

Appendix A

RF Test Data (Conducted Measurement)

Product Name: Transceiver Module

Trade Mark: Cansec Wireless

Test Model: LR68-NA-C-915

Environmental Conditions

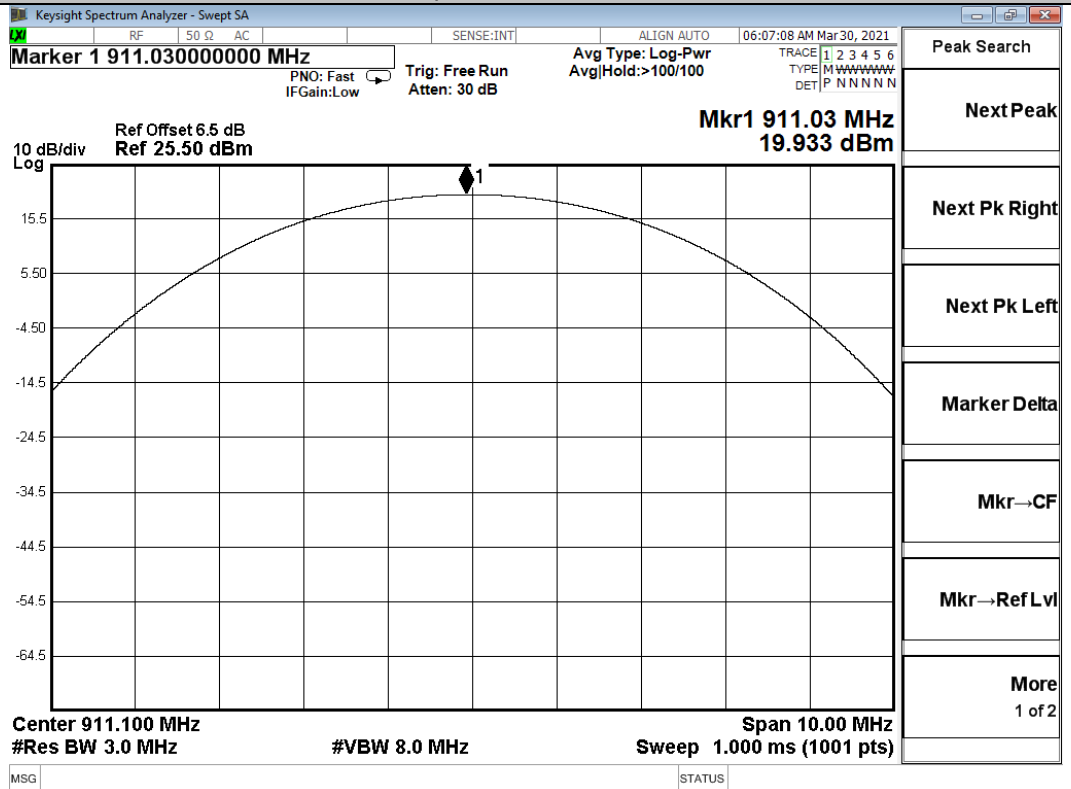
Temperature:	24.6 ° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Ben Jin
Supervised by:	Li Huan

A.1 Maxmum Conducted Peak Output Power

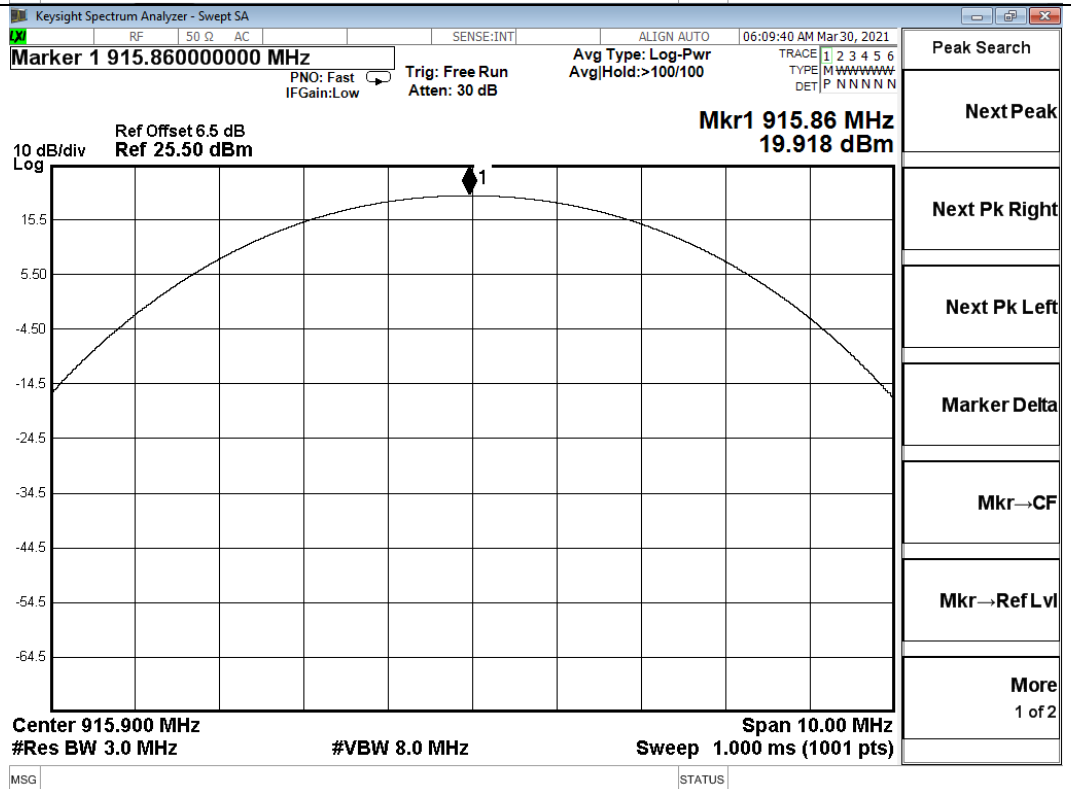
Mode	Channel.	Maximum Peak Output Power [dBm]	Limit [dBm]	Verdict
RF ID	LCH	19.933	30	PASS
	MCH	19.918	30	PASS
	HCH	19.929	30	PASS

