

7.4. POWER SPECTRAL DENSITY

LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC §15.247 (e) RSS-247 5.2 (b)	Power Spectral Density	8 dBm in any 3 kHz band	2400-2483.5
Note:	1. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. 2. Limit=8dBm – (Directional gain -6)dBi Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi, where N_{ANT} is the number of outputs, G_{ANT} is the Antenna gain.		

TEST PROCEDURE

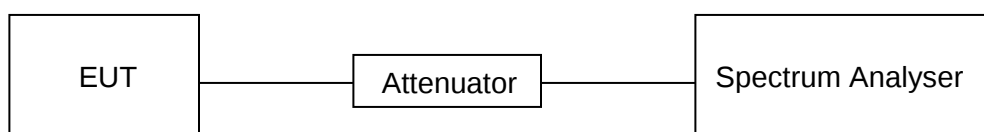
Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	$3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
VBW	$\geq 3 \times \text{RBW}$
Span	$1.5 \times \text{DTS bandwidth}$
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST SETUP

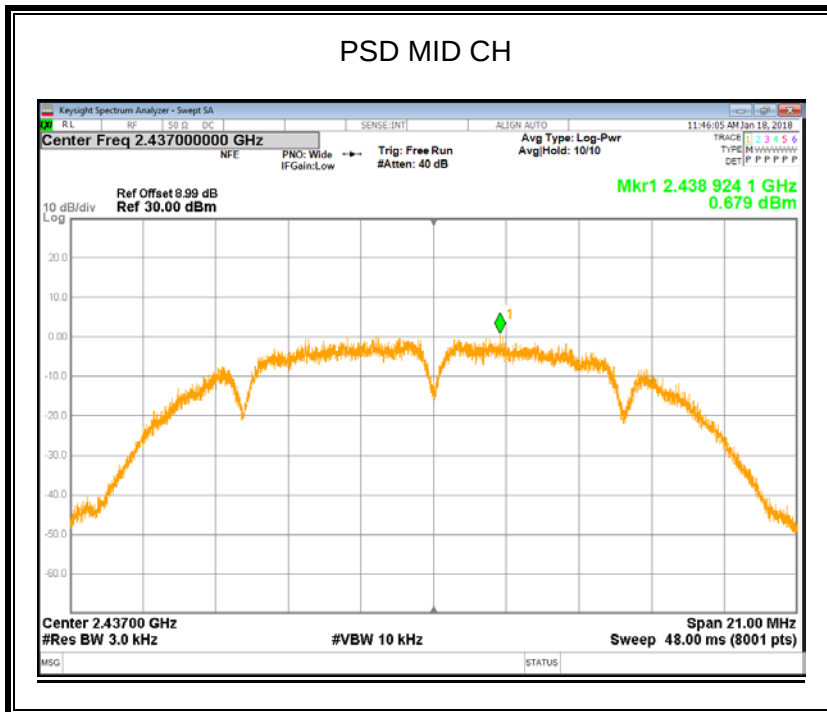
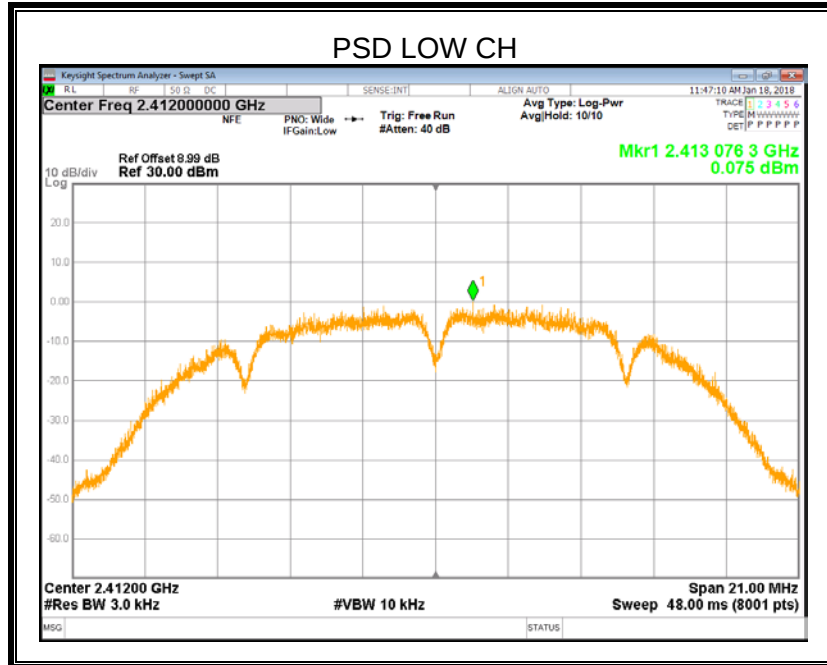


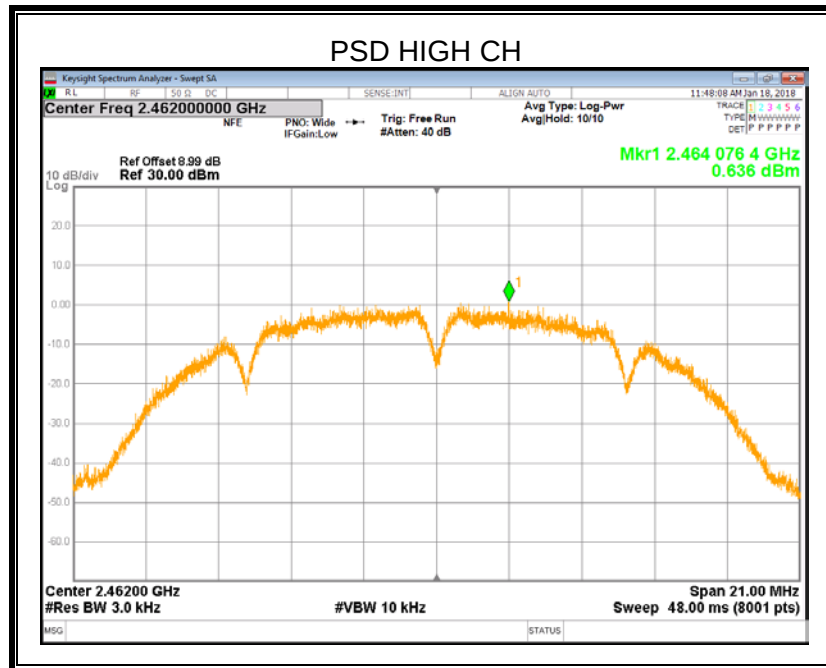
RESULTS

7.4.1. 1TX Mode

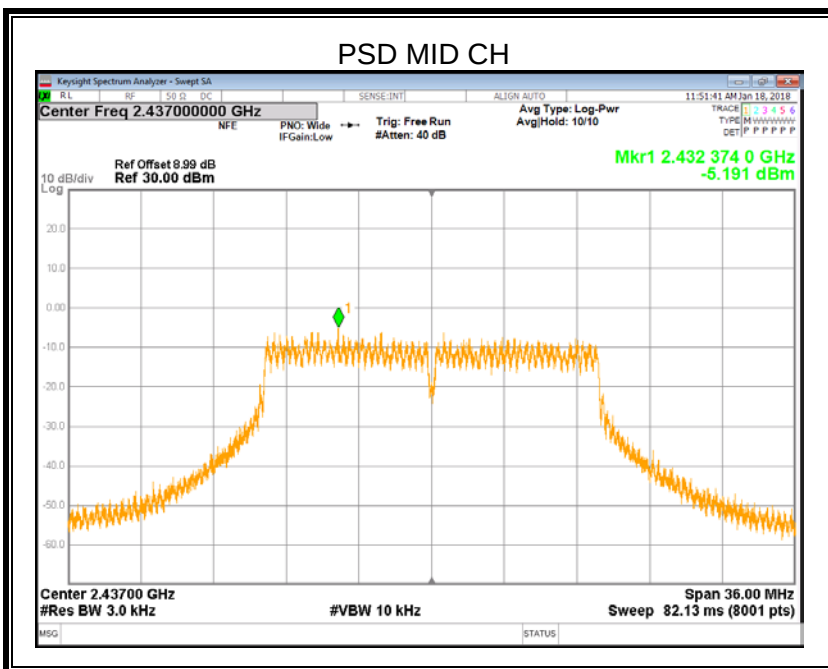
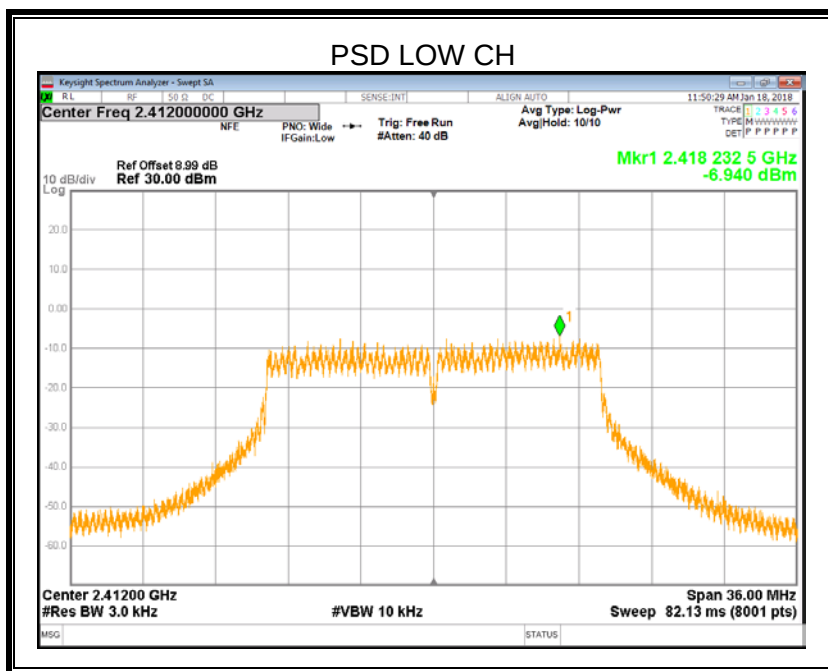
1TX Mode					
Mode	Channel	Antenna	Meas.Level [dBm/3kHz]	Limit (dBm/3KHz)	Verdict
802.11b	LCH	A	0.075	2.5	PASS
	MCH	A	0.679	2.5	PASS
	HCH	A	0.636	2.5	PASS
802.11g	LCH	A	-6.94	2.5	PASS
	MCH	A	-5.191	2.5	PASS
	HCH	A	-6.976	2.5	PASS
802.11n20	LCH	A	-5.785	2.5	PASS
	MCH	A	-5.409	2.5	PASS
	HCH	A	-6.002	2.5	PASS
802.11n40	LCH	A	-10.37	2.5	PASS
	MCH	A	-8.905	2.5	PASS
	HCH	A	-8.262	2.5	PASS

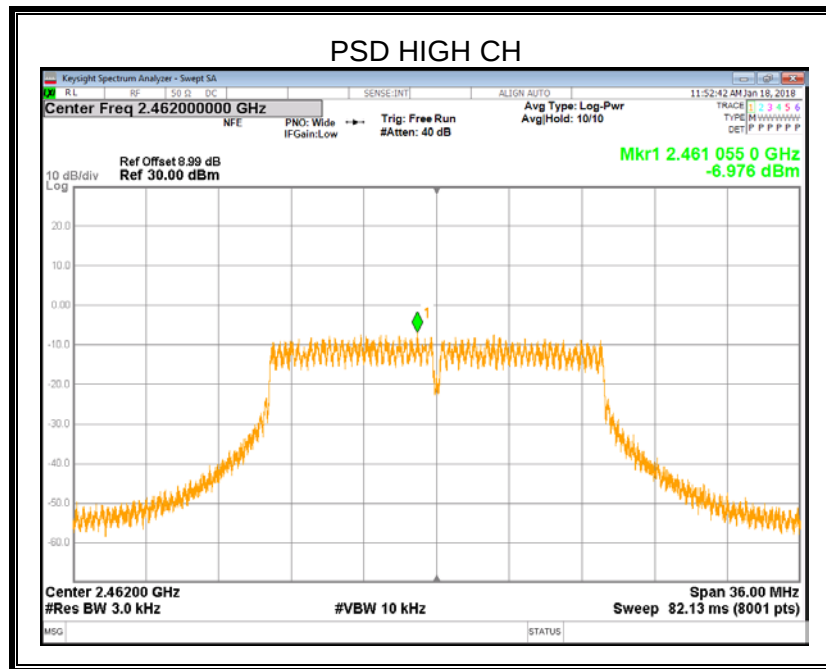
802.11b



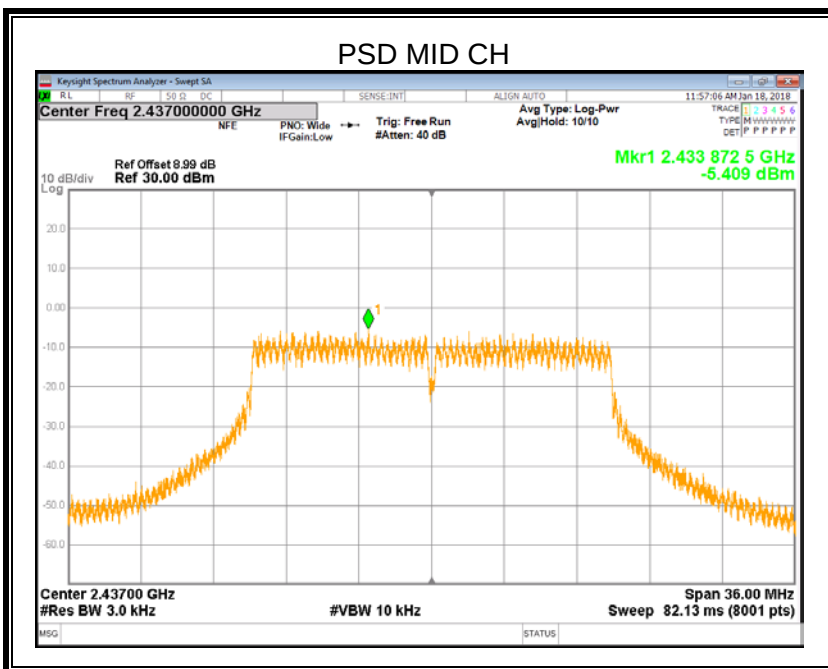
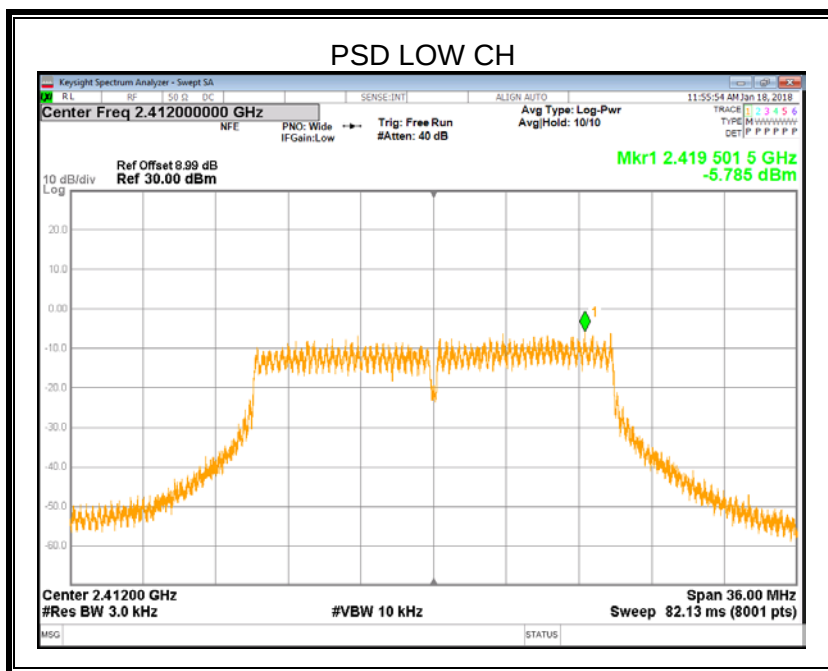


