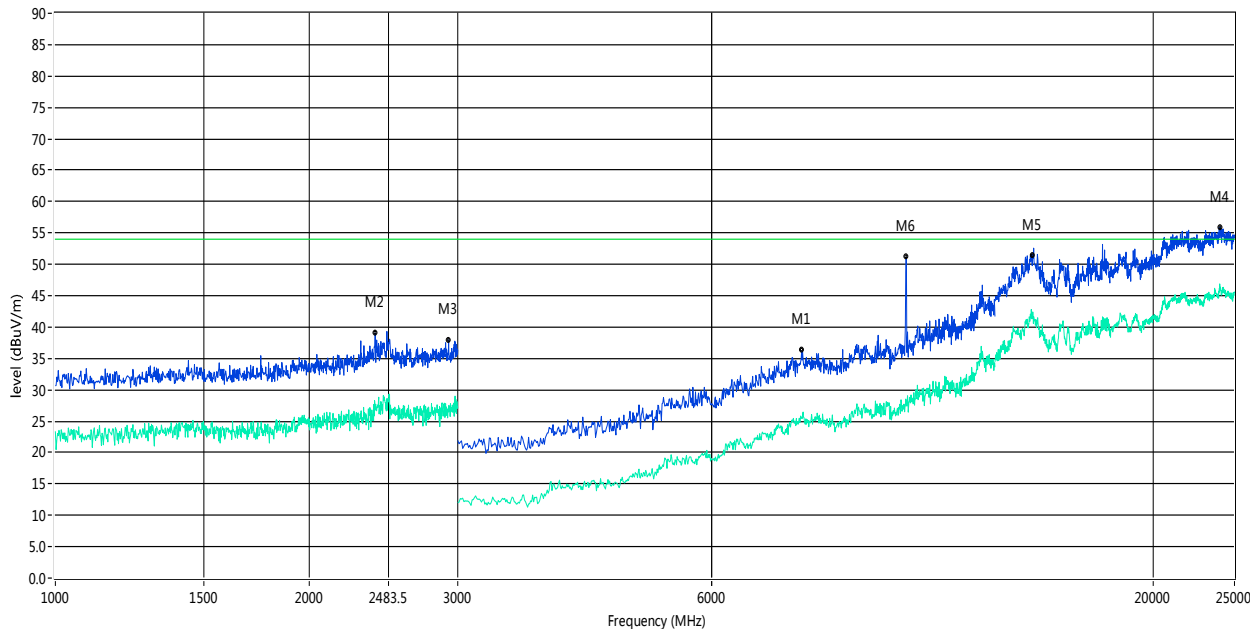




Temperature:	25°C	Relative Humidity:	65%
Pressure:	1010hPa	Phase:	Vertical

RSE_FCC Test Case_FCC 15C 1GHz-25GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	ANT	Verdict
1**	7670.000	25.61	10.29	54.0	-28.39	AV	V	Pass
1	7670.000	36.22	10.29	74.0	-37.78	Peak	V	Pass
2**	2394.000	26.76	0.75	54.0	-27.24	AV	V	Pass
2	2394.000	39.04	0.75	74.0	-34.96	Peak	V	Pass
3**	2926.000	26.48	1.67	54.0	-27.52	AV	V	Pass
3	2926.000	37.95	1.67	74.0	-36.05	Peak	V	Pass
4**	24039.999	46.36	23.29	54.0	-7.64	AV	V	Pass
4	24039.999	55.90	23.29	74.0	-18.10	Peak	V	Pass
5**	14452.000	41.75	24.56	54.0	-12.25	AV	V	Pass
5	14452.000	52.57	24.56	74.0	-21.43	Peak	V	Pass
6**	10200.001	28.24	12.33	54.0	-25.76	AV	V	Pass
6	10200.001	51.17	12.33	74.0	-22.83	Peak	V	Pass

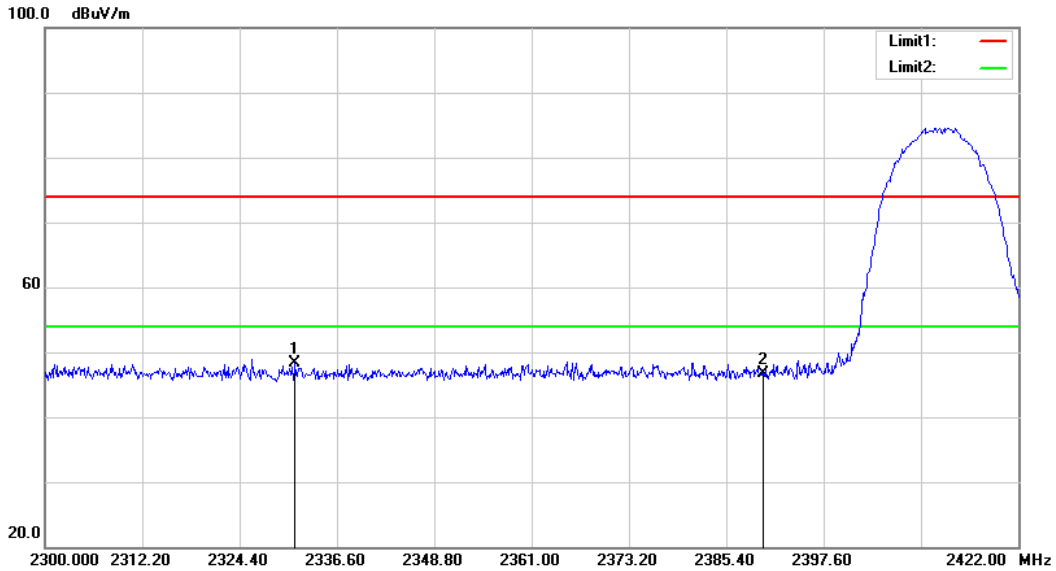
Note: 802.11b, 802.11g, 802.11n (HT-20) mode all have been tested, the worst case is 802.11g, only show the worst case.



3.3.7 TEST RESULTS (RESTRICTED BAND)

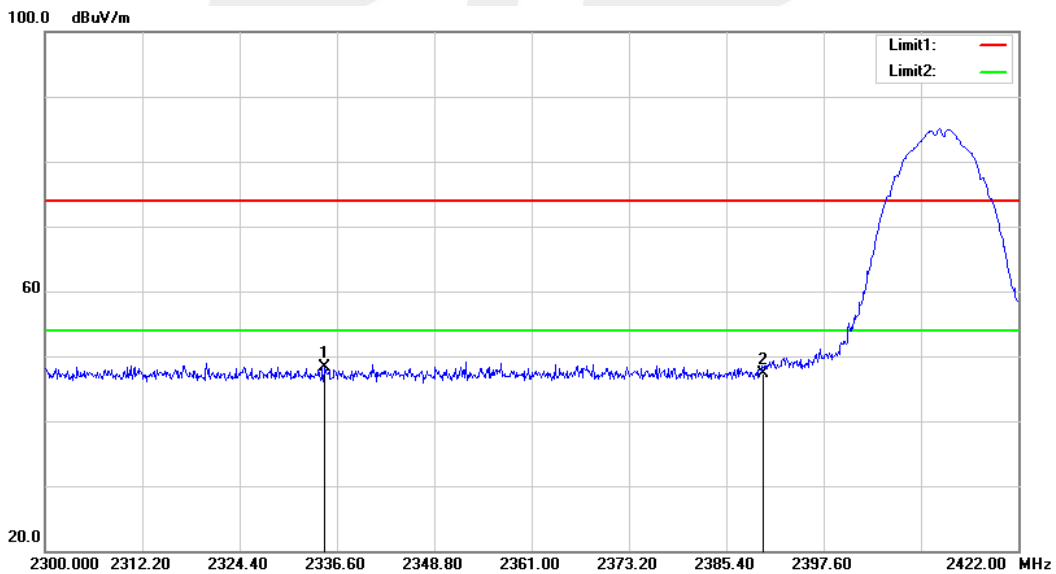
802.11b-Low

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2331.354	56.08	-7.79	48.29	74.00	-25.71	peak
2	2390.000	54.31	-7.54	46.77	74.00	-27.23	peak

Vertical

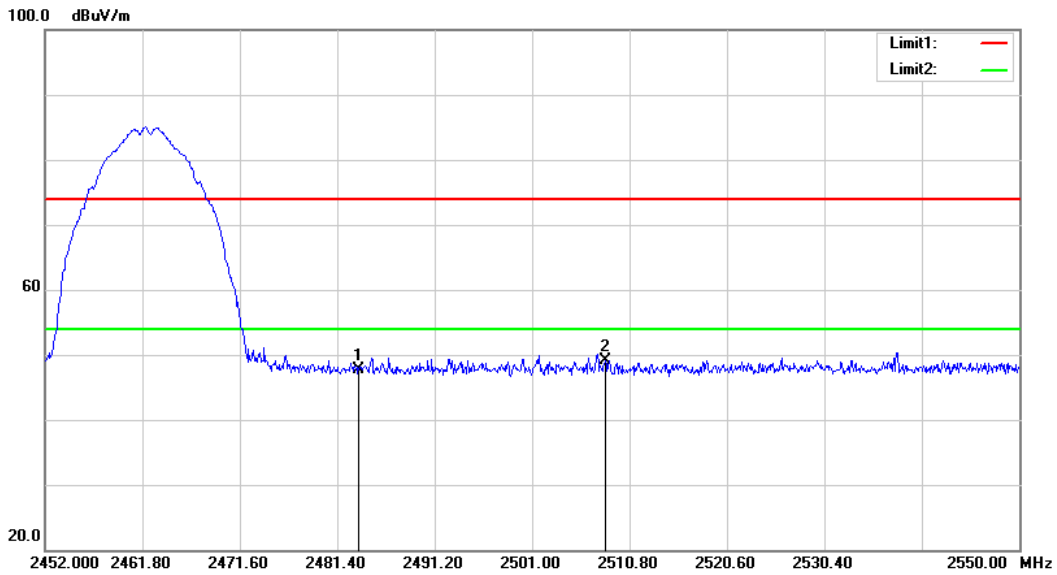


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2335.014	56.44	-8.04	48.40	74.00	-25.60	peak
2	2390.000	55.19	-7.81	47.38	74.00	-26.62	peak



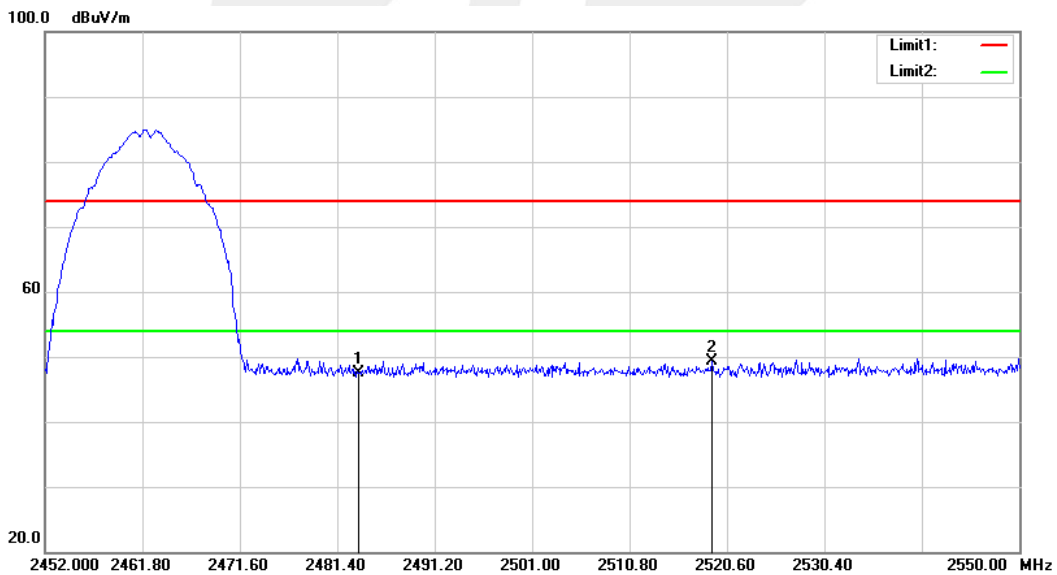
802.11b-High

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	54.93	-7.13	47.80	74.00	-26.20	peak
2	2508.350	56.10	-7.04	49.06	74.00	-24.94	peak