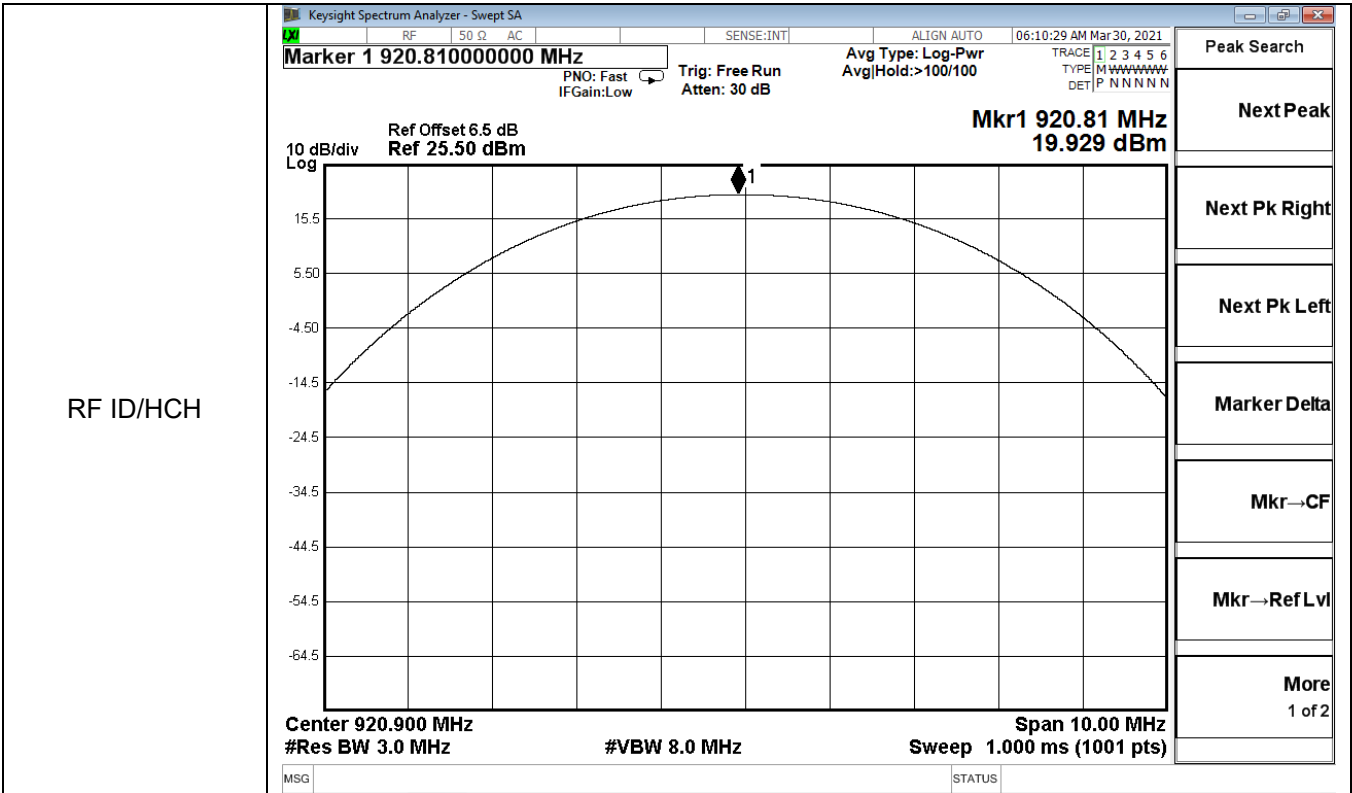
Test Graphs

RF ID/LCH



RF ID/MCH

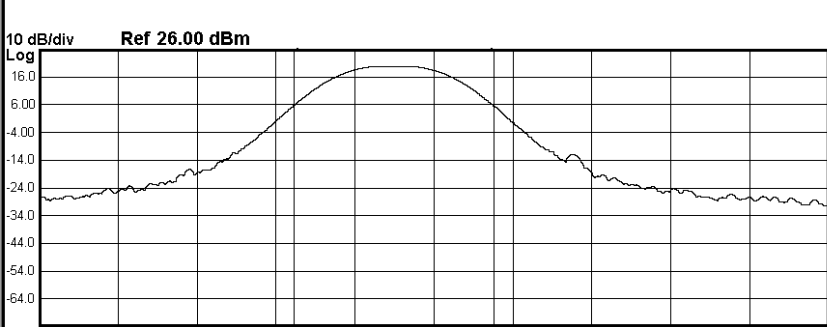




A.2 20dB Bandwidth

Mode	Channel.	20dB Bandwidth [KHz]	Limit [KHz]	Verdict
RF ID	LCH	90.33	250	PASS
	MCH	89.28	250	PASS
	HCH	89.61	250	PASS

Test Graphs	
RF ID/LCH	<p>Keysight Spectrum Analyzer - Occupied BW</p> <p>Center Freq 911.100000 MHz</p> <p>Center Freq: 911.100000 MHz</p> <p>Trig: Free Run</p> <p>#Gain:Low</p> <p>#Atten: 30 dB</p> <p>Radio Std: None</p> <p>Avg/Hold:>10/10</p> <p>Radio Device: BTS</p> <p>10 dB/div Ref 26.00 dBm</p> <p>Log</p> <p>Center 911.1 MHz</p> <p>#Res BW 30 kHz</p> <p>#VBW 100 kHz</p> <p>Span 300 kHz</p> <p>Sweep 1 ms</p> <p>Occupied Bandwidth 75.718 kHz</p> <p>Total Power 21.2 dBm</p> <p>Transmit Freq Error -11.760 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 90.33 kHz</p> <p>x dB -20.00 dB</p> <p>Frequency 911.100000 MHz</p> <p>CF Step 30.000 kHz</p> <p>Freq Offset 0 Hz</p>
RF ID/MCH	<p>Keysight Spectrum Analyzer - Occupied BW</p> <p>Center Freq 915.900000 MHz</p> <p>Center Freq: 915.900000 MHz</p> <p>Trig: Free Run</p> <p>#Gain:Low</p> <p>#Atten: 30 dB</p> <p>Radio Std: None</p> <p>Avg/Hold:>10/10</p> <p>Radio Device: BTS</p> <p>10 dB/div Ref 26.00 dBm</p> <p>Log</p> <p>Center 915.9 MHz</p> <p>#Res BW 30 kHz</p> <p>#VBW 100 kHz</p> <p>Span 300 kHz</p> <p>Sweep 1 ms</p> <p>Occupied Bandwidth 75.408 kHz</p> <p>Total Power 21.1 dBm</p> <p>Transmit Freq Error -13.931 kHz</p> <p>OBW Power 99.00 %</p> <p>x dB Bandwidth 89.28 kHz</p> <p>x dB -20.00 dB</p> <p>Frequency 915.900000 MHz</p> <p>CF Step 30.000 kHz</p> <p>Freq Offset 0 Hz</p>

RF ID/HCH	Keysight Spectrum Analyzer - Occupied BW RF 50 Ω AC SENSE:INT ALIGN AUTO 06:12:51 AM Mar 30, 2021		
	Center Freq 920.900000 MHz #FGain:Low		Center Freq: 920.900000 MHz Trig: Free Run Avg Hold:>10/10 Radio Std: None Radio Device: BTS
	 <p>10 dB/div Ref 26.00 dBm Log 16.0 6.00 -4.00 -14.0 -24.0 -34.0 -44.0 -54.0 -64.0</p>		
	Center 920.9 MHz #Res BW 30 kHz #VBW 100 kHz		Span 300 kHz Sweep 1 ms
Occupied Bandwidth		Total Power 21.1 dBm	
75.778 kHz			
Transmit Freq Error -15.160 kHz	OBW Power 99.00 %		
x dB Bandwidth 89.61 kHz	x dB -20.00 dB		
MSG		STATUS	

A.3 Carrier Frequency Separation

Mode	Channel.	Carrier Frequency Separation [KHz]	Limit [KHz]	Verdict
RF ID	LCH	202.4	90.33	PASS
	MCH	207.2	89.28	PASS
	HCH	207.2	89.61	PASS