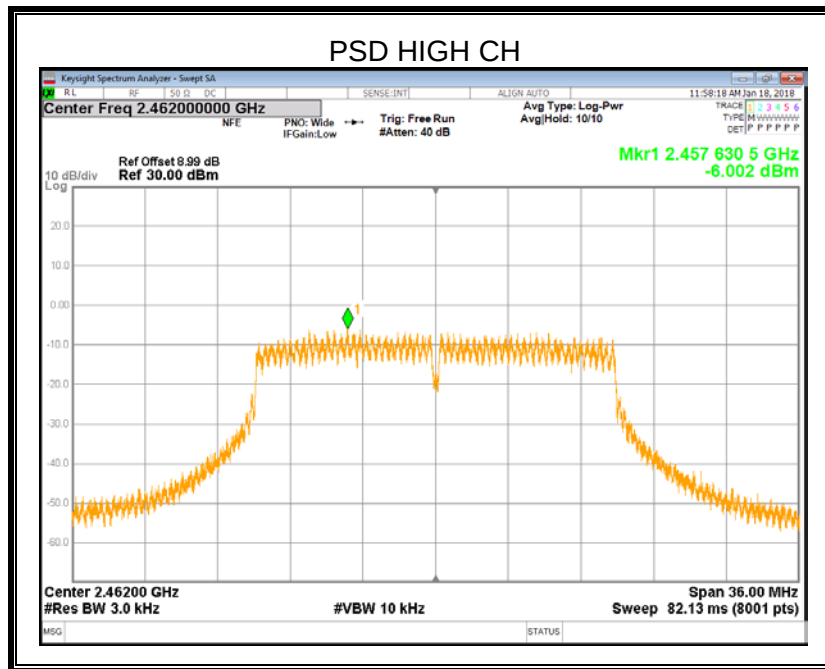
802.11g



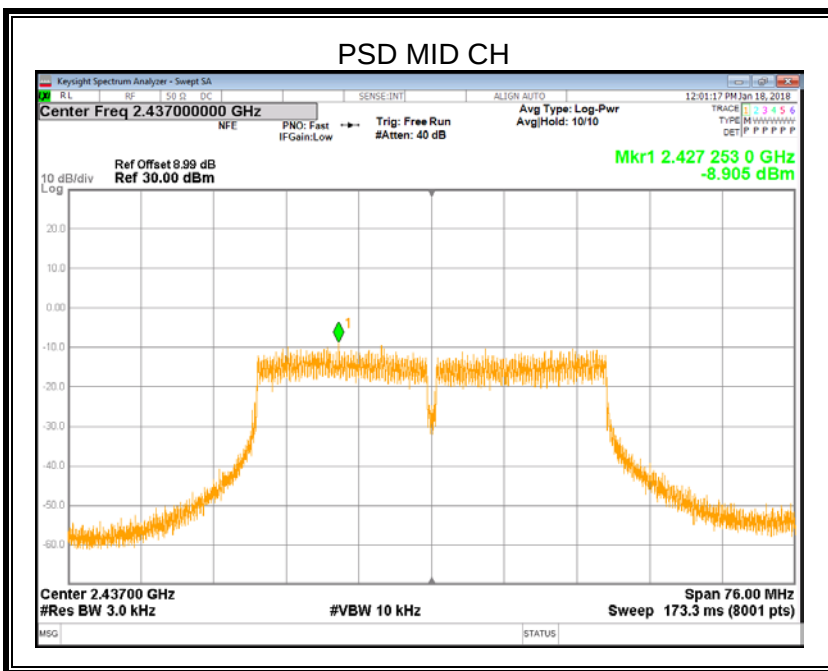
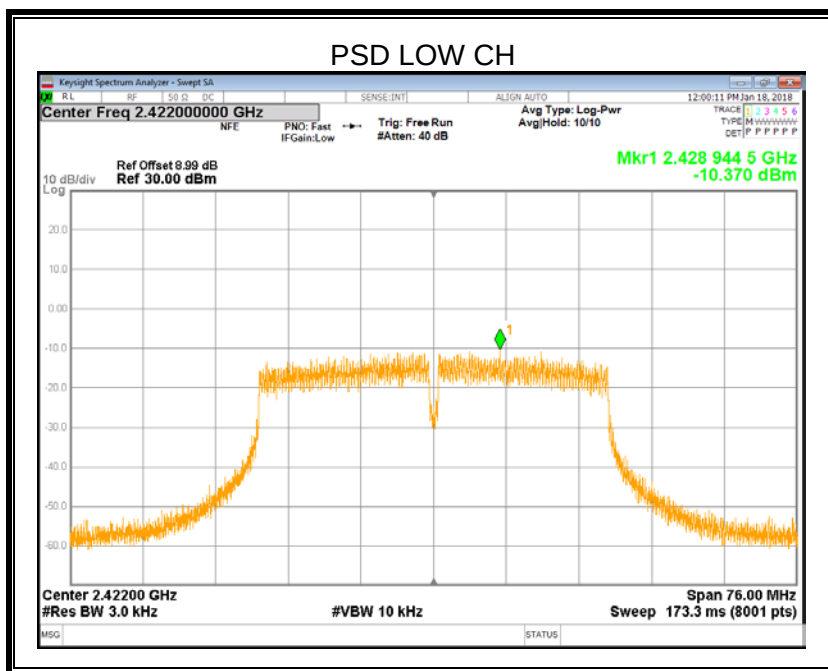


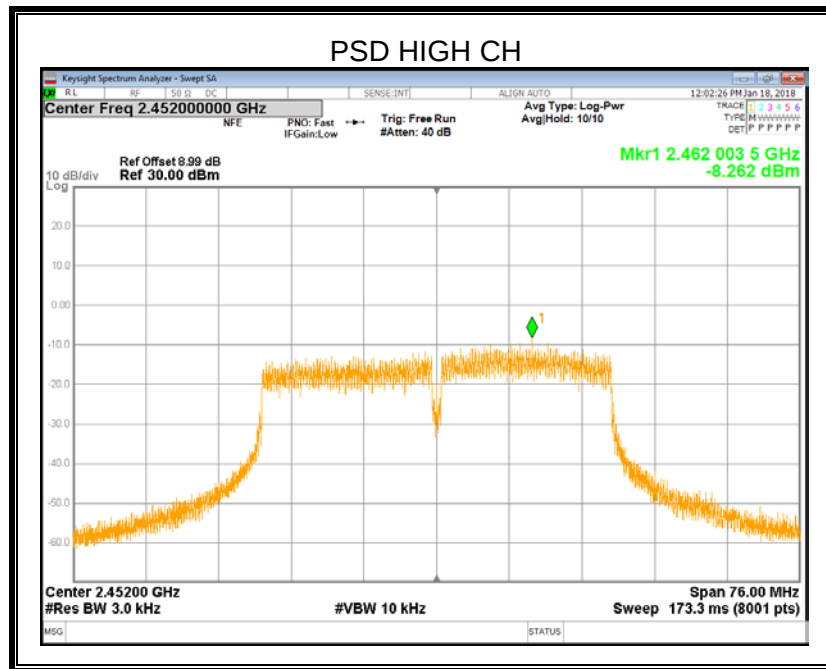
802.11n Ht20





802.11 Ht40



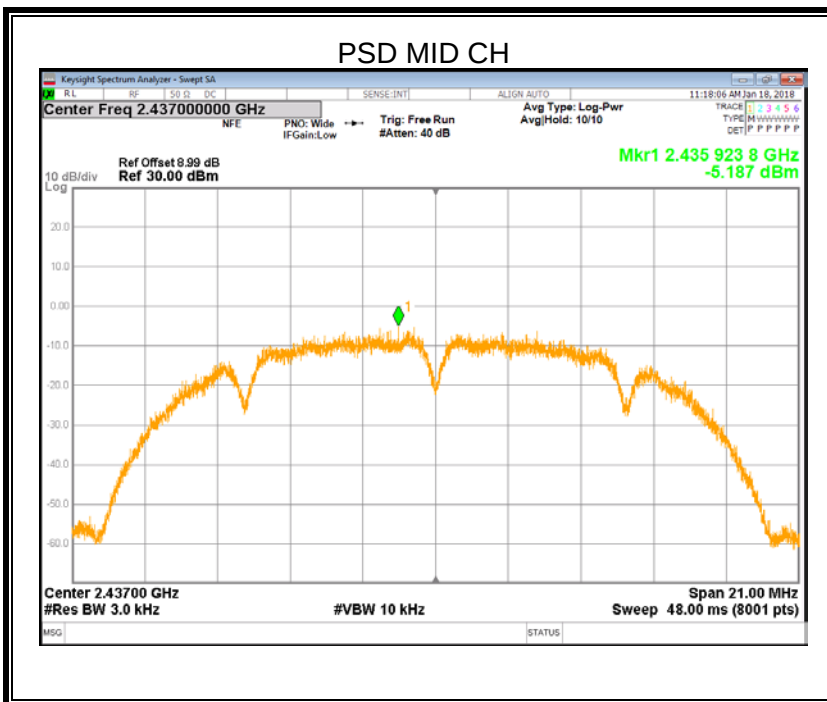
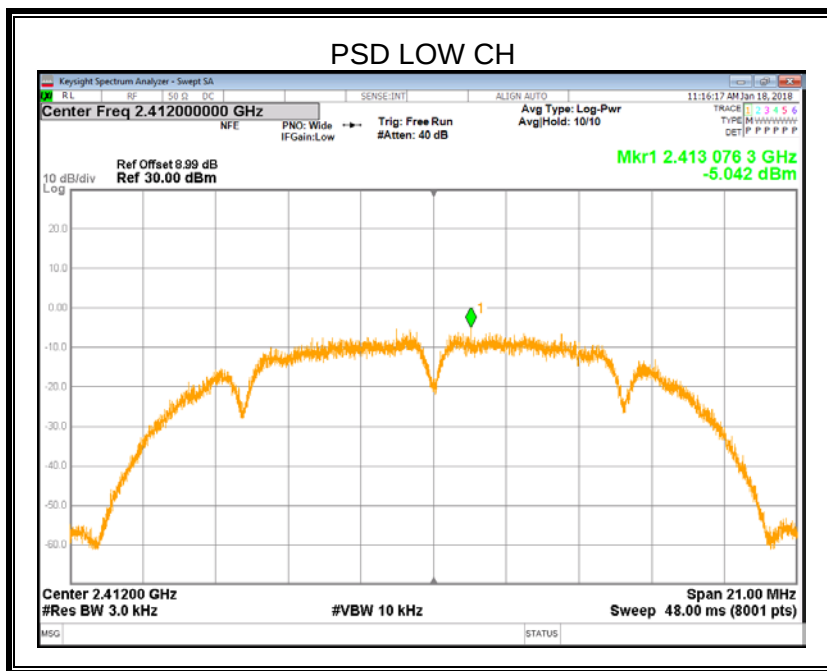


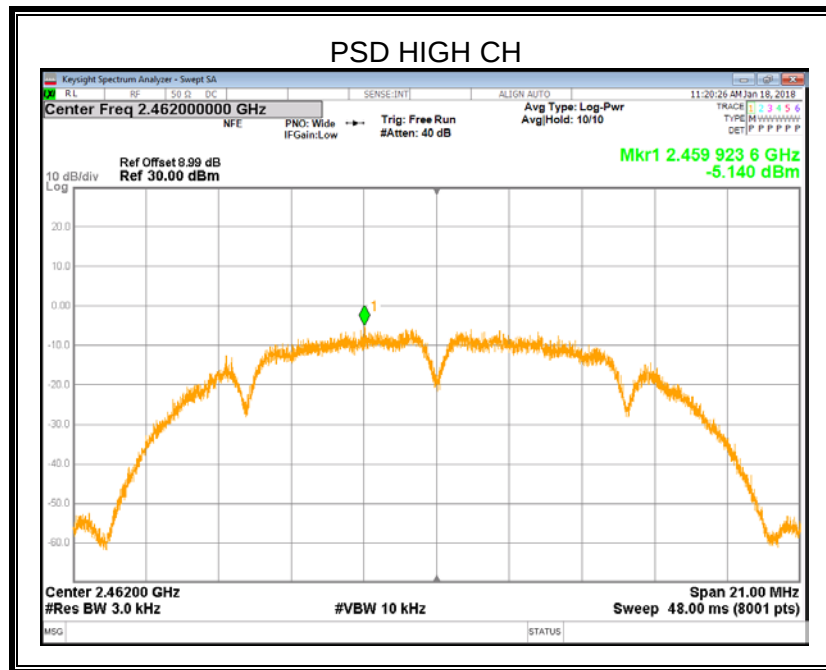
7.4.2. 2TX Mode

2TX Mode						
Mode	Channel	Antenna	Meas.Level [dBm/3kHz]	Total [dBm/3kHz]	Limit (dBm/3KHz)	Verdict
802.11b	LCH	A	-5.042	-1.925	-0.5	PASS
		C	-4.832			
	MCH	A	-5.187	-1.46	-0.5	PASS
		C	-3.857			
	HCH	A	-5.140	-2.67	-0.5	PASS
		C	-6.299			
802.11g	LCH	A	-6.963	-4.06	-0.5	PASS
		C	-7.183			
	MCH	A	-6.736	-4.14	-0.5	PASS
		C	-7.608			
	HCH	A	-6.661	-3.73	-0.5	PASS
		C	-6.819			
802.11n20	LCH	A	-7.419	-4.74	-0.5	PASS
		C	-8.099			
	MCH	A	-7.948	-5.04	-0.5	PASS
		C	-8.146			
	HCH	A	-8.375	-4.82	-0.5	PASS
		C	-7.350			
802.11n40	LCH	A	-10.115	-7.48	-0.5	PASS
		C	-10.882			
	MCH	A	-10.092	-6.86	-0.5	PASS
		C	-9.652			
	HCH	A	-9.800	-7.00	-0.5	PASS
		C	-10.230			

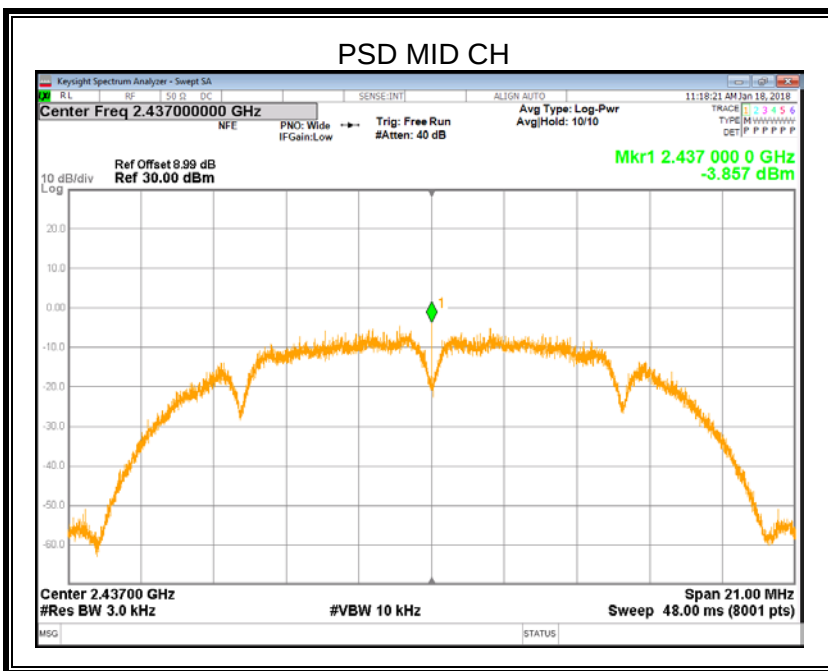
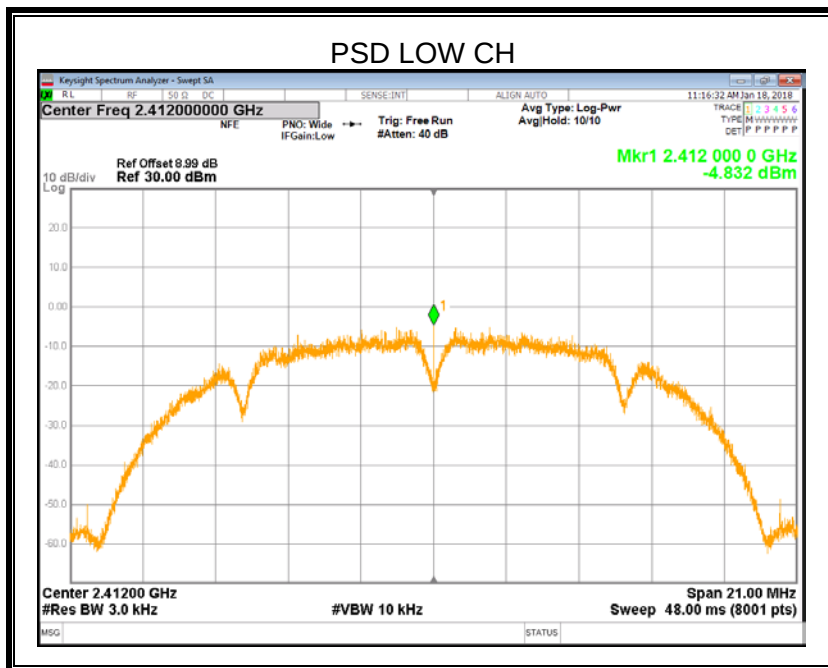
802.11b

