

Appendix A

RF Test Data for 2.4G (Conducted Measurement)

Product Name: SPEEDLITE

Trade Mark: NEEWER

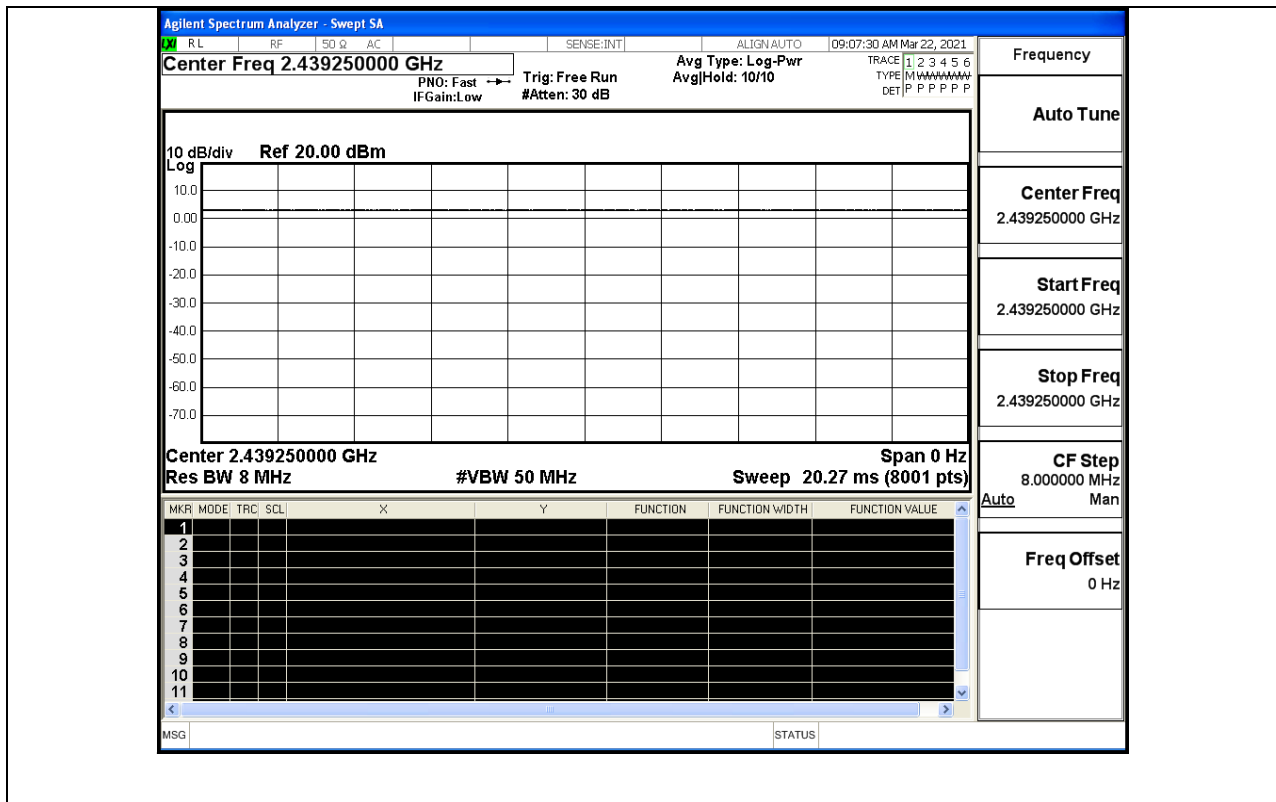
Test Model: NW655

Environmental Conditions

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

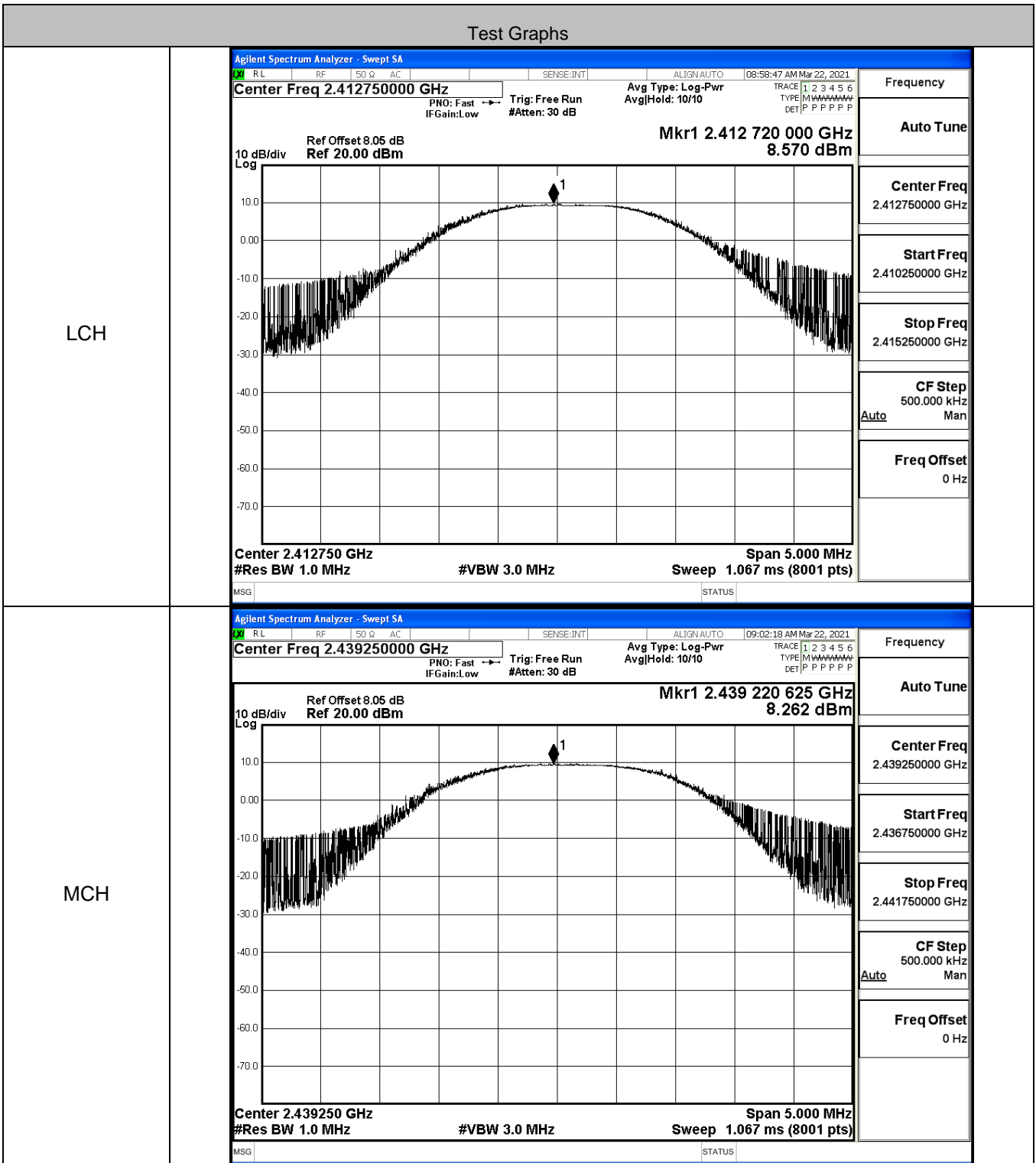
A.1 Duty Cycle