Test Graphs

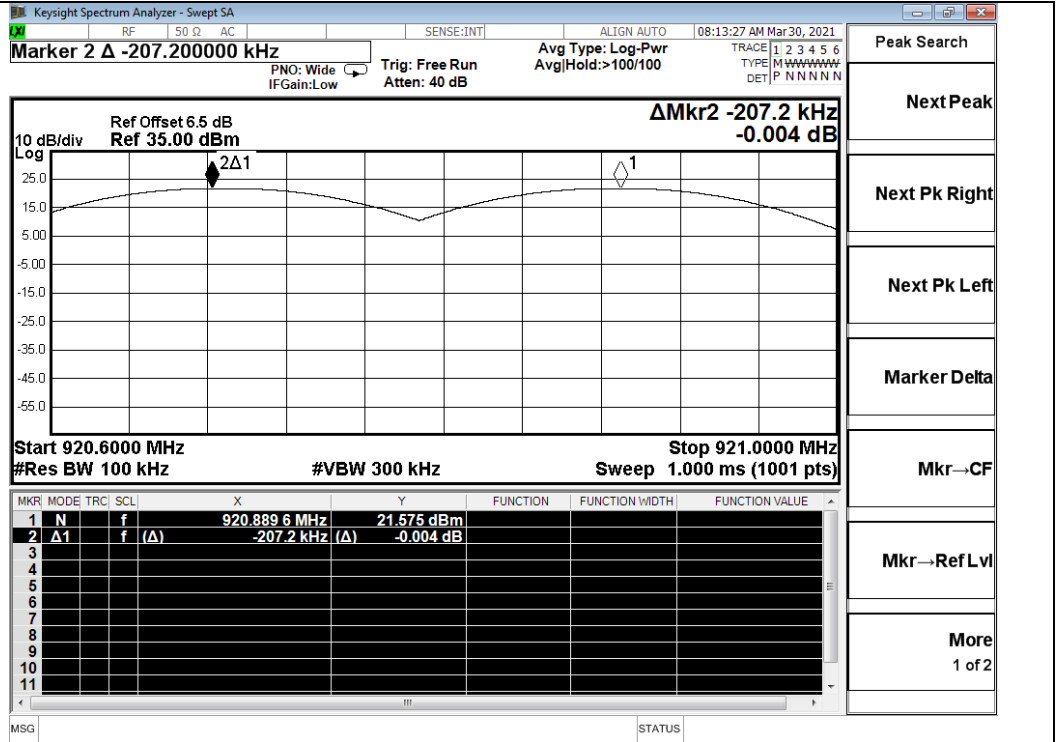
RF ID/LCH

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	911.286 0 MHz	21.487 dBm			
2	Δ1		f (Δ)	-202.4 kHz (Δ)	-0.002 dB			

RF ID/MCH

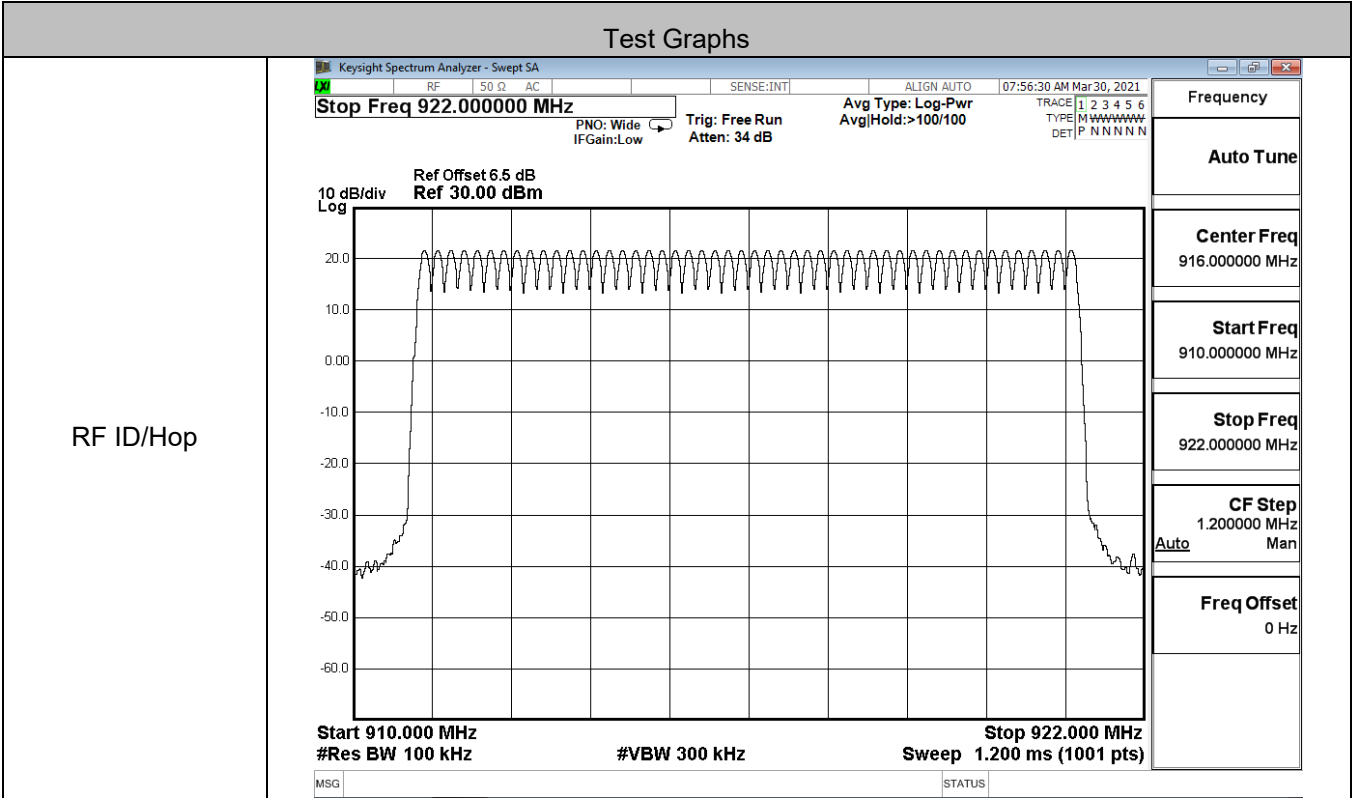
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	916.089 6 MHz	21.531 dBm			
2	Δ1		f (Δ)	-207.2 kHz (Δ)	0.000 dB			