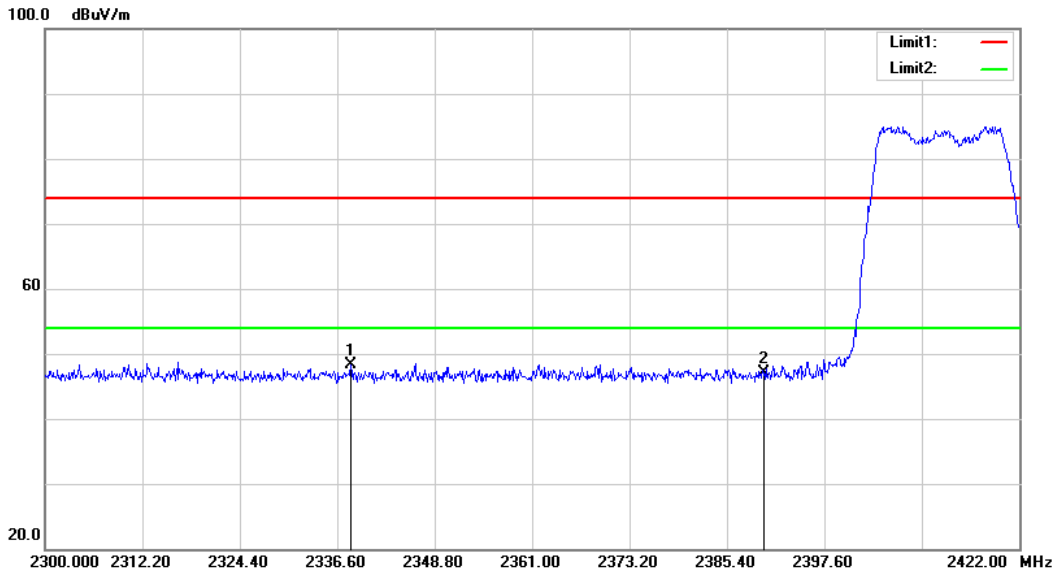
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	54.91	-7.43	47.48	74.00	-26.52	peak
2	2519.032	56.71	-7.32	49.39	74.00	-24.61	peak

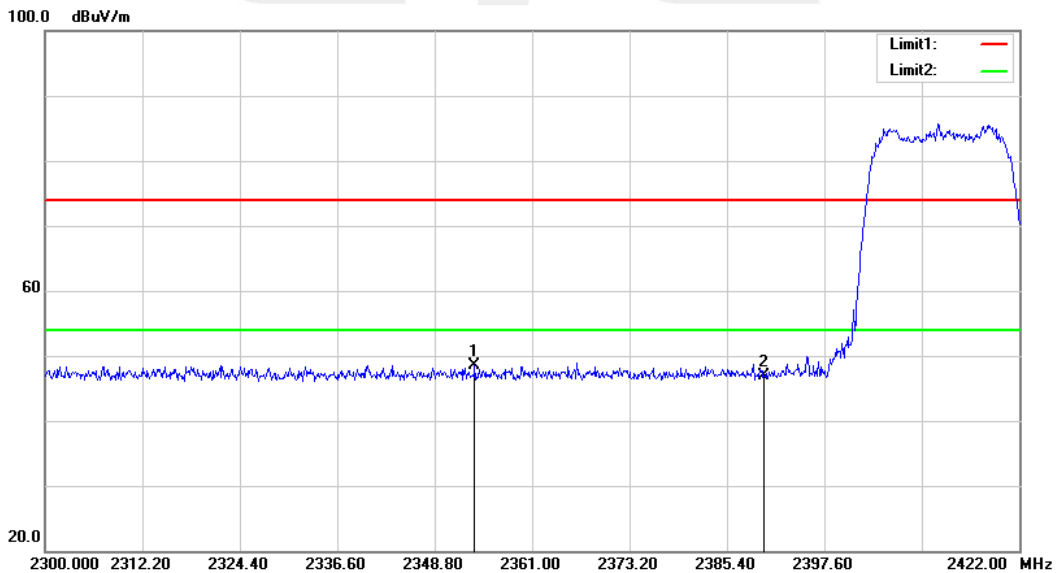


802.11g-Low
Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2338.308	56.12	-7.76	48.36	74.00	-25.64	peak
2	2390.000	54.72	-7.54	47.18	74.00	-26.82	peak

Vertical

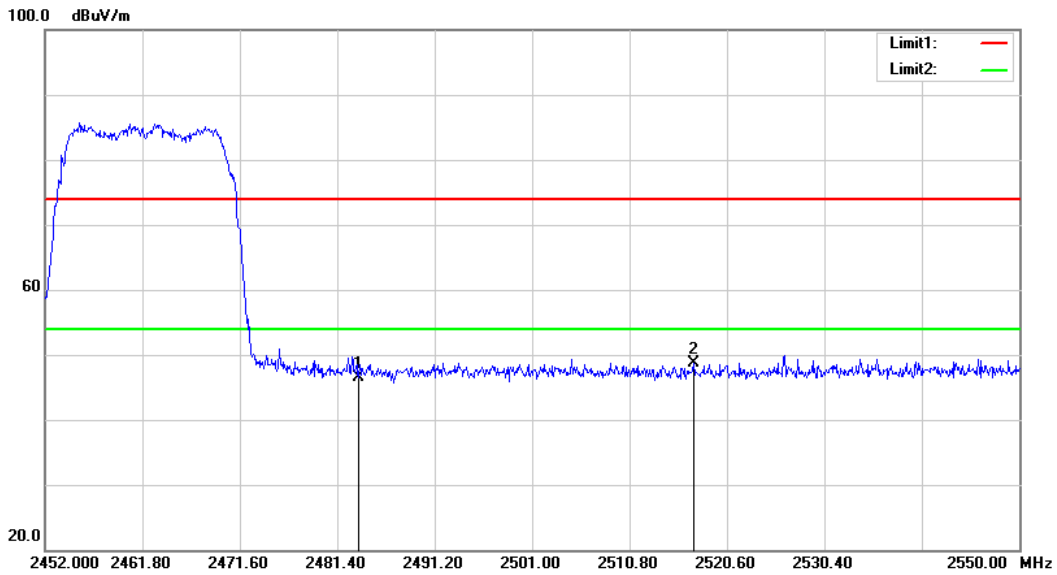


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2353.802	56.43	-7.97	48.46	74.00	-25.54	peak
2	2390.000	54.79	-7.81	46.98	74.00	-27.02	peak



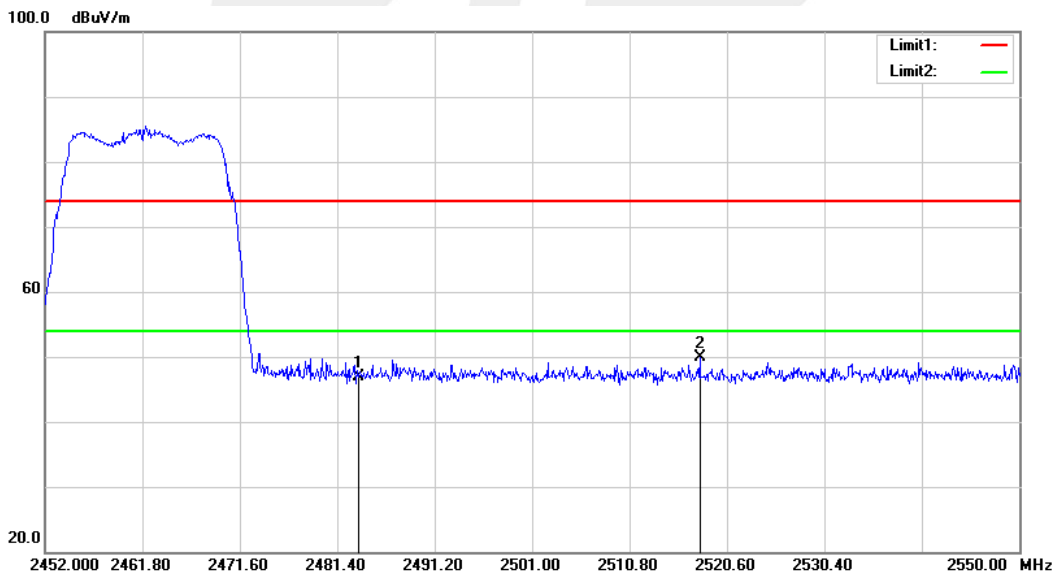
802.11g-High

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	53.62	-7.13	46.49	74.00	-27.51	peak
2	2517.268	55.78	-7.02	48.76	74.00	-25.24	peak

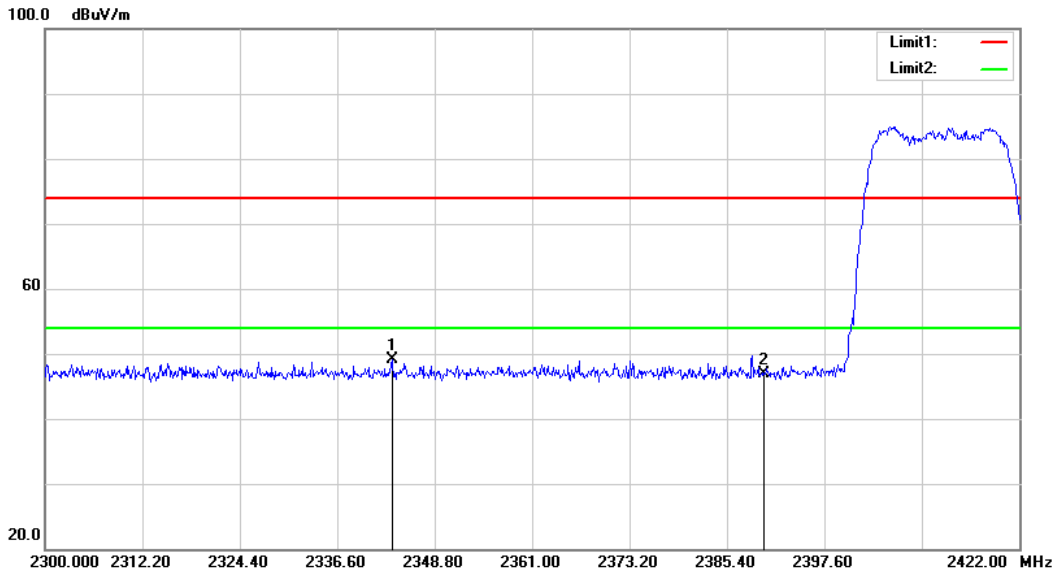
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	54.29	-7.43	46.86	74.00	-27.14	peak
2	2517.856	57.27	-7.32	49.95	74.00	-24.05	peak

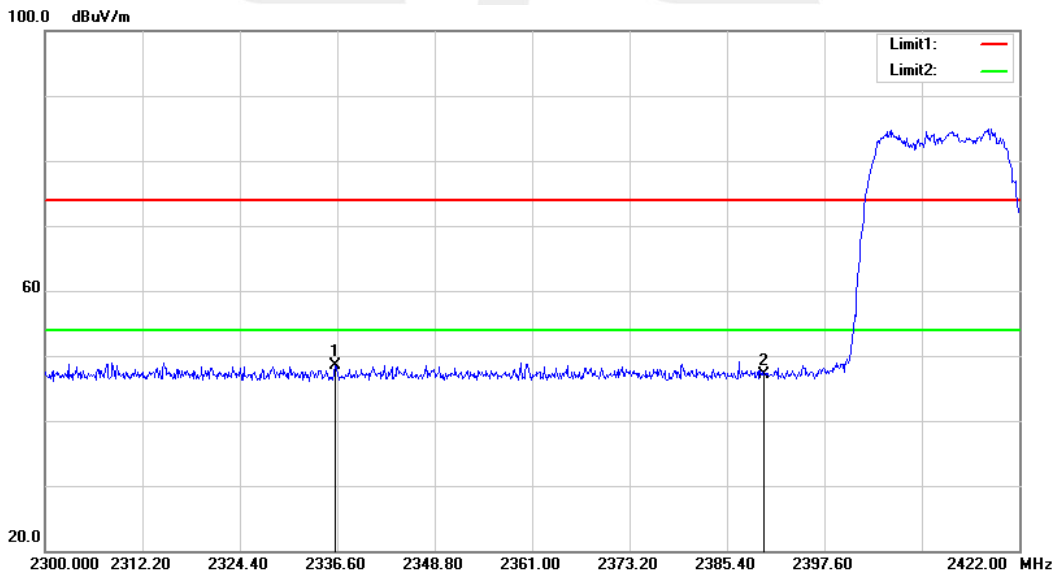


802.11HT(20)-Low
Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2343.432	56.83	-7.73	49.10	74.00	-24.90	peak
2	2390.000	54.43	-7.54	46.89	74.00	-27.11	peak

