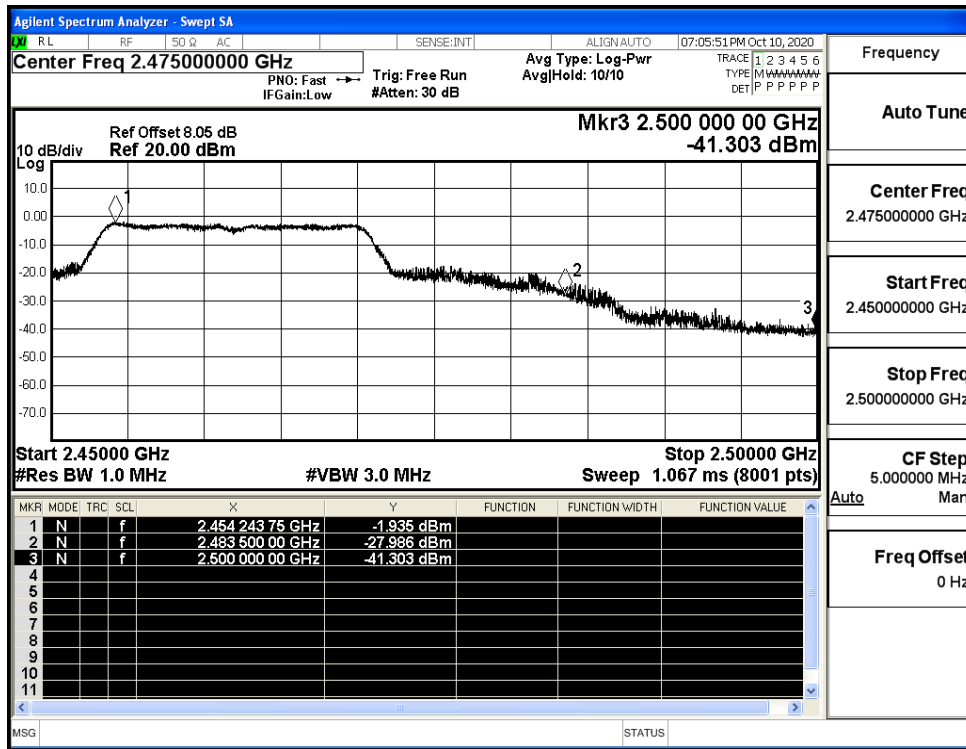
Restrict-band band-edge measurements_11N20SISO_2412_Ant1_PEAK



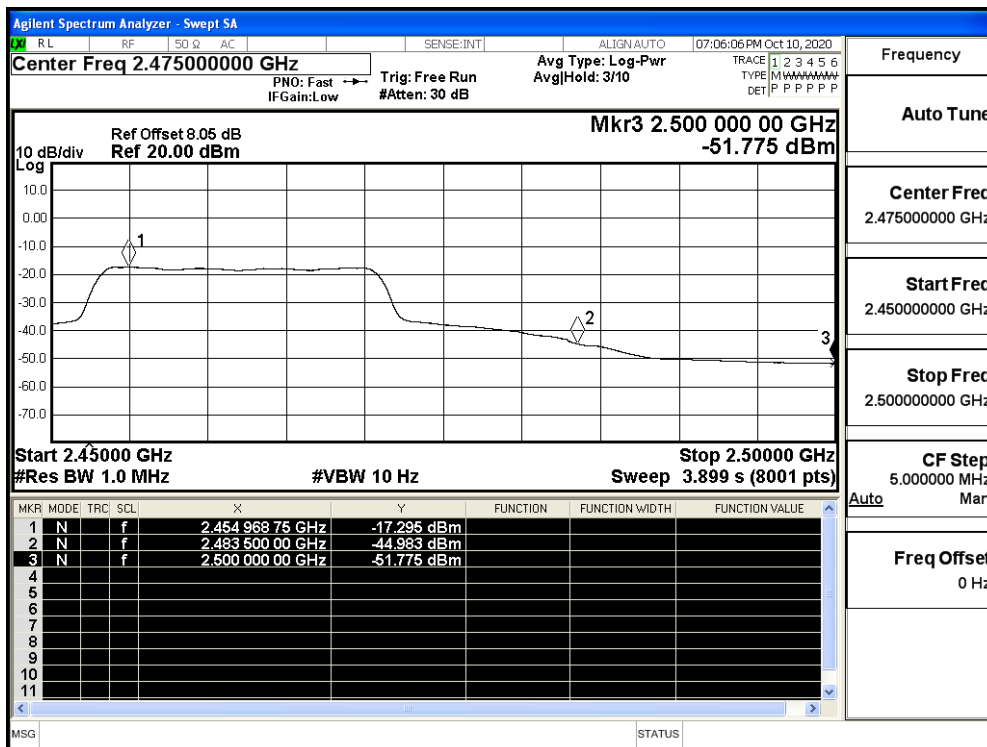
Restrict-band band-edge measurements_11N20SISO_2412_Ant1_AV