RF ID/HCH



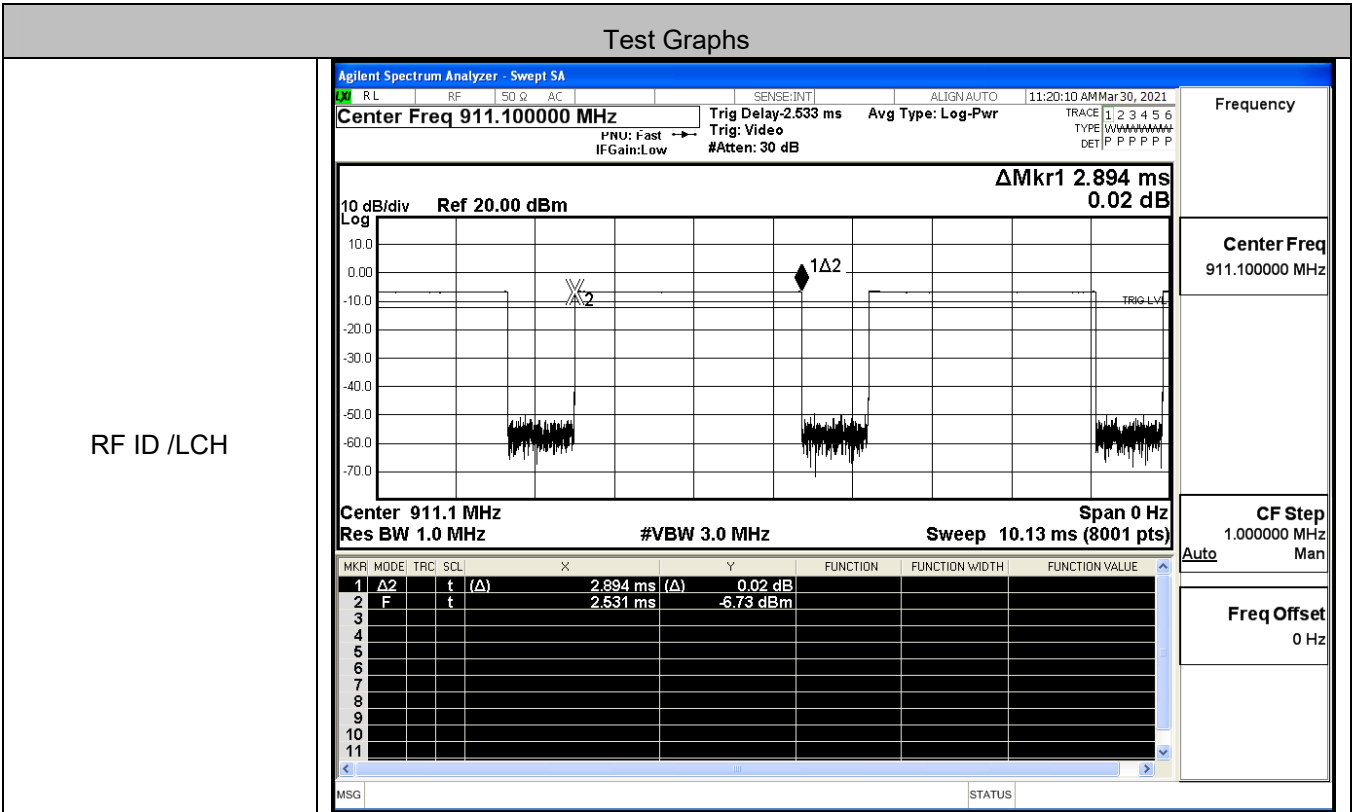
A.4 Hopping Channel Number

Mode	Channel.	Number of Hopping Channel [N]	Limit [N]	Verdict
RF ID	Hop	50	>=50	PASS

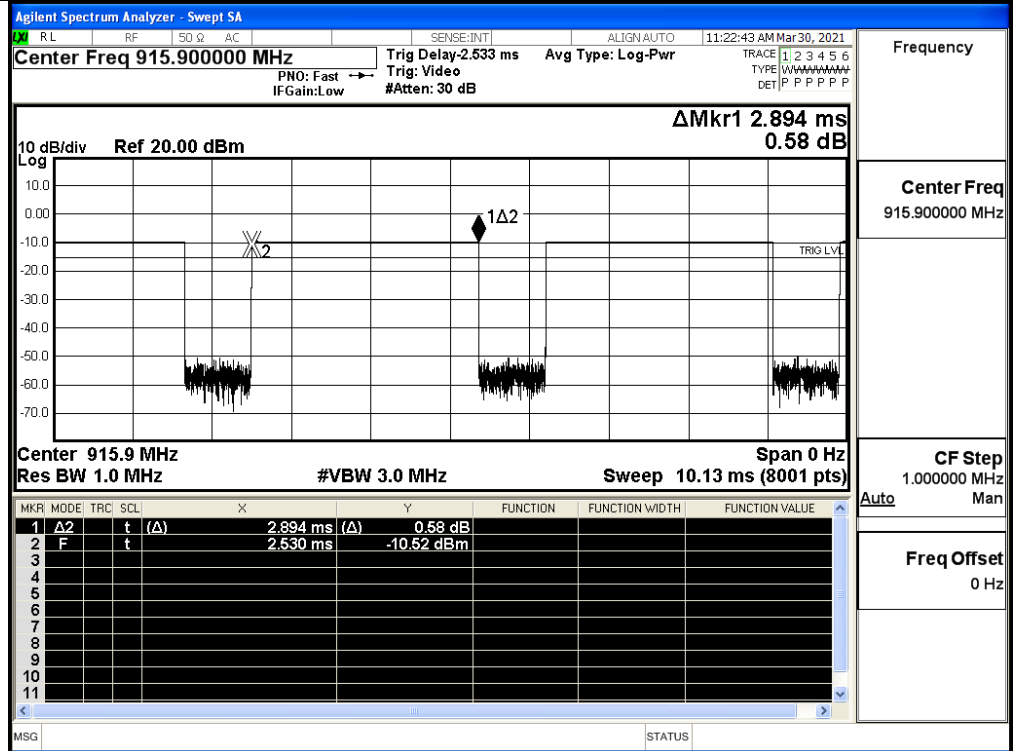


A.5 Dwell Time

Mode	Channel	Burst Width [ms/hop/ch]	Total Hops[hop*ch]	Dwell Time[s]	Limit [s]	Verdict
RF ID	LCH	2.89	41	0.11849	0.4	PASS
	MCH	2.89	41	0.11849	0.4	PASS
	HCH	2.89	41	0.11849	0.4	PASS