Test Mode	Test Channel	Ant	Duty Cycle[%]	Verdict
GFSK	2439.25	Ant1	100	PASS



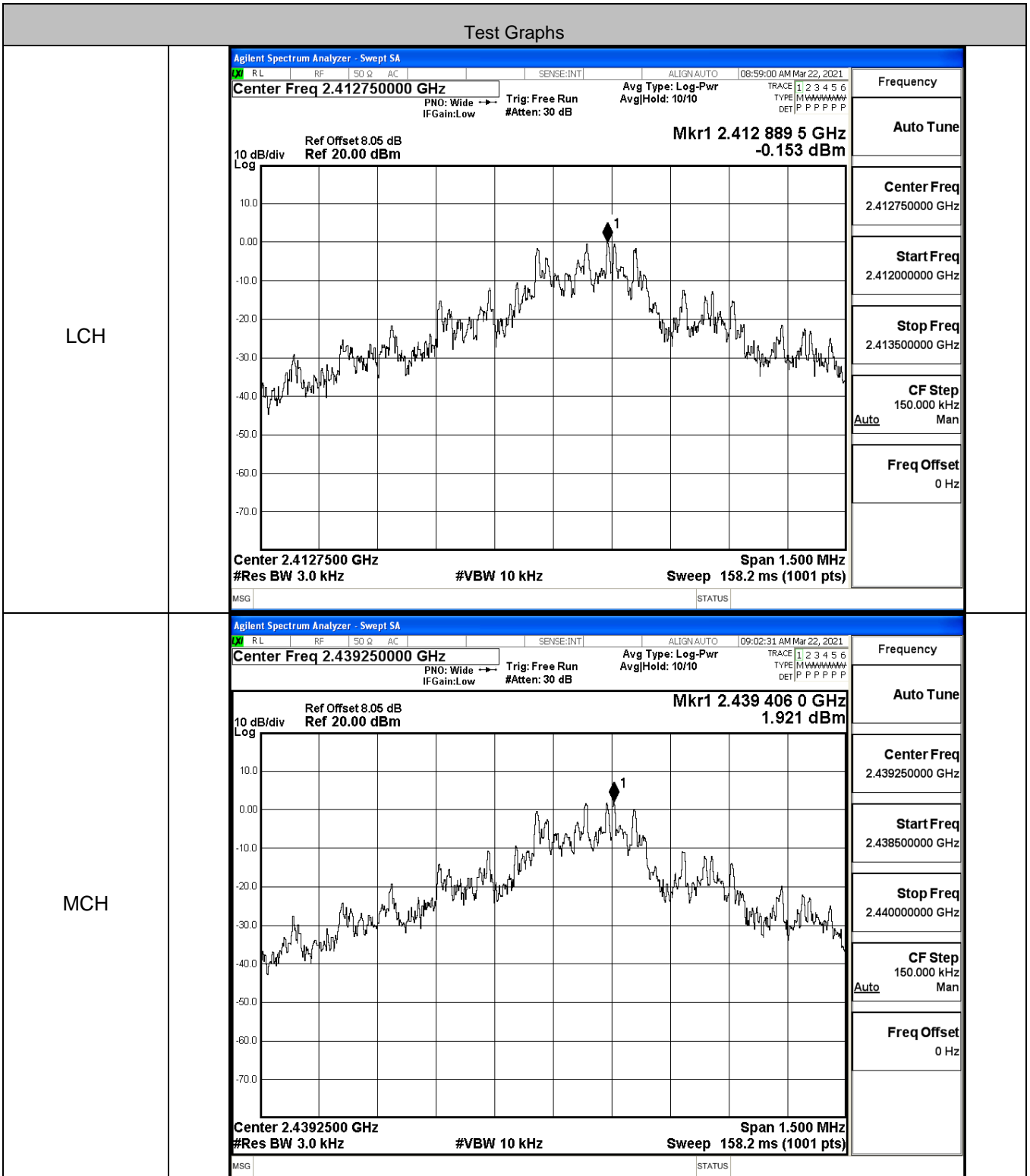
A.2 Maximum Conducted Peak Output Power

Mode	Channel	Conduct Peak Power[dBm]	Limit [dBm]	Verdict
GFSK	LCH	8.570	30	PASS
GFSK	MCH	8.262	30	PASS
GFSK	HCH	8.560	30	PASS



A.3 Maximum Power Spectral Density

