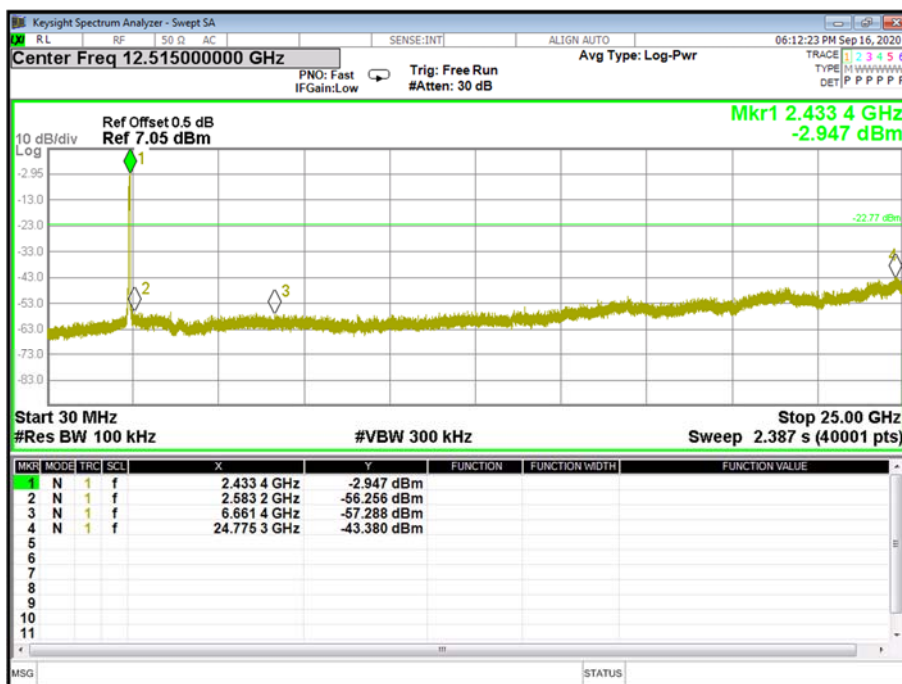




Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX n Mode(40M) /CH03, CH06, CH09

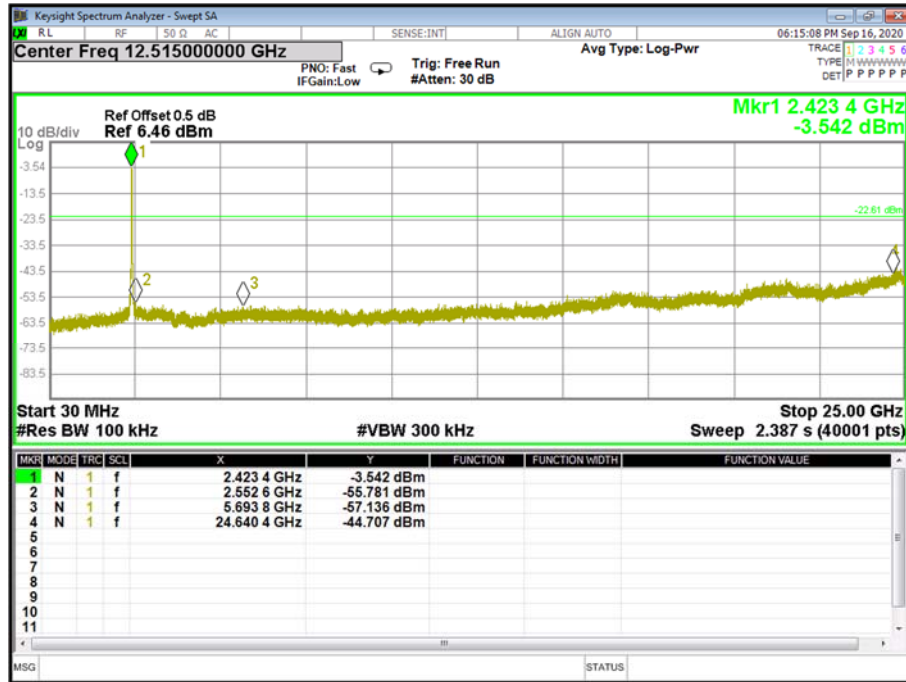
Antenna A

CH 03

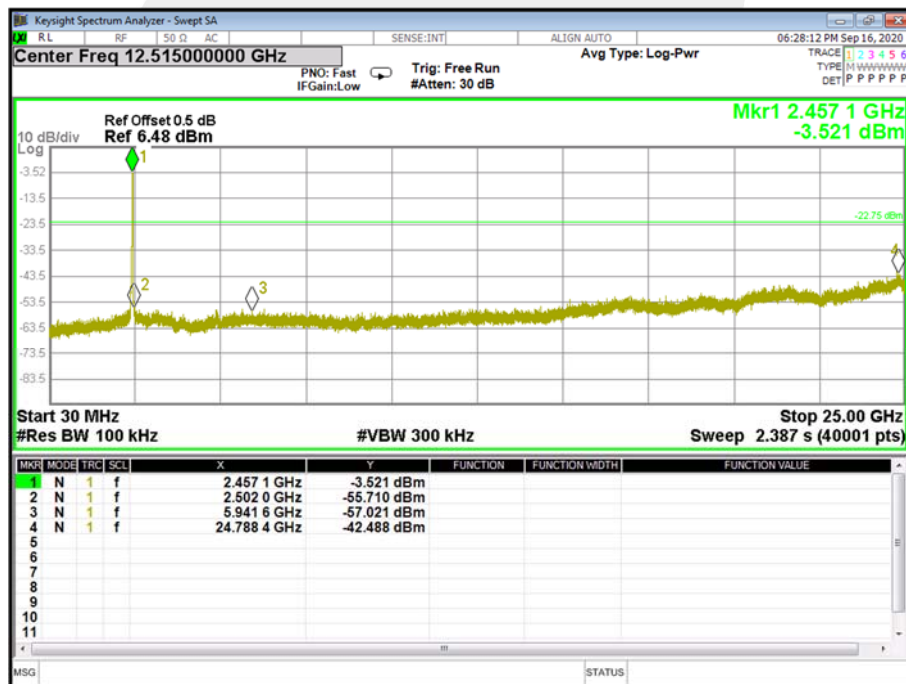




CH06



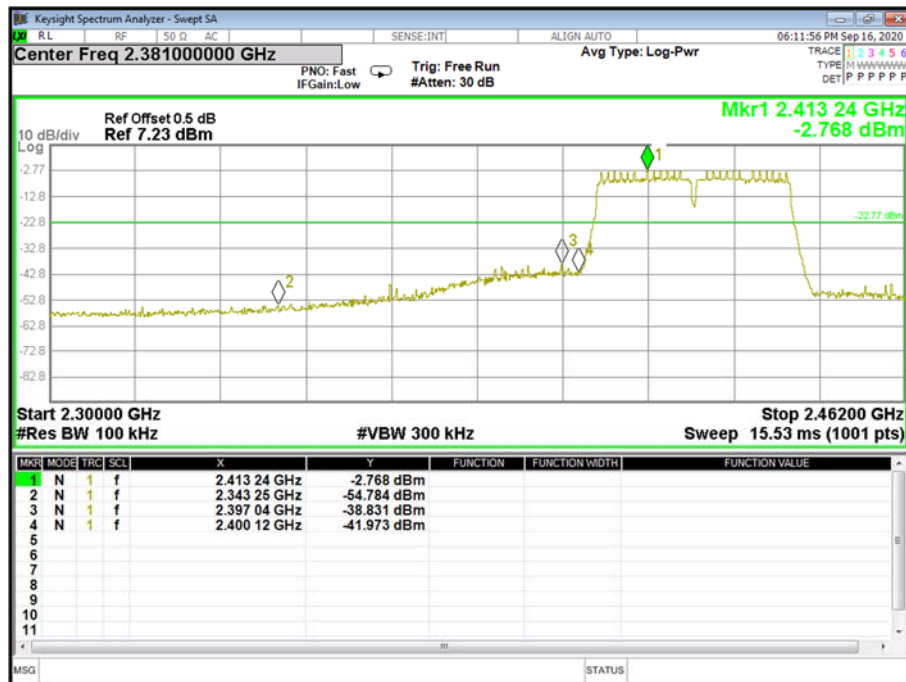
CH09



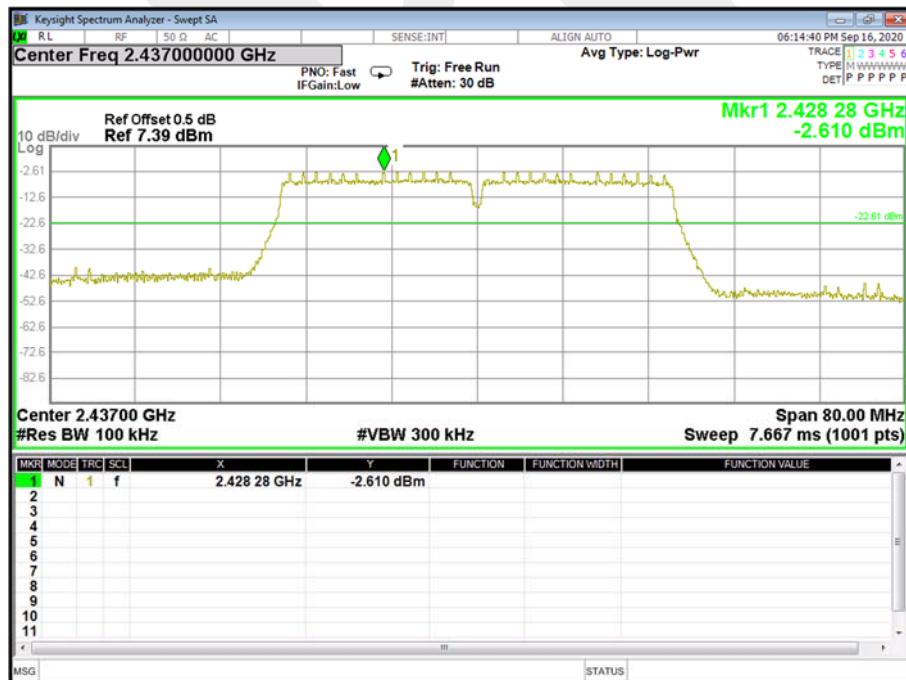


Band edge(it's also the reference level for conducted spurious emission)

CH03

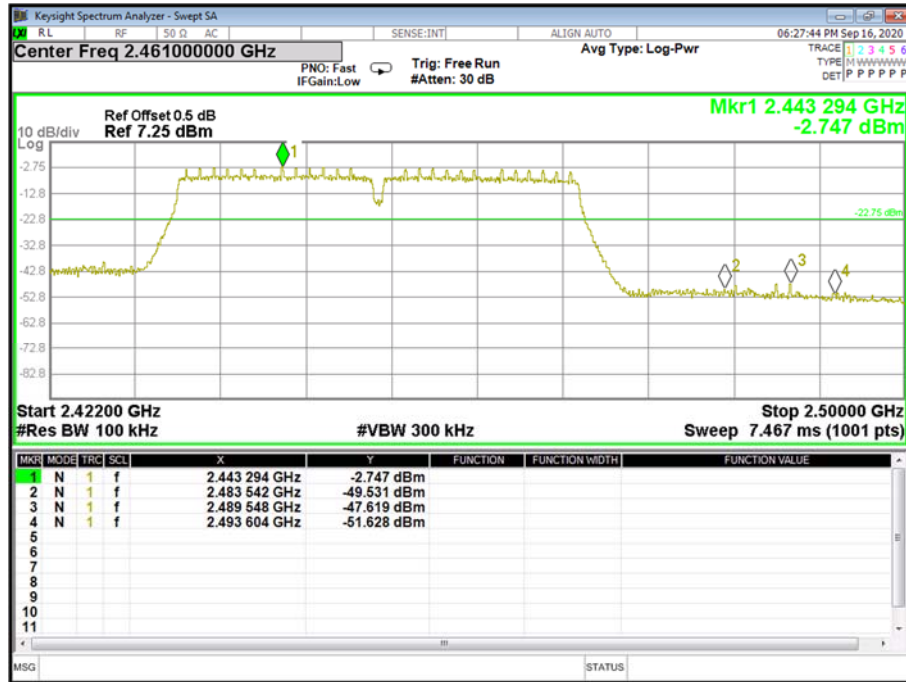


CH 06





CH 09





5. POWER SPECTRAL DENSITY TEST

5.1 LIMIT

FCC Part15.247 , Subpart C RSS-247 Issue 2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e) RSS-247 Issue 2	Power Spectral Density	≤ 8 dBm (RBW ≥ 3 KHz)	2400-2483.5	PASS

5.2 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the $100 \text{ kHz} \geq \text{RBW} \geq 3 \text{ kHz}$.
4. Set the $\text{VBW} \geq 3 \times \text{RBW}$.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP



5.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



5.6 TEST RESULTS

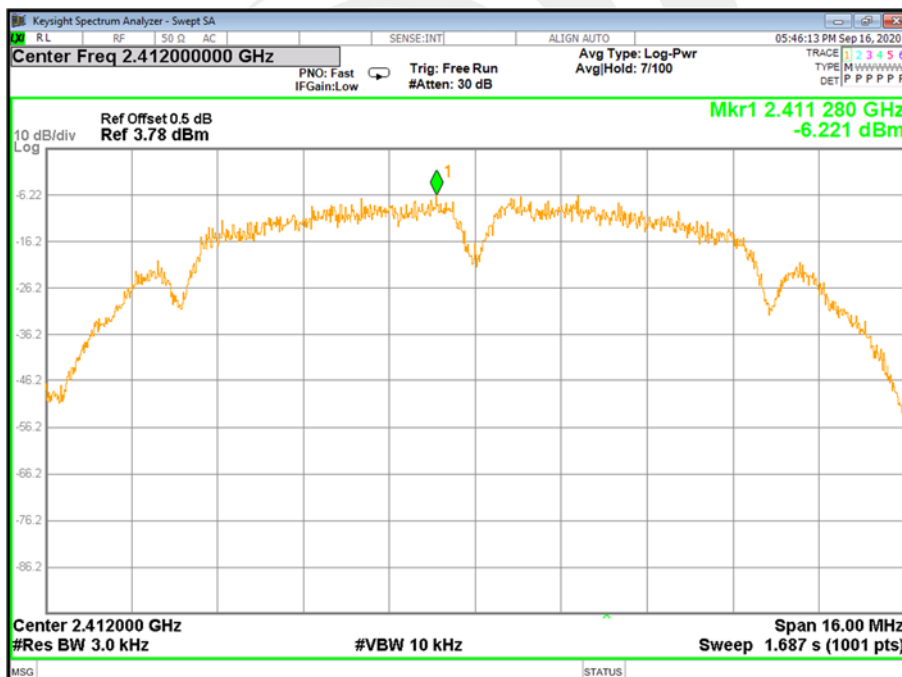
Note: The MIMO antenna gain is 6.01dBi, which is greater than 6dBi, so the MIMO mode limit will be reduced by 0.01dBi.

Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX b Mode /CH01, CH06, CH11

Frequency	Power Density			Limit	Result
	ANT A (dBm)	ANT B (dBm)	TOTAL (dBm)	(3KHz/dBm)	
2412	-6.22	-7.90	--	≤8	PASS
2437	-6.83	-7.51	--	≤8	PASS
2462	-6.86	-7.18	--	≤8	PASS

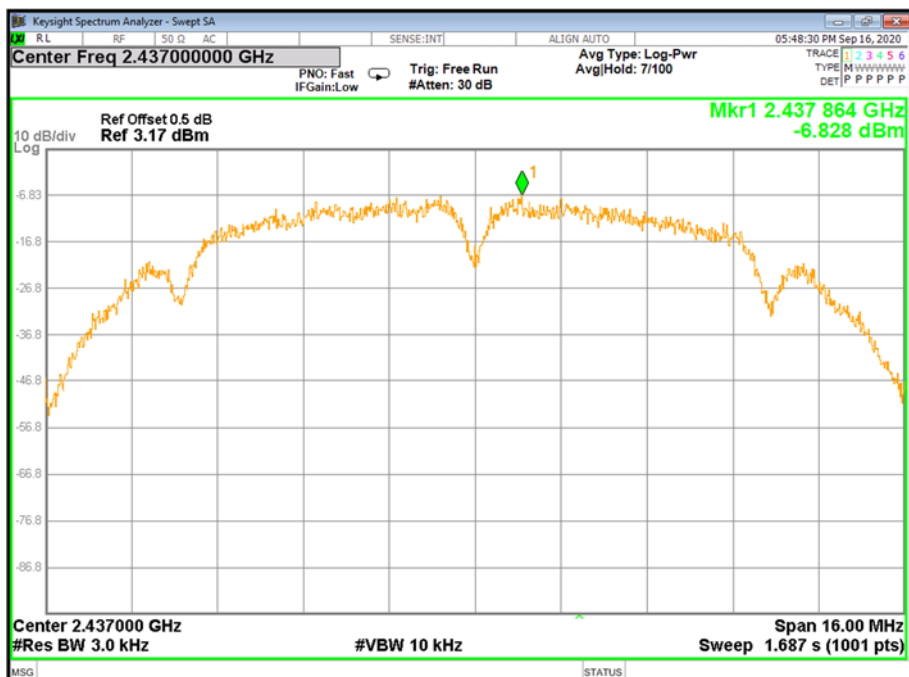
Test plots for Ant A

TX CH01

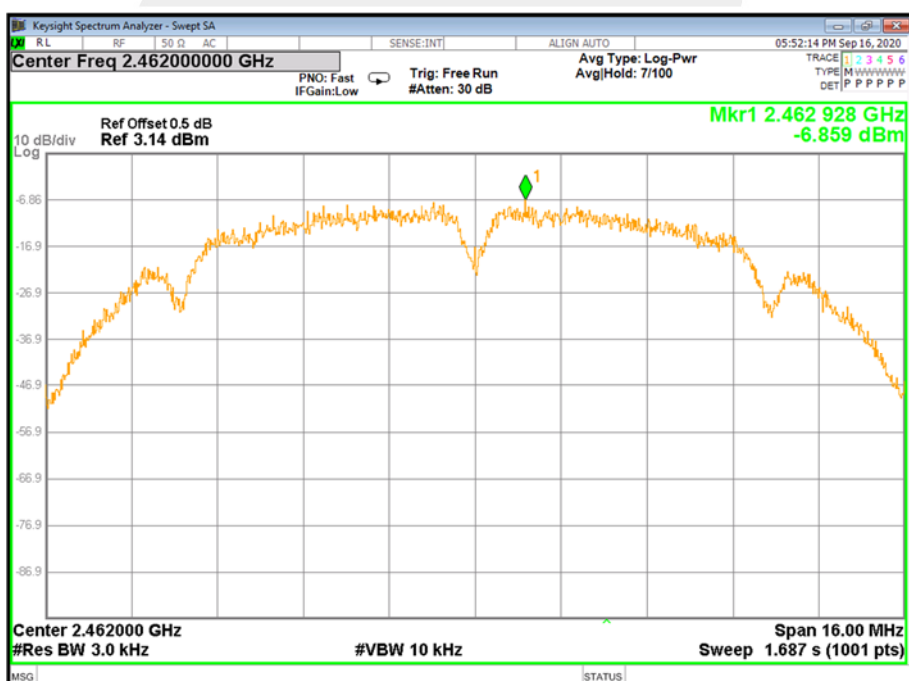




TX CH06



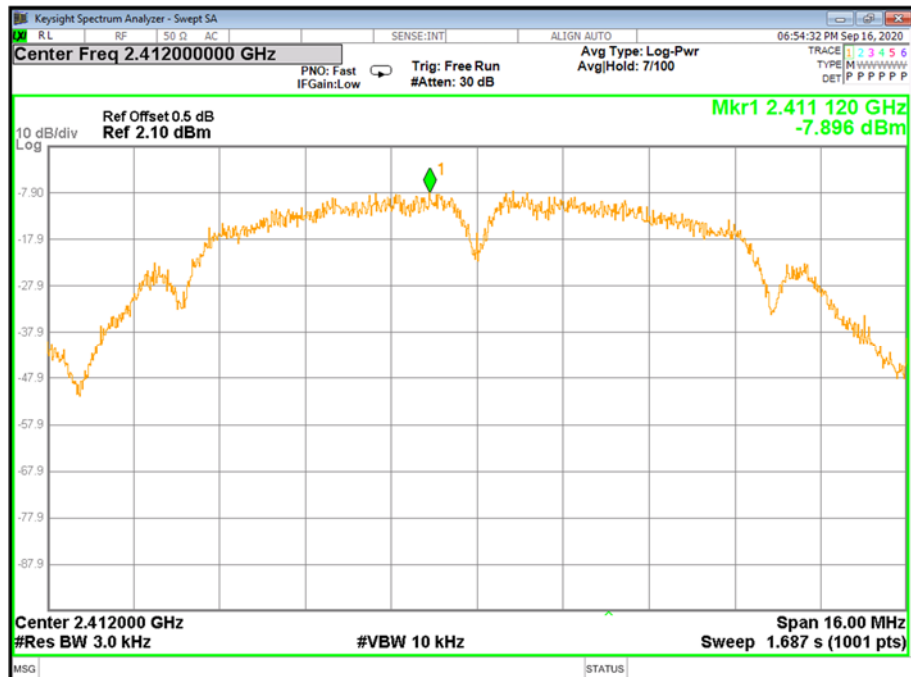
TX CH11



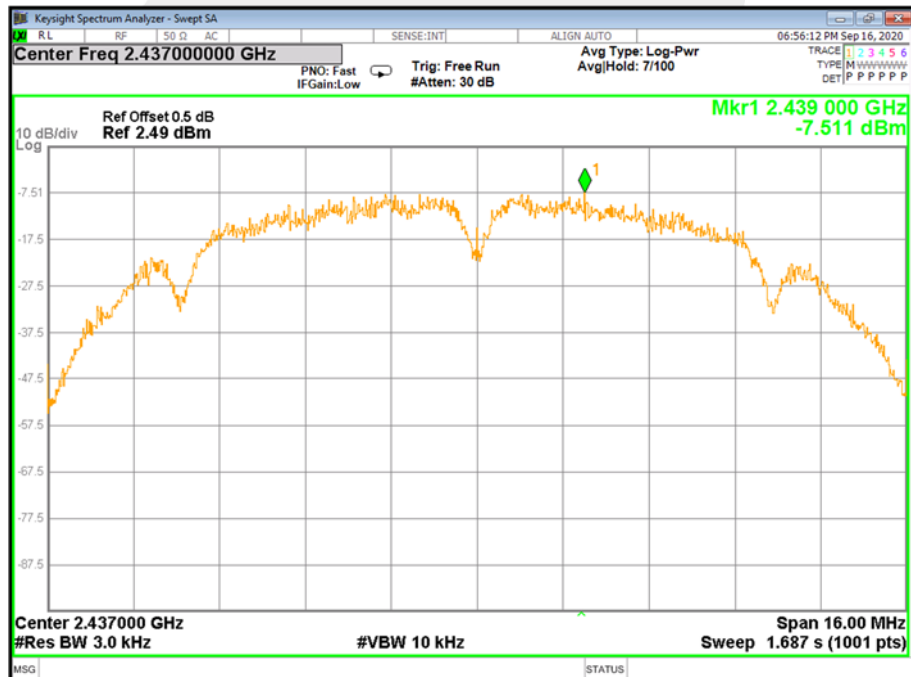


Test plots for Ant B

TX CH01

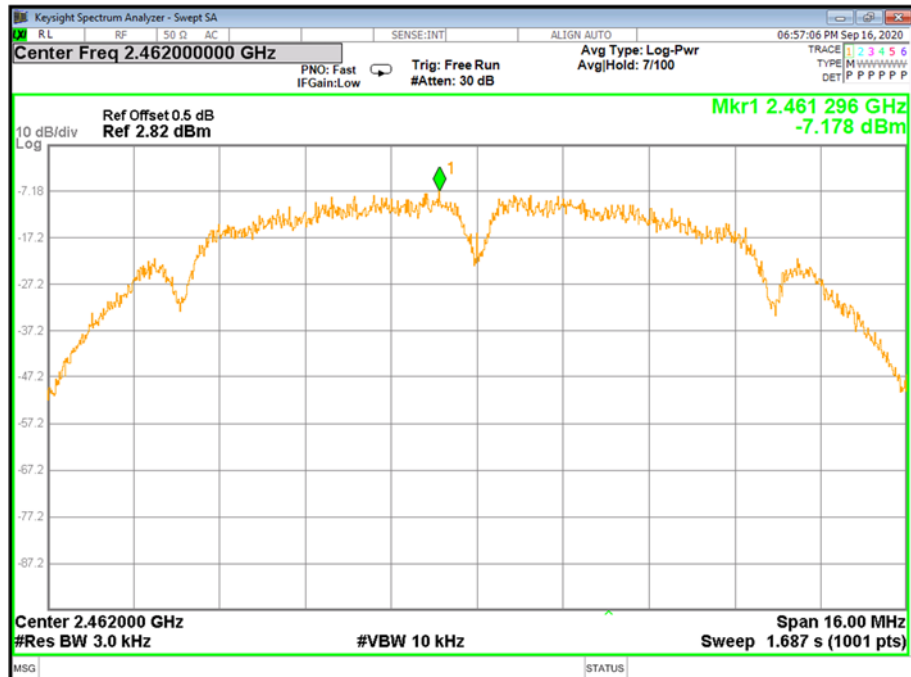


TX CH06





TX CH11



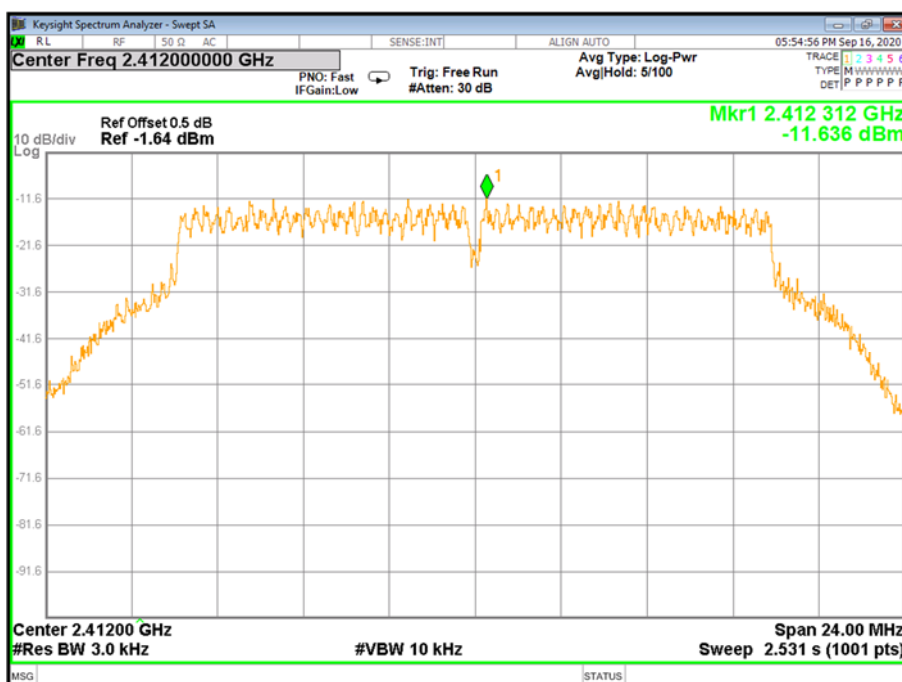


Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX g Mode /CH01, CH06, CH11

Frequency	Power Density			Limit	Result
	ANT A (dBm)	ANT B (dBm)	TOTAL (dBm)	(3KHz/dBm)	
2412	-11.64	-11.86	--	≤8	PASS
2437	-11.08	-12.11	--	≤8	PASS
2462	-11.18	-12.94	--	≤8	PASS