RF ID/MCH

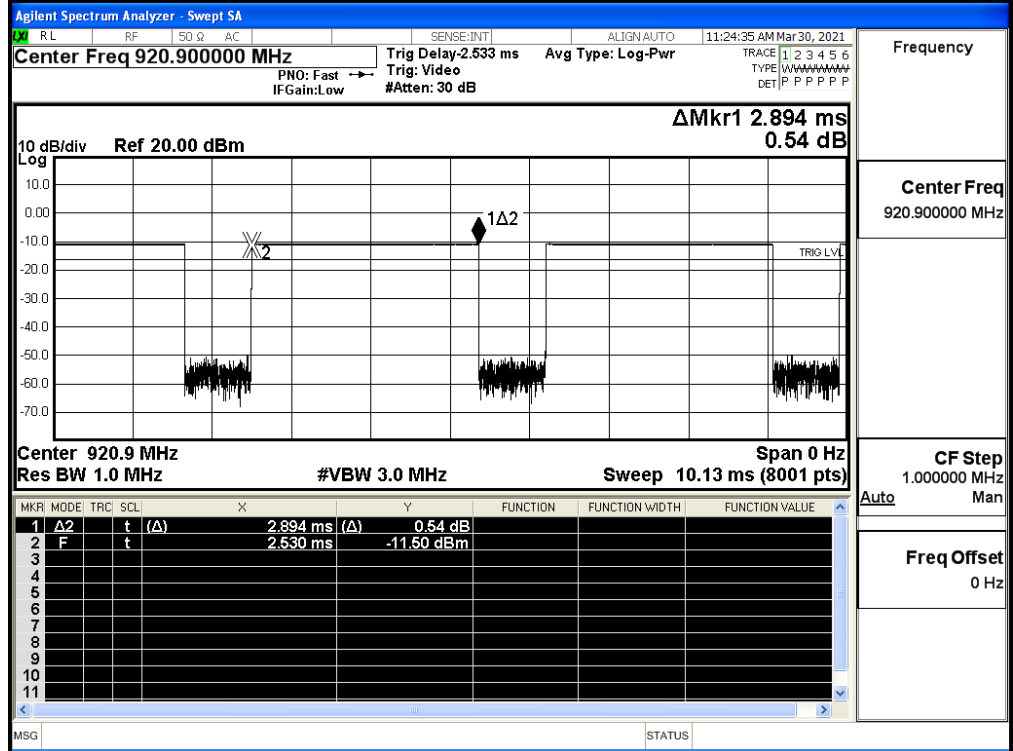


Frequency
915.900000 MHz

CF Step
1.000000 MHz
Auto Man

Freq Offset
0 Hz

RF ID/HCH



Frequency
920.900000 MHz

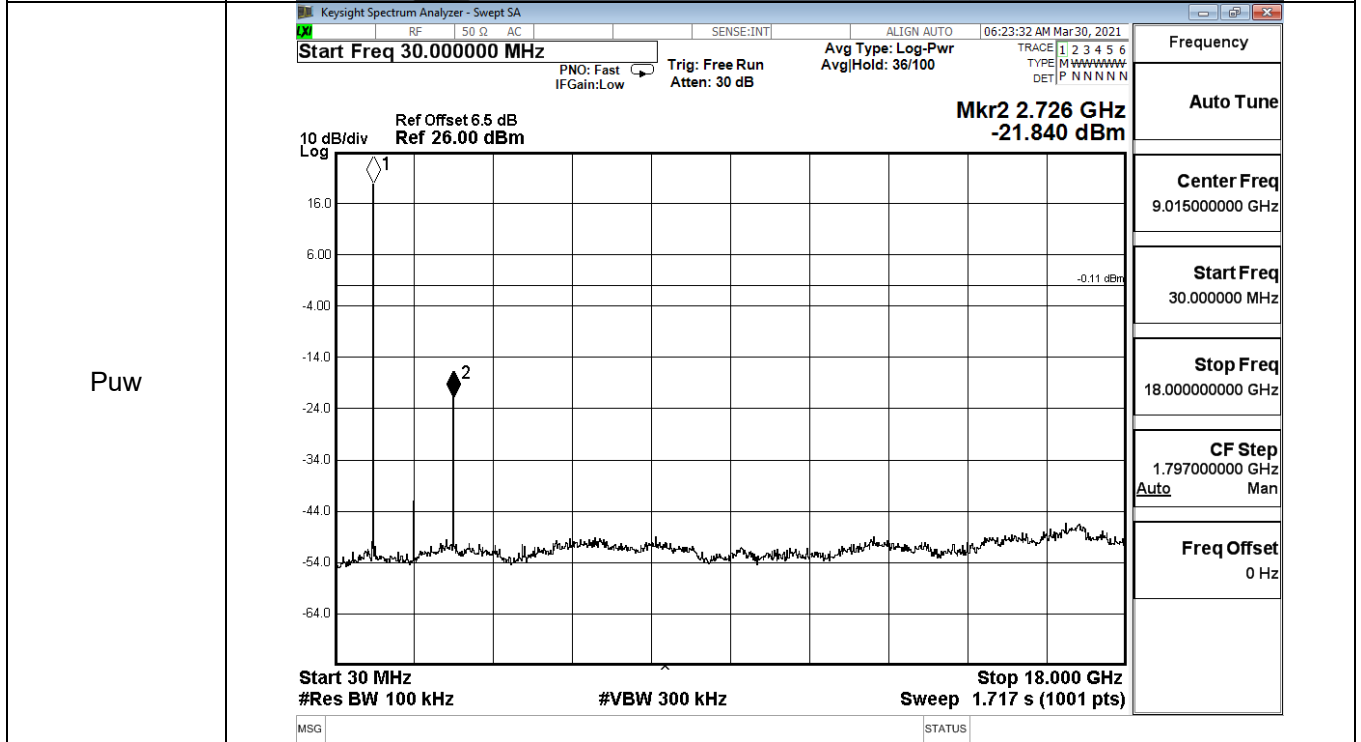
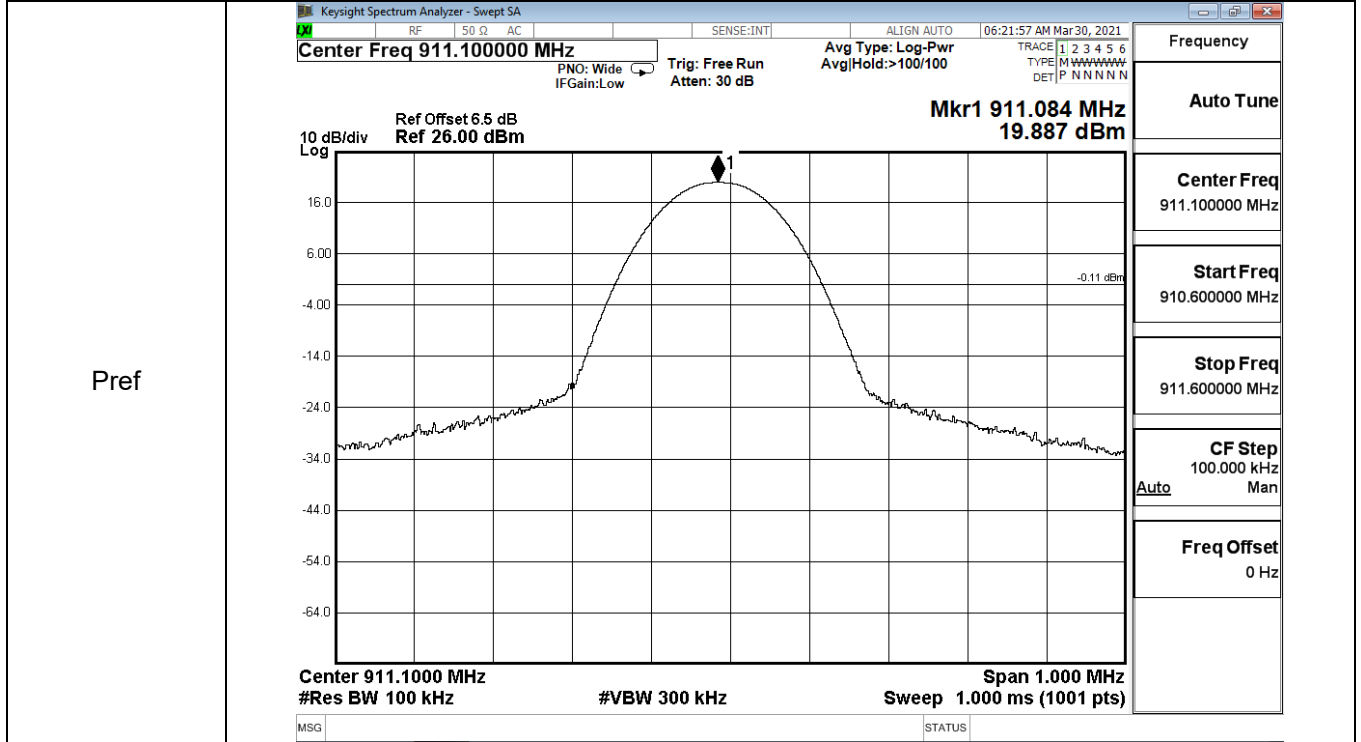
CF Step
1.000000 MHz
Auto Man