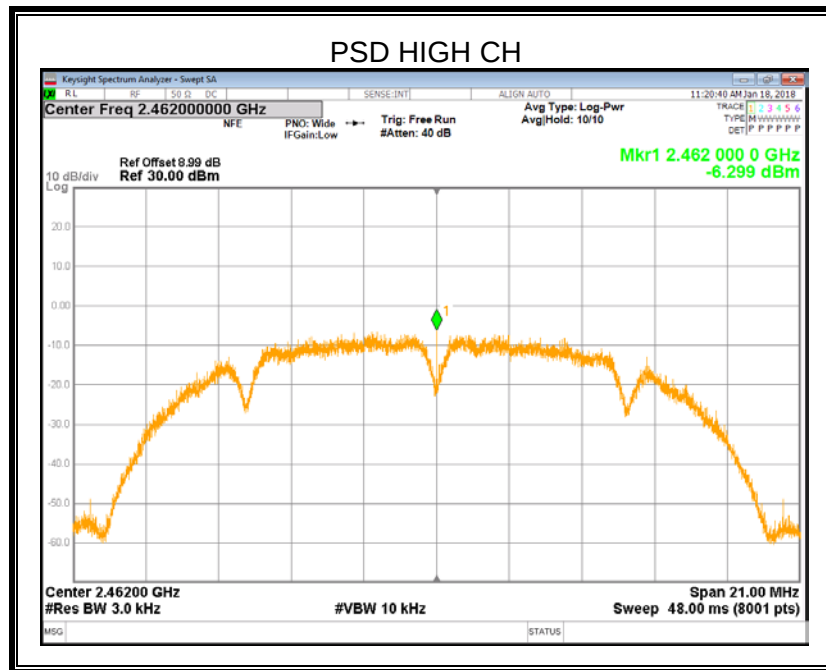
Antenna A





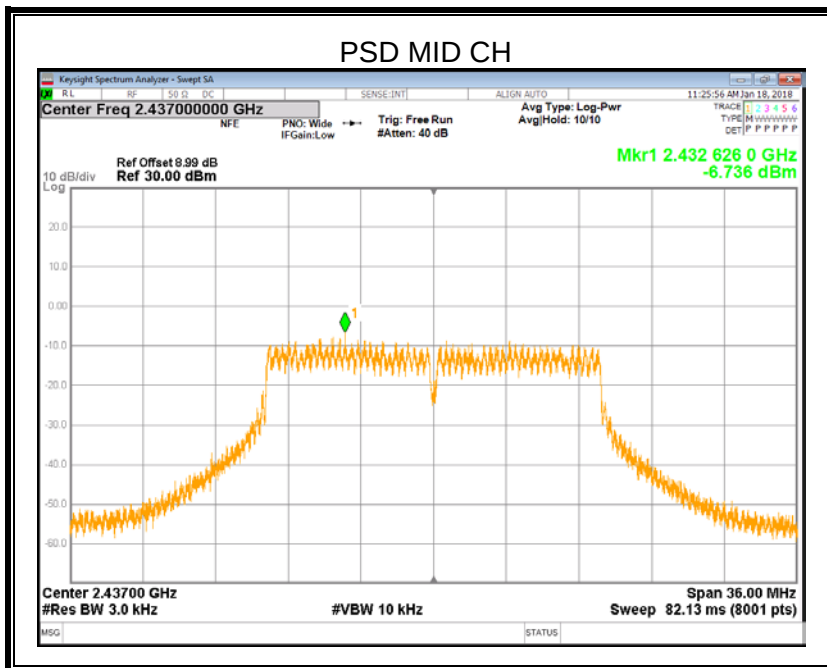
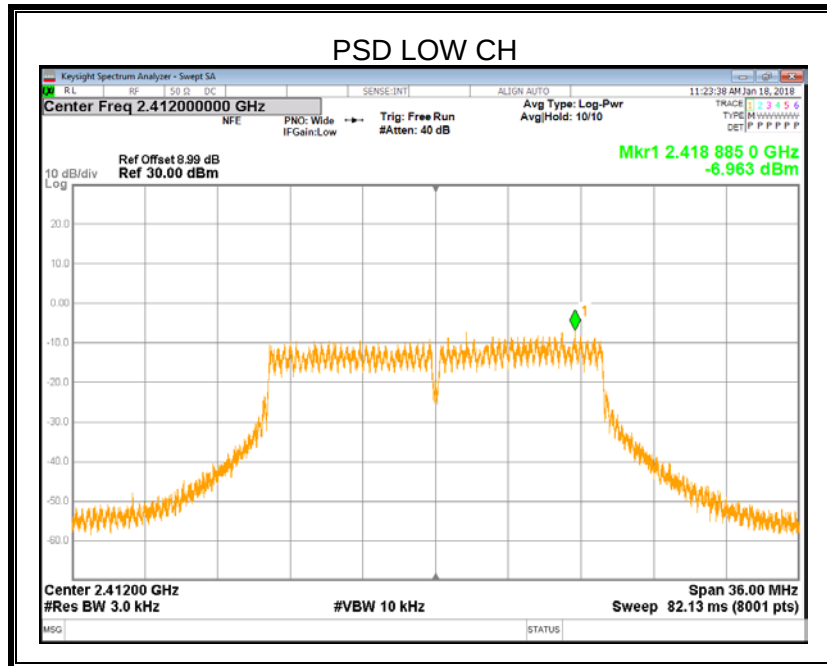
Antenna C

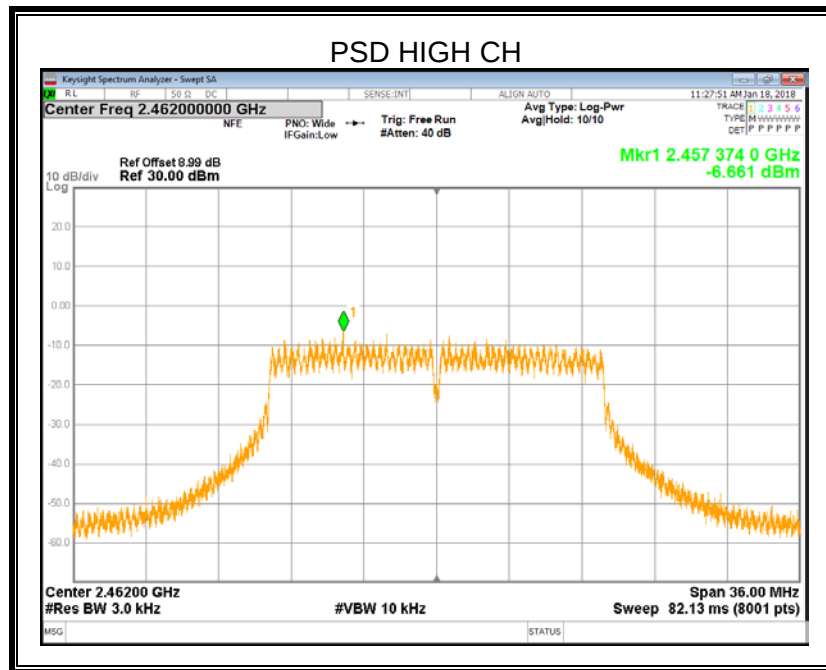




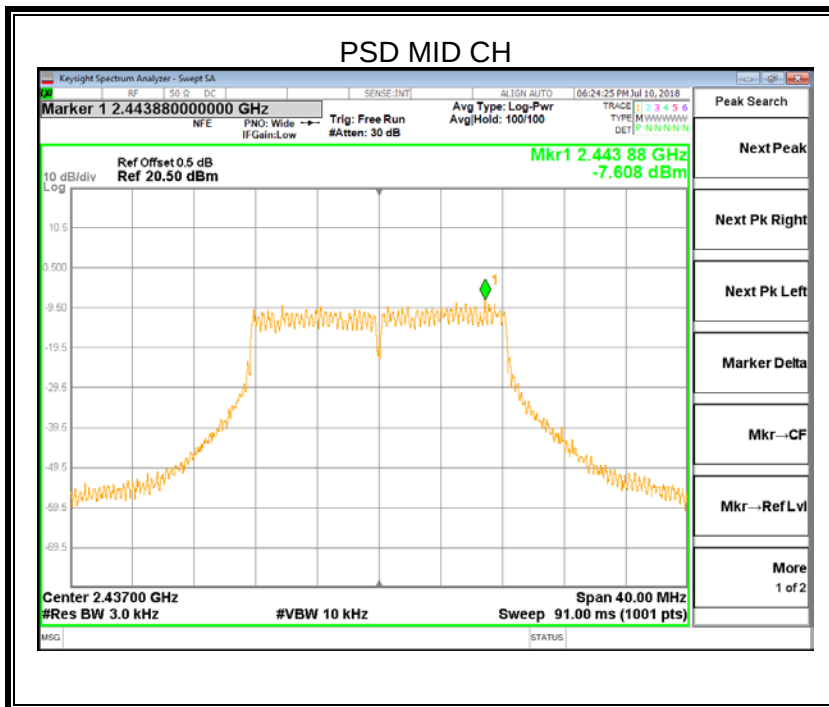
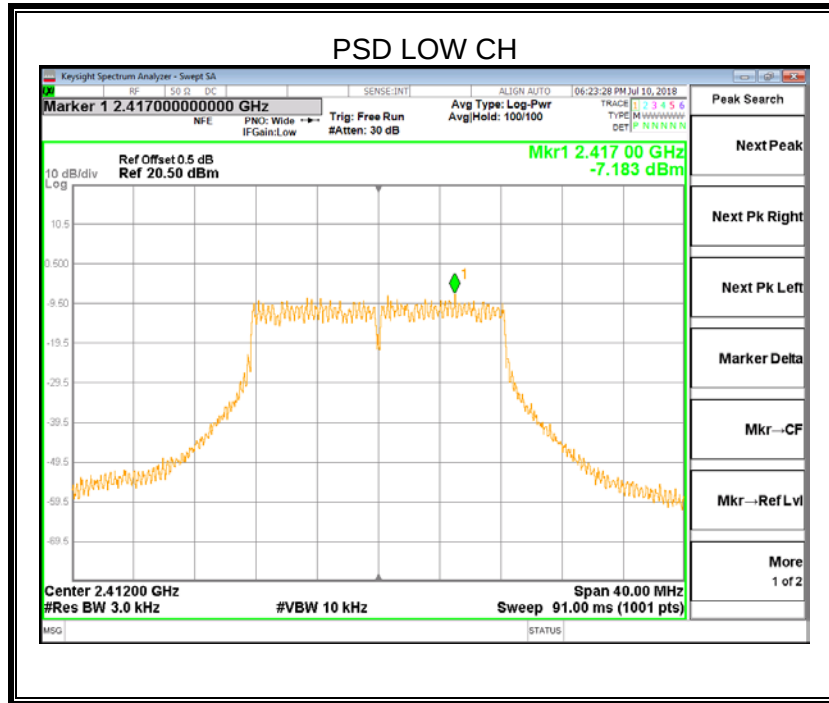
802.11g

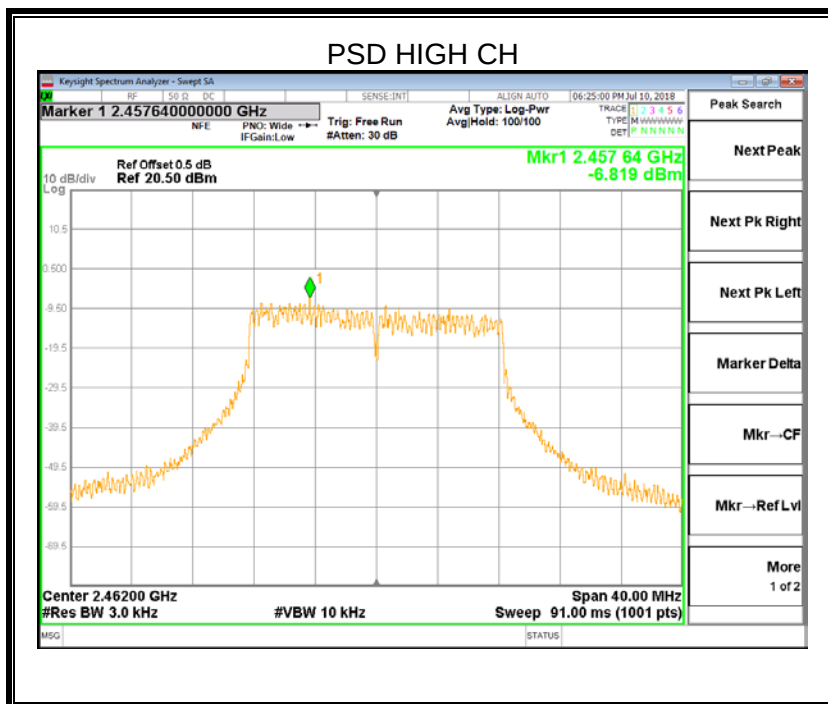
Antenna A





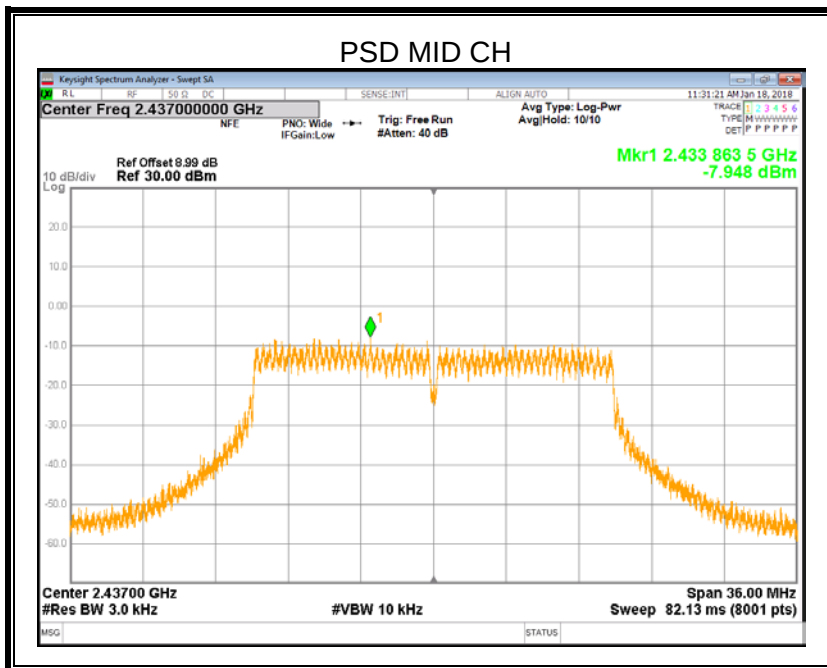
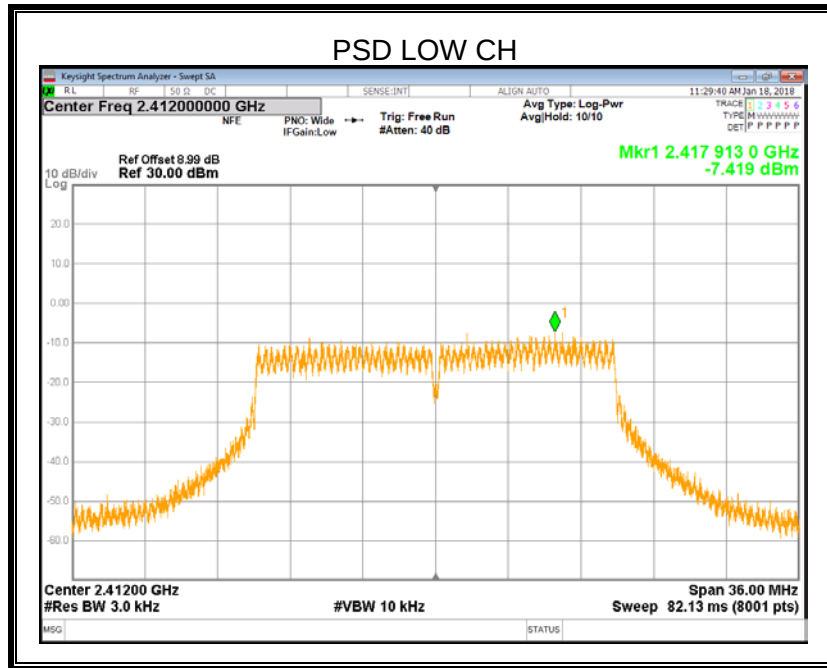
Antenna C