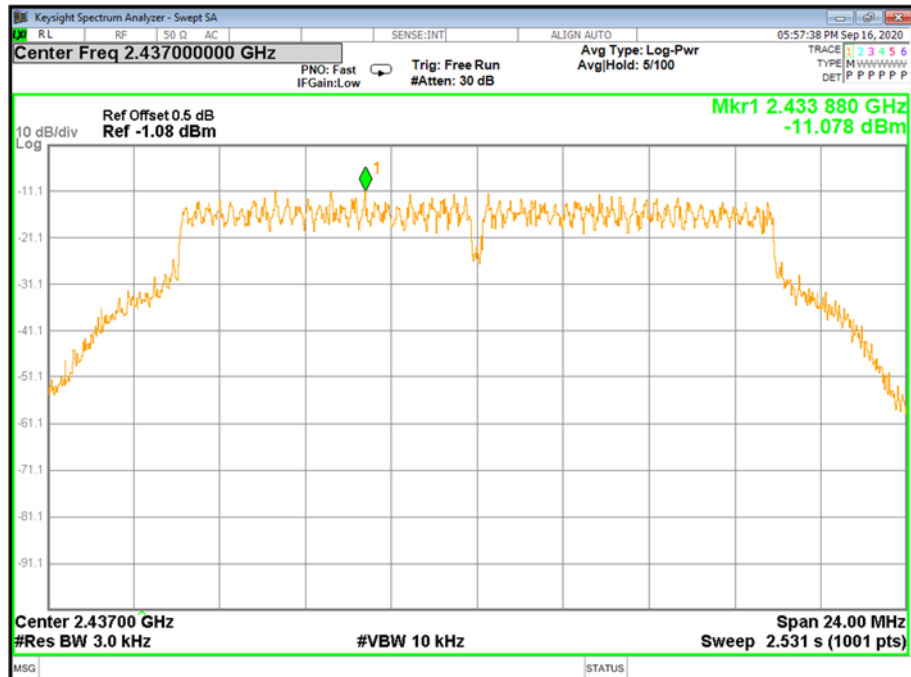
Test plots for Ant A

TX CH01

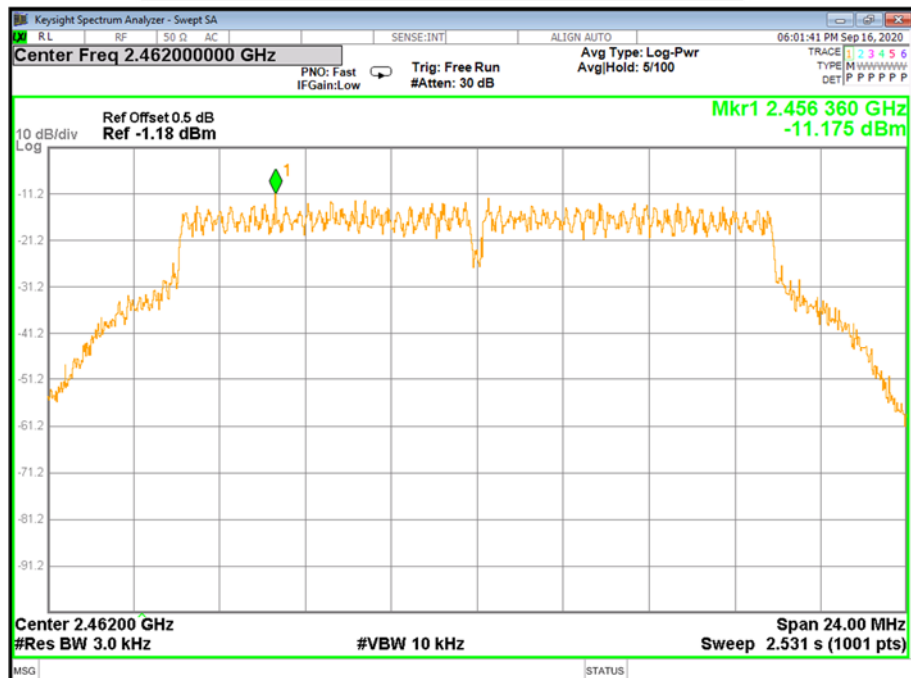




TX CH06



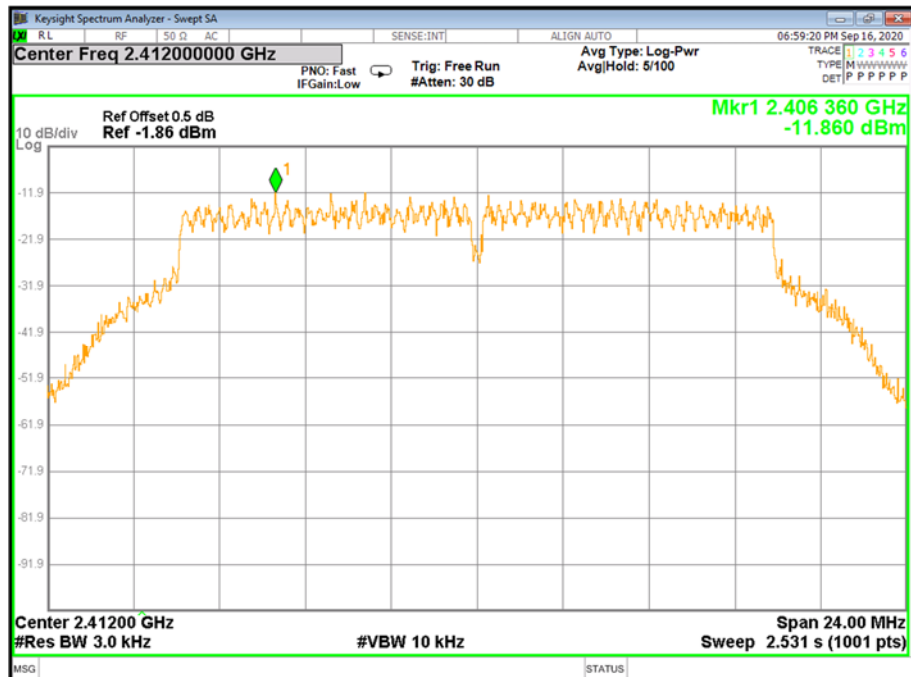
TX CH11



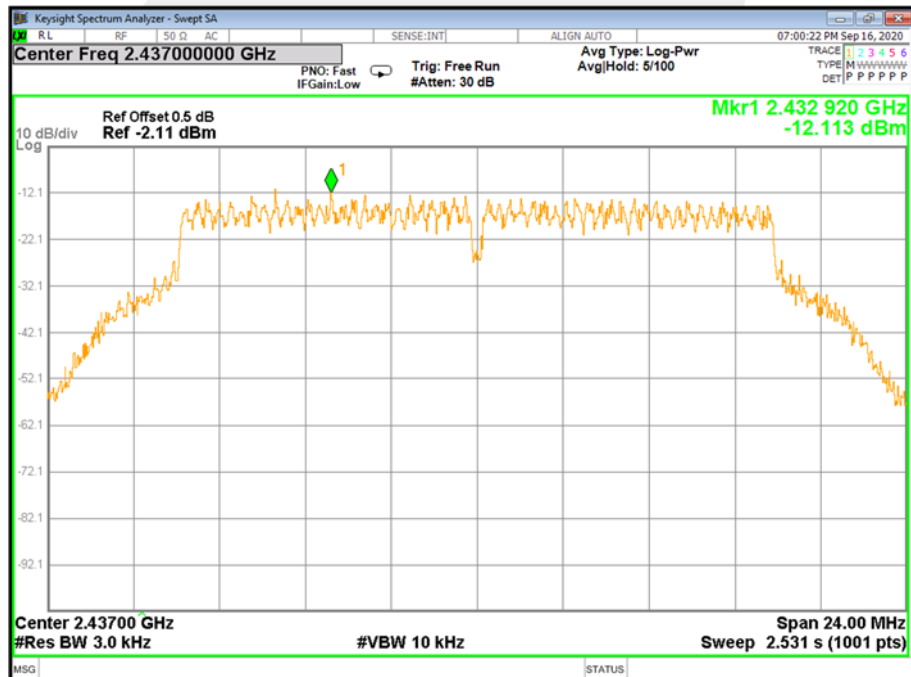


Test plots for Ant B

TX CH01

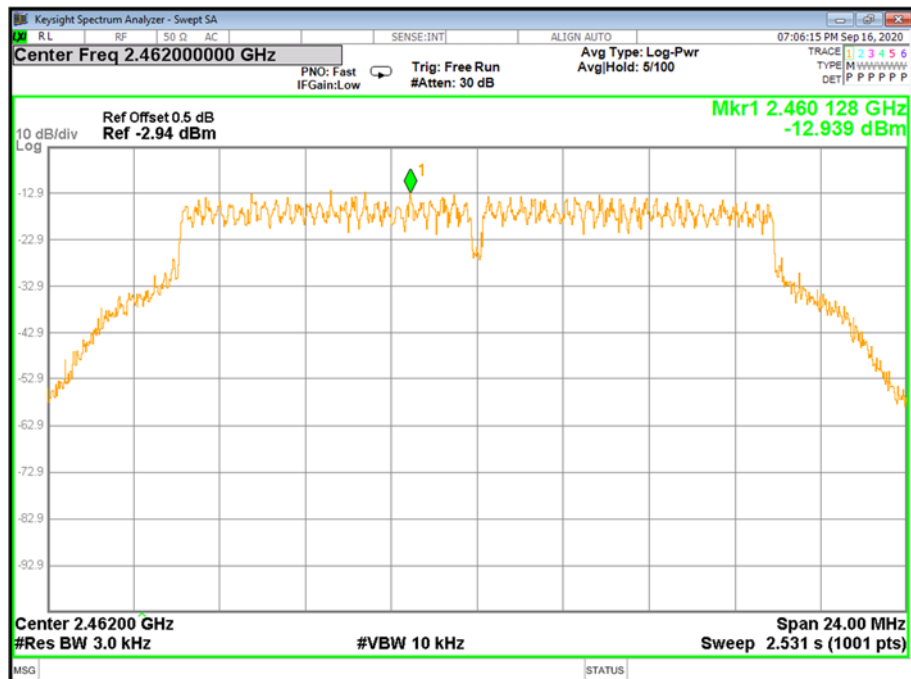


TX CH06





TX CH11



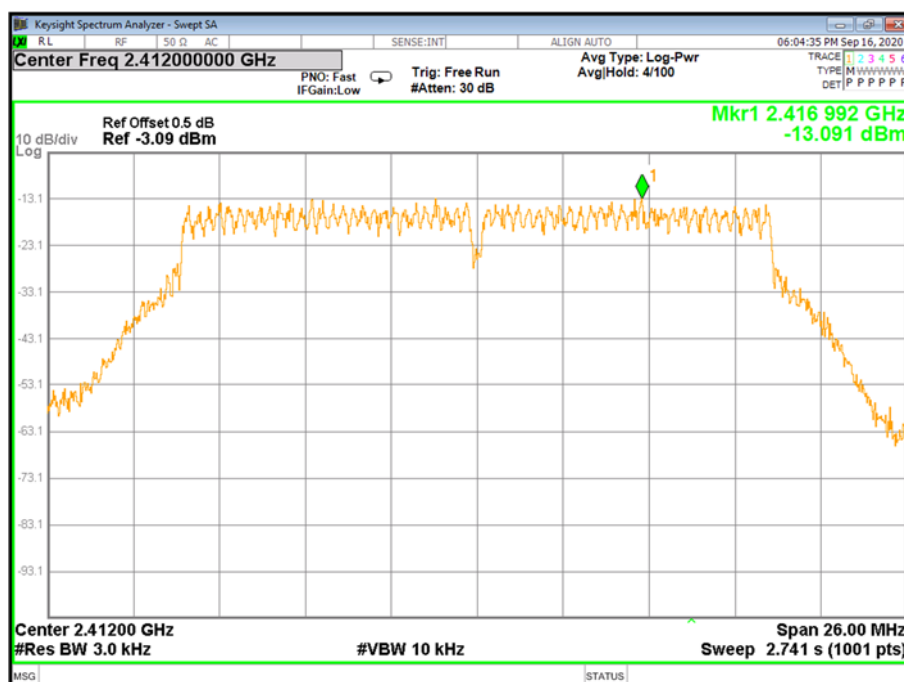


Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX n Mode(20M) /CH01, CH06, CH11

Frequency	Power Density			Limit	Result
	ANT A (dBm)	ANT B (dBm)	TOTAL (dBm)	(3KHz/dBm)	
2412	-13.09	-13.30	-10.18	≤7.99	PASS
2437	-12.76	-13.84	-10.26	≤7.99	PASS
2462	-11.71	-13.86	-9.64	≤7.99	PASS