Mode	Channel	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
GFSK	LCH	-0.153	8	PASS
GFSK	MCH	1.921	8	PASS
GFSK	HCH	2.178	8	PASS



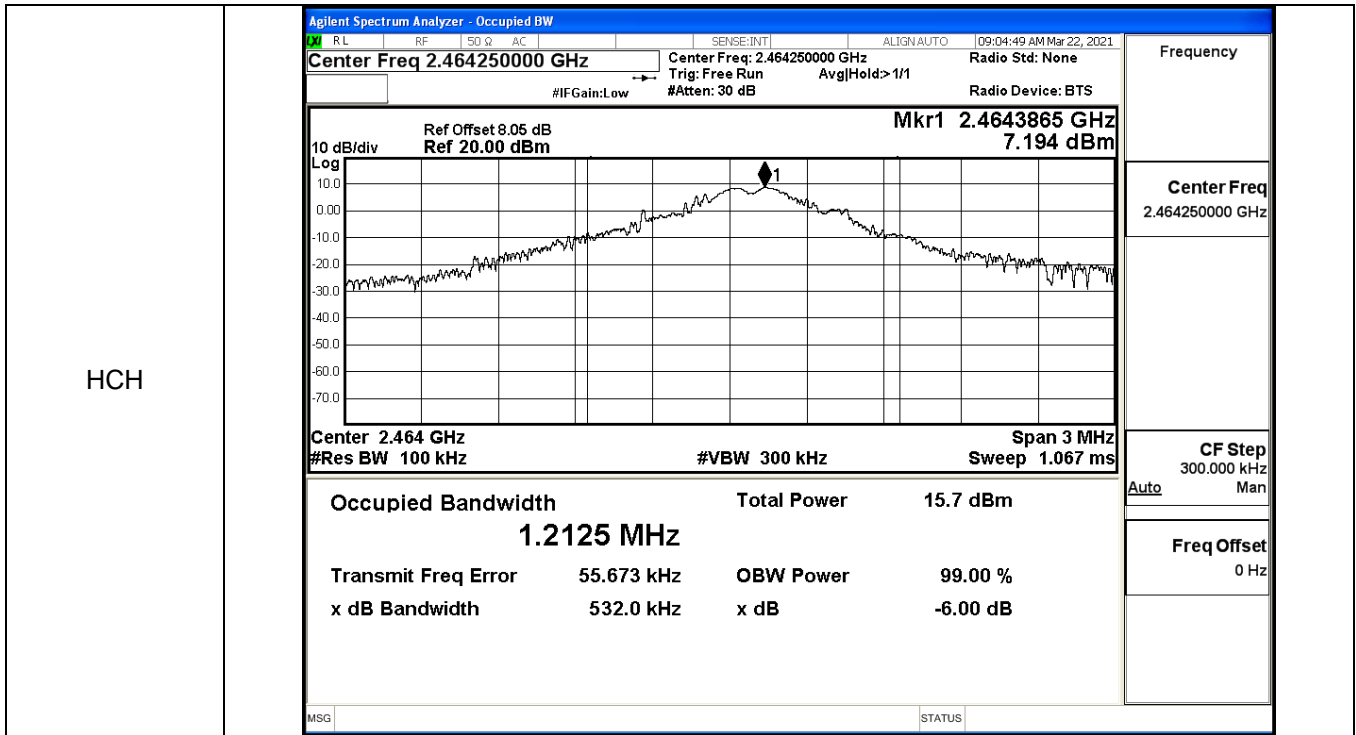
A.4 6dB Bandwidth

Mode	Channel	6dB Bandwidth [MHz]	Limit [MHz]	Verdict
GFSK	LCH	0.5434	≥0.5	PASS
GFSK	MCH	0.5768	≥0.5	PASS
GFSK	HCH	0.5320	≥0.5	PASS