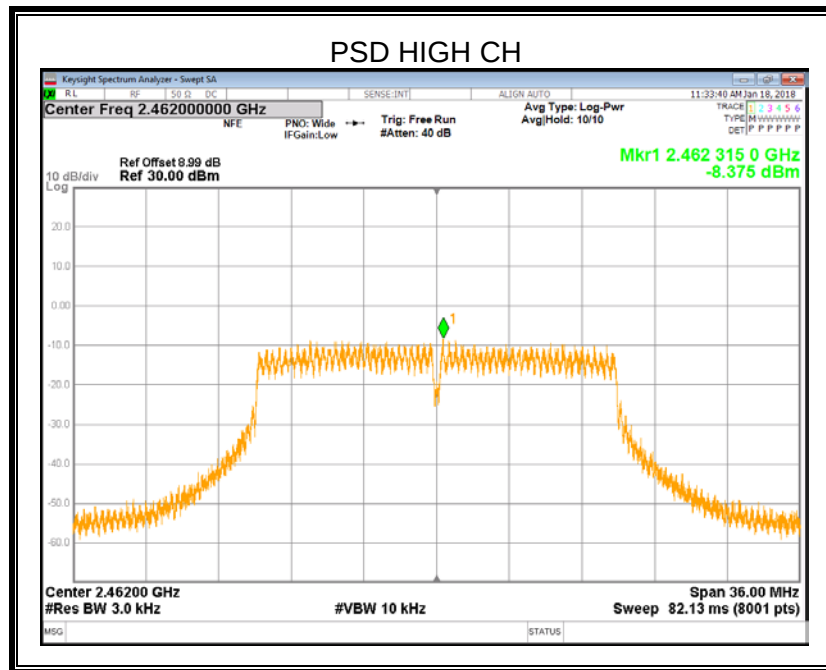




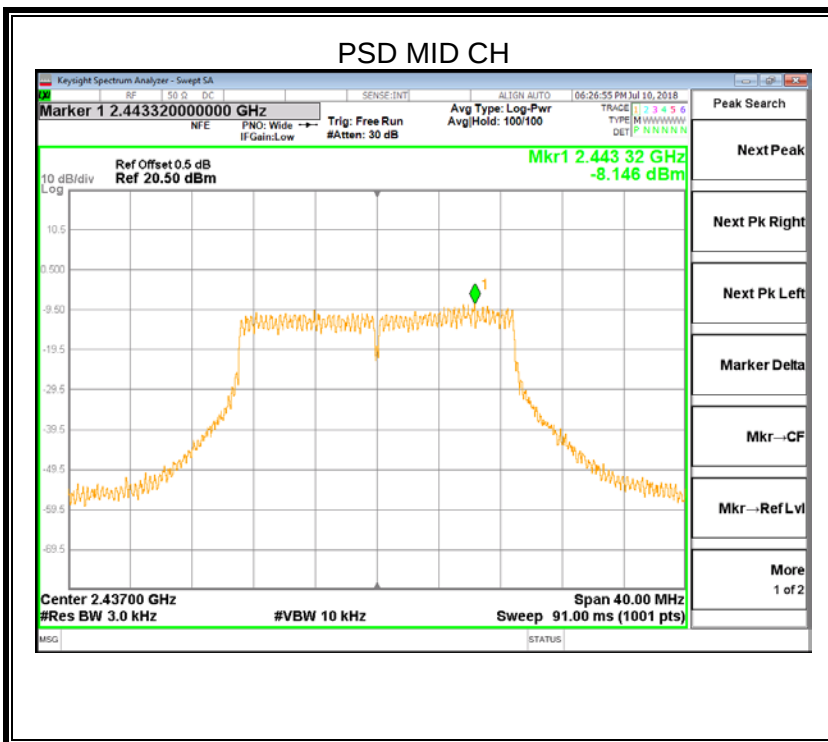
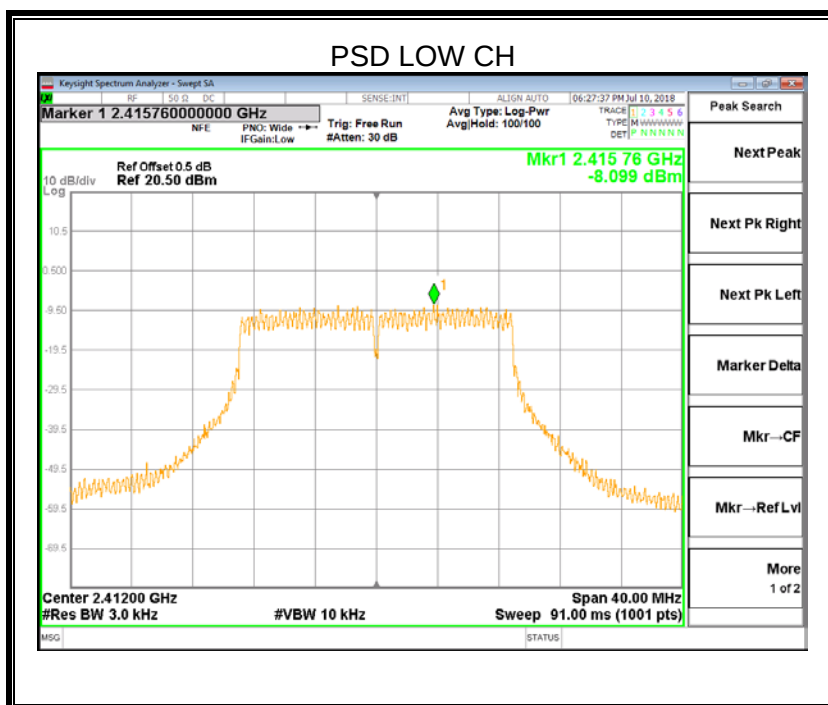
802.11n20

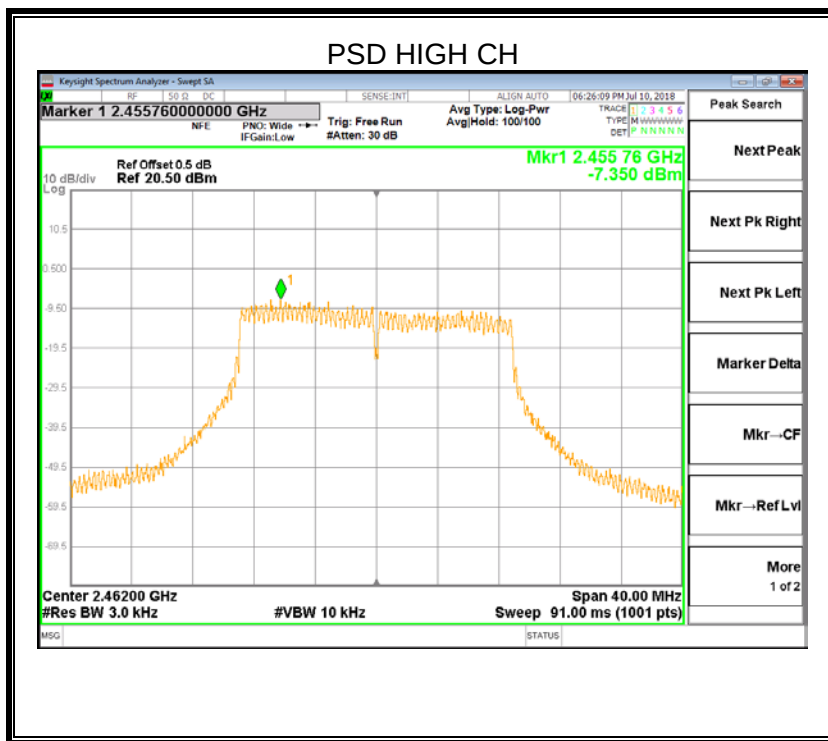
Antenna A





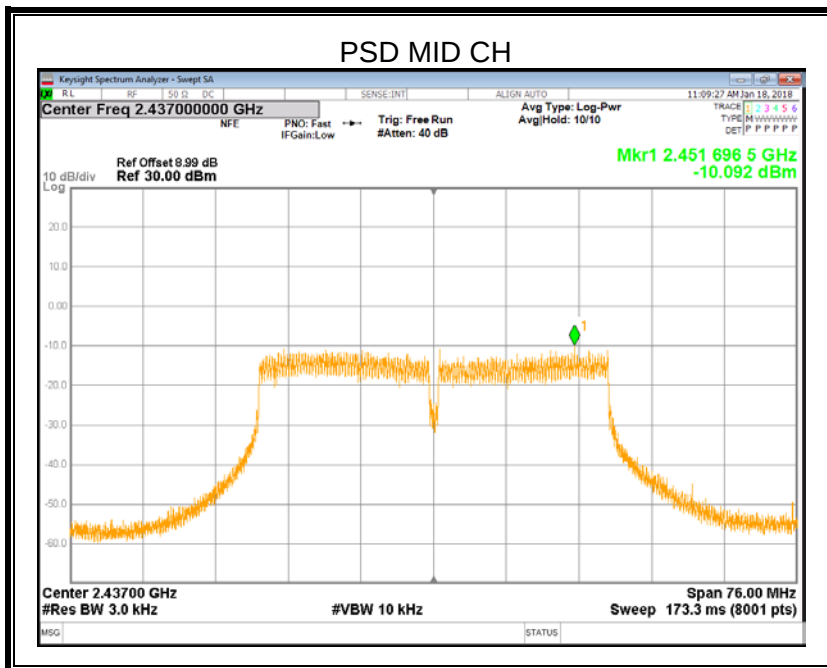
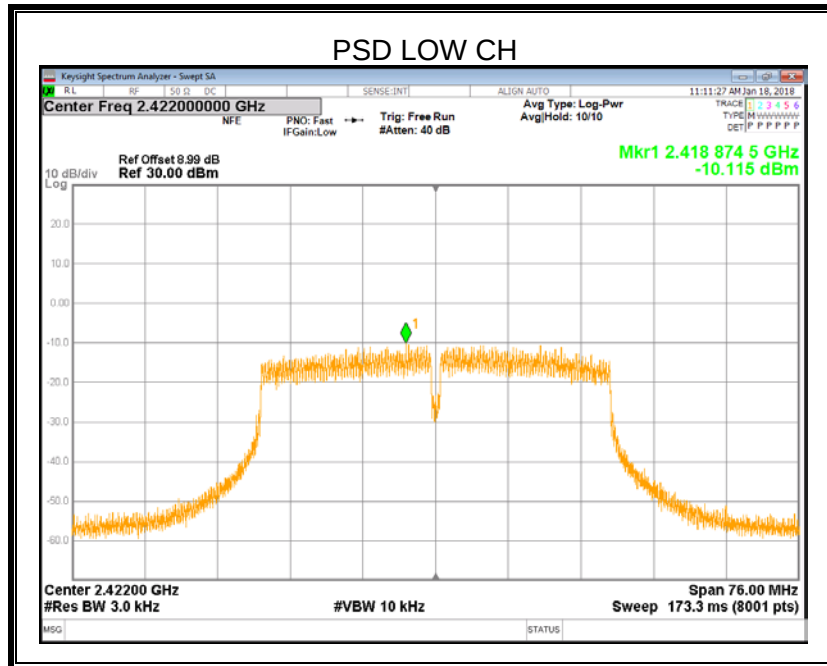
Antenna C

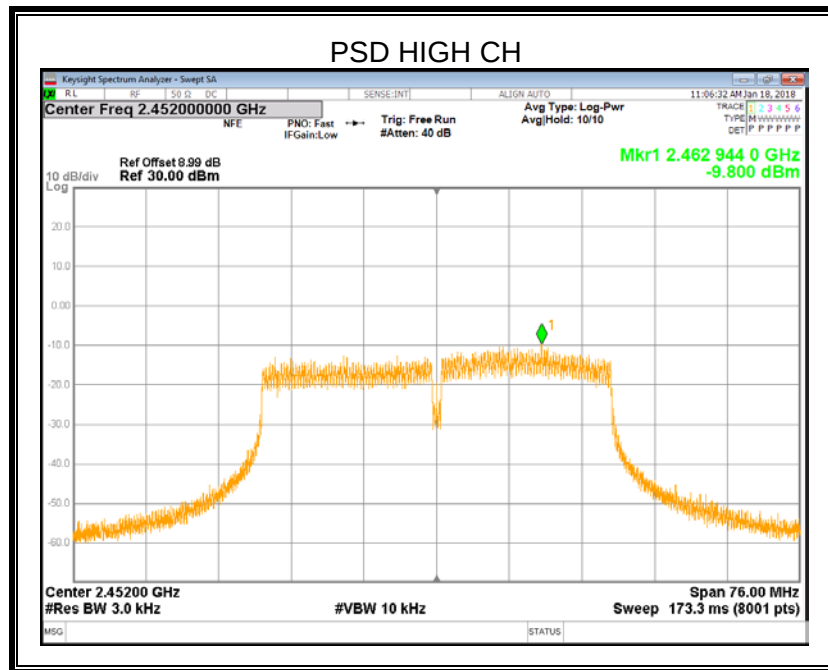




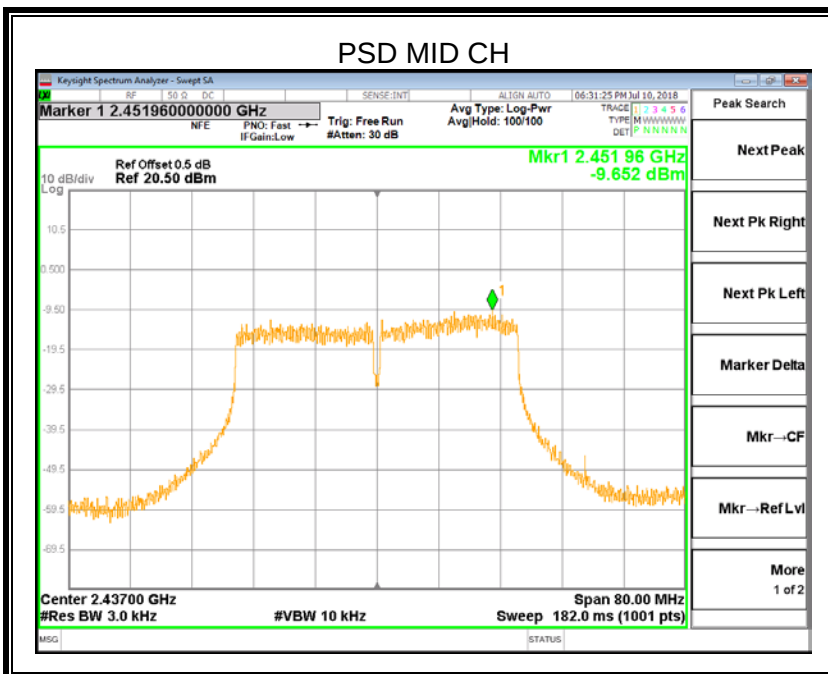
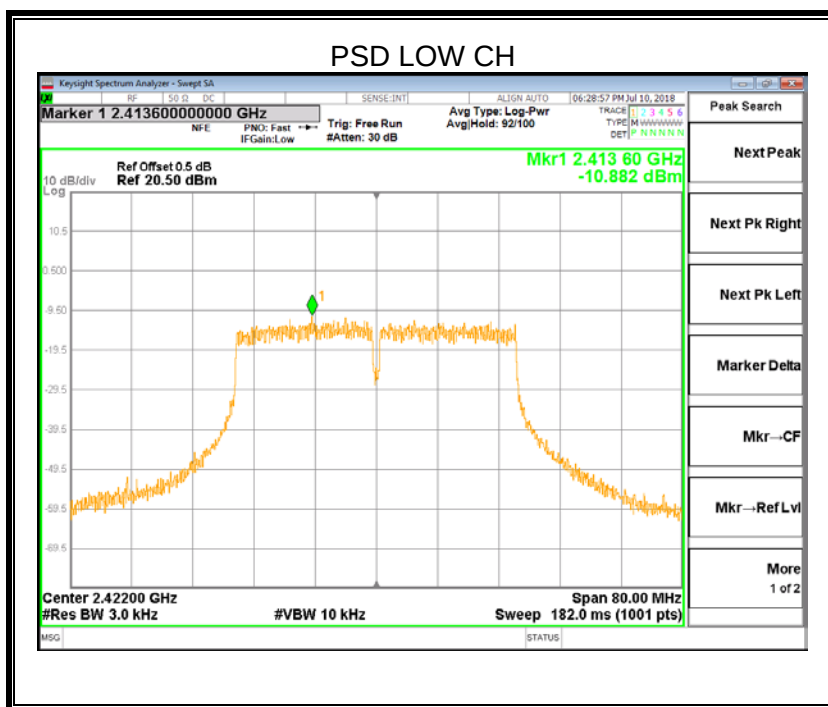
802.11n40