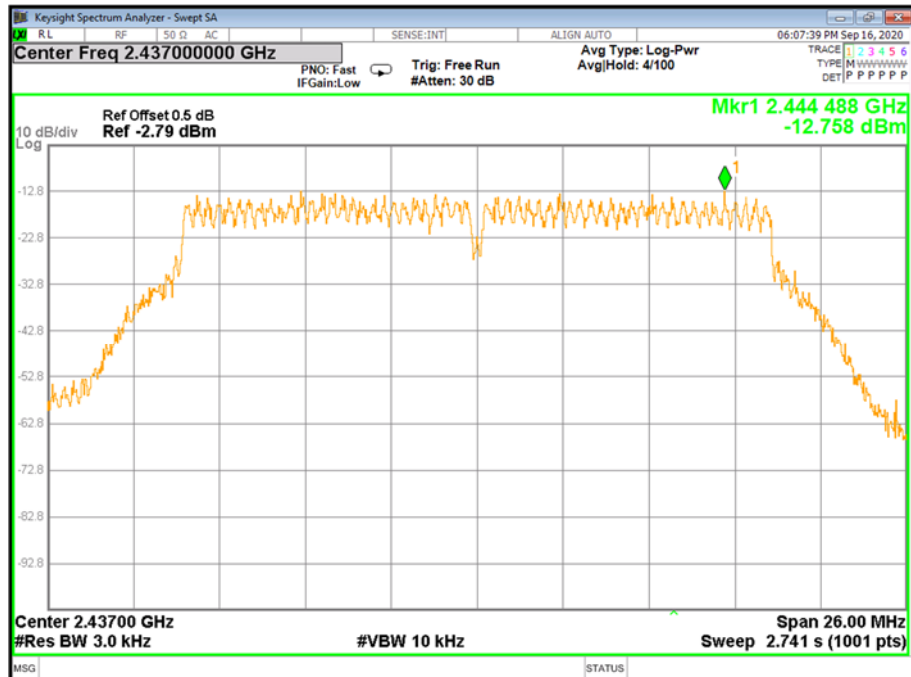
Test plots for Ant A

TX CH01

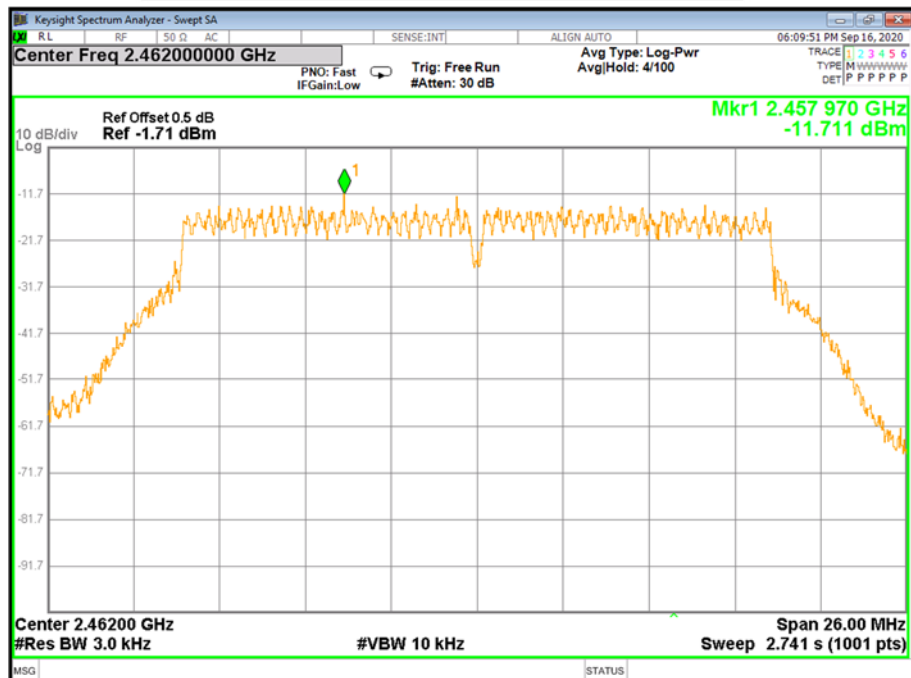




TX CH06



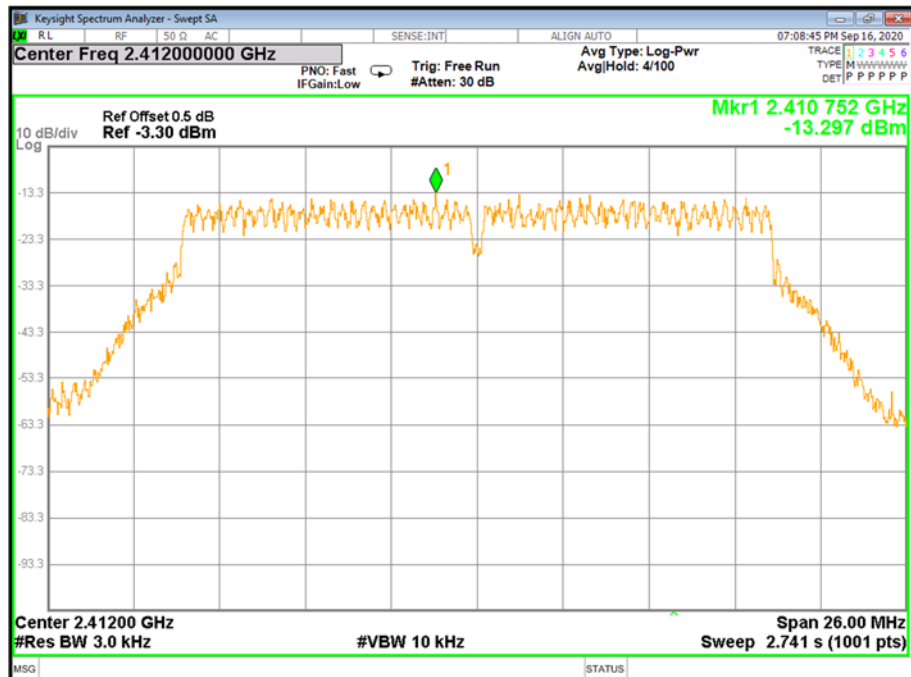
TX CH11



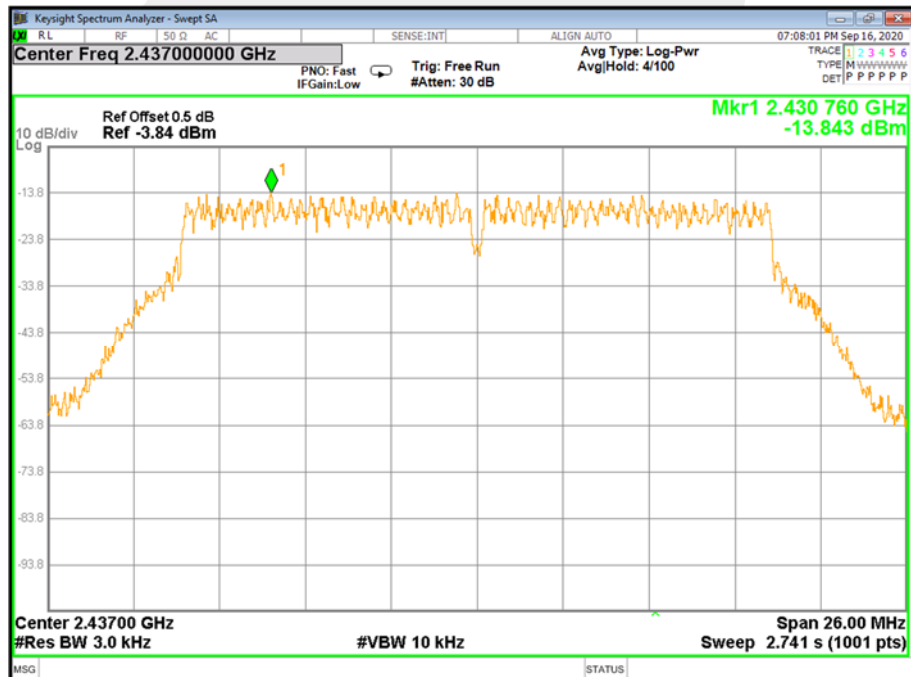


Test plots for Ant B

TX CH01

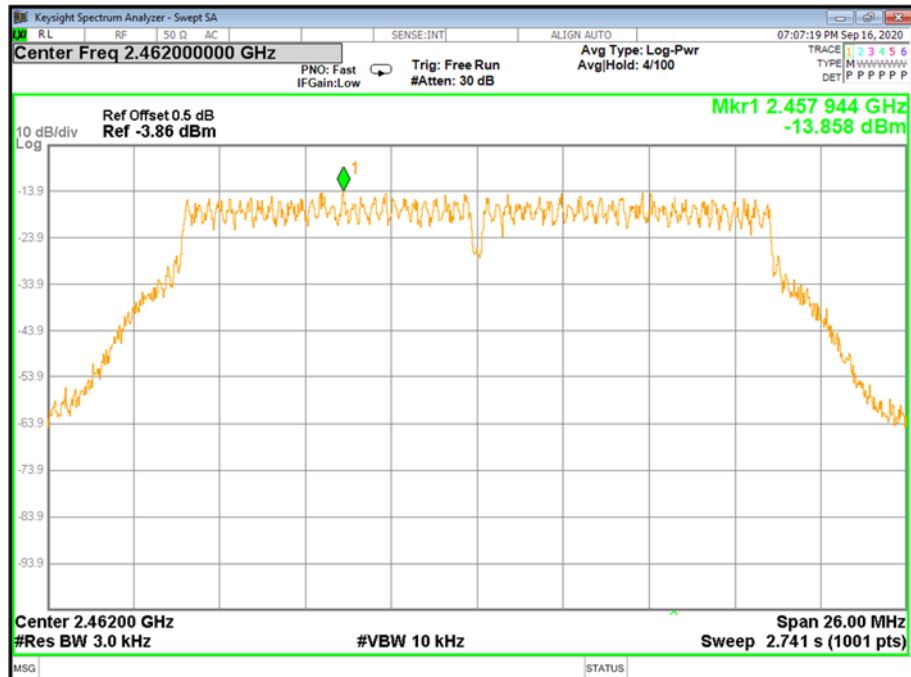


TX CH06





TX CH11



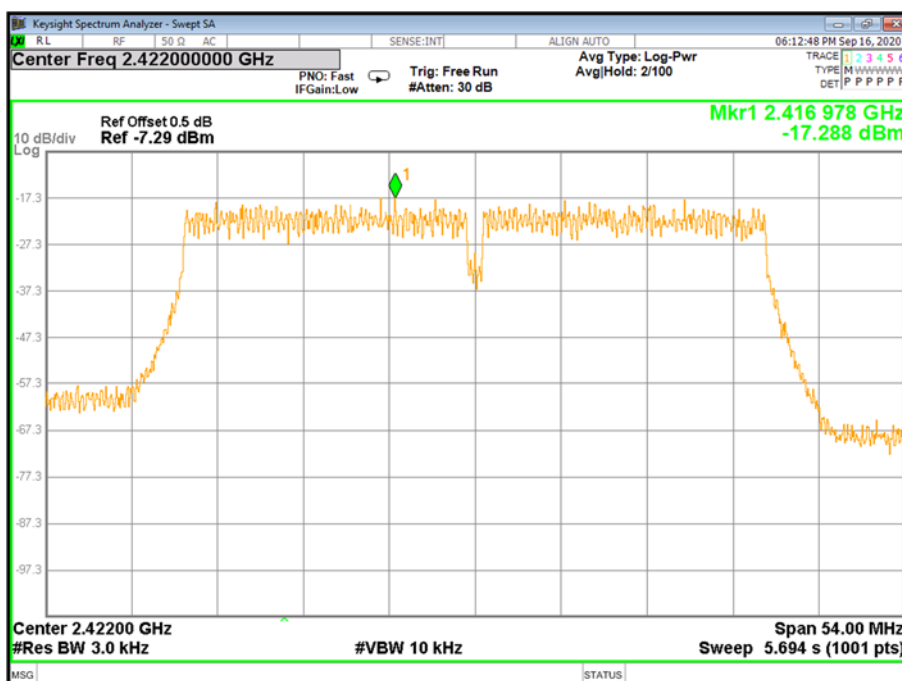


Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX n Mode(40M) /CH03, CH06, CH09

Frequency	Power Density			Limit	Result
	ANT A (dBm)	ANT B (dBm)	TOTAL (dBm)	(3KHz/dBm)	
2422	-17.29	-18.19	-14.70	≤7.99	PASS
2437	-17.75	-18.07	-14.90	≤7.99	PASS
2452	-17.40	-18.37	-14.84	≤7.99	PASS