Vertical

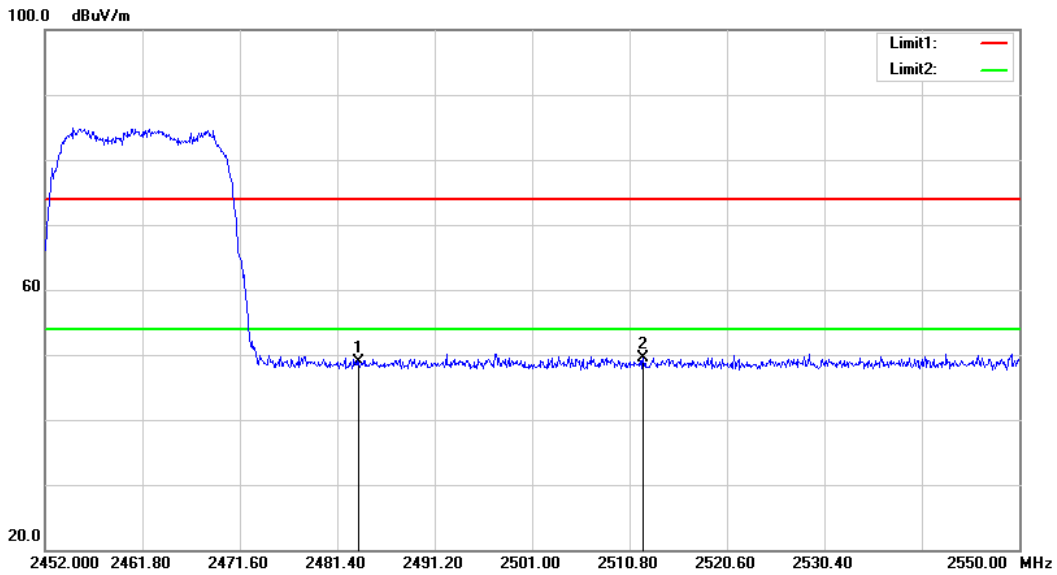


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2336.356	56.49	-8.04	48.45	74.00	-25.55	peak
2	2390.000	54.99	-7.81	47.18	74.00	-26.82	peak



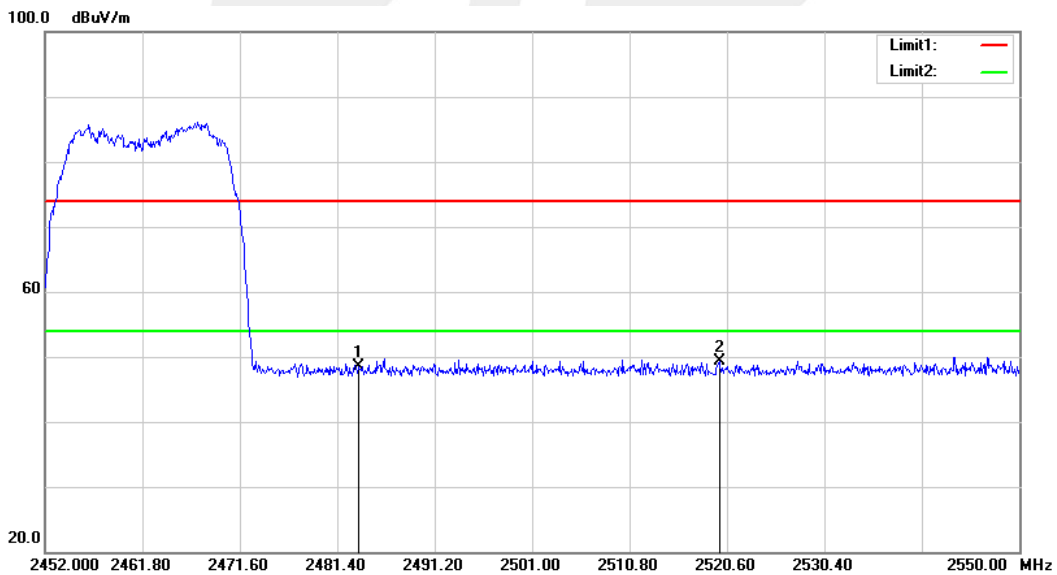
802.11HT(20)-High

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	56.00	-7.13	48.87	74.00	-25.13	peak
2	2512.172	56.58	-7.03	49.55	74.00	-24.45	peak

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	55.84	-7.43	48.41	74.00	-25.59	peak
2	2519.816	56.56	-7.32	49.24	74.00	-24.76	peak

4 CONDUCTED SPURIOUS & BAND EDGE EMISSION

4.1 APPLIED PROCEDURES / LIMIT

According to FCC Part 15.247(d) and RSS-247 Clause 5.5, in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

4.2 TEST PROCEDURE

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	30 MHz to 10th carrier harmonic
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

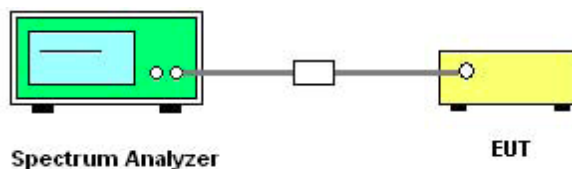
For Band edge

Spectrum Parameter	Setting
Detector	Peak
Start/Stop Frequency	Lower Band Edge: 2300 to 2422 MHz Upper Band Edge: 2452 to 2500 MHz
RB / VB (emission in restricted band)	100 KHz/300 KHz
Trace-Mode:	Max hold

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50 Ohm; the path loss as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

4.5 EUT OPERATION CONDITIONS

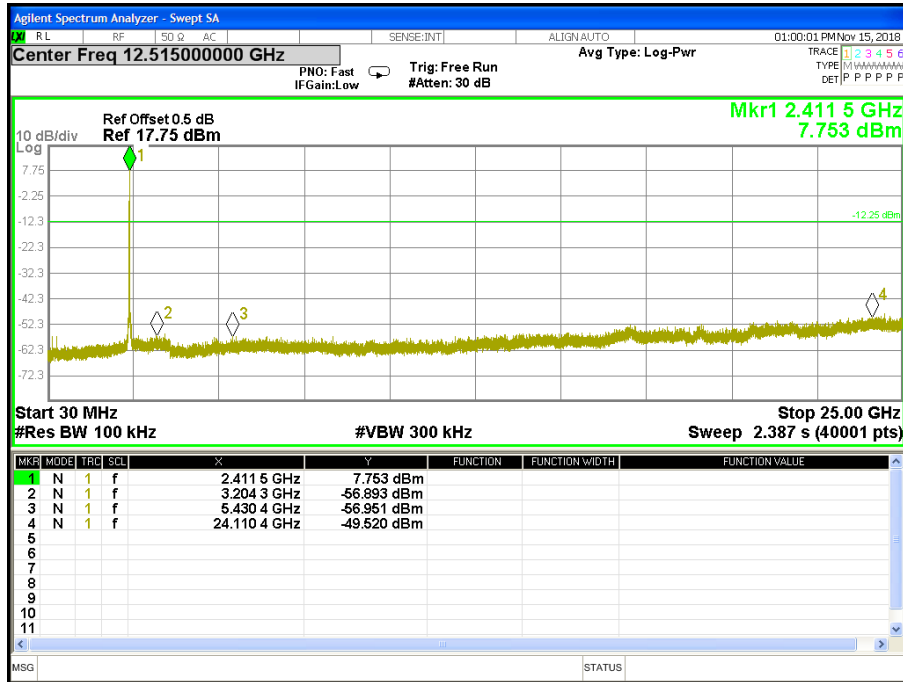
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



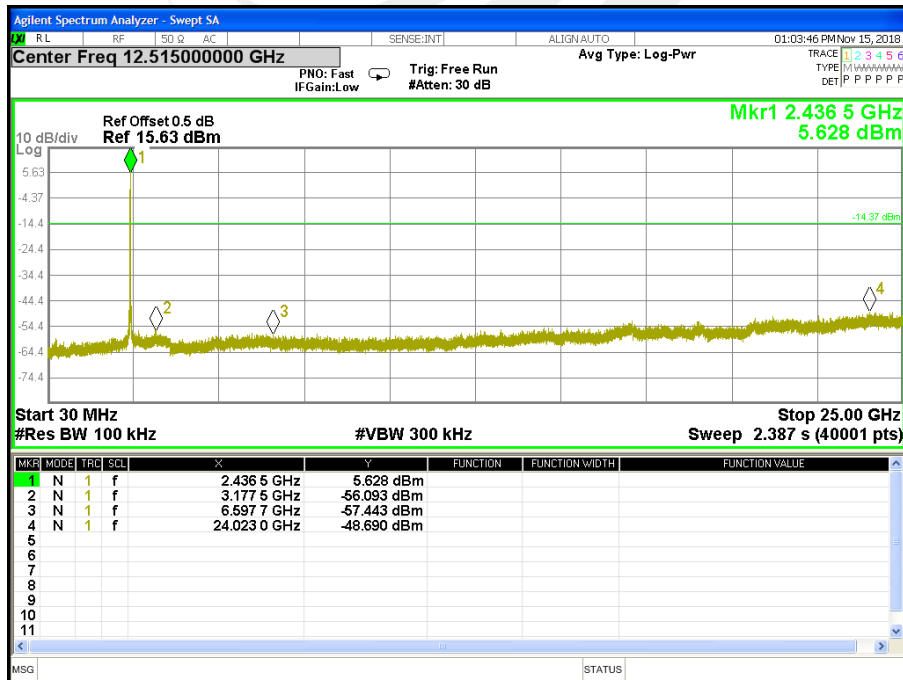
4.6 TEST RESULTS

Temperature :	25°C	Relative Humidity :	60%
Test Voltage :	DC 12V	Test Mode :	TX b Mode /CH01, CH06, CH11