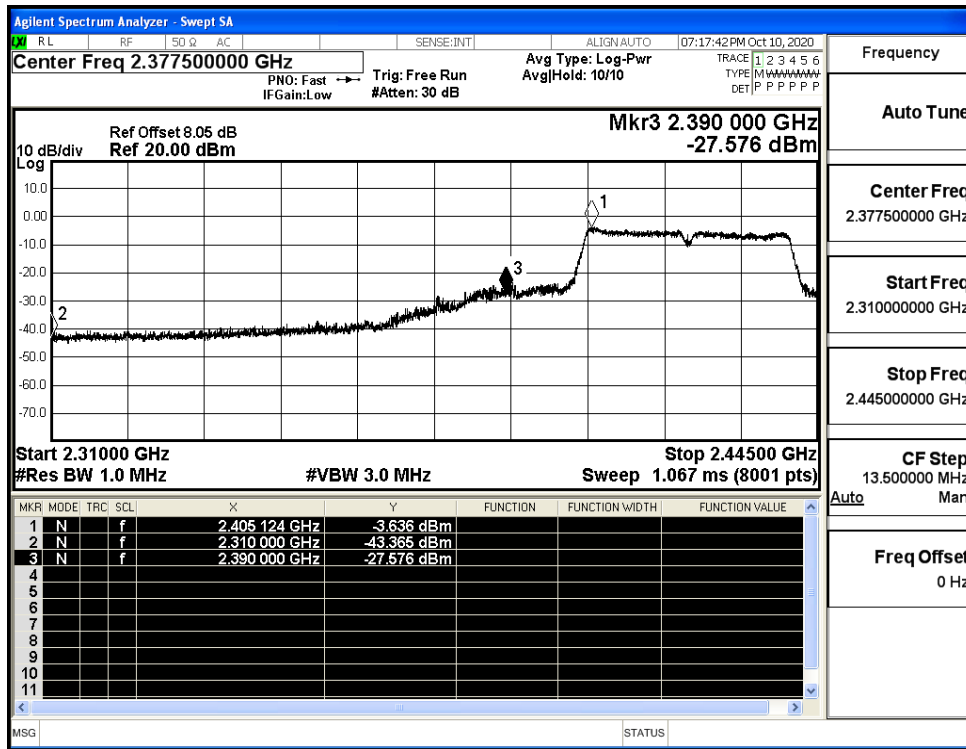
Restrict-band band-edge measurements_11N20SISO_2462_Ant1_PEAK