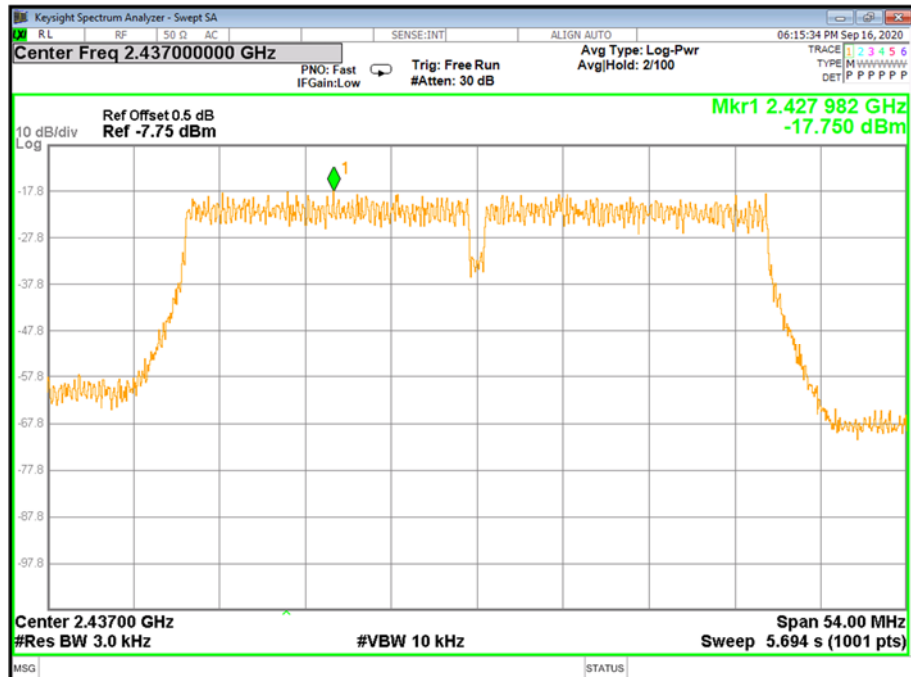
Test plots for Ant A

TX CH03

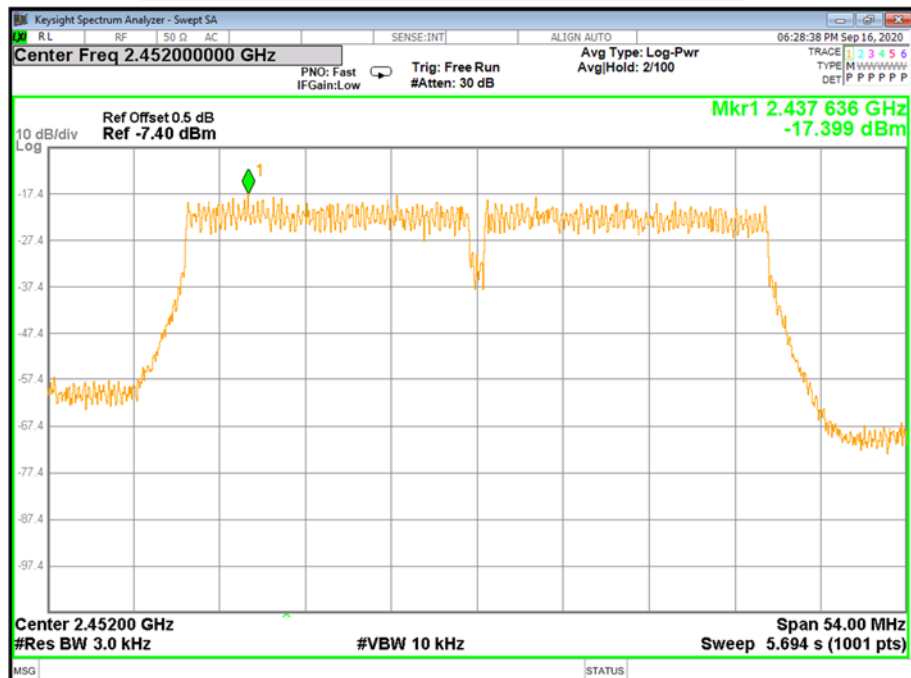




TX CH06



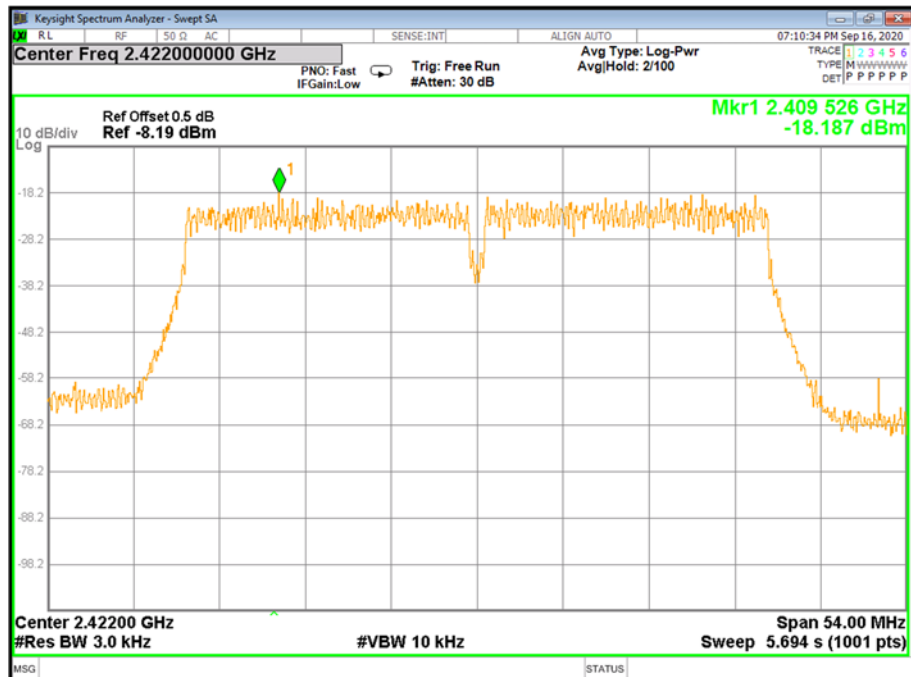
TX CH09



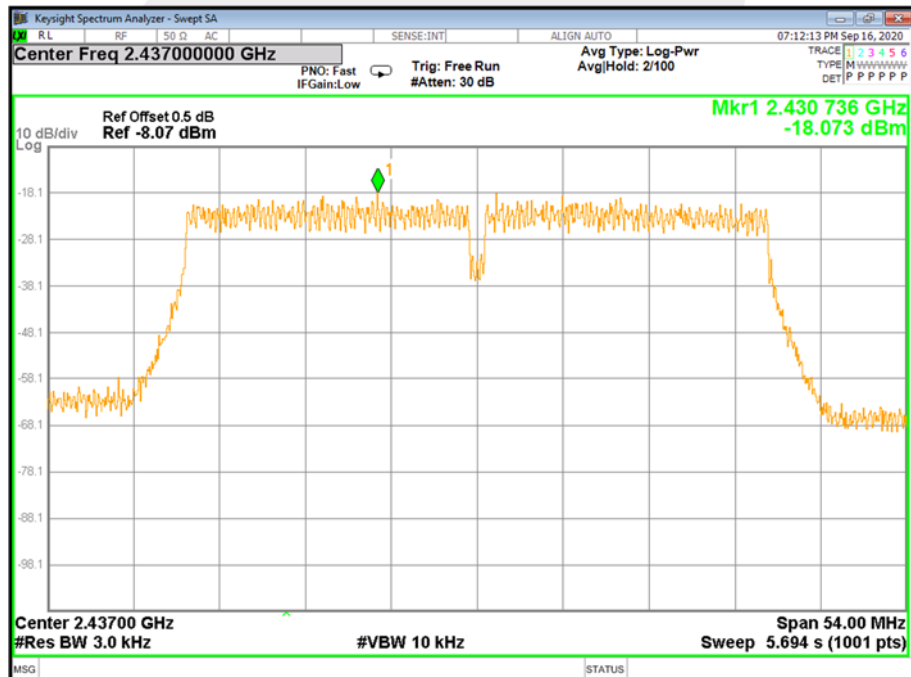


Test plots for Ant B

TX CH03

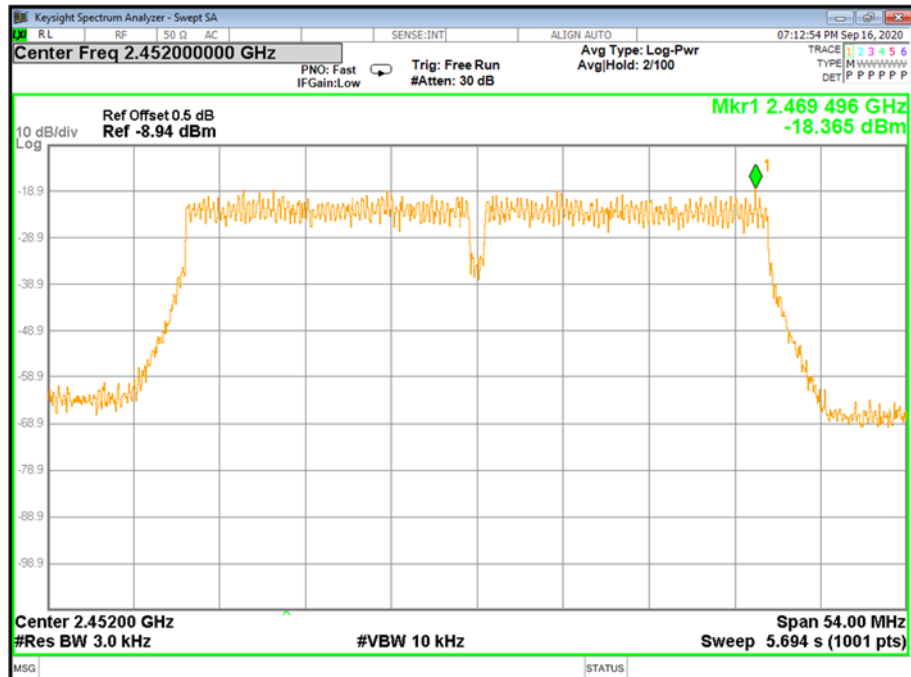


TX CH06





TX CH09





6. BANDWIDTH TEST

6.1 LIMIT

FCC Part15.247,Subpart C RSS-247 Issue 2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2) RSS-247 Issue 2	Bandwidth	$\geq 500\text{KHz}$ (6Db bandwidth)	2400-2483.5	PASS
RSS-Gen Clause 6.7	99% Bandwidth	For reporting purposes only.	2400-2483.5	PASS

6.2 TEST PROCEDURE

The automatic bandwidth measurement capability of an instrument may be employed using the X Db bandwidth mode with X set to 6 Db, if the functionality described above (i.e., RBW = 100 kHz, VBW $\geq$ 3RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 Db.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



6.6 TEST RESULTS

Note: Antenna A Power > Antenna B Power, Both antenna A and B have been test, Only show the worst data of Antenna A

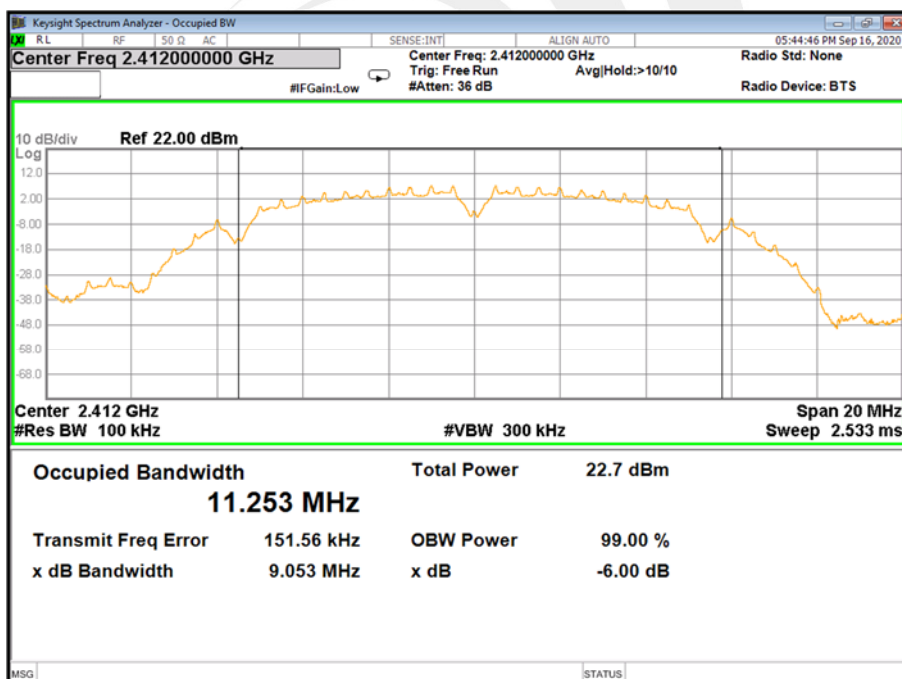
Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX b Mode /CH01, CH06, CH11

Remark: PEAK DETECTOR IS USED

Frequency	6Db Bandwidth	99% Bandwidth	Limit	Result
	(MHz)	(MHz)	(KHz)	
2412 MHz	9.053	11.591	≥500KHz	PASS
2437 MHz	9.053	11.636	≥500KHz	PASS
2462 MHz	9.037	11.566	≥500KHz	PASS