CH 01

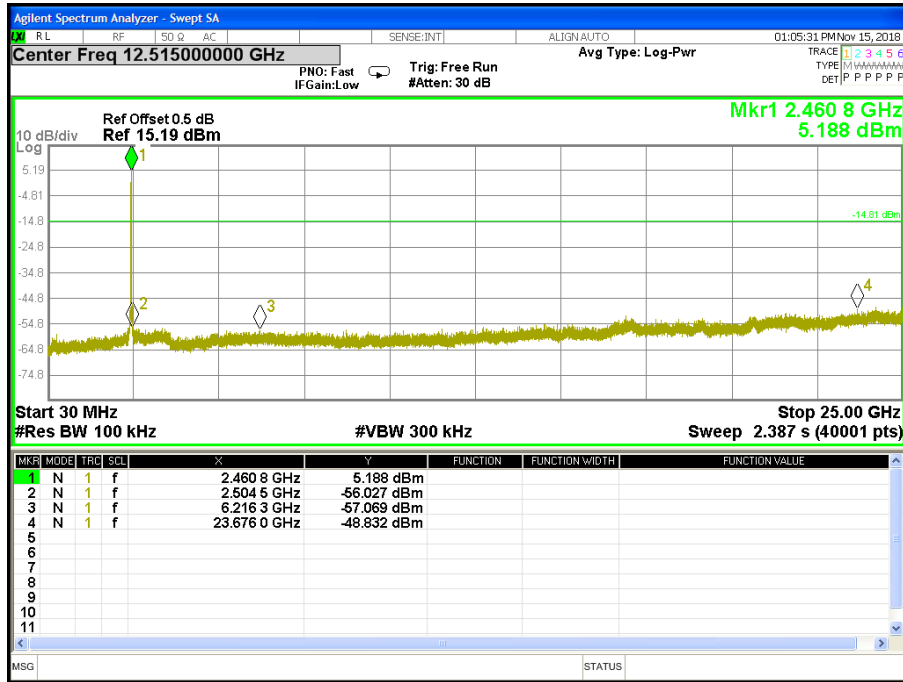


CH 06





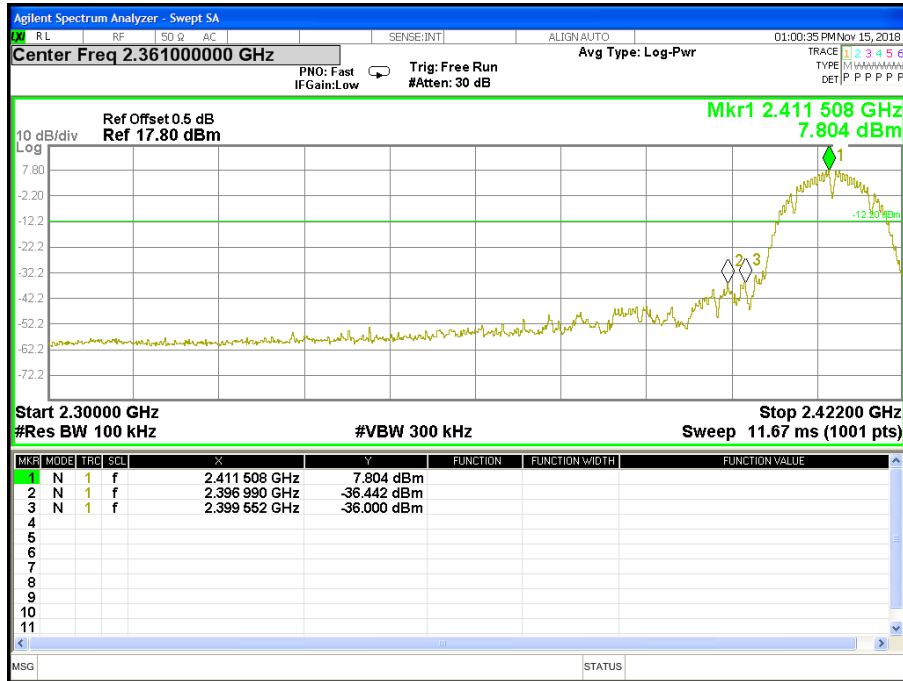
CH 11



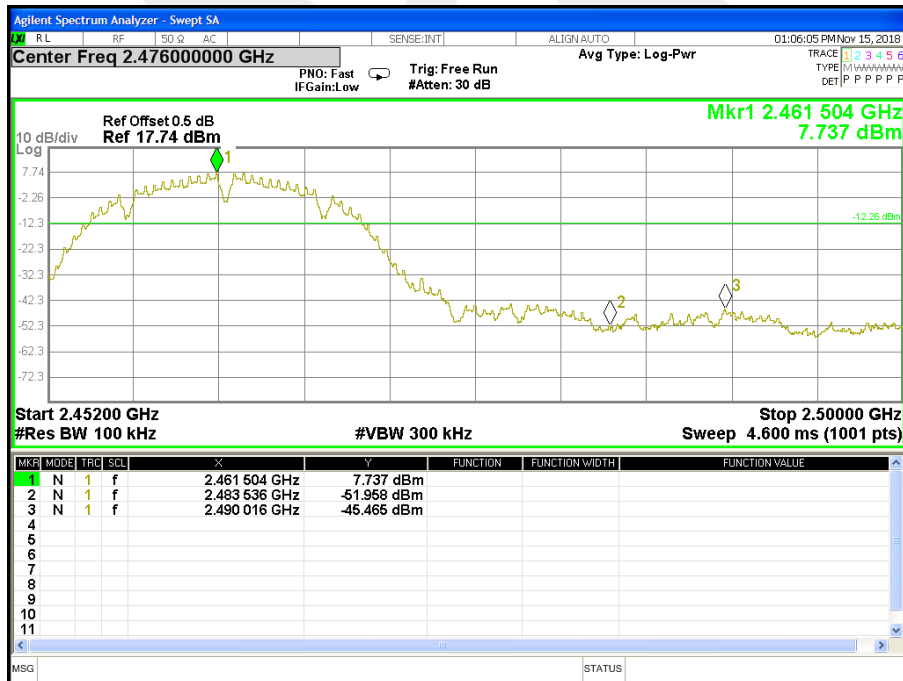


Band edge

CH 01



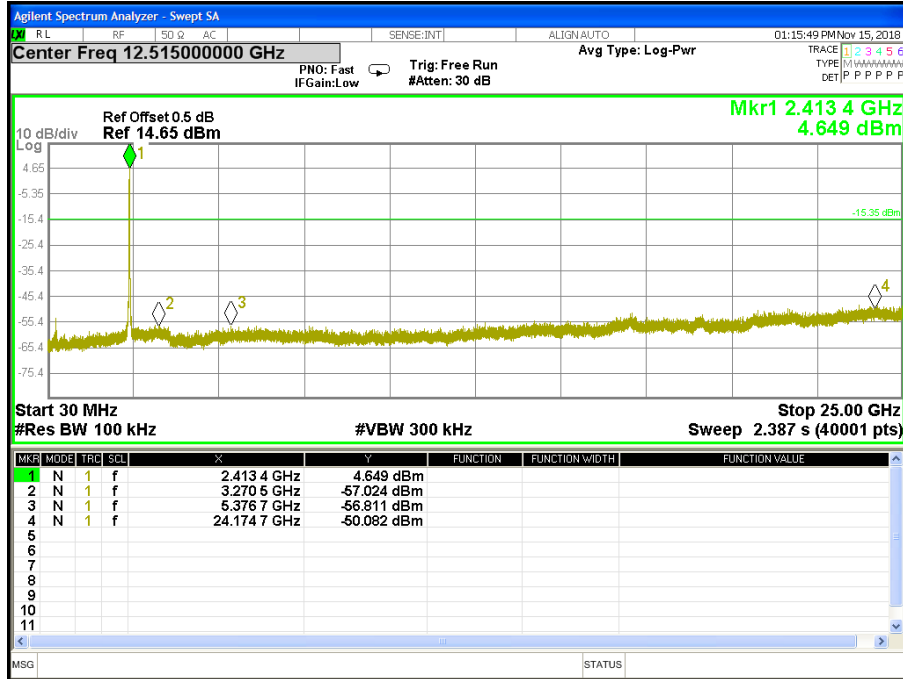
CH 11



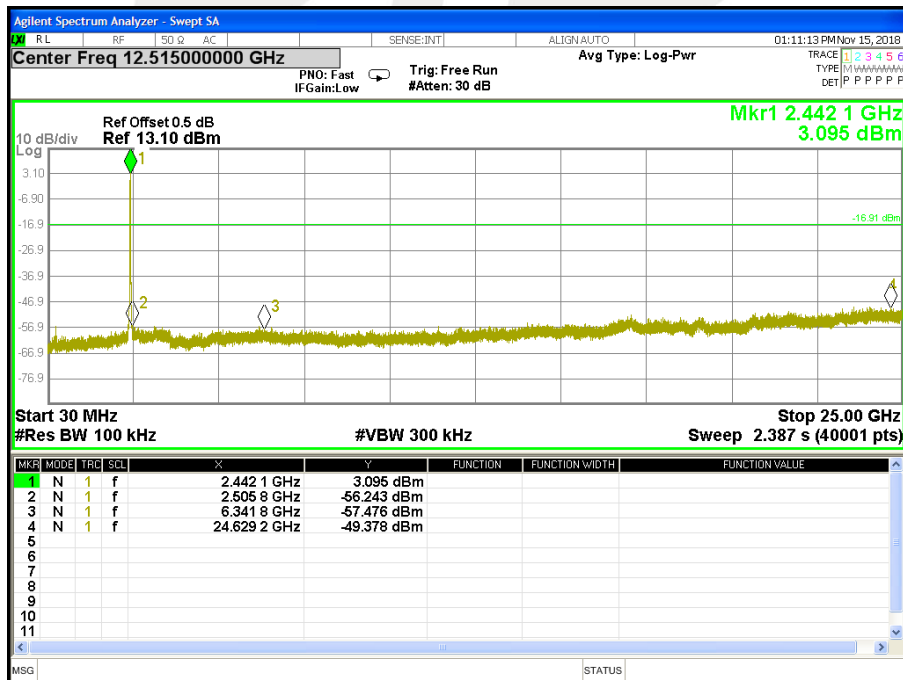


Temperature :	25°C	Relative Humidity :	60%
Test Voltage :	DC 12V	Test Mode :	TX g Mode /CH01, CH06, CH11