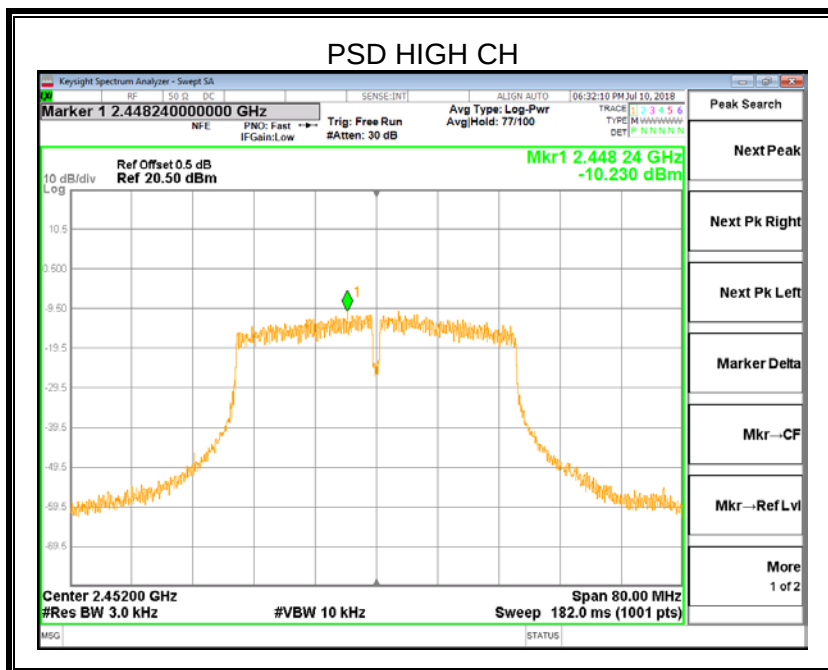
Antenna A





Antenna C



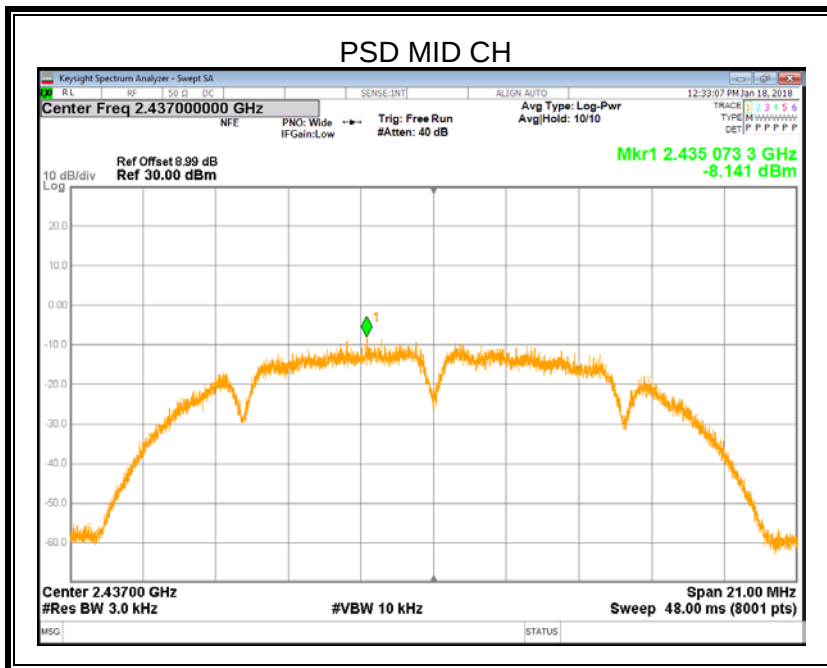
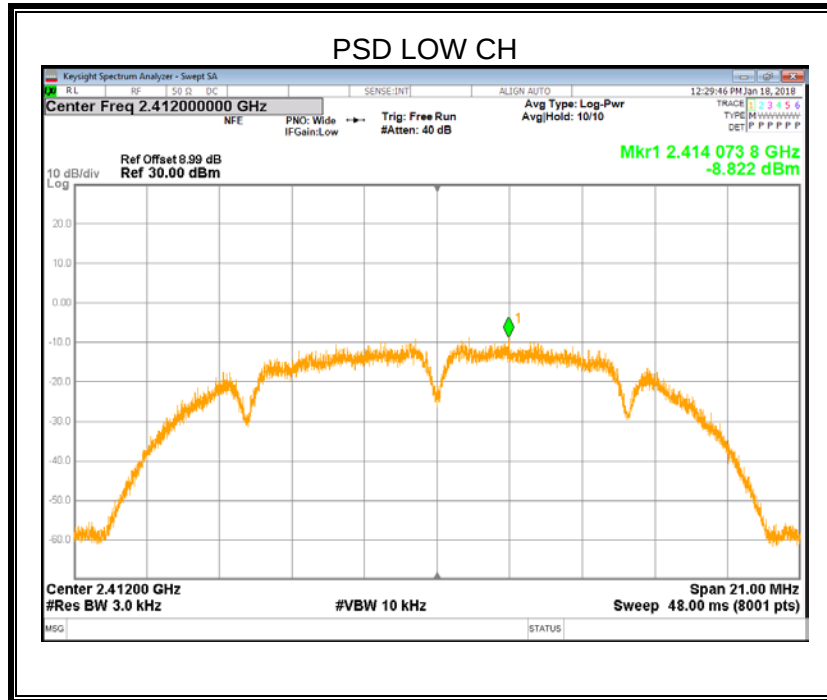


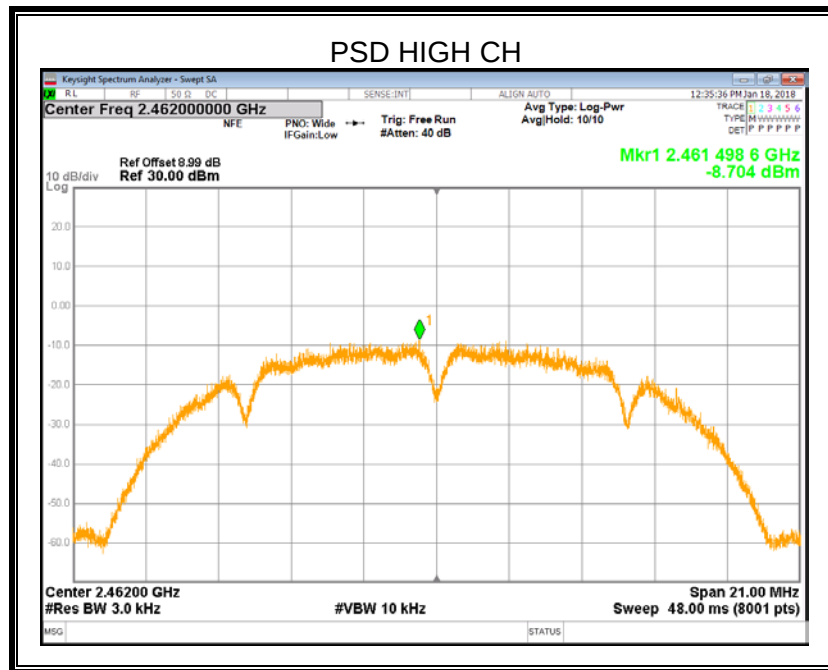
7.4.3. 3TX Mode

3TX Mode						
Mode	Channel	Antenna	Meas.Level [dBm/3kHz]	Total [dBm/3kHz]	Limit (dBm/3KHz)	Verdict
802.11b	LCH	A	-8.822	-4.544	-2.5	PASS
		B	-9.931			
		C	-9.265			
	MCH	A	-8.141	-3.965	-2.5	PASS
		B	-8.776			
		C	-9.380			
	HCH	A	-8.704	-3.99	-2.5	PASS
		B	-8.893			
		C	-8.690			
802.11g	LCH	A	-10.075	-5.316	-2.5	PASS
		B	-10.479			
		C	-9.7380			
	MCH	A	-10.085	-5.016	-2.5	PASS
		B	-9.433			
		C	-9.870			
	HCH	A	-9.965	-5.609	-2.5	PASS
		B	-10.924			
		C	-10.606			
802.11n20	LCH	A	-10.488	-6.098	-2.5	PASS
		B	-10.628			
		C	-11.569			
	MCH	A	-11.120	-6.359	-2.5	PASS
		B	-11.136			
		C	-11.134			
	HCH	A	-11.623	-6.31	-2.5	PASS
		B	-9.848			
		C	-12.114			
802.11n40	LCH	A	-14.217	-9.695	-2.5	PASS
		B	-13.829			
		C	-15.530			
	MCH	A	-14.294	-10.083	-2.5	PASS
		B	-15.523			
		C	-14.833			
	HCH	A	-13.282	-9.036	-2.5	PASS
		B	-14.262			
		C	-13.937			

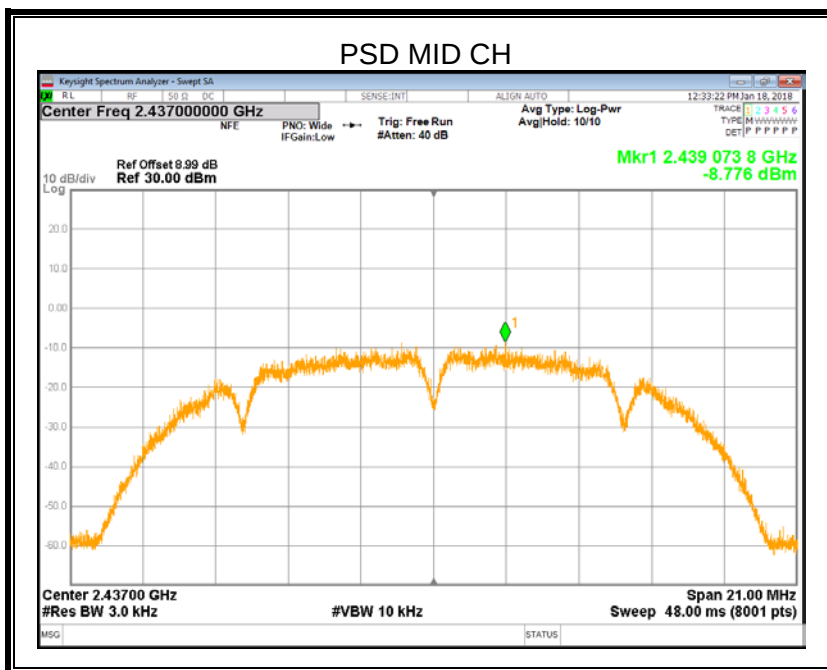
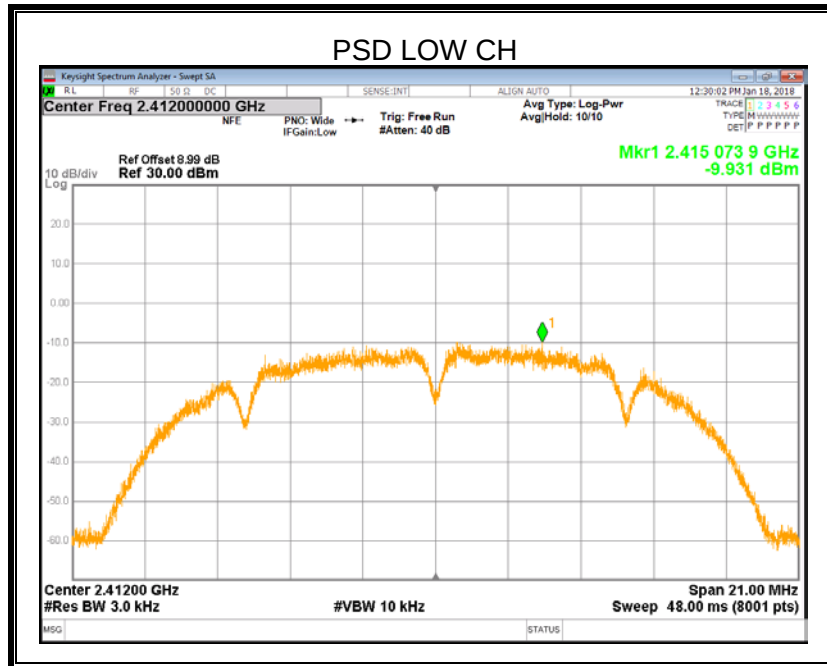
802.11b

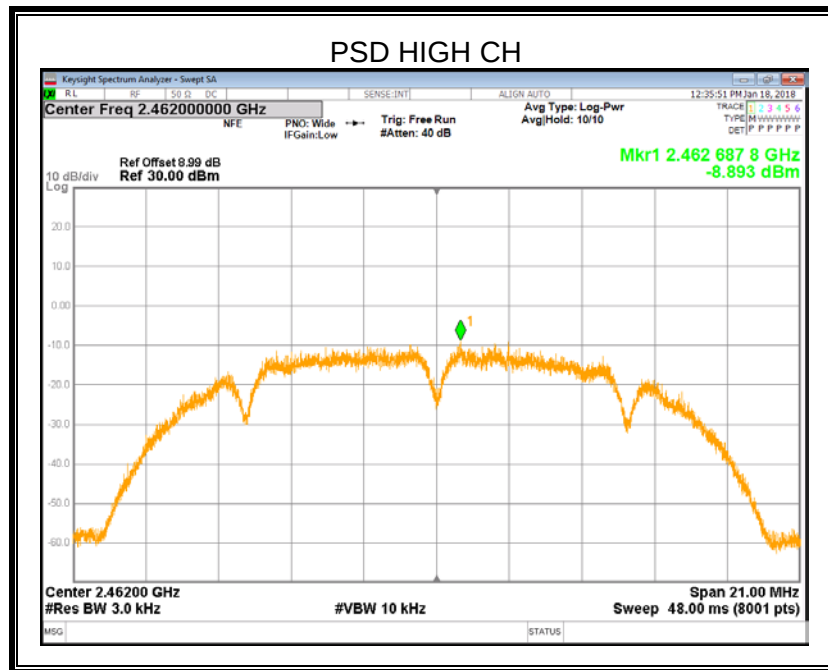
Antenna A



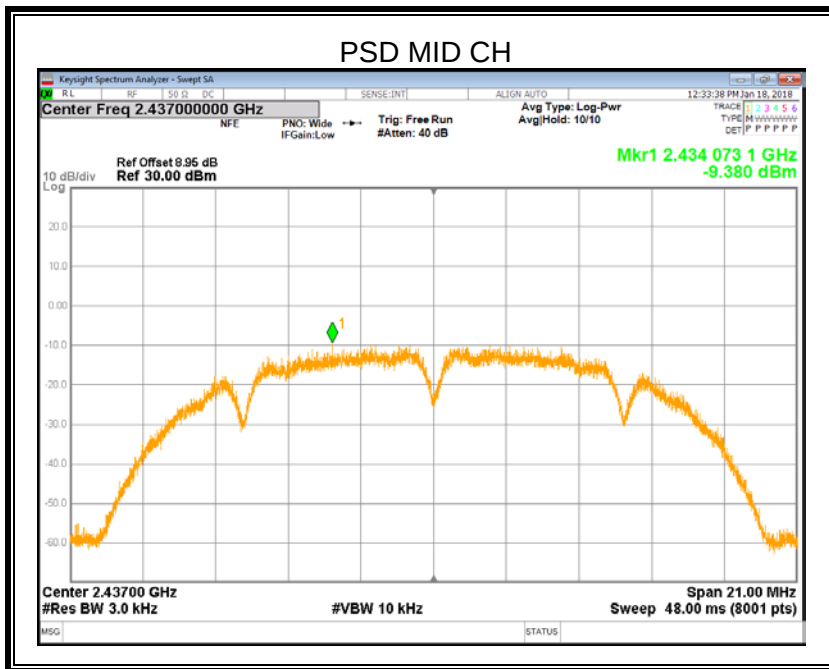
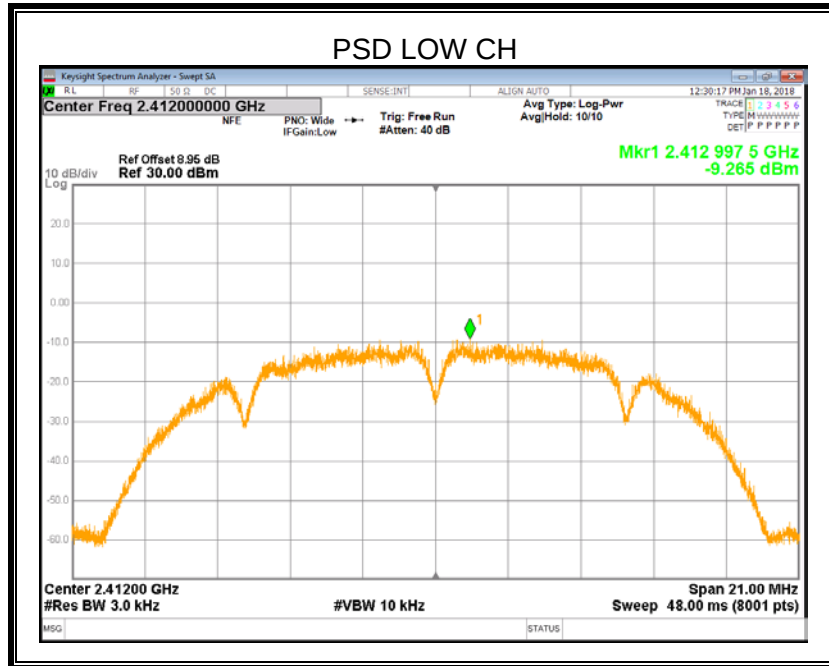