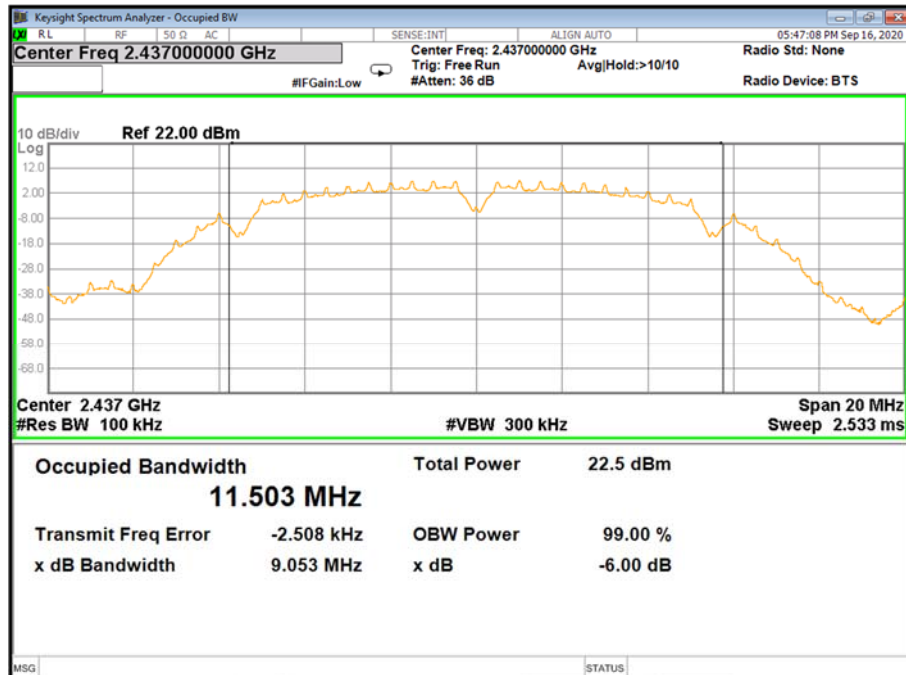
Antenna A

6Db Bandwidth TX CH 01

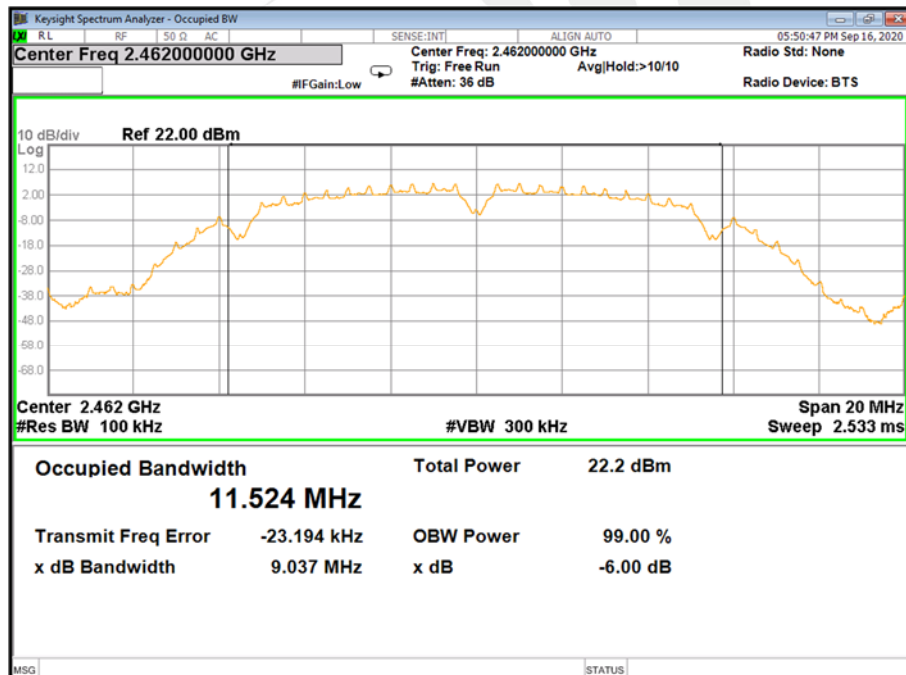




6Db Bandwidth TX CH 06

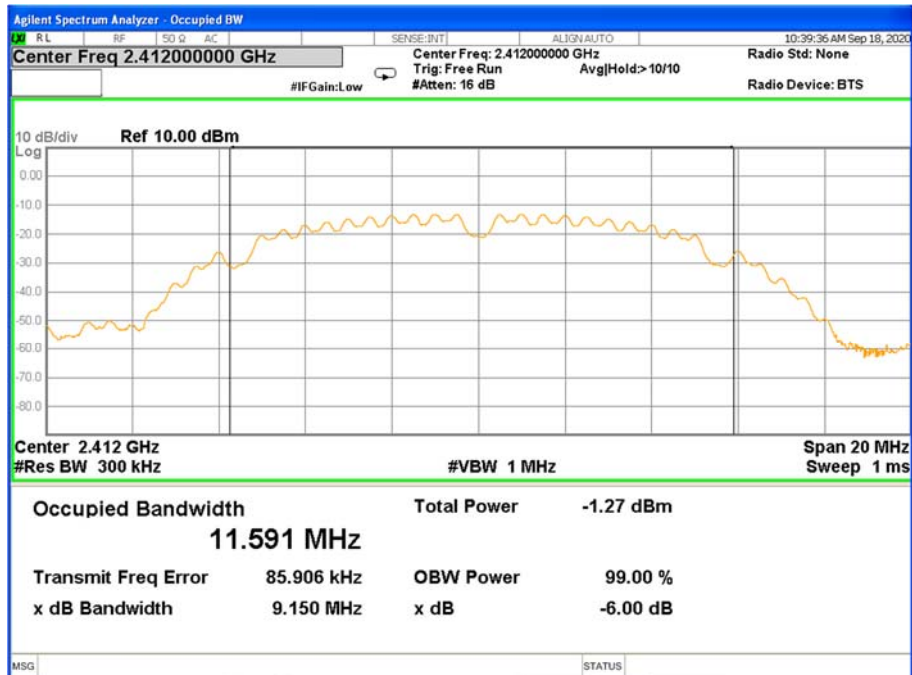


6Db Bandwidth TX CH 11

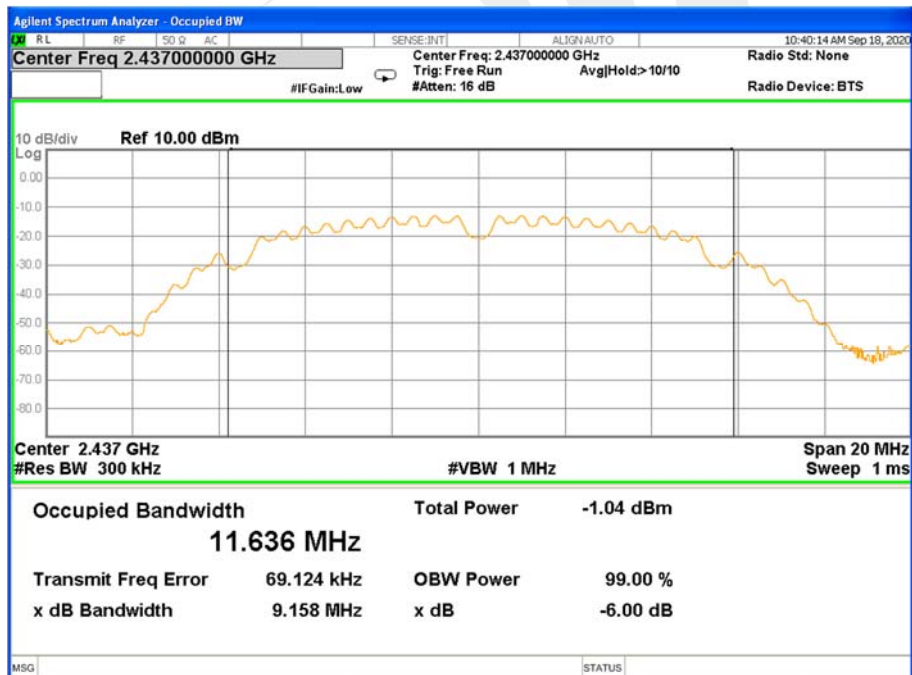




99% Bandwidth TX CH 01

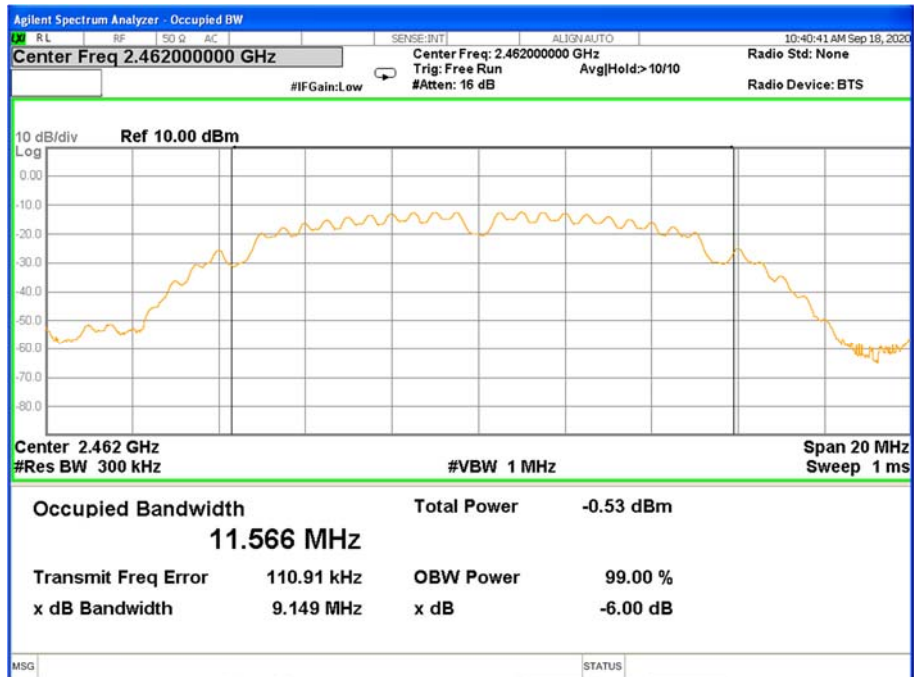


99% Bandwidth TX CH 06





99% Bandwidth TX CH 11



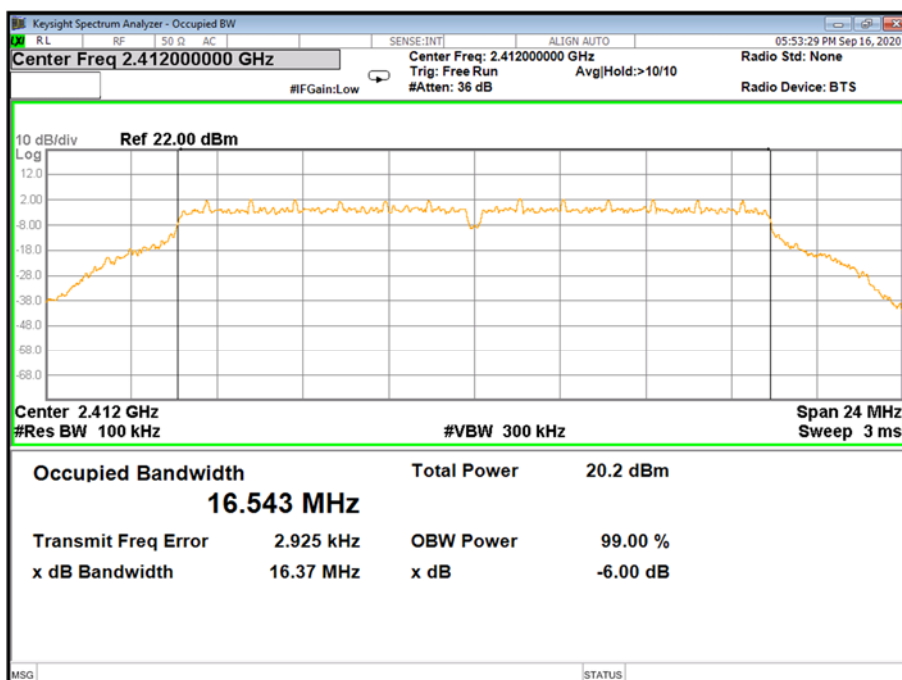


Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX g Mode /CH01, CH06, CH11

Frequency	6Db Bandwidth	99% Bandwidth	Limit	Result
	(MHz)	(MHz)	(KHz)	
2412 MHz	16.37	17.10	≥500KHz	PASS
2437 MHz	16.36	17.13	≥500KHz	PASS
2462 MHz	16.36	17.14	≥500KHz	PASS

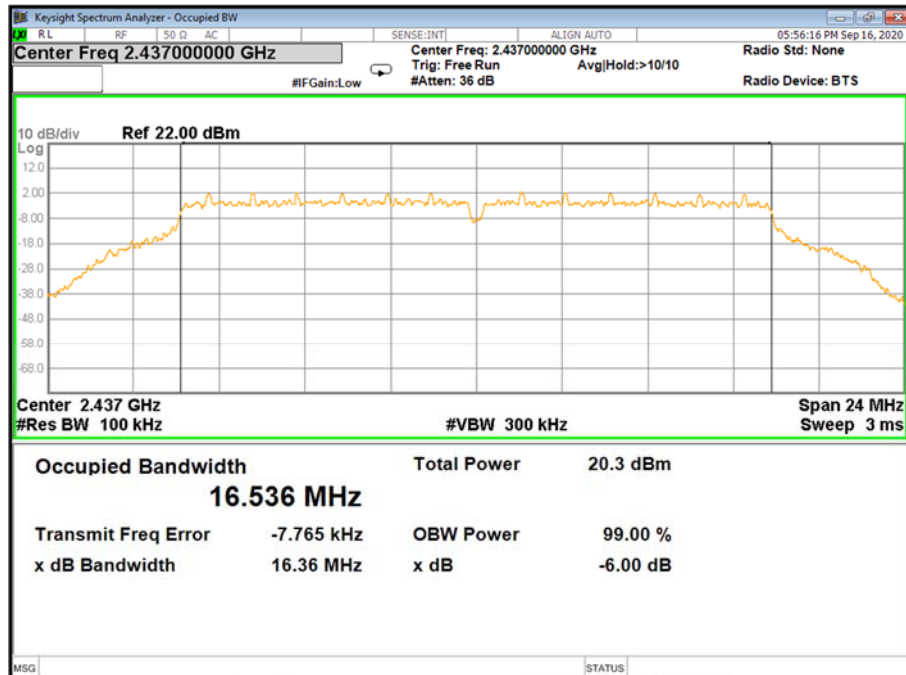
Antenna A

6Db Bandwidth TX CH 01

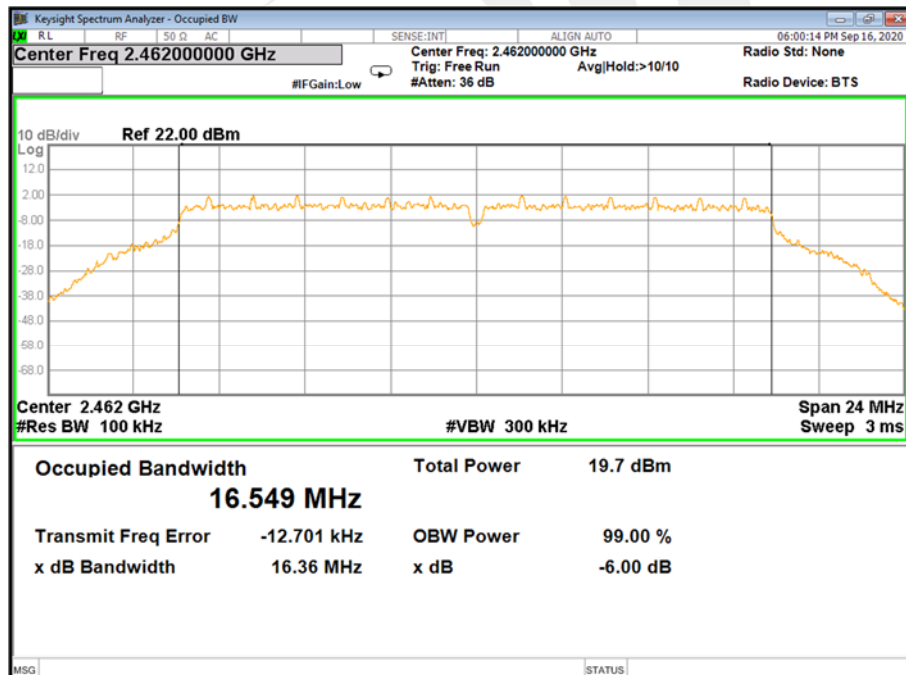




6Db Bandwidth TX CH 06

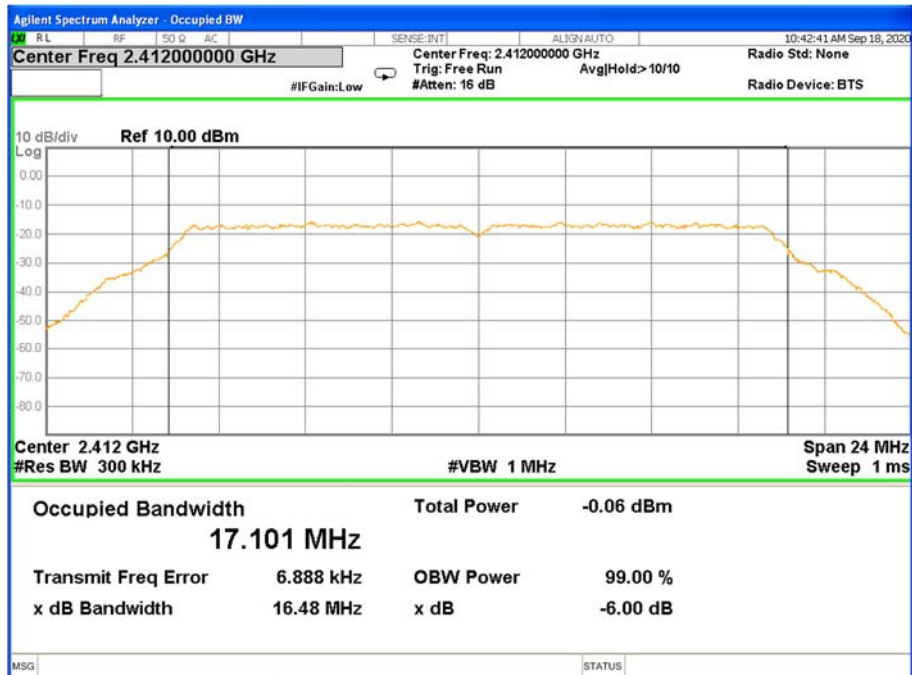


6Db Bandwidth TX CH 11

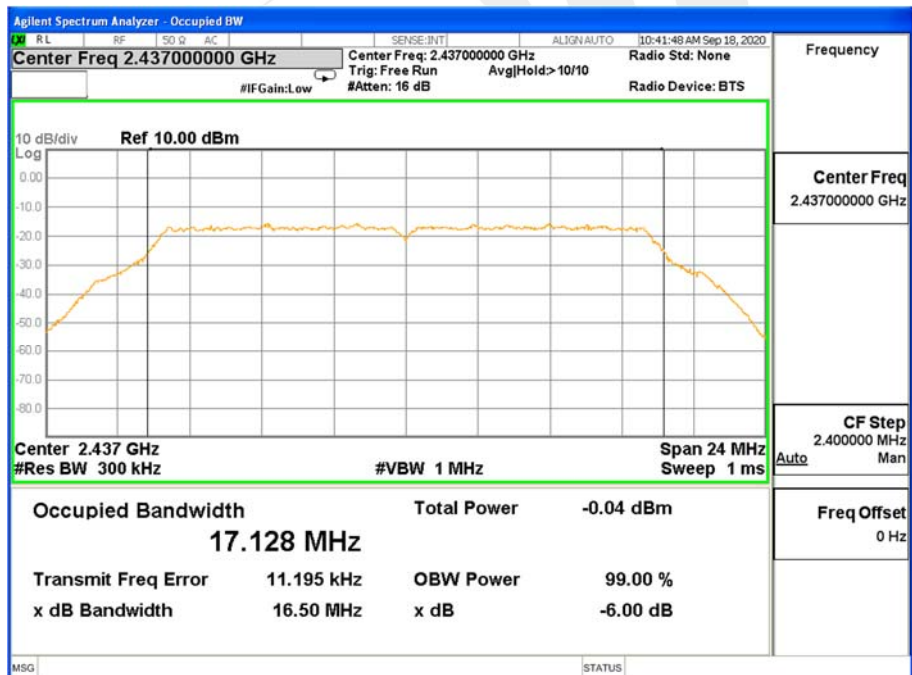




99% Bandwidth TX CH 01

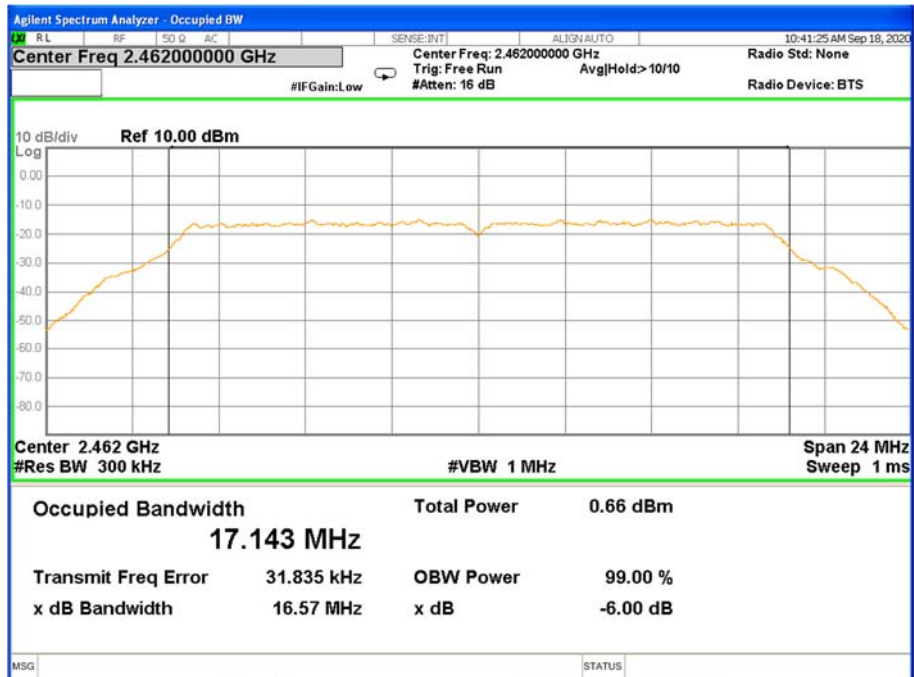


99% Bandwidth TX CH 06





99% Bandwidth TX CH 11



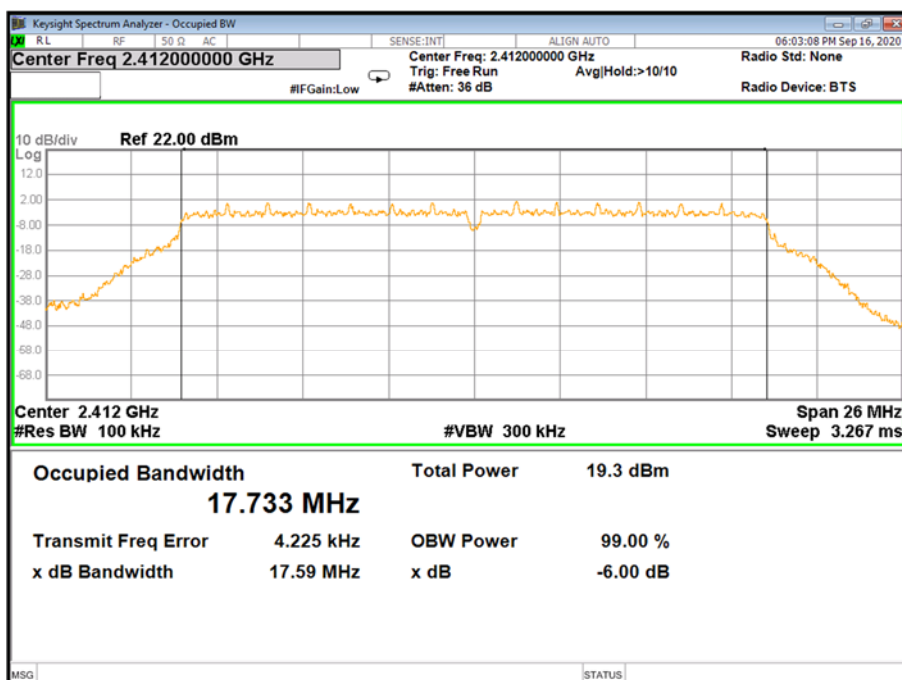


Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX n Mode(20M) /CH01, CH06, CH11

Frequency	6Db Bandwidth	99% Bandwidth	Limit	Result
	(MHz)	(MHz)	(KHz)	
2412 MHz	17.59	18.15	≥500KHz	PASS
2437 MHz	17.60	18.16	≥500KHz	PASS
2462 MHz	17.60	18.14	≥500KHz	PASS