Test Graphs

LCH	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.412750000 GHz Center Freq: 2.412750000 GHz Radio Std: None</p> <p>Trig: Free Run Avg/Hold: 1/1 Radio Device: BTS</p> <p>#IFGain:Low #Atten: 30 dB</p>		Frequency
	<p>10 dB/div Ref Offset 8.05 dB Mkr1 2.4128929 GHz Log Ref 20.00 dBm 7.9300 dBm</p> <p>Center 2.413 GHz Span 3 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <p>Occupied Bandwidth Total Power 13.5 dBm 1.1632 MHz</p> <p>Transmit Freq Error 81.234 kHz OBW Power 99.00 % x dB Bandwidth 543.4 kHz x dB -6.00 dB</p>		Center Freq 2.412750000 GHz
			CF Step 300.000 kHz Auto Man
			Freq Offset 0 Hz

MCH	<p>Agilent Spectrum Analyzer - Occupied BW</p> <p>Center Freq 2.439250000 GHz Center Freq: 2.439250000 GHz Radio Std: None</p> <p>Trig: Free Run Avg/Hold: 1/1 Radio Device: BTS</p> <p>#IFGain:Low #Atten: 30 dB</p>		Frequency
	<p>10 dB/div Ref Offset 8.05 dB Mkr1 2.4392808 GHz Log Ref 20.00 dBm 7.475 dBm</p> <p>Center 2.439 GHz Span 3 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms</p> <p>Occupied Bandwidth Total Power 15.0 dBm 1.1399 MHz</p> <p>Transmit Freq Error 68.733 kHz OBW Power 99.00 % x dB Bandwidth 576.8 kHz x dB -6.00 dB</p>		Center Freq 2.439250000 GHz
			CF Step 300.000 kHz Auto Man
			Freq Offset 0 Hz



A.5 RF Conducted Spurious Emissions

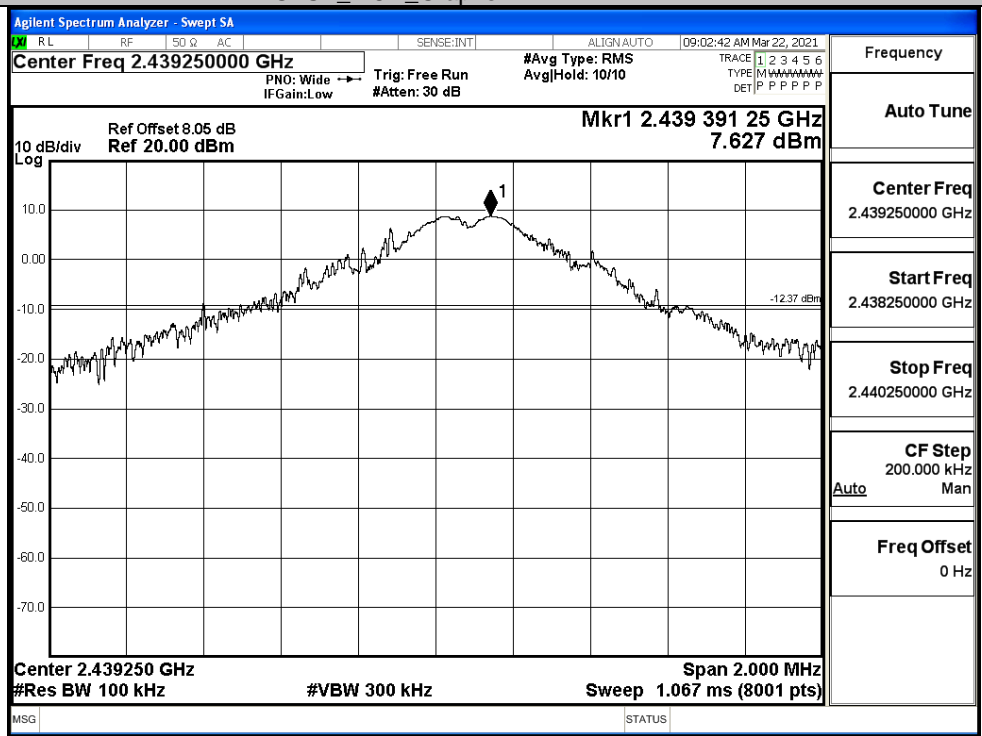
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	8.944	-33.945	-11.056	PASS
GFSK	MCH	7.627	-37.986	-12.373	PASS
GFSK	HCH	7.062	-36.466	-12.938	PASS