Freq Offset
0 Hz

A.6 RF Conducted Spurious Emissions

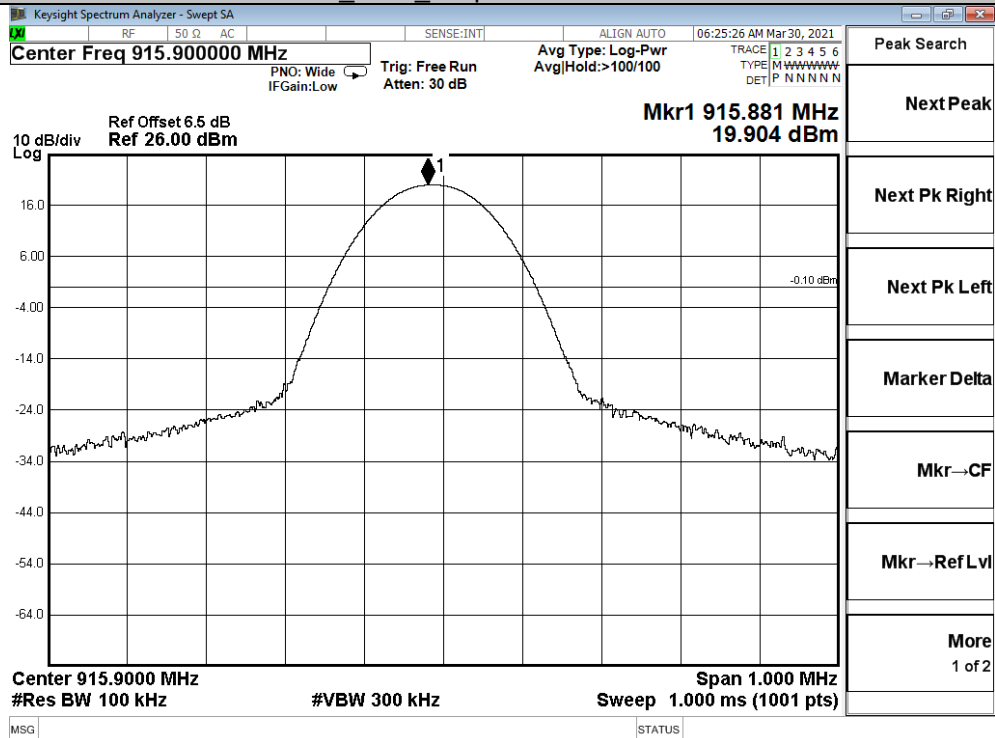
Mode	Channel	Pref [dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
RF ID	LCH	19.887	-21.840	-0.11	PASS
	MCH	19.904	-20.816	-0.10	PASS
	HCH	19.904	-20.816	-0.10	PASS