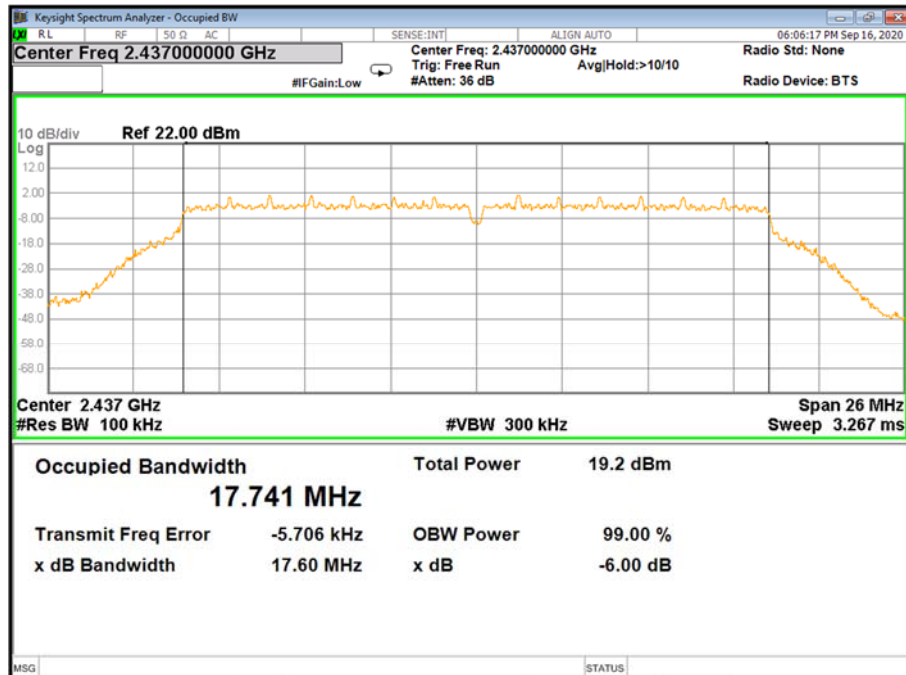
Antenna A

6Db Bandwidth TX CH 01

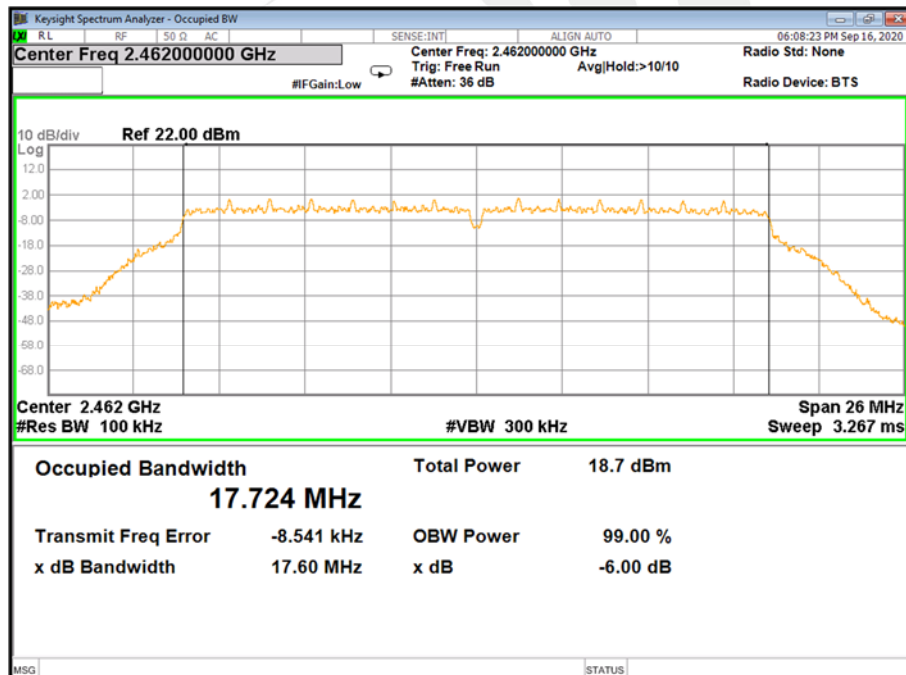




6Db Bandwidth TX CH 06

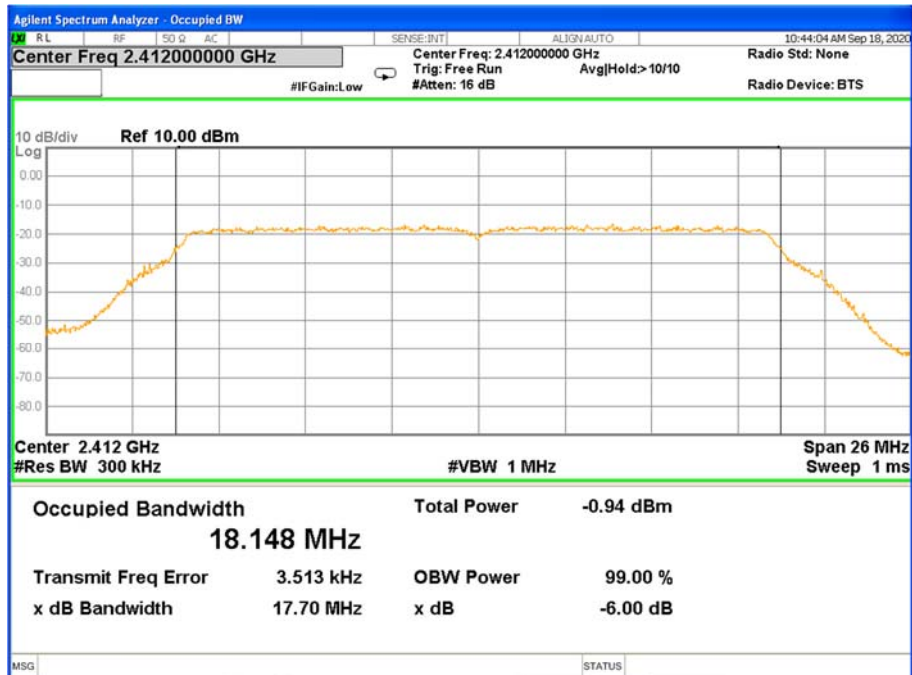


6Db Bandwidth TX CH 11

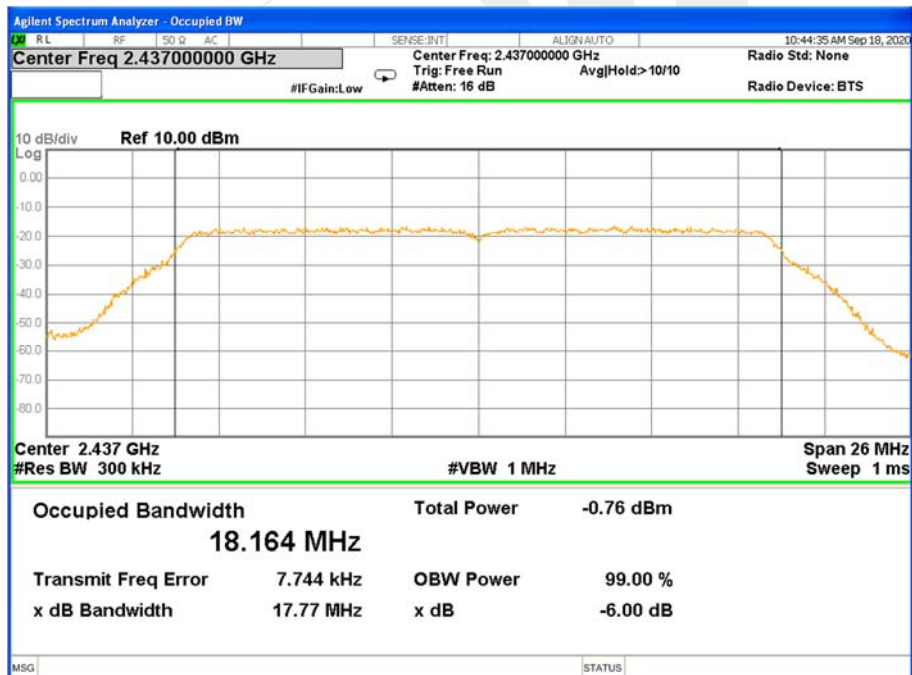




99% Bandwidth TX CH 01

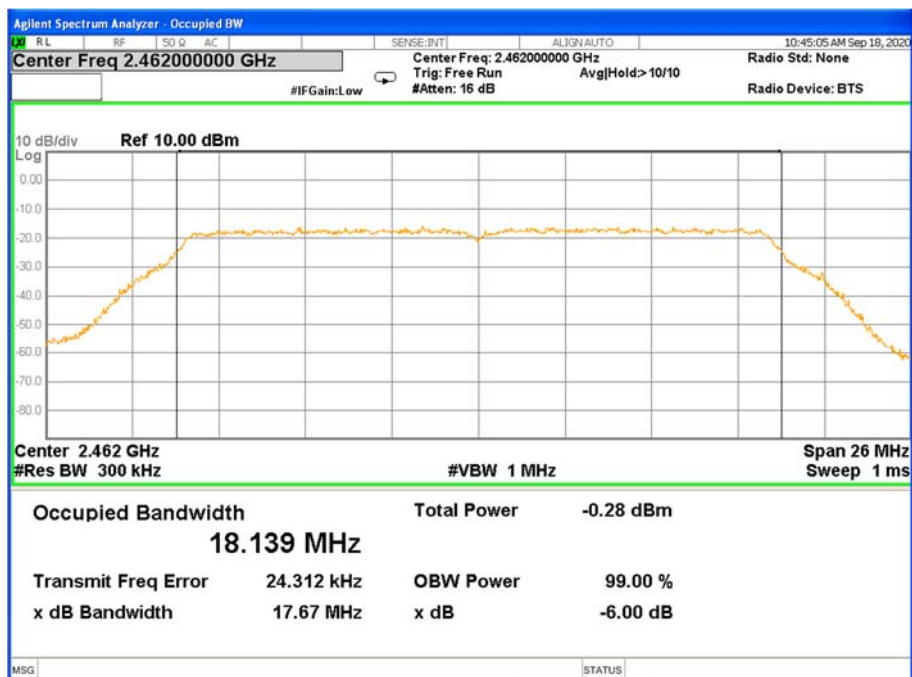


99% Bandwidth TX CH 06





99% Bandwidth TX CH 11



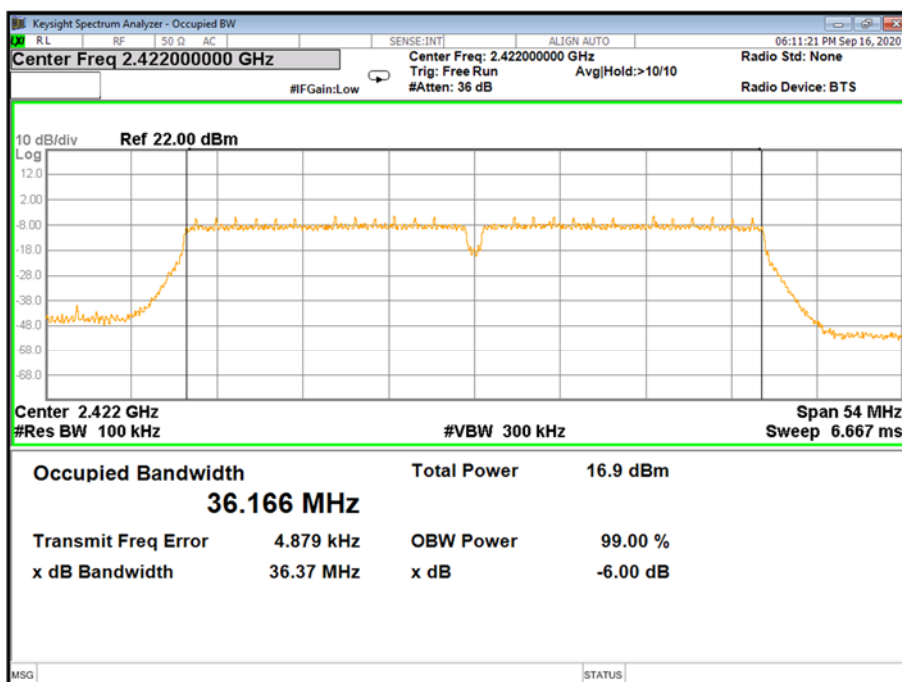


Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V	Test Mode:	TX n Mode(40M) /CH03, CH06, CH09

Frequency	6Db Bandwidth	99% Bandwidth	Limit	Result
	(MHz)	(MHz)	(KHz)	
2422 MHz	36.37	36.21	≥500KHz	PASS
2437 MHz	36.36	36.23	≥500KHz	PASS
2452 MHz	36.36	36.21	≥500KHz	PASS