GFSK_LCH_Graphs

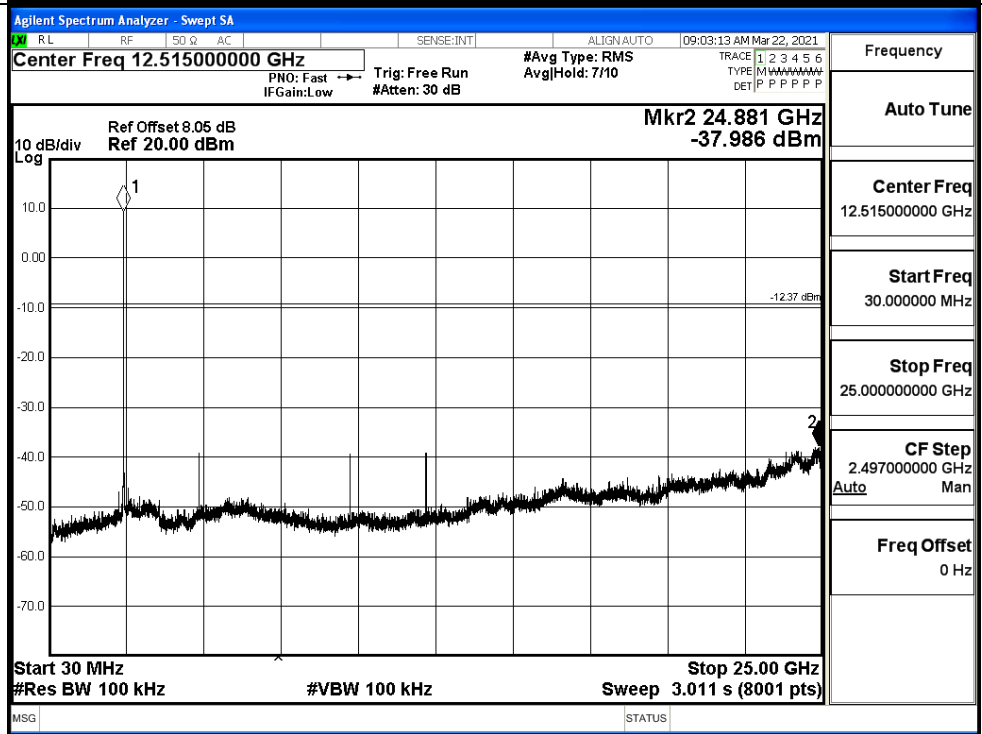
Pref/GFSK/LCH		<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 2.412750000 GHz</p> <p>Mkr1 2.412 890 75 GHz 8.944 dBm</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>Center 2.412750 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 1.067 ms (8001 pts)</p>	<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.412750000 GHz</p> <p>Start Freq 2.411750000 GHz</p> <p>Stop Freq 2.413750000 GHz</p> <p>CF Step 200.000 kHz Auto Man</p> <p>Freq Offset 0 Hz</p>
	Puw/GFSK/LCH		<p>Agilent Spectrum Analyzer - Swept SA</p> <p>Center Freq 12.515000000 GHz</p> <p>Mkr2 1.887 GHz -33.945 dBm</p> <p>Ref Offset 8.05 dB Ref 20.00 dBm</p> <p>10 dB/div Log</p> <p>Start 30 MHz #Res BW 100 kHz #VBW 100 kHz Sweep 3.011 s (8001 pts)</p>