CH 01

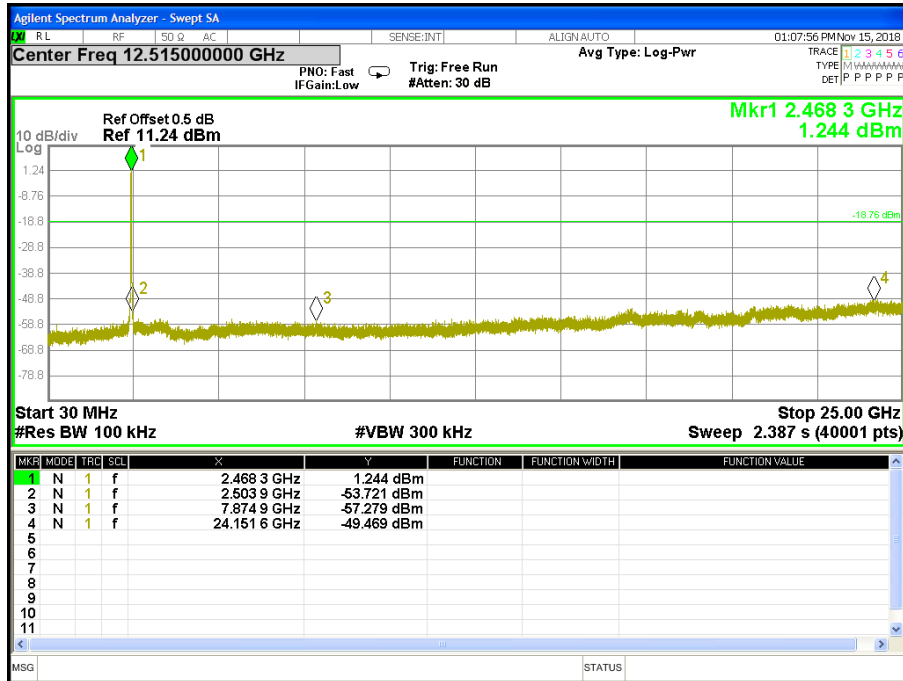


CH06





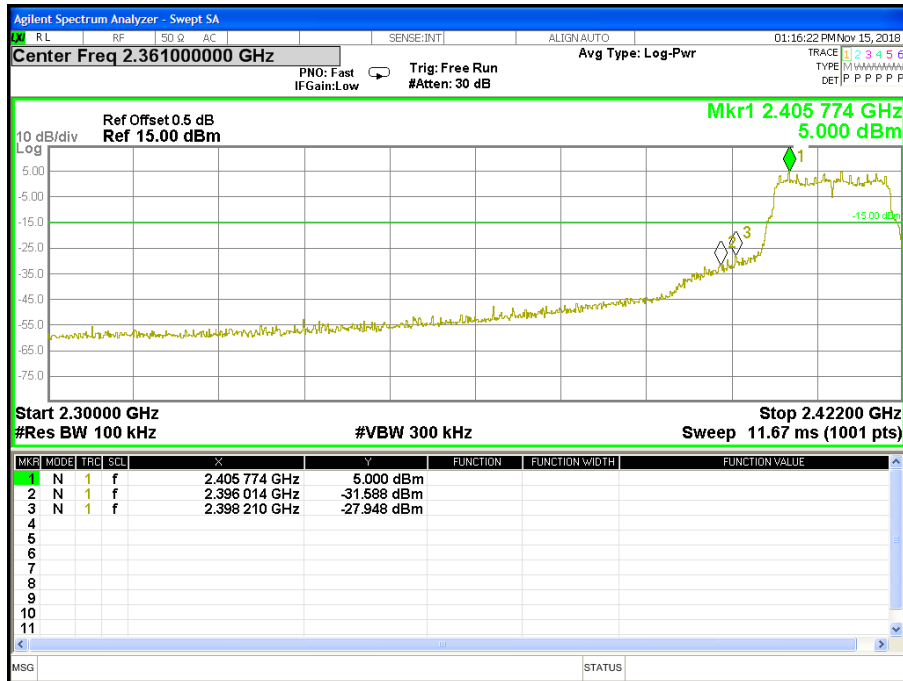
CH 11



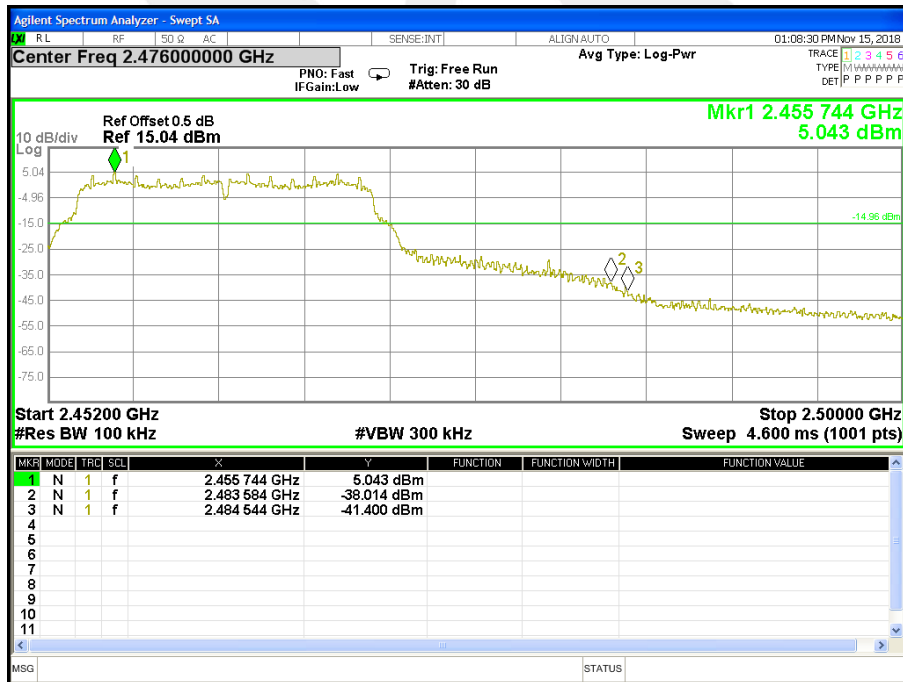


Band edge

CH 01



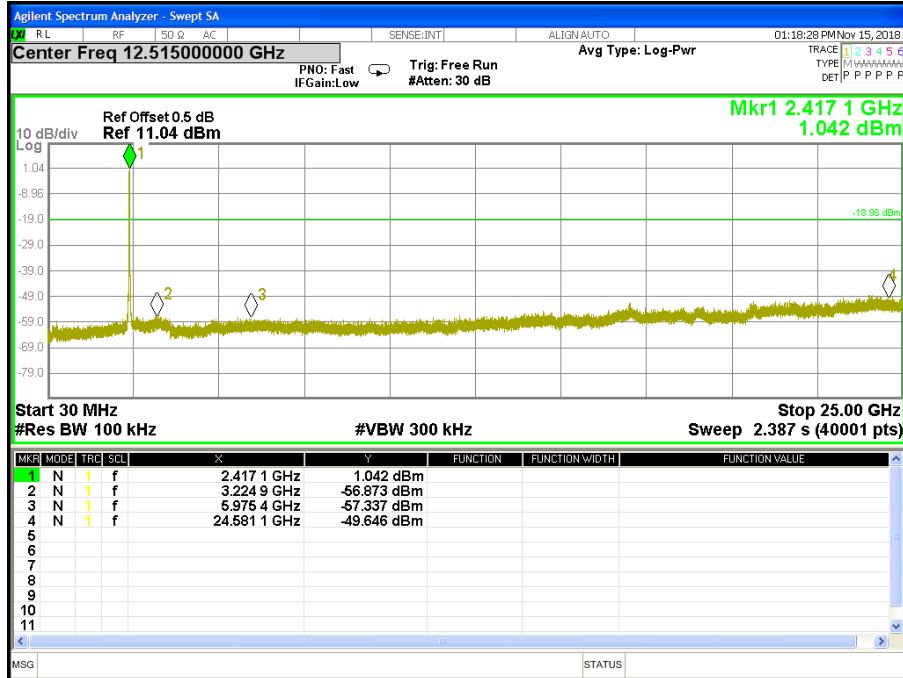
CH11



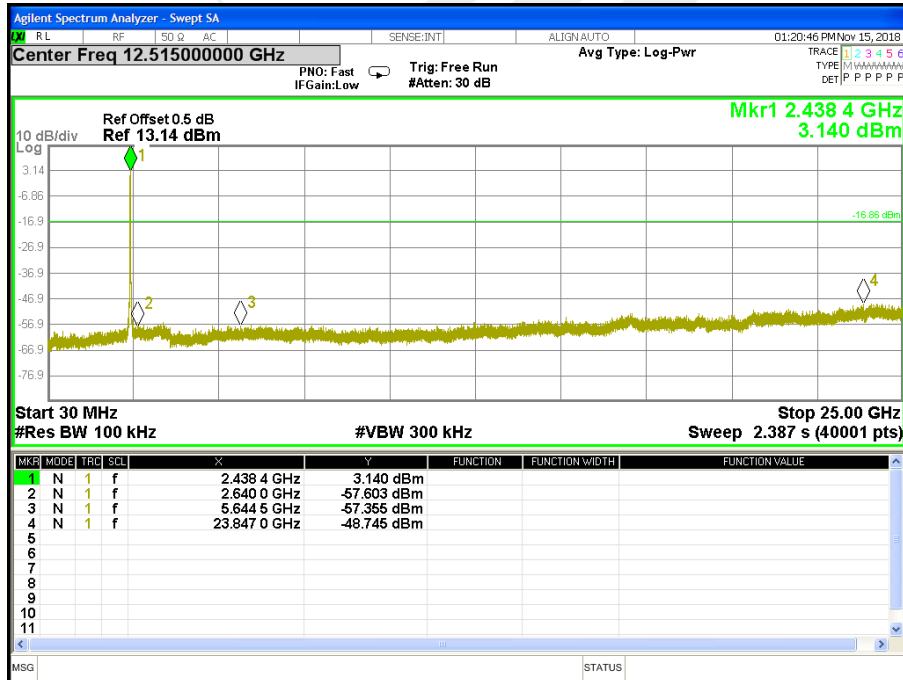


Temperature :	25°C	Relative Humidity :	60%
Test Voltage :	DC 12V	Test Mode :	TX n Mode(20M) /CH01, CH06, CH11

CH 01

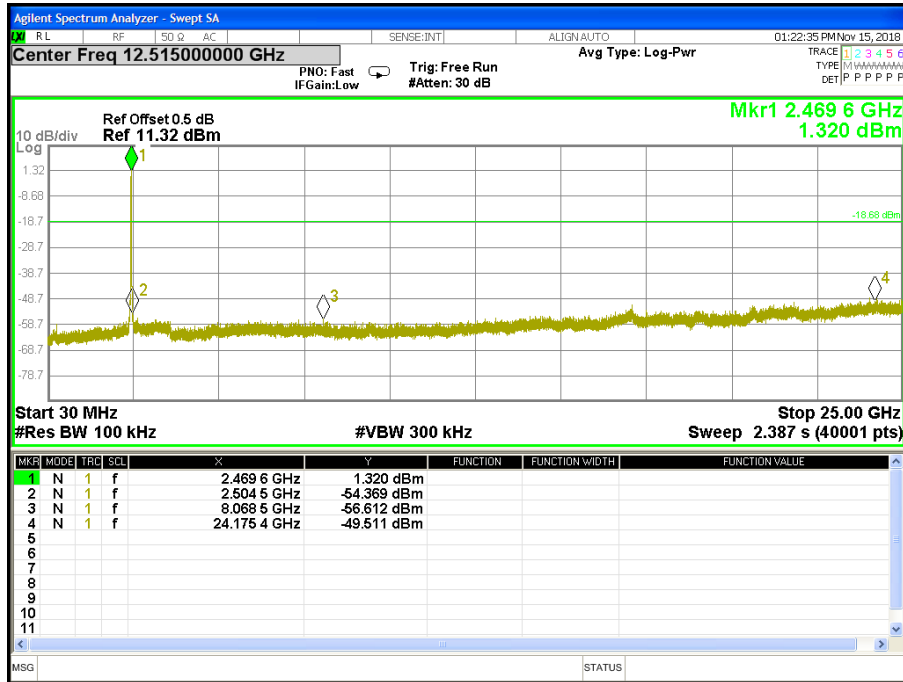


CH 06





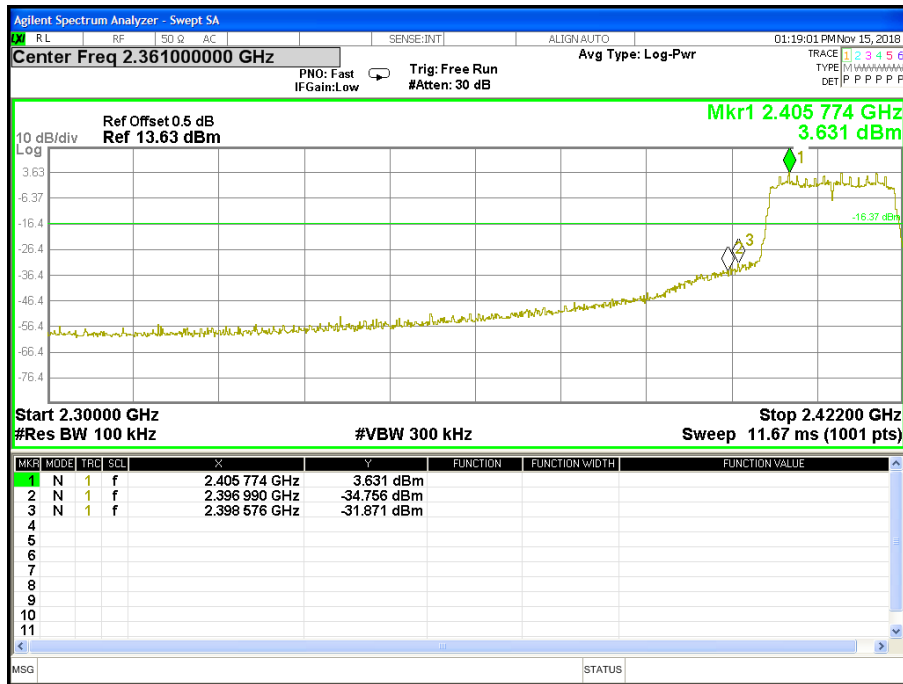
CH 11



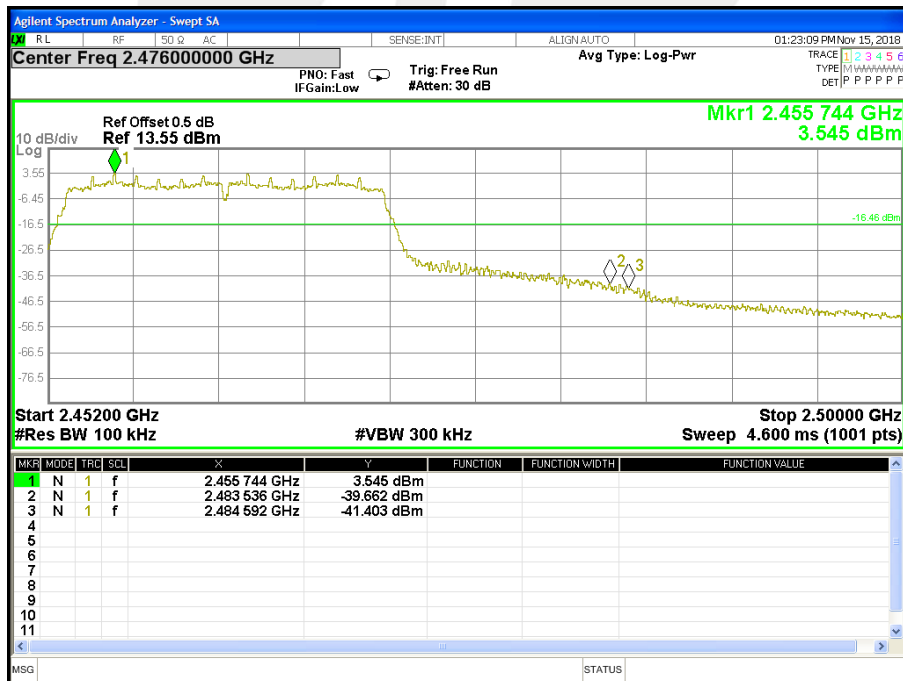


Band edge

CH 01



CH 11





5 POWER SPECTRAL DENSITY TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15.247,Subpart C RSS-247 Issue 2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e) RSS-247 Clause 5.2(b)	Power Spectral Density	≤ 8 dBm (RBW ≥ 3 KHz)	2400-2483.5	PASS