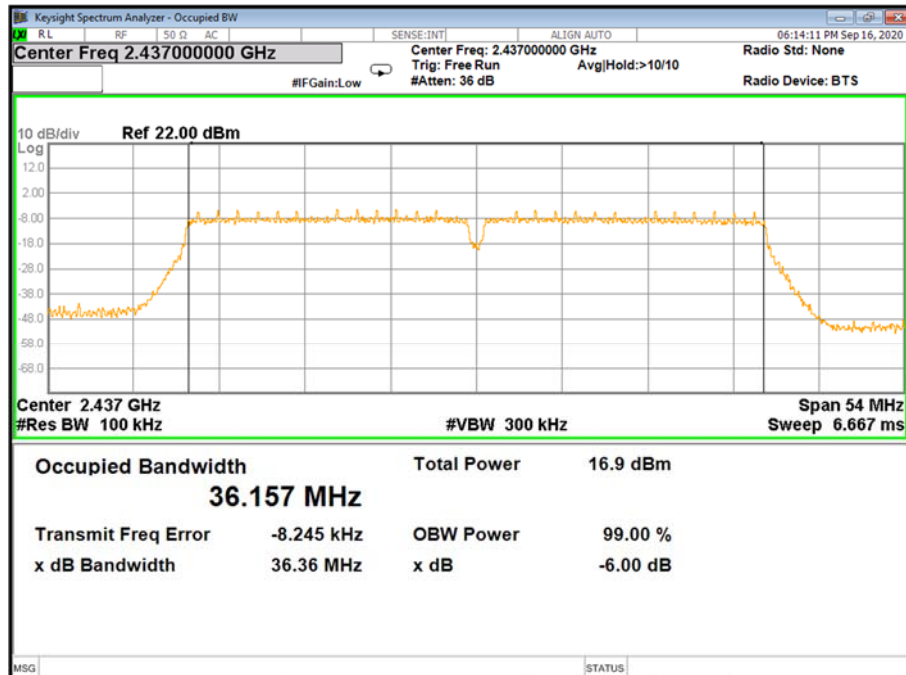
Antenna A

6Db Bandwidth TX CH 03

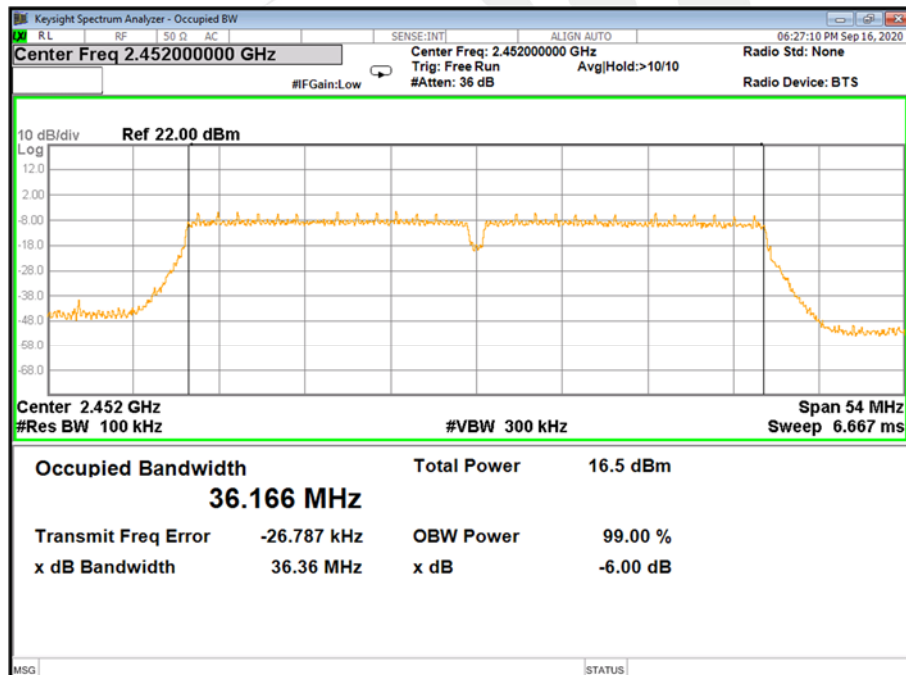




6Db Bandwidth TX CH 06

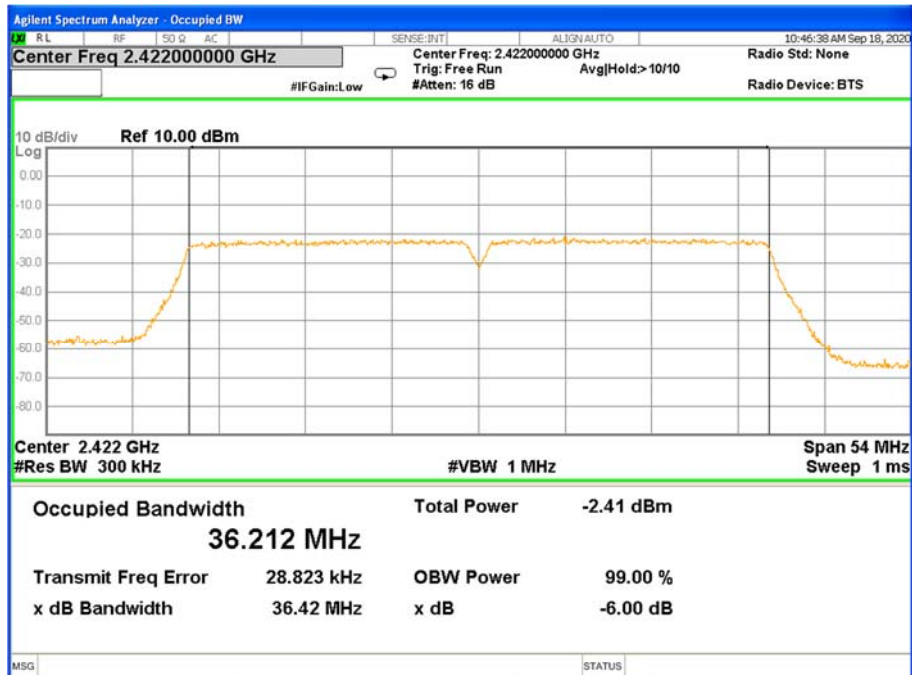


6Db Bandwidth TX CH 09

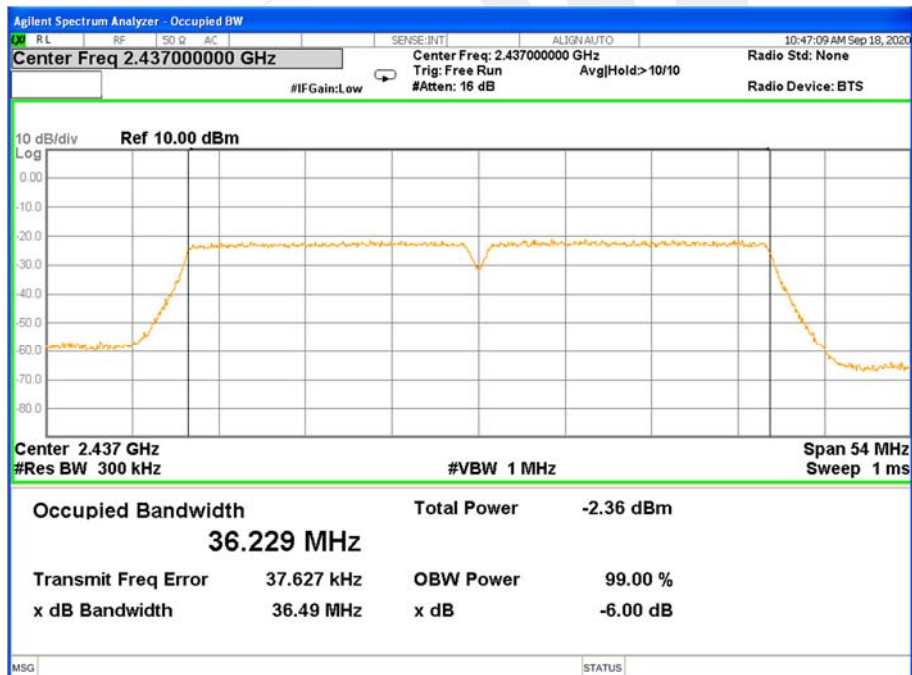




99% Bandwidth TX CH 03

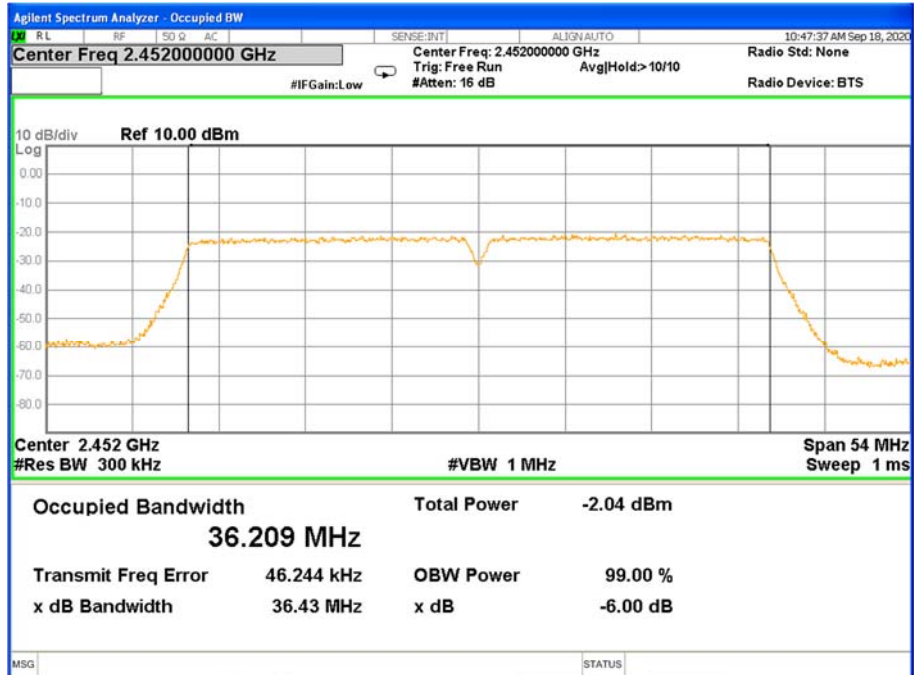


99% Bandwidth TX CH 06





99% Bandwidth TX CH 09





7. PEAK OUTPUT POWER TEST

7.1 LIMIT

FCC Part15.247,Subpart C RSS 247 Issue 2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3) RSS 247 Issue 2	Output Power	1 watt or 30dBm	2400-2483.5	PASS
RSS-247	EIRP	4W	2400-2483.5	PASS

7.2 TEST PROCEDURE

One of the following procedures may be used to determine the maximum peak conducted output power of a DTS EUT.

$RBW \geq$ DTS bandwidth

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:

- Set the $RBW \geq$ DTS bandwidth.
- Set $VBW \geq [3 \times RBW]$.
- Set span $\geq [3 \times RBW]$.
- Sweep time = auto couple.
- Detector = peak.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use peak marker function to determine the peak amplitude level.

Integrated band power method:

The following procedure can be used when the maximum available RBW of the instrument is less than the

DTS bandwidth:

- Set the $RBW = 1$ MHz.
- Set the $VBW \geq [3 \times RBW]$.
- Set the span $\geq [1.5 \times \text{DTS bandwidth}]$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select the peak detector). If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS channel bandwidth.

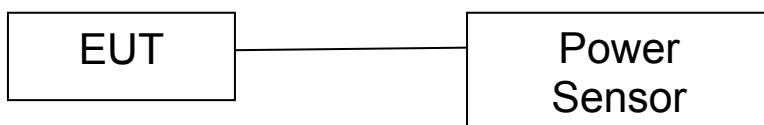
PKPM1 Peak power meter method:

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



7.6 TEST RESULTS

Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 3.8V		

TX 802.11b Mode								
Test Channe	Frequency	PK Power ANT A	PK Power ANT B	PK Power ANT A+ANT B	AV Power ANT A	AV Power ANT B	AV Power ANT A+ANT B	LIMIT
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	dBm
CH01	2412	19.87	19.56	--	16.80	16.40	--	30.00
CH06	2437	19.68	19.45	--	16.79	16.44	--	30.00
CH11	2462	19.71	19.42	--	16.54	16.36	--	30.00

TX 802.11g Mode								
Test Channe	Frequency	PK Power ANT A	PK Power ANT B	PK Power ANT A+ANT B	AV Power ANT A	AV Power ANT B	AV Power ANT A+ANT B	LIMIT
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	dBm
CH01	2412	20.86	20.54	--	14.46	14.11	--	30.00
CH06	2437	20.75	20.47	--	14.34	14.37	--	30.00
CH11	2462	20.86	20.53	--	14.49	14.25	--	30.00

TX 802.11n20 Mode								
Test Channe	Frequency	PK Power ANT A	PK Power ANT B	PK Power ANT A+ANT B	AV Power ANT A	AV Power ANT B	AV Power ANT A+ANT B	LIMIT
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	dBm
CH01	2412	20.02	19.61	22.83	13.26	12.87	16.08	29.99
CH06	2437	20.23	19.98	23.12	13.12	12.99	16.07	29.99
CH11	2462	20.36	19.68	23.04	13.21	12.97	16.10	29.99



TX 802.11n40 Mode								
Test Channel	Frequency	PK Power ANT A	PK Power ANT B	PK Power ANT A+ANT B	AV Power ANT A	AV Power ANT B	AV Power ANT A+ANT B	LIMIT
	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	dBm
CH03	2422	17.95	17.55	20.76	11.12	10.68	13.92	29.99
CH06	2437	17.79	17.41	20.61	11.07	10.70	13.90	29.99
CH09	2452	17.87	17.49	20.69	11.11	10.72	13.93	29.99

Note: The MIMO antenna gain is 6.01dBi, which is greater than 6dBi, so the MIMO mode limit will be reduced by 0.01dBi.





EIRP Power

TX 802.11b Mode

Test Channel	Frequency	Peak Power Ant_A	Peak Power Ant_B	Antenna A Gain	Antenna B Gain	EIRP Power Ant_A	EIRP Power Ant_B	EIRP Power Total	LIMIT
	(MHz)	(dBm)	(dBm)	(dBi)	(dBi)	(dBm)	(dBm)	(dBm)	dBm
CH01	2412	19.87	19.56	3.00	3.00	22.87	22.56	--	36.02
CH06	2437	19.68	19.45	3.00	3.00	22.68	22.45	--	36.02
CH11	2462	19.71	19.42	3.00	3.00	22.71	22.42	--	36.02

TX 802.11g Mode

Test Channel	Frequency	Peak Power Ant_A	Peak Power Ant_B	Antenna A Gain	Antenna B Gain	EIRP Power Ant_A	EIRP Power Ant_B	EIRP Power Total	LIMIT
	(MHz)	(dBm)	(dBm)	(dBi)	(dBi)	(dBm)	(dBm)	(dBm)	dBm
CH01	2412	20.86	20.54	3.00	3.00	23.86	23.54	--	36.02
CH06	2437	20.75	20.47	3.00	3.00	23.75	23.47	--	36.02
CH11	2462	20.86	20.53	3.00	3.00	23.86	23.53	--	36.02

TX 802.11n20 Mode

Test Channel	Frequency	Peak Power Ant_A	Peak Power Ant_B	Antenna A Gain	Antenna B Gain	EIRP Power Ant_A	EIRP Power Ant_B	EIRP Power Total	LIMIT
	(MHz)	(dBm)	(dBm)	(dBi)	(dBi)	(dBm)	(dBm)	(dBm)	dBm
CH01	2412	20.02	19.61	3.00	3.00	23.02	22.61	25.83	36.02
CH06	2437	20.23	19.98	3.00	3.00	23.23	22.98	26.12	36.02
CH11	2462	20.36	19.68	3.00	3.00	23.36	22.68	26.04	36.02

TX 802.11n40 Mode

Test Channel	Frequency	Peak Power Ant_A	Peak Power Ant_B	Antenna A Gain	Antenna B Gain	EIRP Power Ant_A	EIRP Power Ant_B	EIRP Power Total	LIMIT
	(MHz)	(dBm)	(dBm)	(dBi)	(dBi)	(dBm)	(dBm)	(dBm)	dBm
CH03	2422	17.95	17.55	3.00	3.00	20.95	20.55	23.76	36.02
CH06	2437	17.79	17.41	3.00	3.00	20.79	20.41	23.61	36.02
CH09	2452	17.87	17.49	3.00	3.00	20.87	20.49	23.69	36.02



8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

15.203&RSS Gen requirement: For intentional device, according to 15.203&RSS Gen: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2 EUT ANTENNA

The EUT antenna is PIFA Antenna. It comply with the standard requirement.





9. FREQUENCY STABILITY

9.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.02\%$ of the operating frequency over a temperature variation of -30 degrees to 50 degrees C at normal supply voltage, and for a variation in primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees.

9.2 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2. Turn the EUT on and couple its output to spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at $+20$ degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

9.3 TEST RESULT

Channel 06 (2437MHz)

Voltage vs. Frequency Stability

Voltage(V)	Measurement Frequency(MHz)
4.37	2437.0041
3.8	2437.0035
3.23	2437.0033
Max.Deviation(MHz)	0.0041
Max.Deviation(ppm)	1.68

Rated working voltage: DC 3.8V

Temperature vs. Frequency Stability

Temperature($^{\circ}$ C)	Measurement Frequency(MHz)
-30	2437.0061
-20	2437.0057
-10	2437.0058
0	2437.0056
10	2437.0054
20	2437.0053
30	2437.0061
40	2437.0055
50	2437.0057
Max.Deviation(MHz)	0.0061
Max.Deviation(ppm)	2.50



APPENDIX-PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※