GFSK_MCH_Graphs

Pref/GFSK/MCH

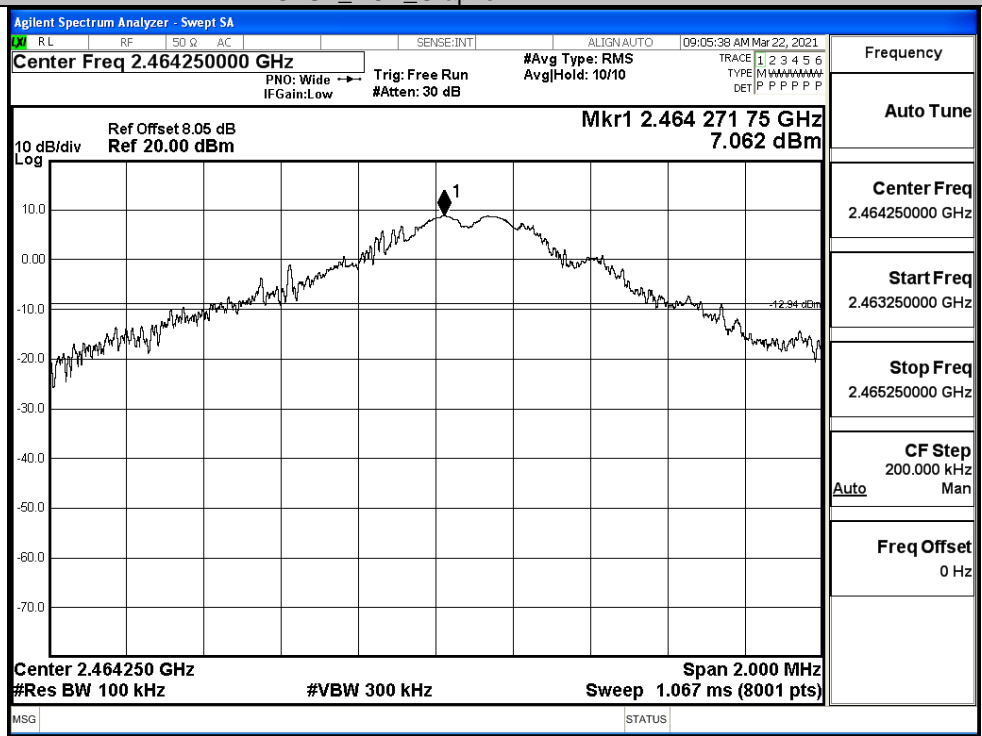


Puw/GFSK/MCH

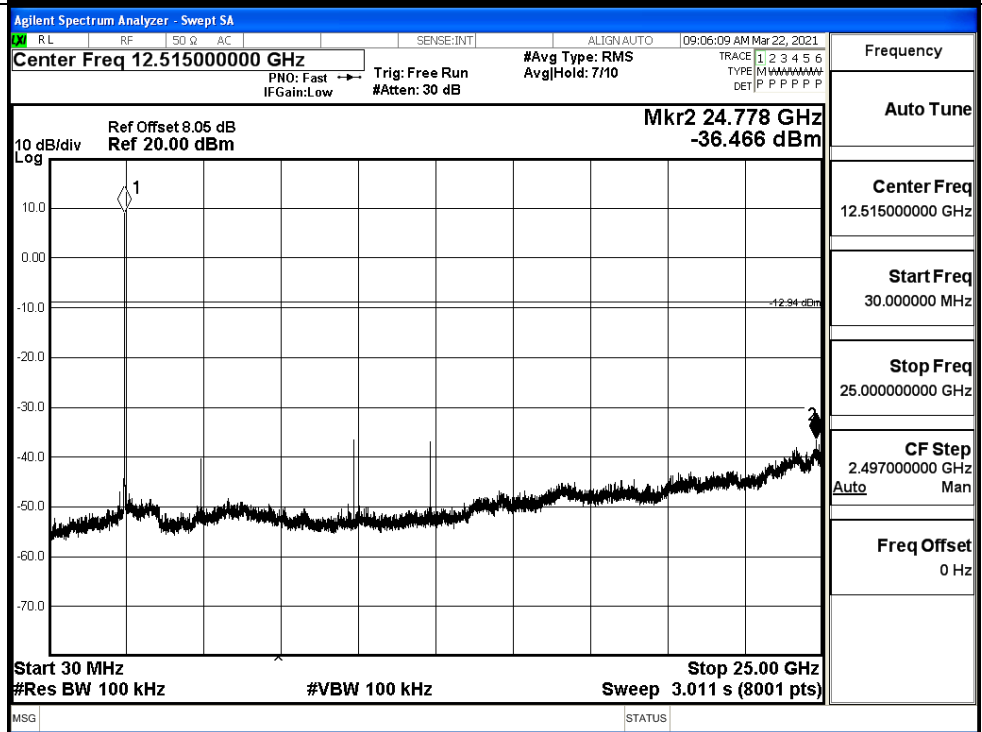


GFSK_HCH_Graphs

Pref/GFSK/HCH



Puw/GFSK/HCH



A.6 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
GFSK	LCH	8.906	-46.430	-11.09	PASS
GFSK	HCH	8.994	-43.495	-11.01	PASS