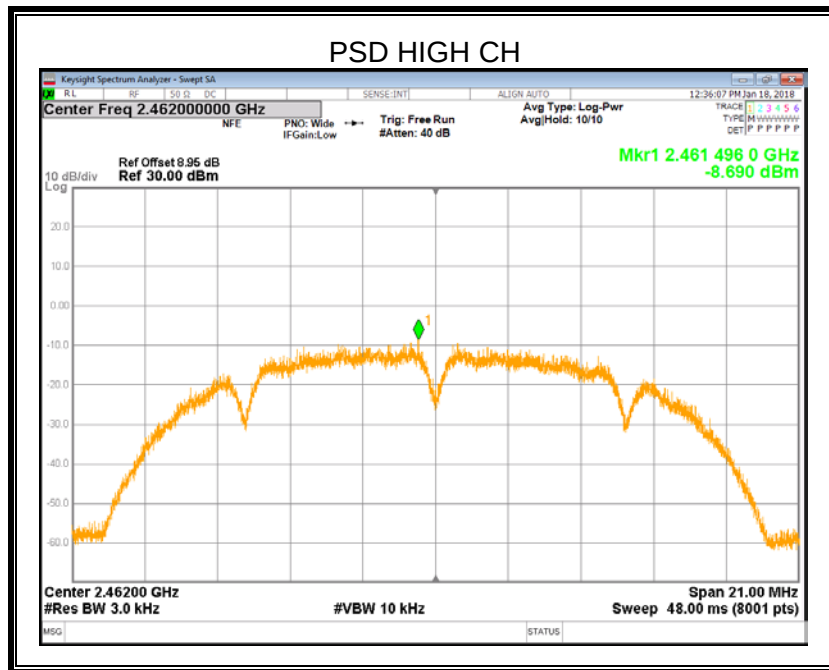
Antenna B





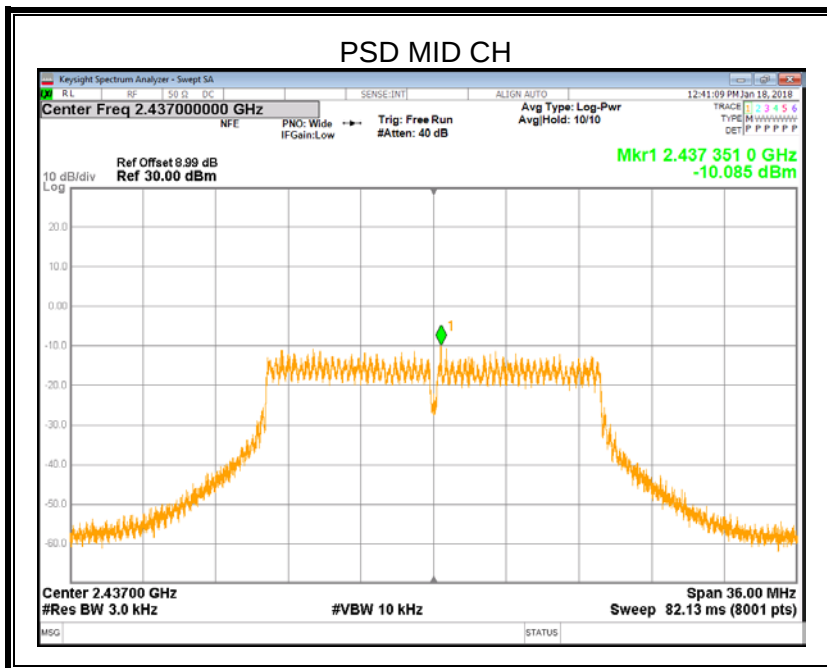
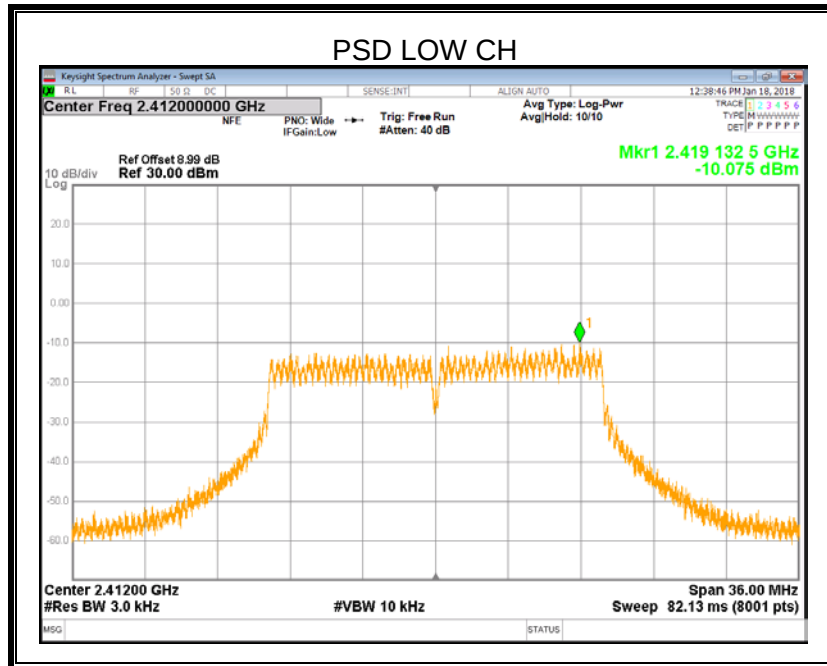
Antenna C

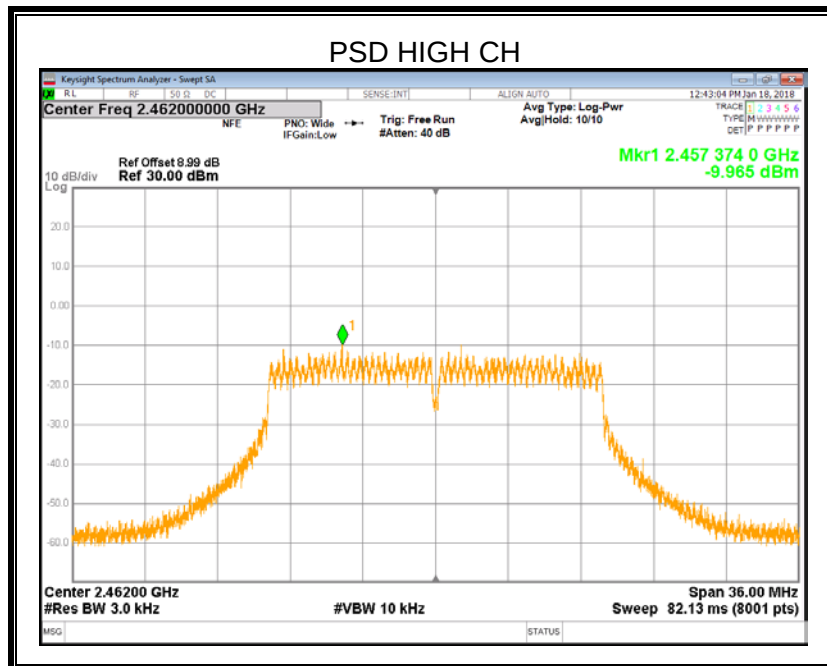




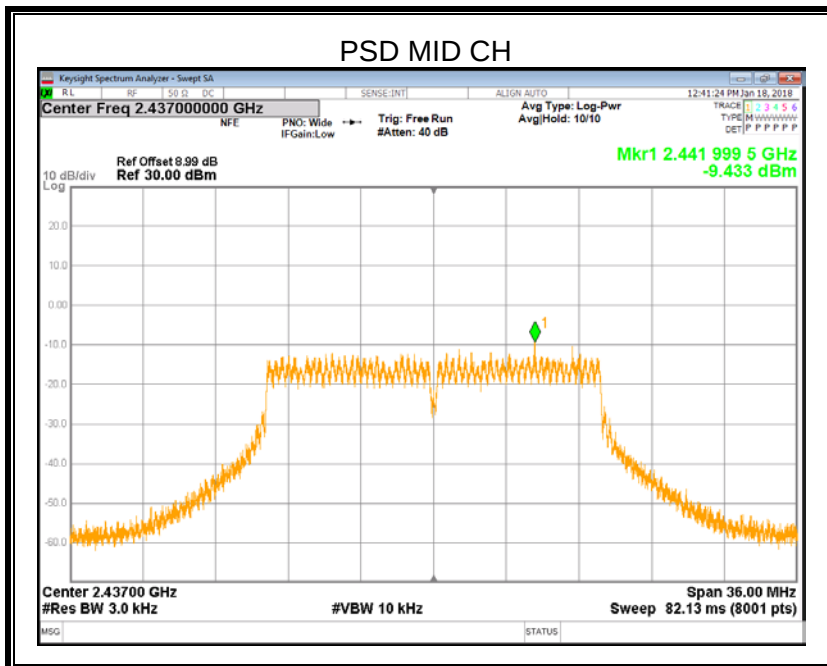
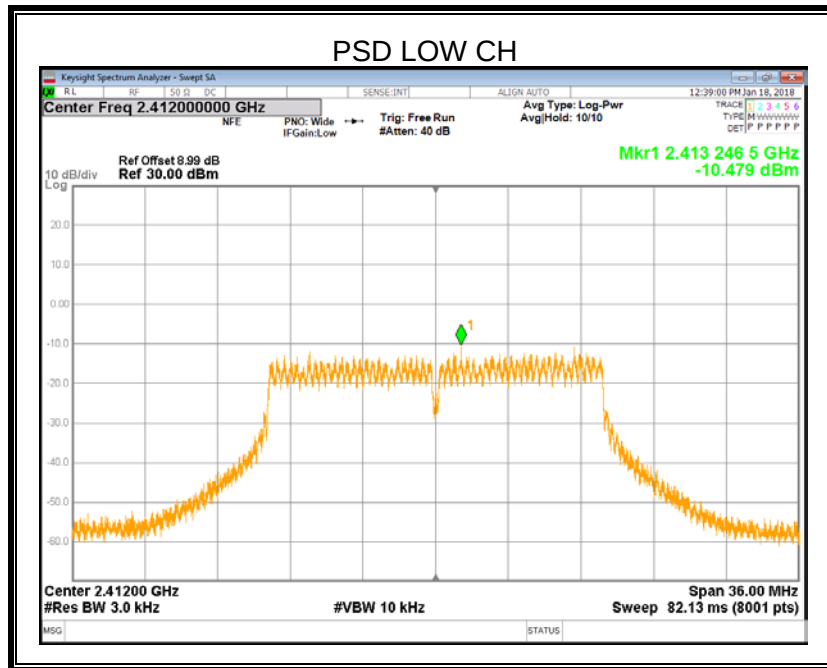
802.11g

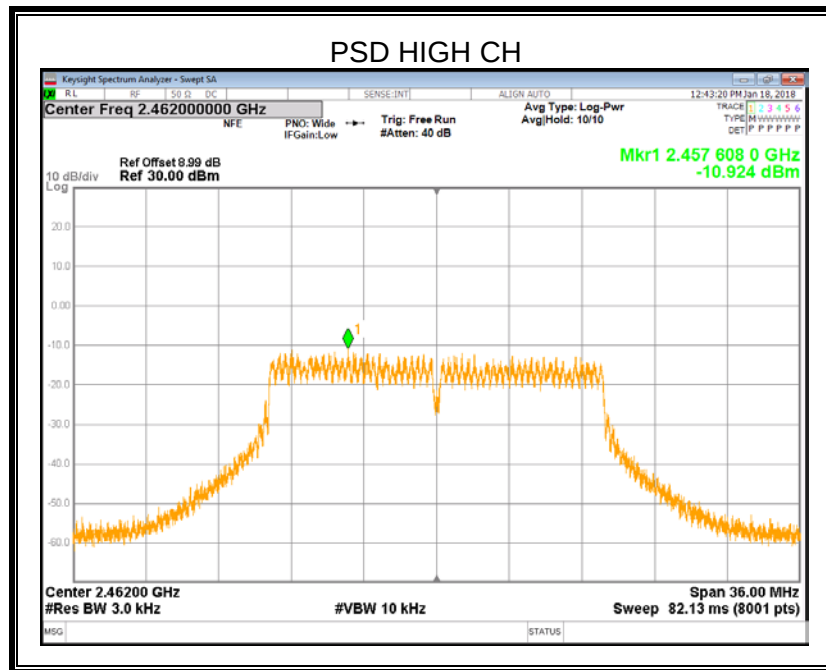
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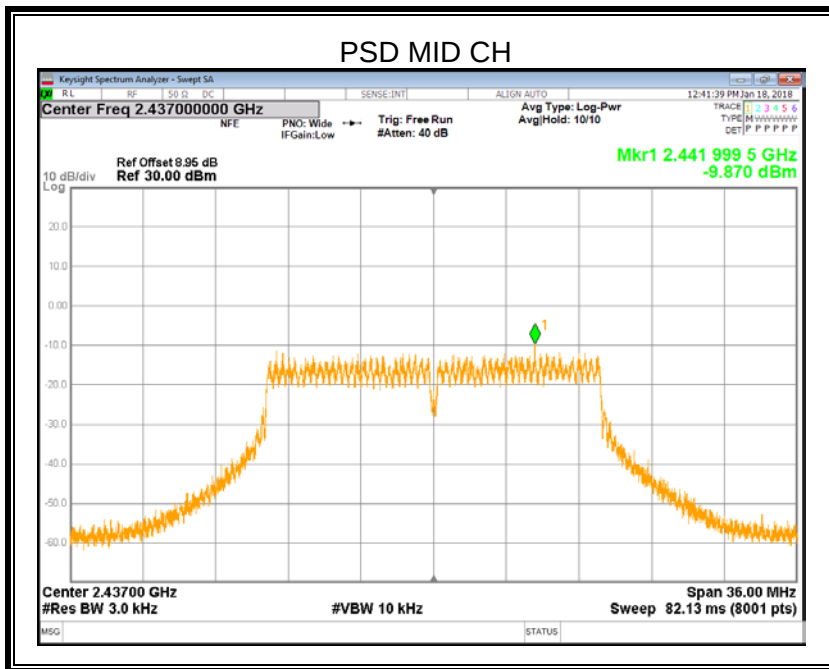
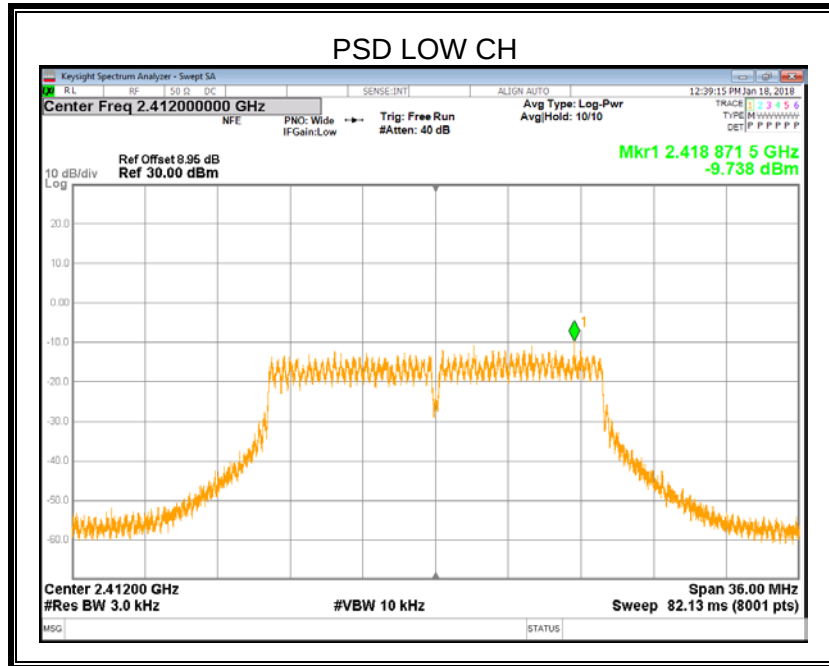