RF ID LCH Graphs

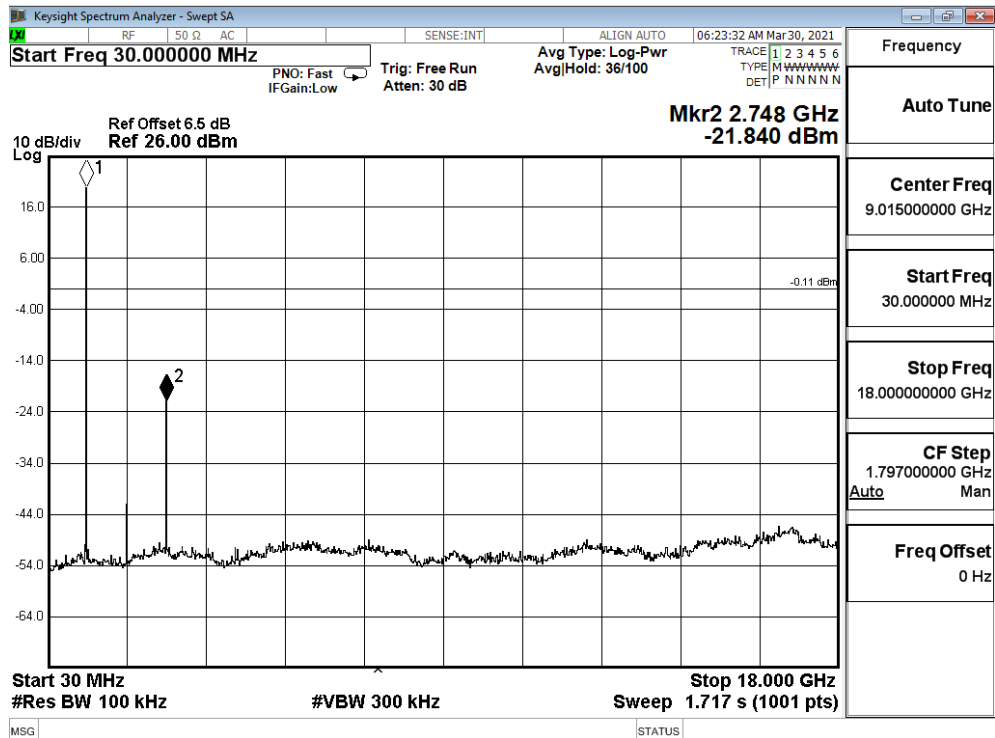


RF ID_MCH_Graphs

Pref

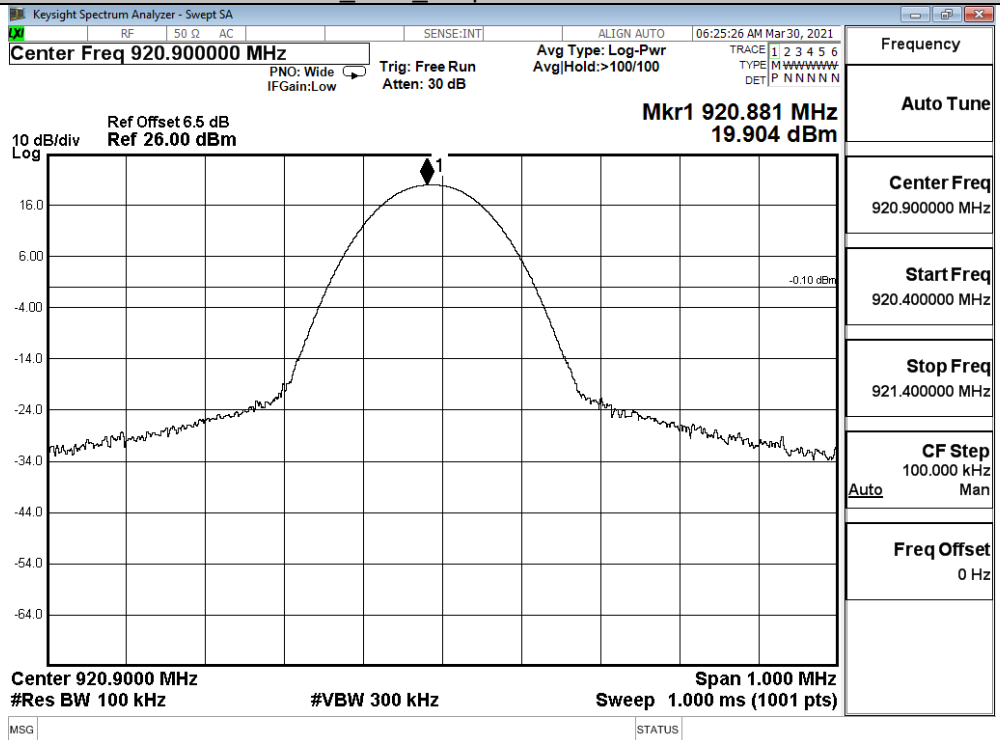


Puw

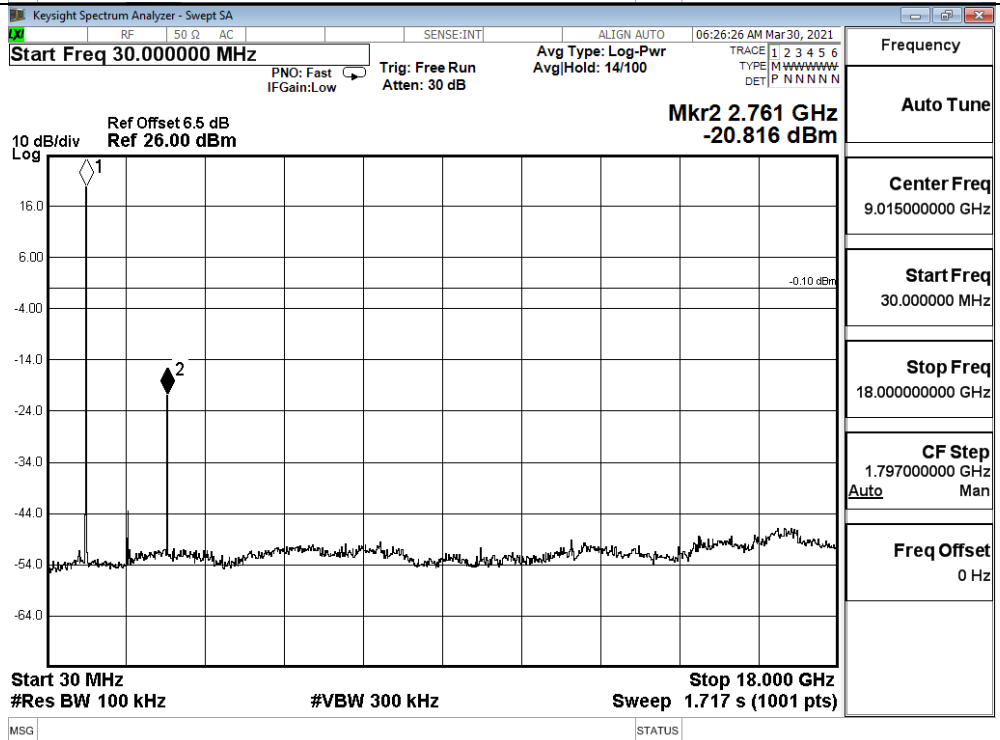


RF ID_HCH_Graphs

Pref



Puw

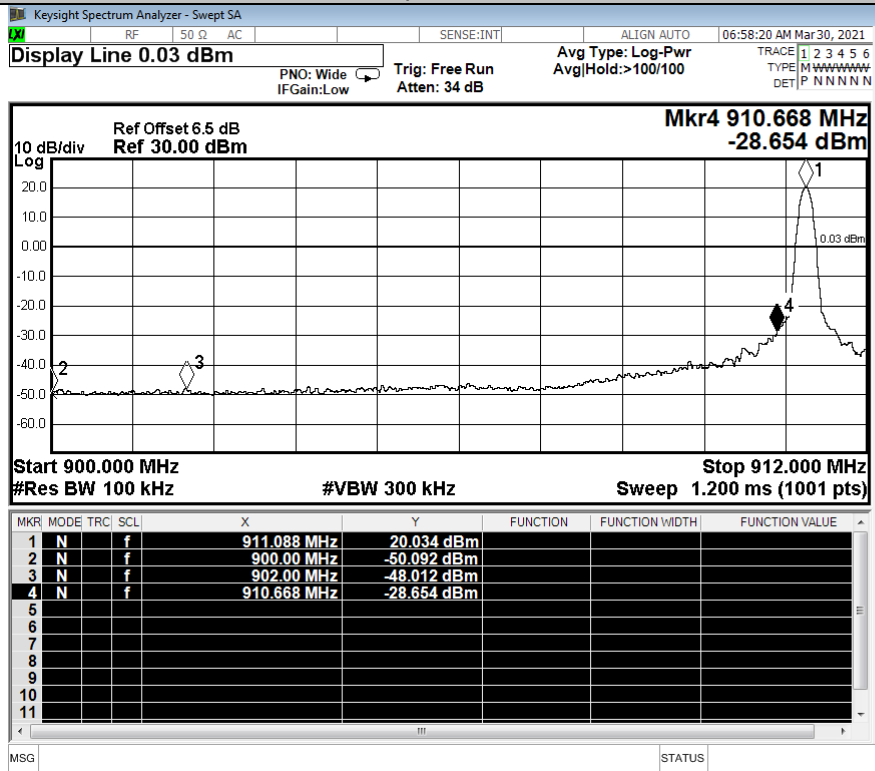


A.7 Band-edge for RF Conducted Emissions

Mode	Channel	Carrier Frequency [MHz]	Carrier Power [dBm]	Frequency Hopping	Max Spurious Level [dBm]	Limit [dBm]	Verdict
RF ID	LCH	911.1	20.034	Off	-28.654	0.03	PASS
			21.639	On	-35.108	-1.64	PASS
	HCH	920.9	19.970	Off	-30.813	-0.03	PASS
			21.680	On	-47.508	1.68	PASS