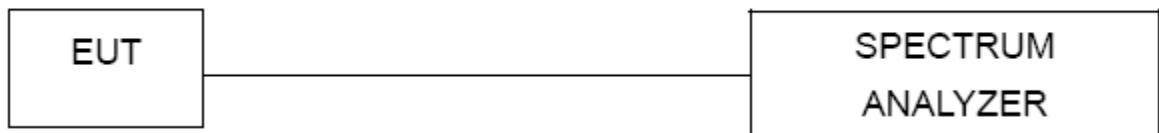
5.2 TEST PROCEDURE

- 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.

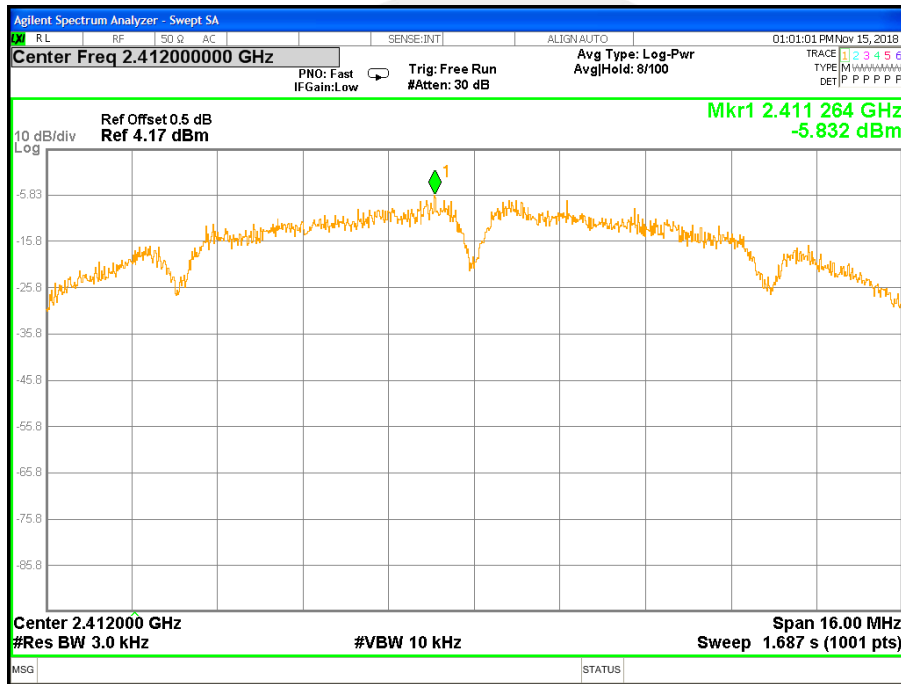


5.6 TEST RESULTS

Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX b Mode /CH01, CH06, CH11

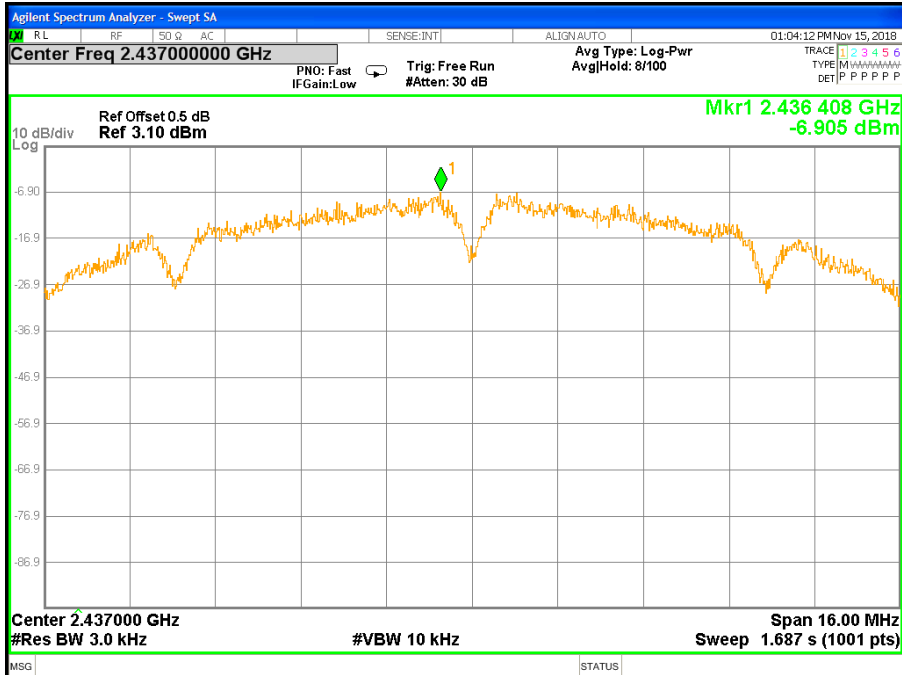
Test Mode	Frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3KHz)	Result
b mode (1 Mbps)	2412.00	-5.832	≤ 8.00	PASS
	2437.00	-6.905	≤ 8.00	PASS
	2462.00	-4.113	≤ 8.00	PASS

TX CH01

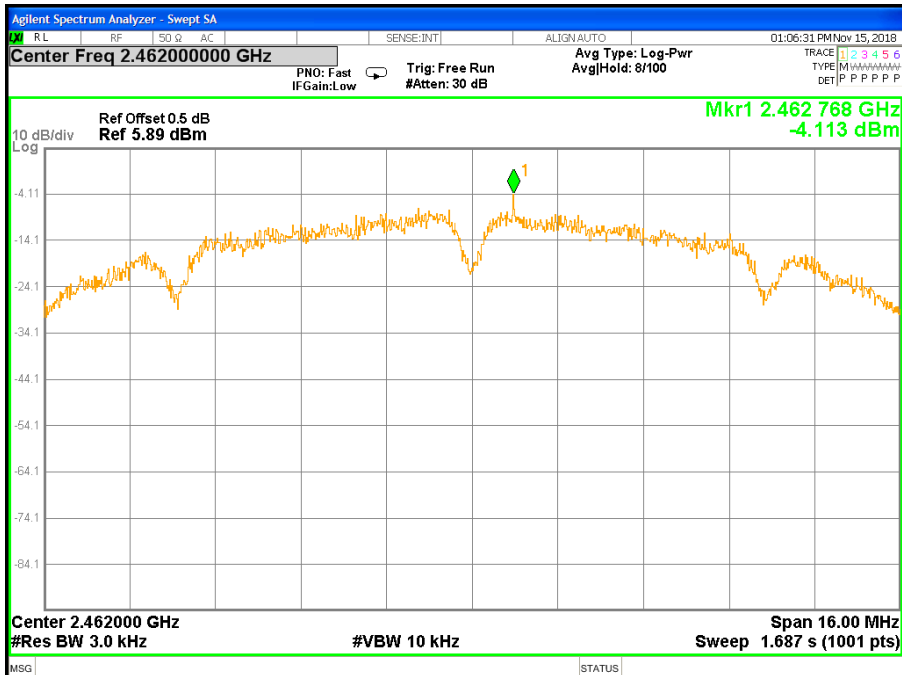




TX CH06



TX CH11

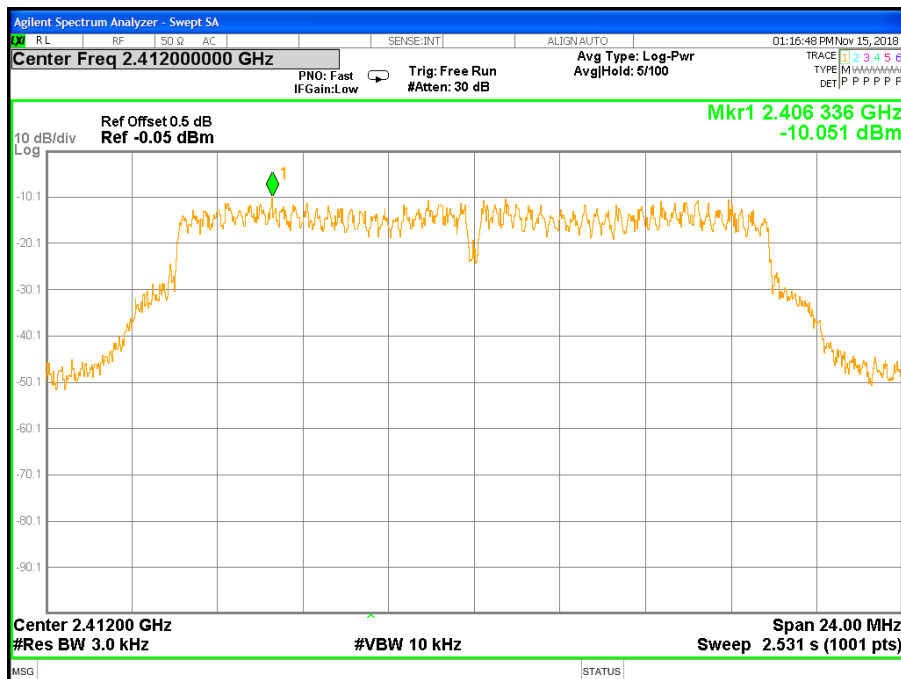




Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX g Mode /CH01, CH06, CH11

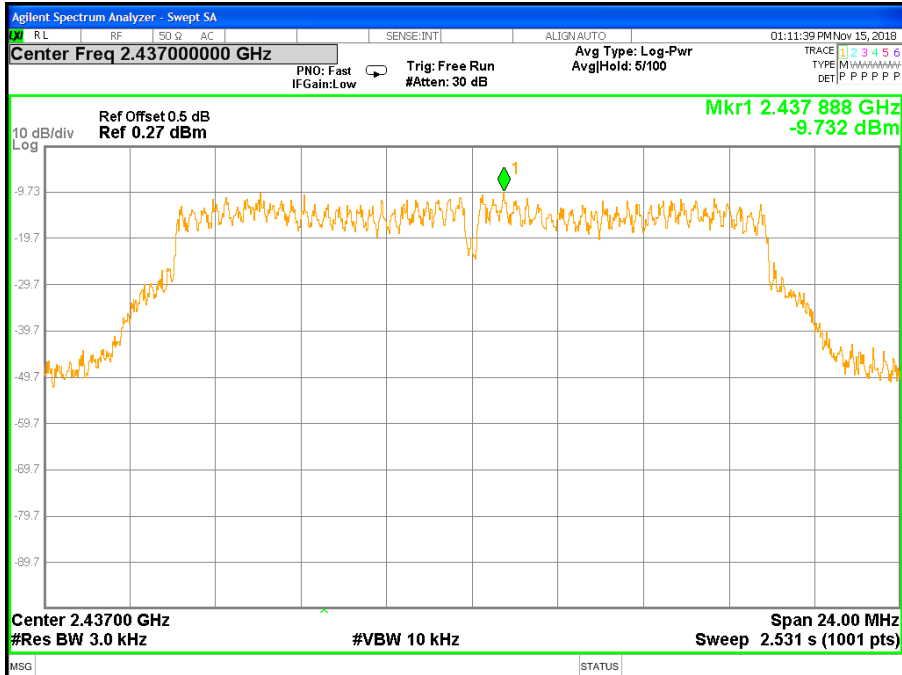
Test Mode	Frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3KHz)	Result
g mode (6 Mbps)	2412.00	-10.051	≤ 8.00	PASS
	2437.00	-9.732	≤ 8.00	PASS
	2462.00	-9.890	≤ 8.00	PASS