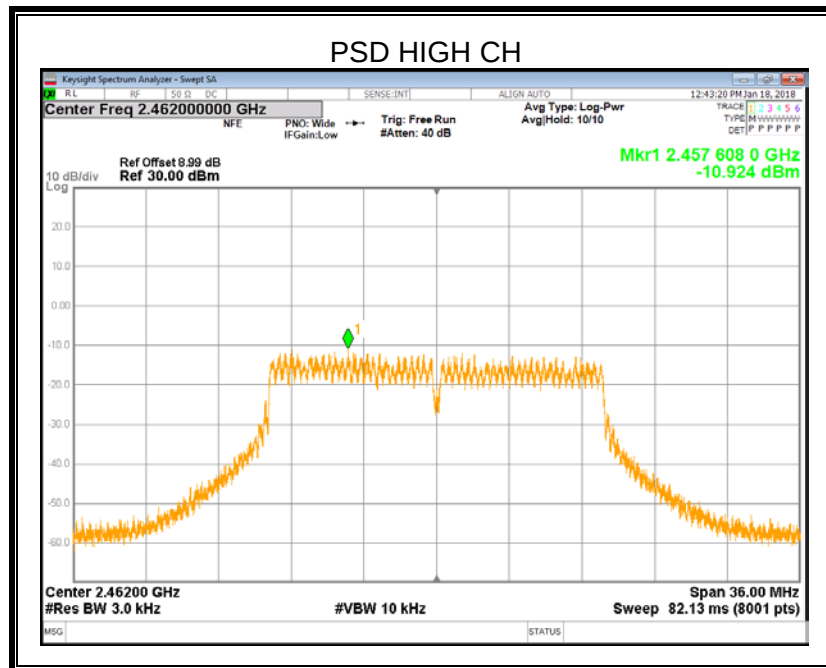
Antenna B





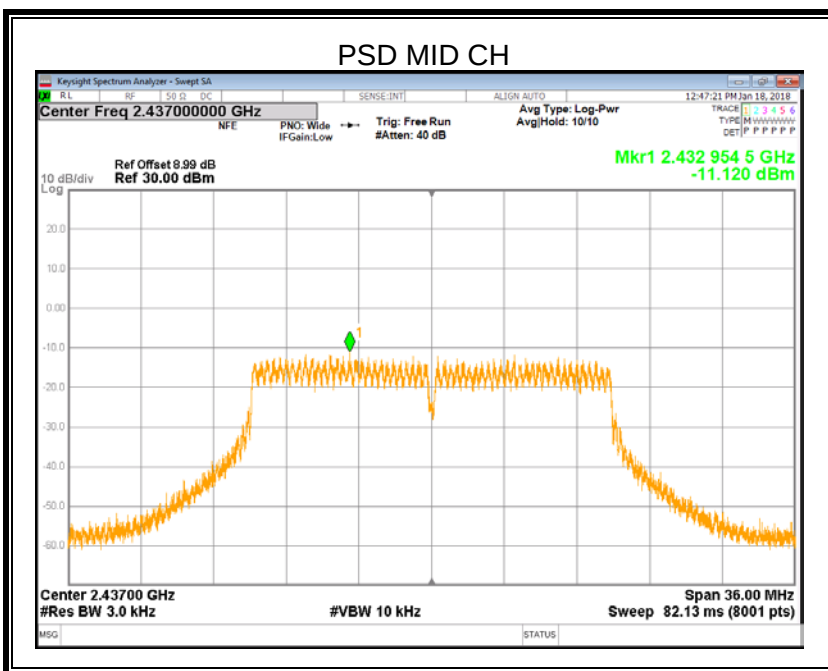
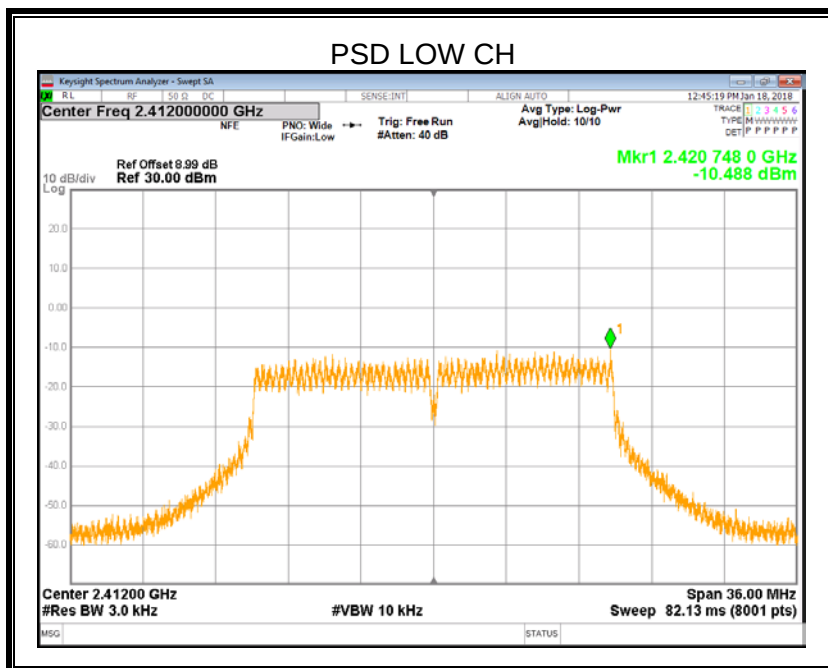
Antenna C

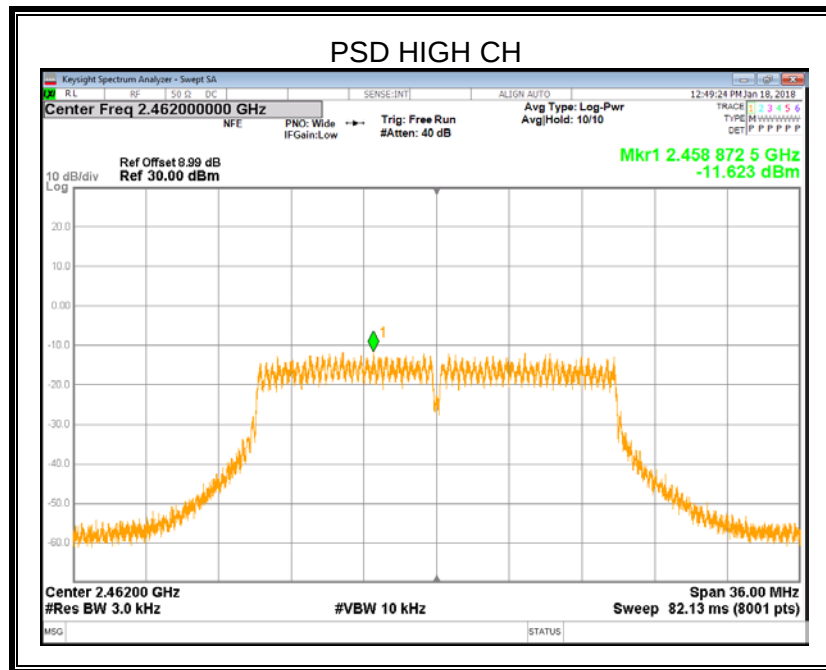




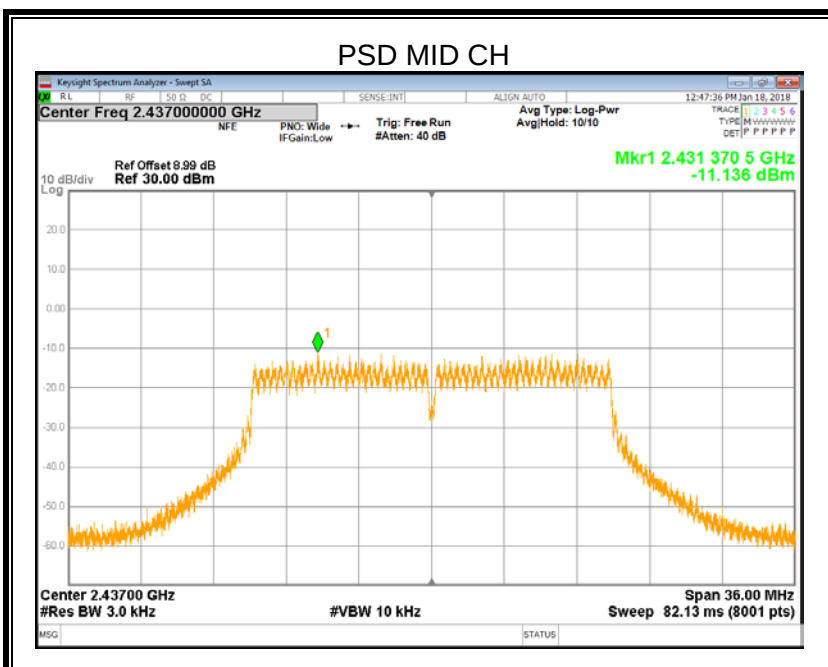
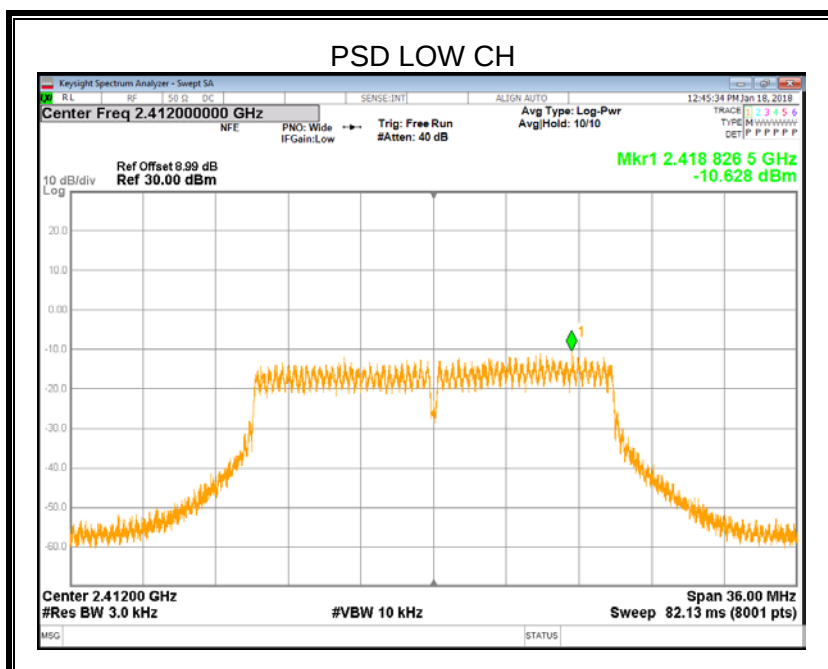
802.11n20

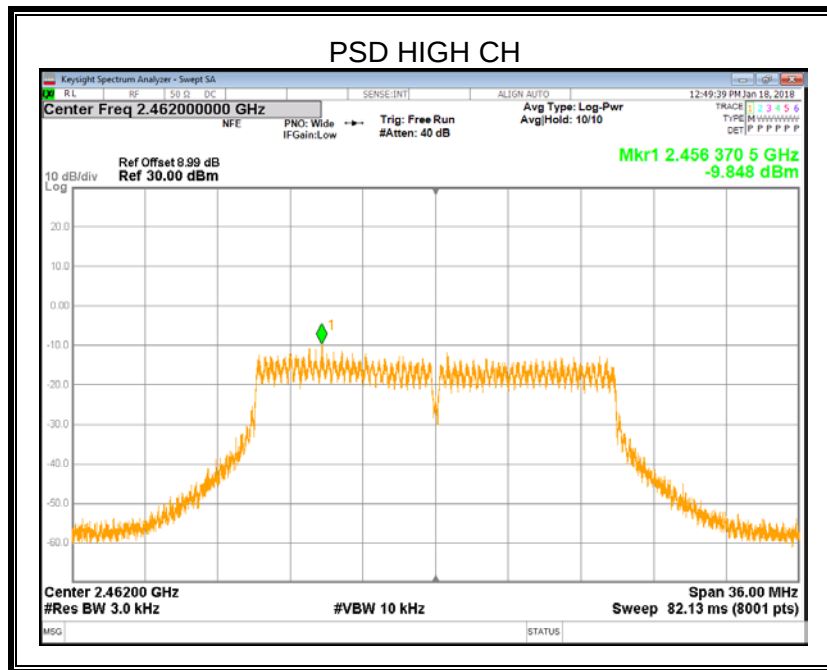
Antenna A



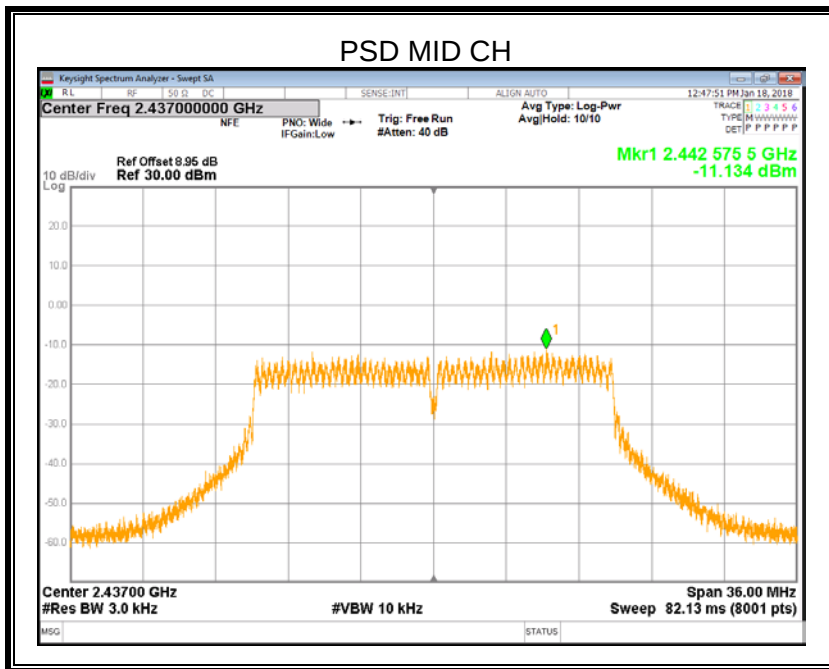
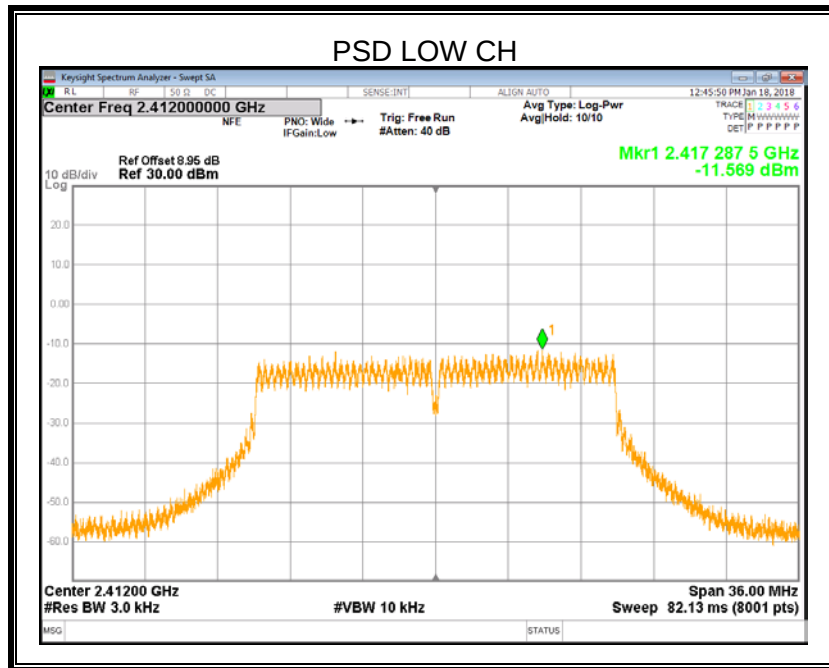