Test Graphs

RF ID/LCH/No Hop



Display

Annotation

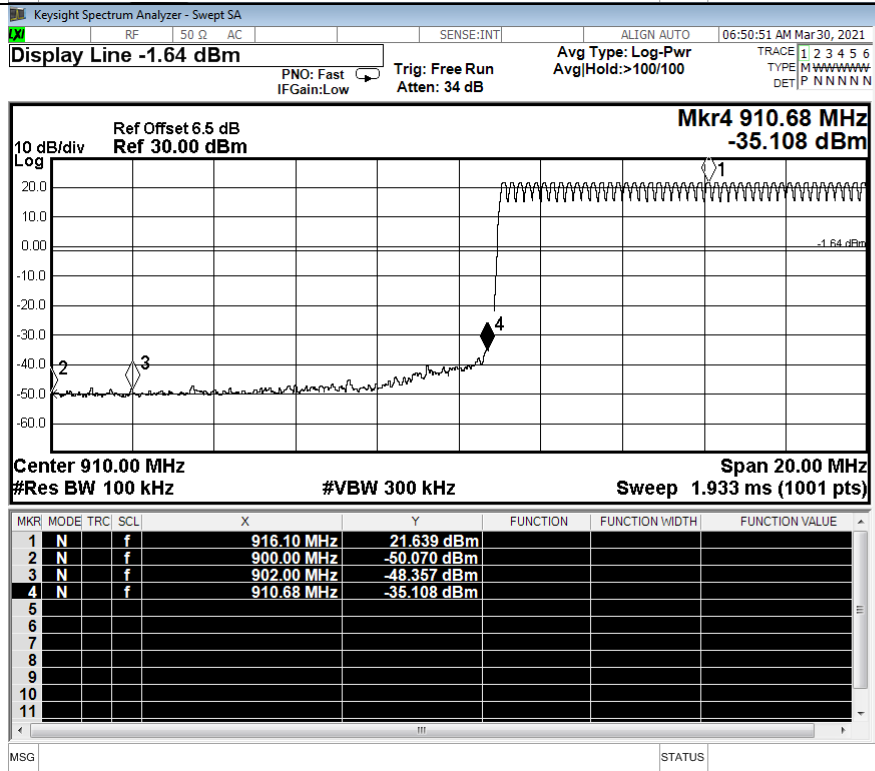
Title

Graticule
On Off

Display Line
0.03 dBm
On Off

System Display Settings

RF ID/LCH/Hop



Display

Annotation

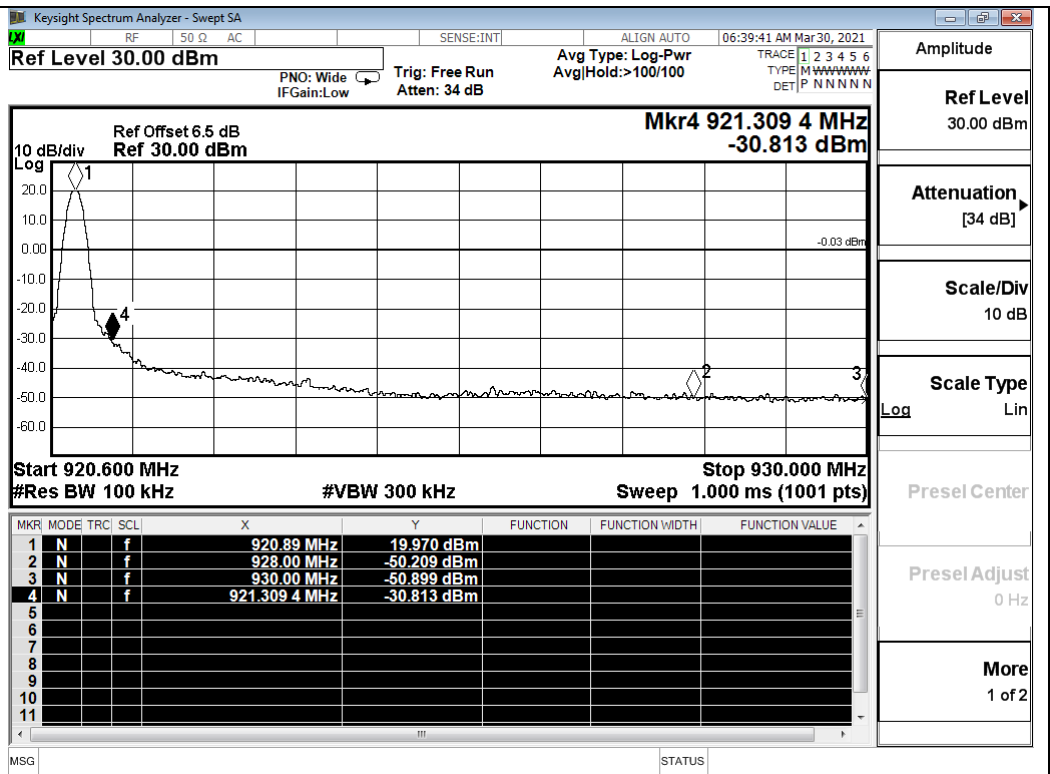
Title

Graticule
On Off

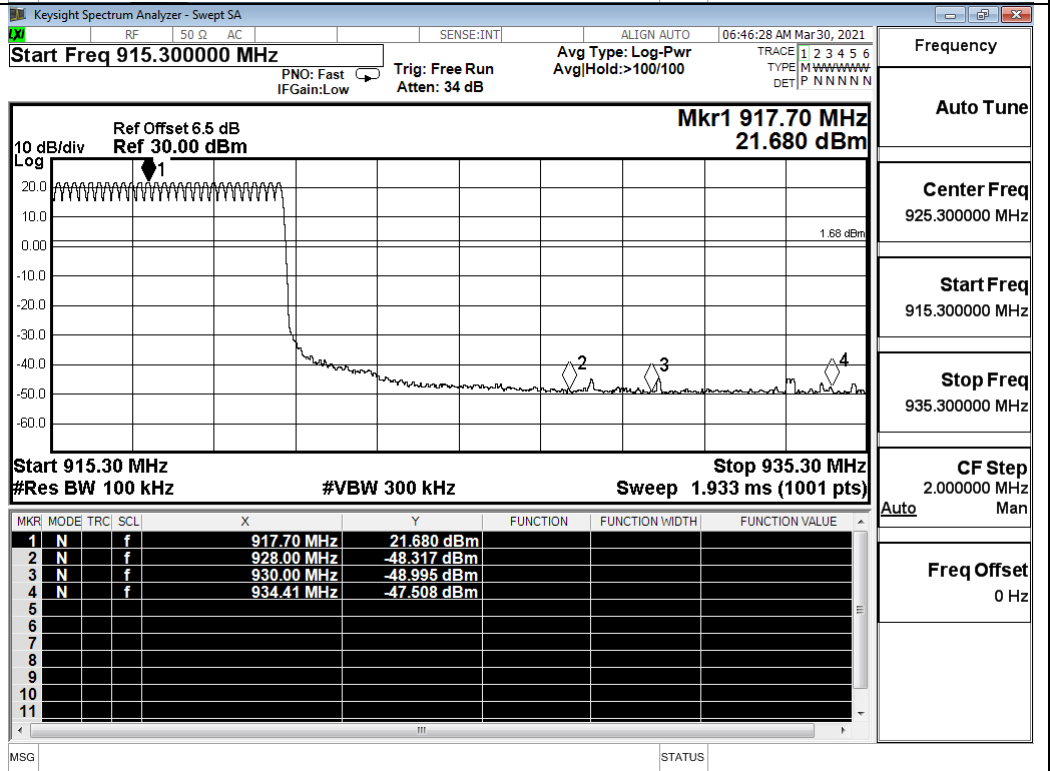
Display Line
-1.64 dBm
On Off

System Display Settings

RF ID/HCH/No Hop



RF ID/HCH/Hop



A.8 Power Spectral Density

Mode	Channel.	PSD [dBm/3KHz]	Limit [dBm/3KHz]	Verdict
RF ID	LCH	7.452	8	PASS
	MCH	7.403	8	PASS
	HCH	7.495	8	PASS

Test Graphs

RF ID/LCH

Marker 1 Δ 911.08500000 MHz
 Avg Type: Log-Pwr
 AvgHold: >100/100
 Center 911.10000 MHz
 #Res BW 3.0 kHz
 #VBW 10 kHz
 Span 150.0 kHz
 Sweep 15.87 ms (1001 pts)

Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

Mkr→CF

Mkr→Ref Lvl

More 1 of 2

RF ID/MCH

Marker 1 Δ 915.88650000 MHz
 Avg Type: Log-Pwr
 AvgHold: >100/100
 Center 915.90000 MHz
 #Res BW 3.0 kHz
 #VBW 10 kHz
 Span 150.0 kHz
 Sweep 15.87 ms (1001 pts)

Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

Mkr→CF

Mkr→Ref Lvl

More 1 of 2