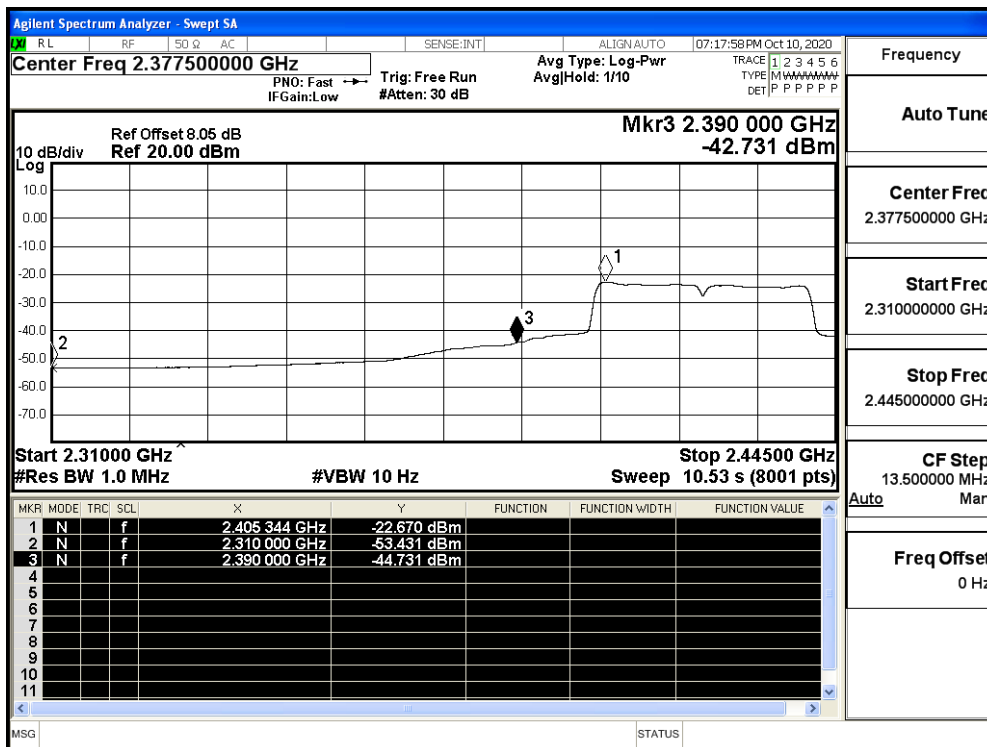
Restrict-band band-edge measurements_11N20SISO_2462_Ant1_AV



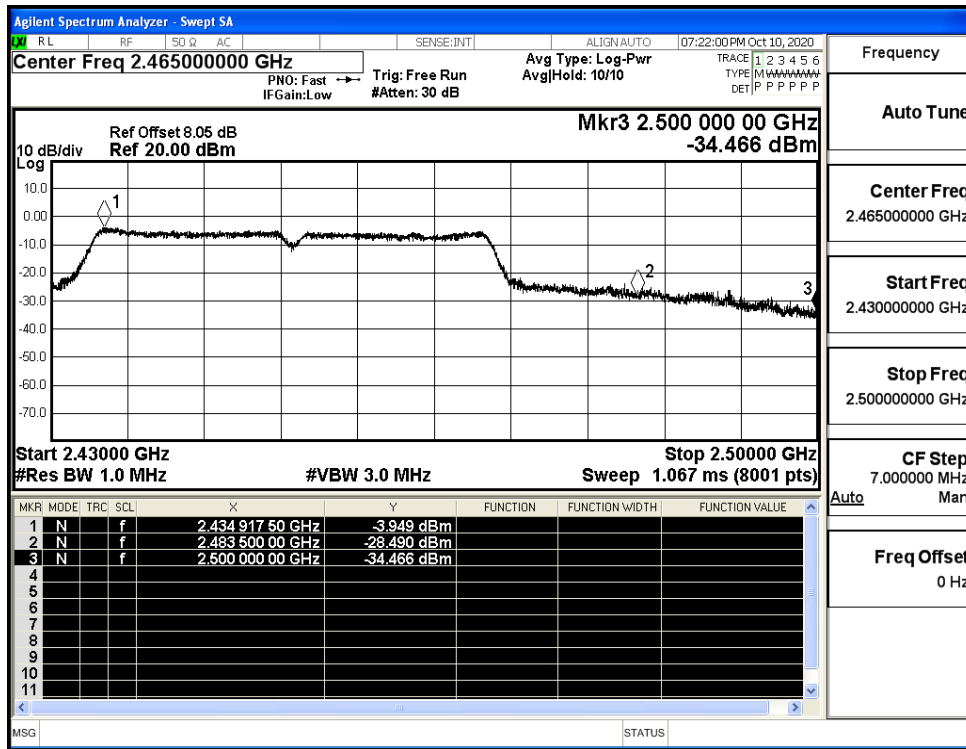
Restrict-band band-edge measurements_11N40SISO_2422_Ant1_PEAK



Restrict-band band-edge measurements_11N40SISO_2422_Ant1_AV



Restrict-band band-edge measurements_11N40SISO_2452_Ant1_PEAK



Restrict-band band-edge measurements_11N40SISO_2452_Ant1_AV