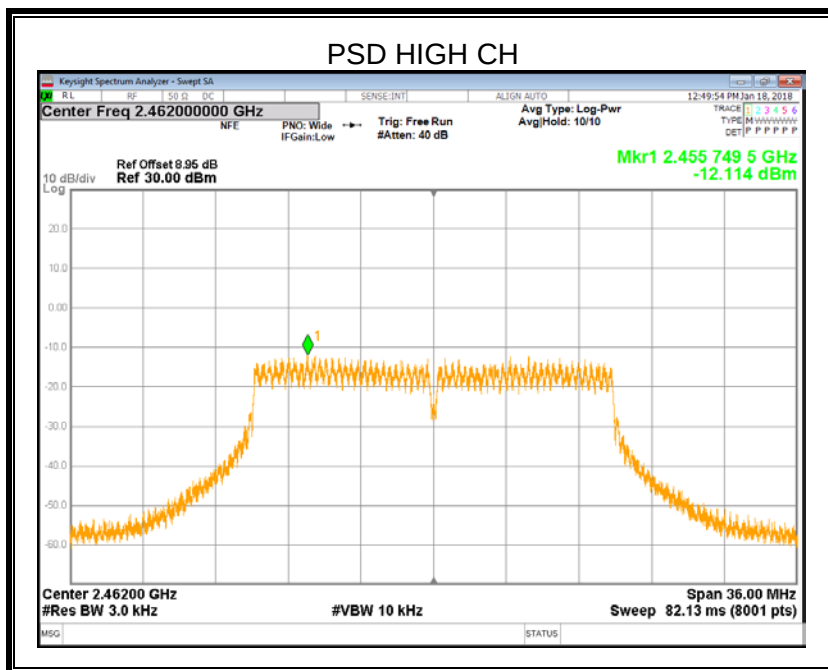
Antenna B





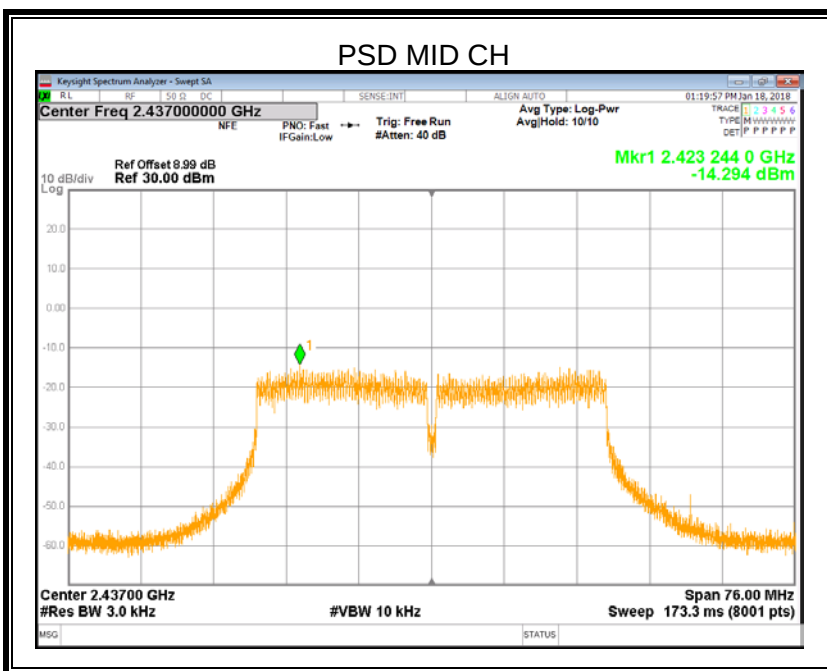
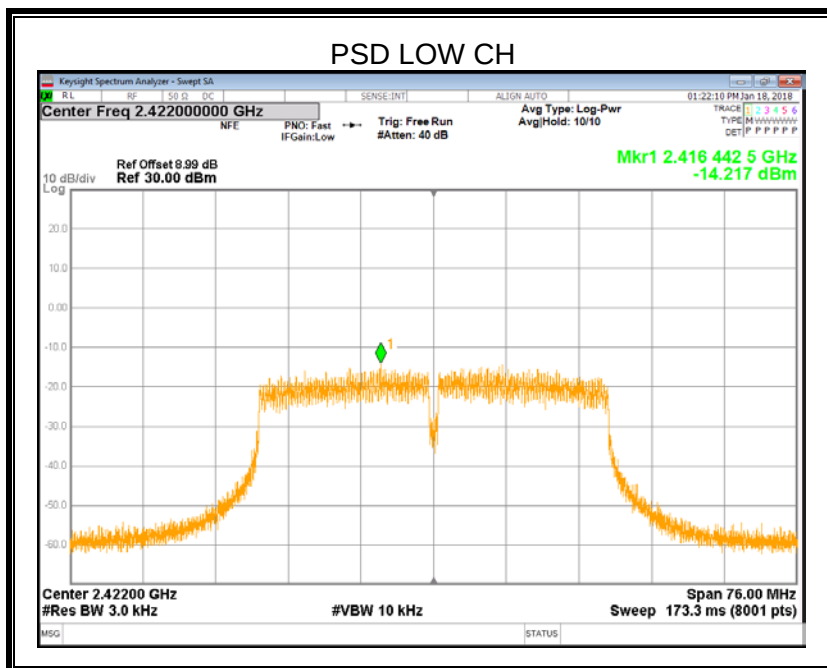
Antenna C

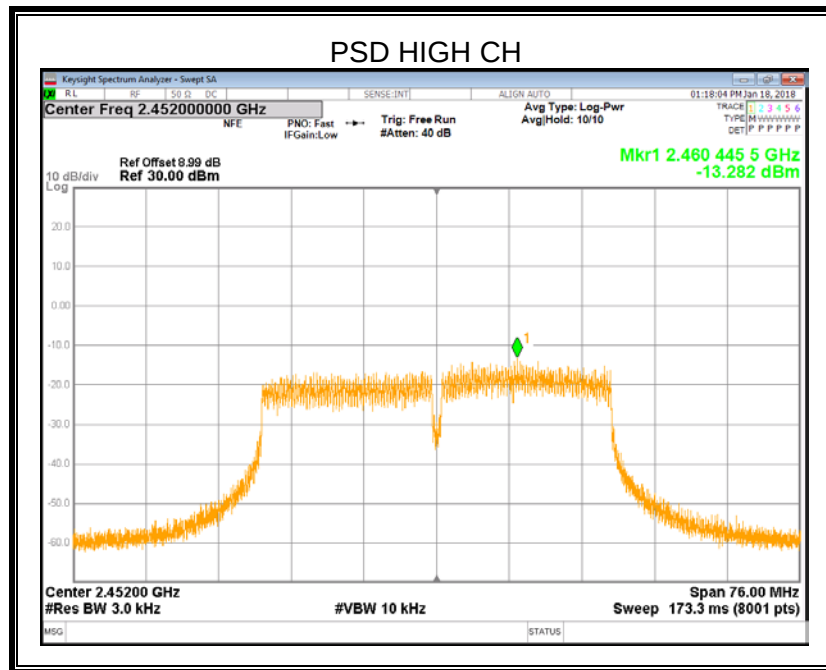




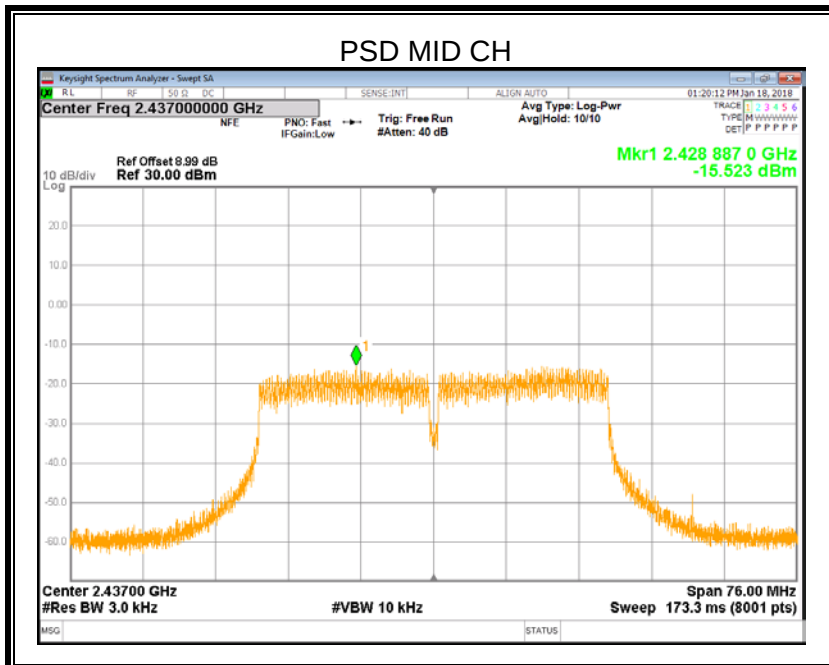
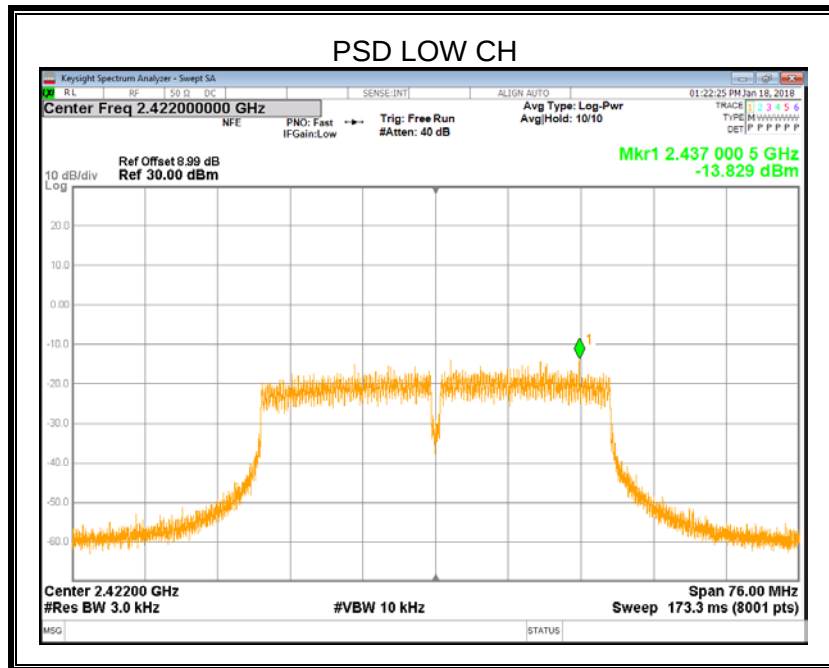
802.11n40

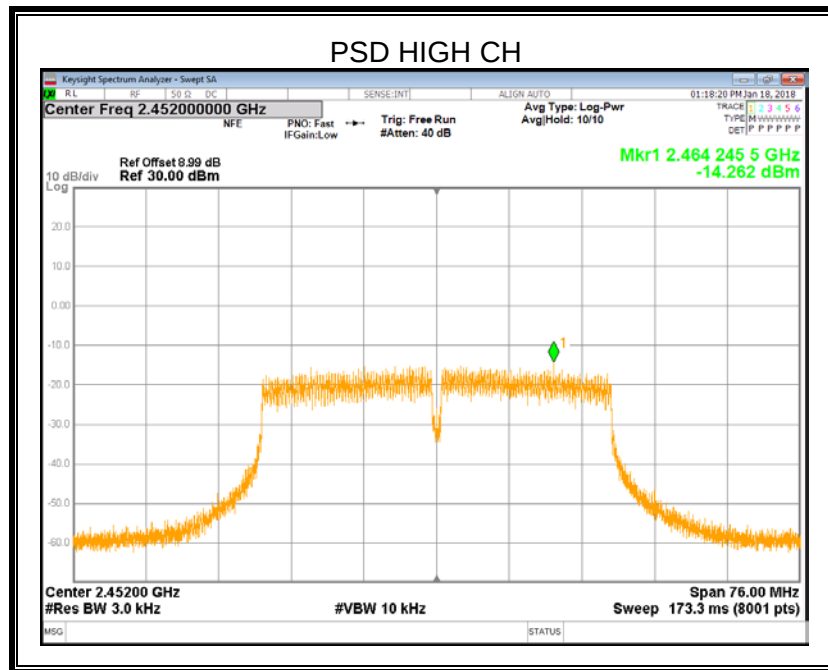
Antenna A



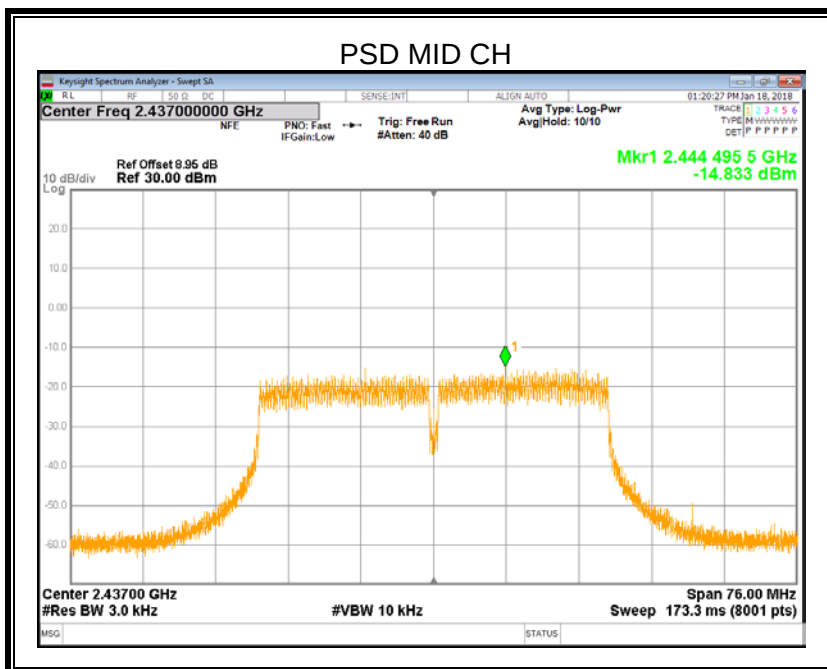
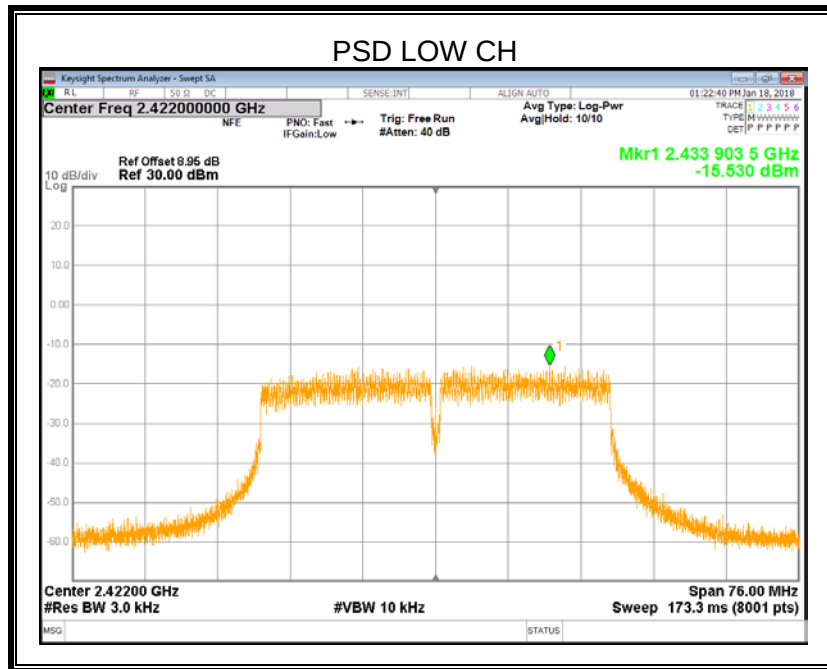


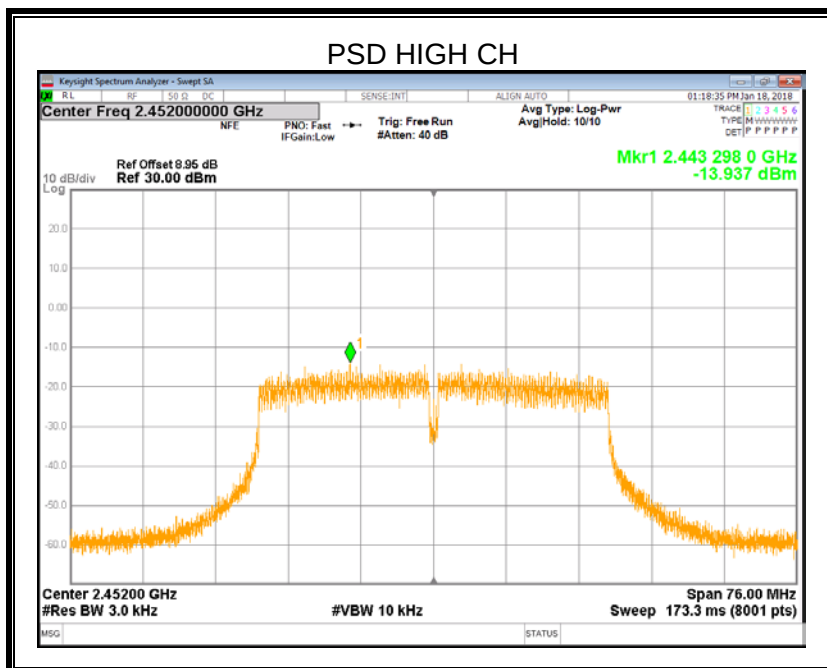
Antenna B





Antenna C





Note: All the modulation and antennas had been tested, but only the worst data recorded in the report.