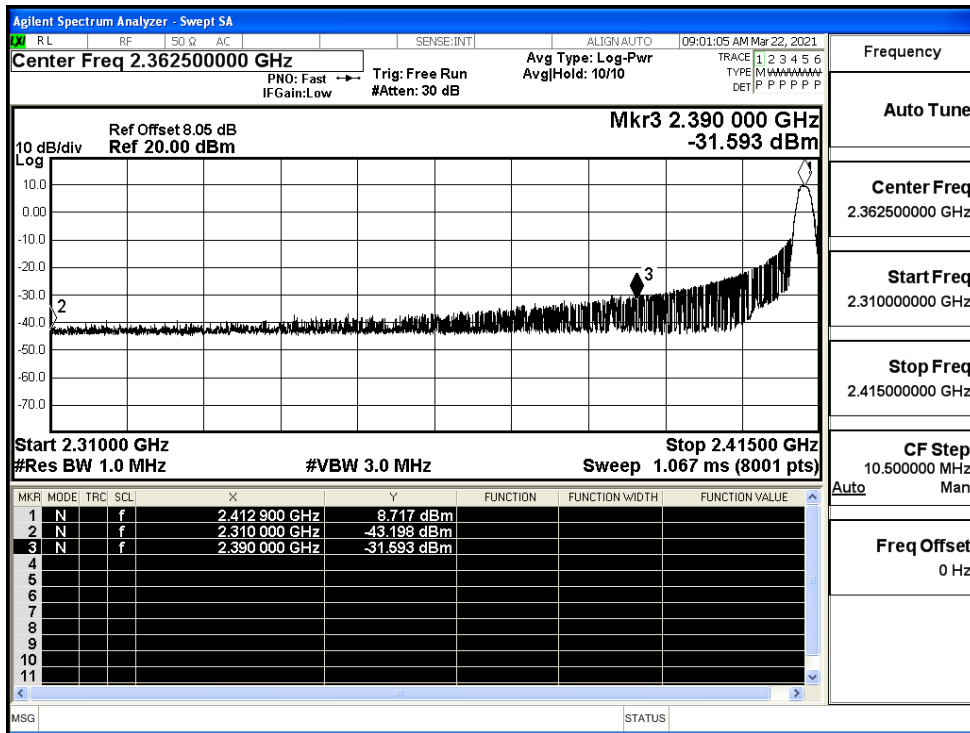
Test Graphs

LCH	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.36250000 GHz #Ave Type: RMS AvgHold: 10/10 Ref Offset 8.05 dB Ref 20.00 dBm Mkr4 2.386 873 GHz -46.430 dBm Start 2.31000 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.41500 GHz Sweep 10.13 ms (8001 pts)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr><td>1</td><td>N</td><td>f</td><td></td><td>2.412 900 GHz</td><td>8.906 dBm</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>N</td><td>f</td><td></td><td>2.400 000 GHz</td><td>-49.409 dBm</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>N</td><td>f</td><td></td><td>2.390 000 GHz</td><td>-53.574 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.386 873 GHz</td><td>-46.430 dBm</td><td></td><td></td><td></td></tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	f		2.412 900 GHz	8.906 dBm				2	N	f		2.400 000 GHz	-49.409 dBm				3	N	f		2.390 000 GHz	-53.574 dBm				4	N	f		2.386 873 GHz	-46.430 dBm				Frequency Auto Tune Center Freq 2.36250000 GHz Start Freq 2.310000000 GHz Stop Freq 2.415000000 GHz CF Step 10.500000 MHz Freq Offset 0 Hz
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4	N	f		2.386 873 GHz	-46.430 dBm																																										
HCH	<p>Agilent Spectrum Analyzer - Swept SA Center Freq 2.48000000 GHz #Ave Type: RMS AvgHold: 10/10 Ref Offset 8.05 dB Ref 20.00 dBm Mkr4 2.483 750 GHz -43.495 dBm Start 2.46000 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.50000 GHz Sweep 4.267 ms (8001 pts)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th>MKR</th> <th>MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr><td>1</td><td>N</td><td>f</td><td></td><td>2.464 395 GHz</td><td>8.994 dBm</td><td></td><td></td><td></td></tr> <tr><td>2</td><td>N</td><td>f</td><td></td><td>2.483 500 GHz</td><td>-45.103 dBm</td><td></td><td></td><td></td></tr> <tr><td>3</td><td>N</td><td>f</td><td></td><td>2.500 000 GHz</td><td>-51.772 dBm</td><td></td><td></td><td></td></tr> <tr><td>4</td><td>N</td><td>f</td><td></td><td>2.483 750 GHz</td><td>-43.495 dBm</td><td></td><td></td><td></td></tr> </tbody> </table>	MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	f		2.464 395 GHz	8.994 dBm				2	N	f		2.483 500 GHz	-45.103 dBm				3	N	f		2.500 000 GHz	-51.772 dBm				4	N	f		2.483 750 GHz	-43.495 dBm				Frequency Auto Tune Center Freq 2.48000000 GHz Start Freq 2.460000000 GHz Stop Freq 2.500000000 GHz CF Step 4.000000 MHz Freq Offset 0 Hz
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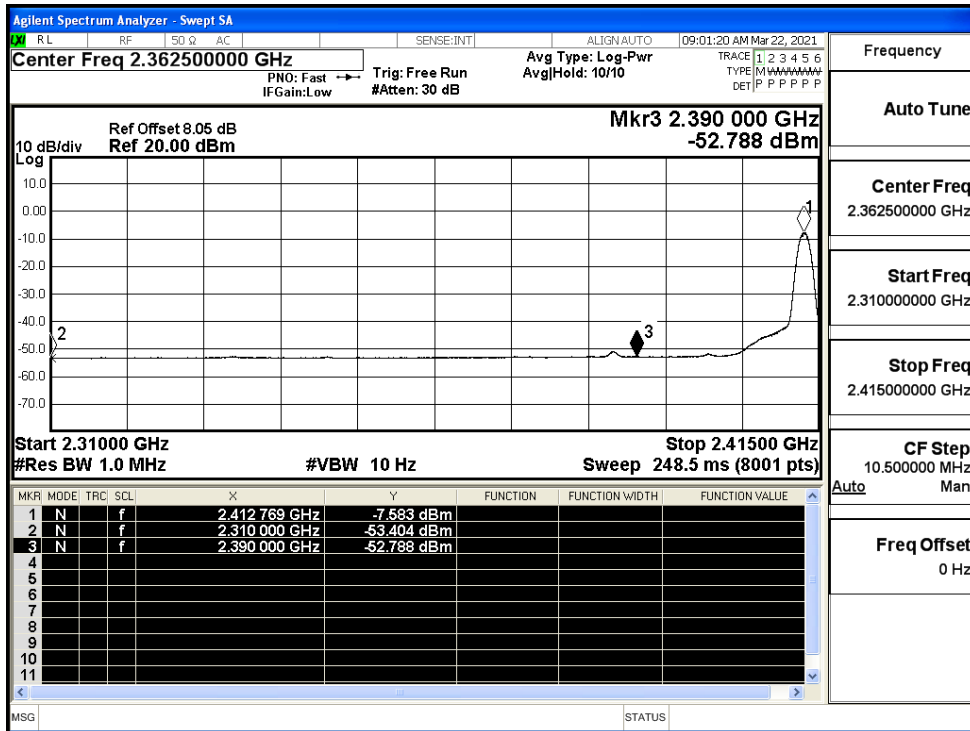
A.7 Restrict-band band-edge measurements