TX CH01

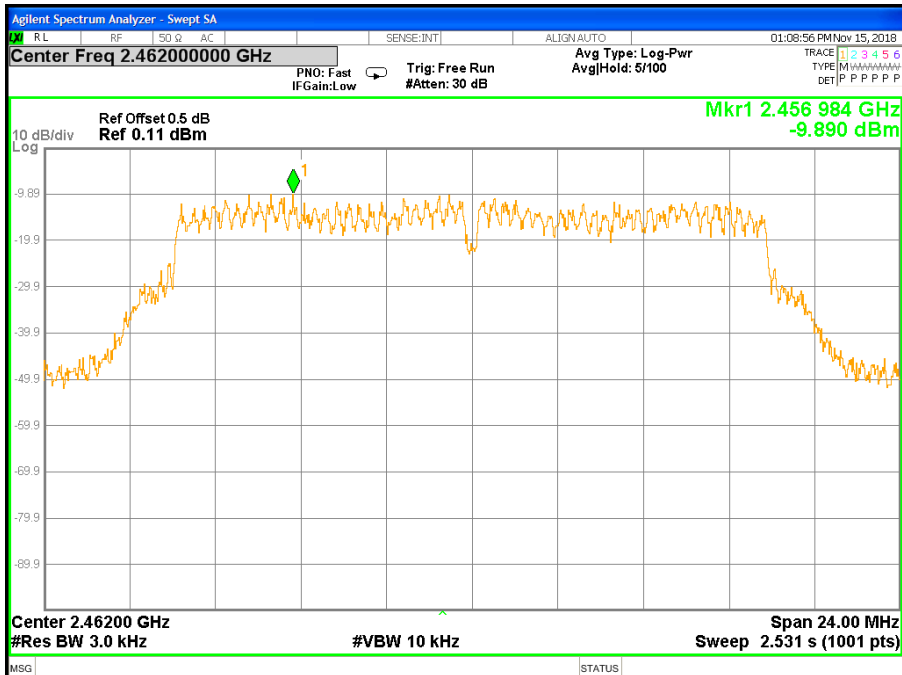




TX CH06



TX CH11

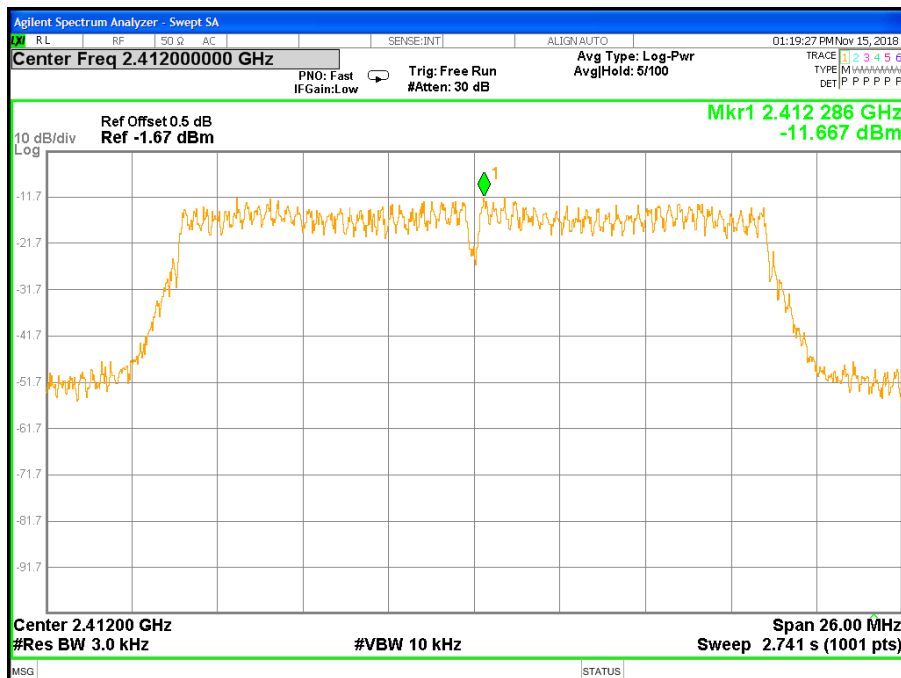




Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX n Mode(20M) /CH01, CH06, CH11

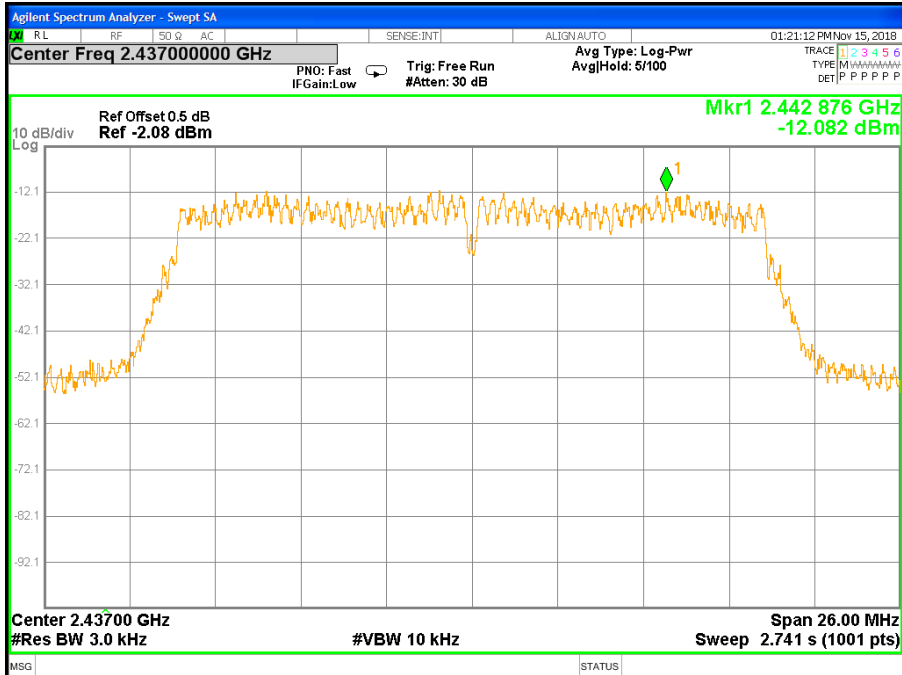
Test Mode	Frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3KHz)	Result
n(HT20) mode (MCS0)	2412.00	-11.667	≤ 8.00	PASS
	2437.00	-12.082	≤ 8.00	PASS
	2462.00	-11.345	≤ 8.00	PASS

TX CH01

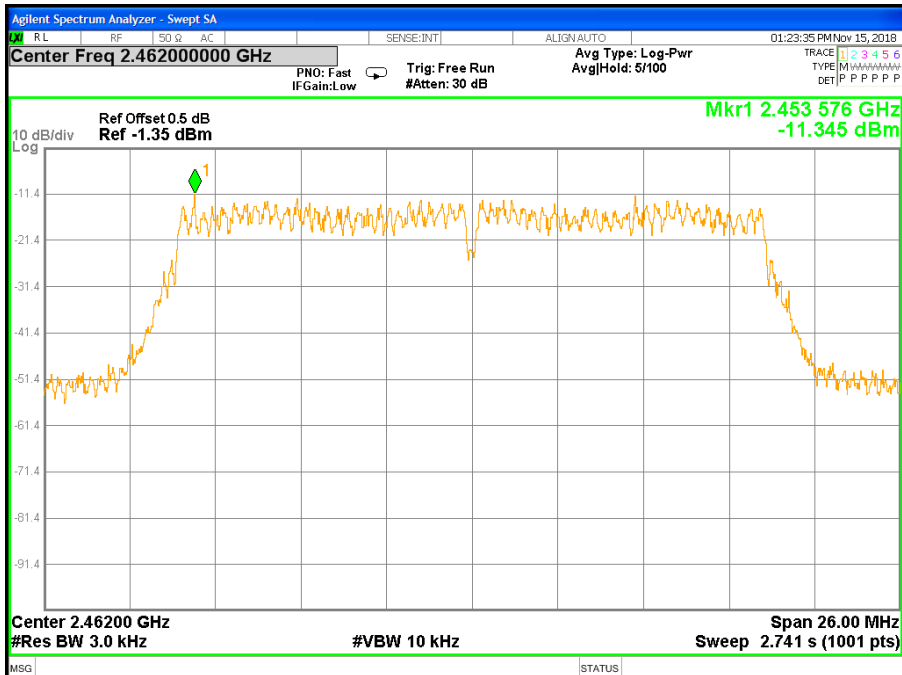




TX CH06



TX CH11





6 BANDWIDTH TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15.247,Subpart C RSS-247 Issue 2&RSS-Gen Issue 5				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2) RSS-247 Clause 5.2(b)	6dB Bandwidth	$\geq 500\text{KHz}$	2400-2483.5	PASS
RSS-Gen Clause 6.6	99%Bandwidth	-	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 \geq 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.



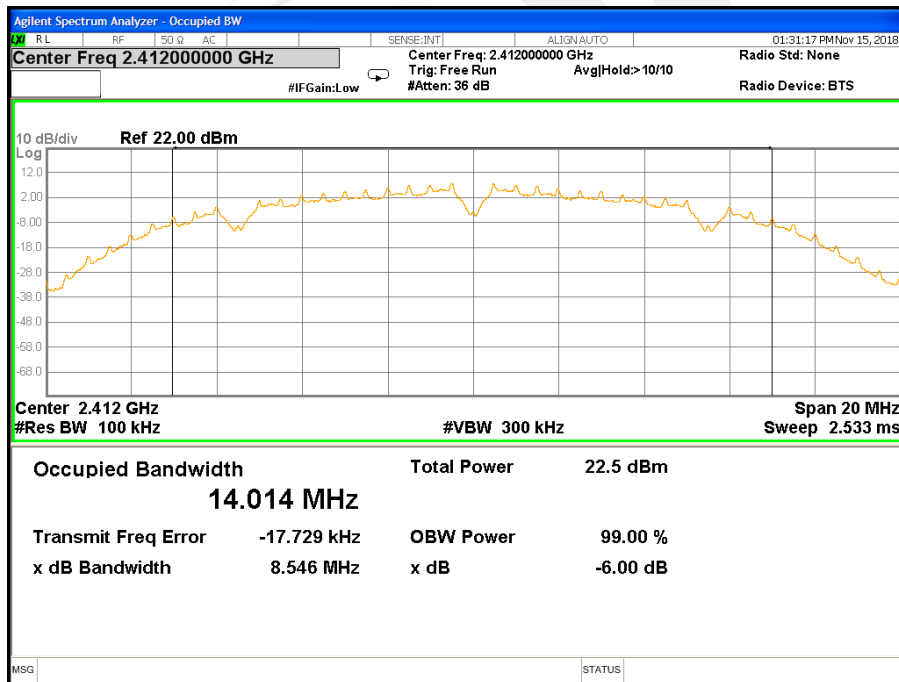
6.6 TEST RESULTS

Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX b Mode /CH01, CH06, CH11

Remark: PEAK DETECTOR IS USED

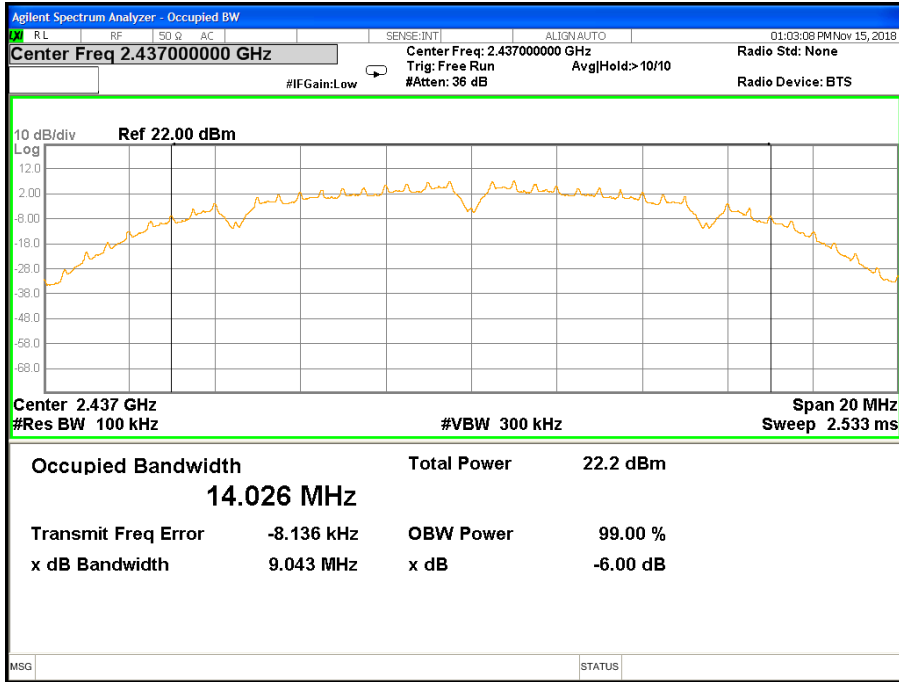
Test Mode	Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit of 6dB Bandwidth (MHz)	Result
b mode (1 Mbps)	2412.00	8.546	14.019	≥ 0.50	PASS
	2437.00	9.043	14.022	≥ 0.50	PASS
	2462.00	8.546	14.015	≥ 0.50	PASS