Test Mode	Test Channel	Ant	Freq.	Power [dBm]	Gain	Ground Factor	E [dBuV/m]	Detector	Limit [dBuV/m]	Verdi
GFSK	2412.7 5	Ant1	2310.0	-43.20	2.0	0	54.06	PEAK	74	PASS
		Ant1	2310.0	-53.40	2.0	0	43.86	AV	54	PASS
		Ant1	2390.0	-31.59	2.0	0	65.67	PEAK	74	PASS
		Ant1	2390.0	-52.79	2.0	0	44.47	AV	54	PASS
	2464.2 5	Ant1	2483.5	-42.58	2.0	0	54.68	PEAK	74	PASS
		Ant1	2483.5	-52.35	2.0	0	44.91	AV	54	PASS
		Ant1	2500.0	-32.15	2.0	0	65.11	PEAK	74	PASS
		Ant1	2500.0	-52.29	2.0	0	44.97	AV	54	PASS

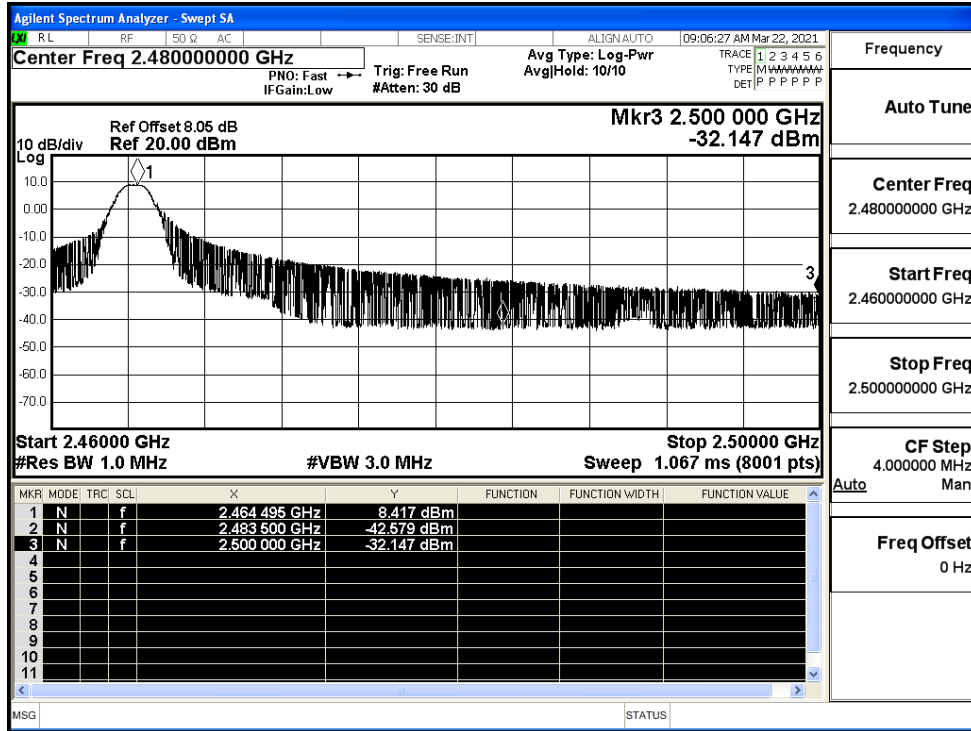
Restrict-band band-edge measurements_GFSK_2412.75_Ant1_PEAK



Restrict-band band-edge measurements_GFSK_2412.75_Ant1_AV



Restrict-band band-edge measurements_GFSK_2464.25_Ant1_PEAK



Restrict-band band-edge measurements_GFSK_2464.25_Ant1_AV