6dB Bandwidth TX CH 01

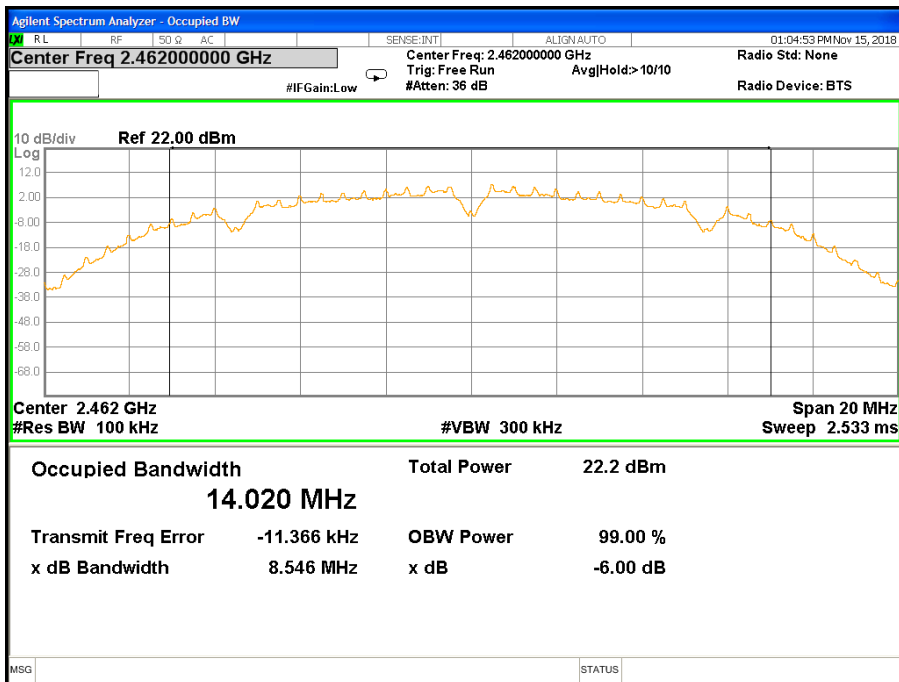




6dB BandwidthTX CH 06

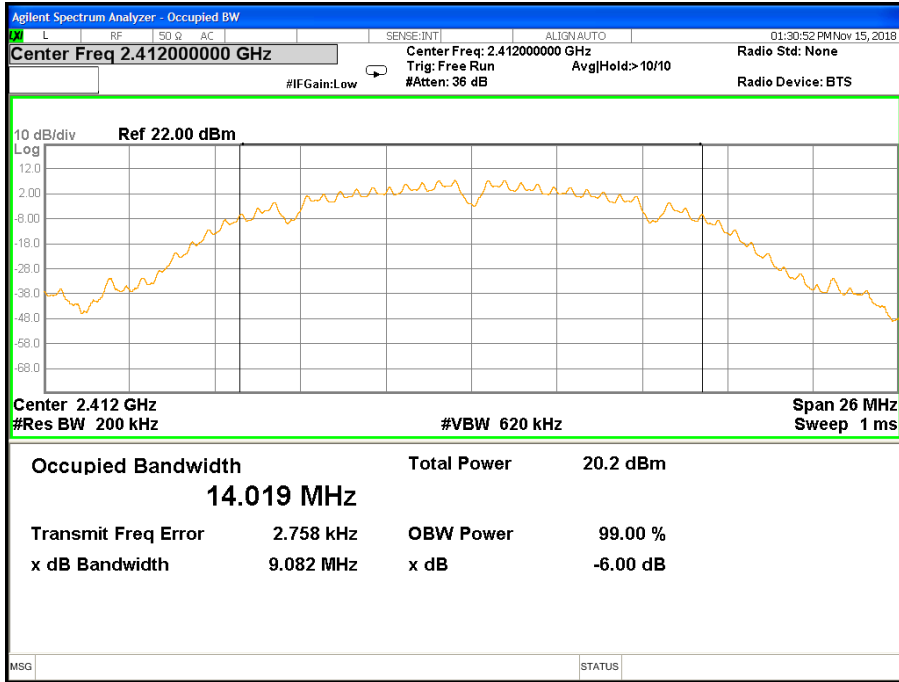


6dB BandwidthTX CH 11

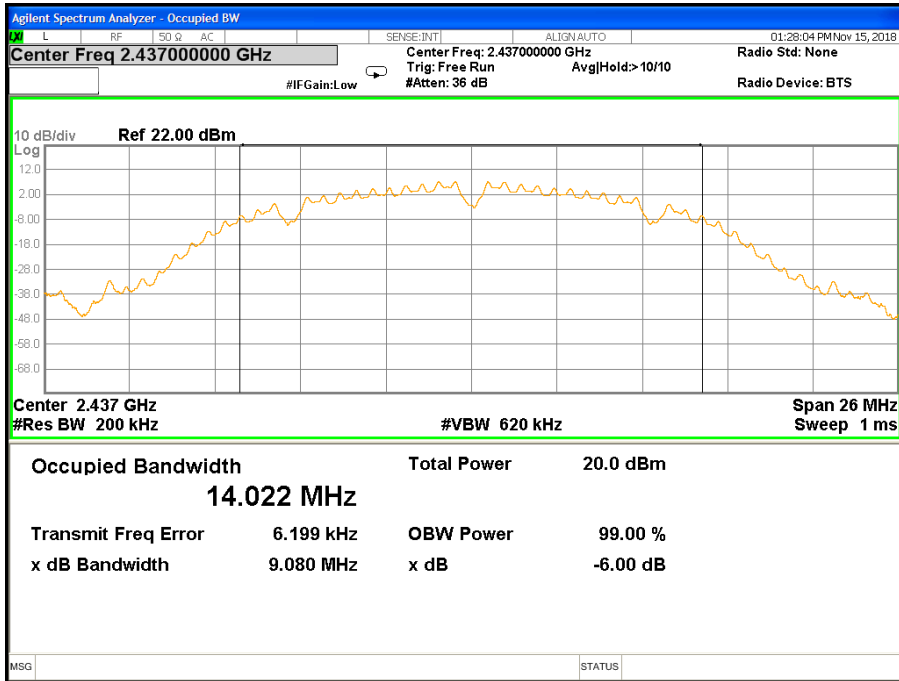




99%BandwidthTX CH 01

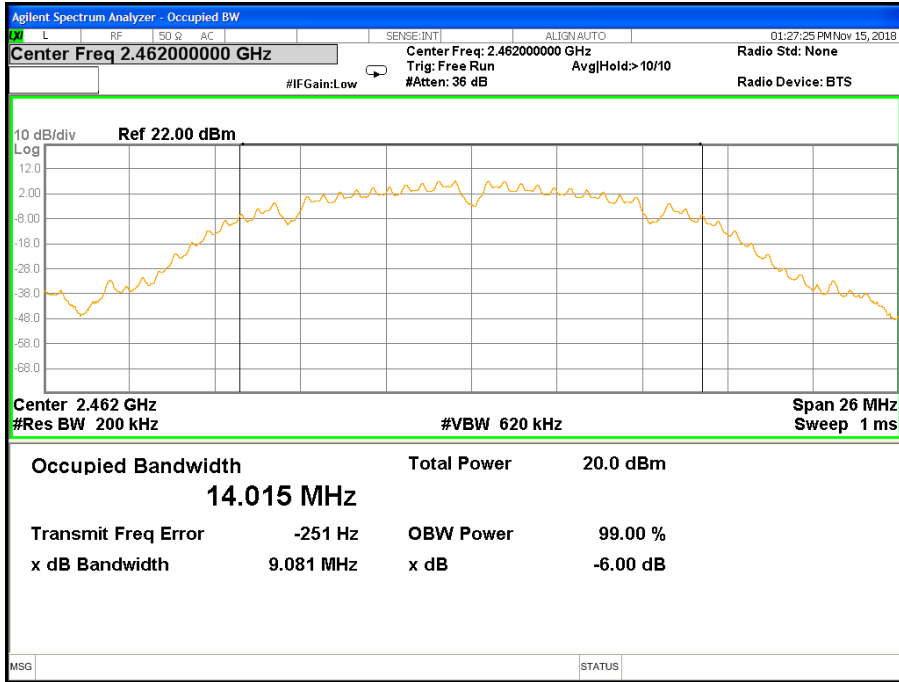


99%BandwidthTX CH 06





99%Bandwidth TX CH 11

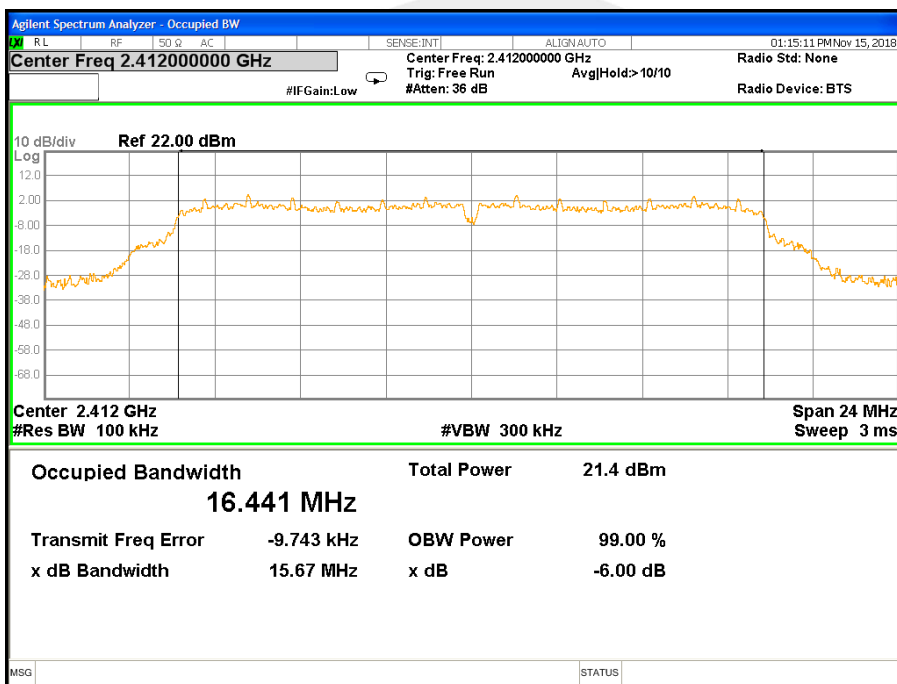




Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX g Mode /CH01, CH06, CH11

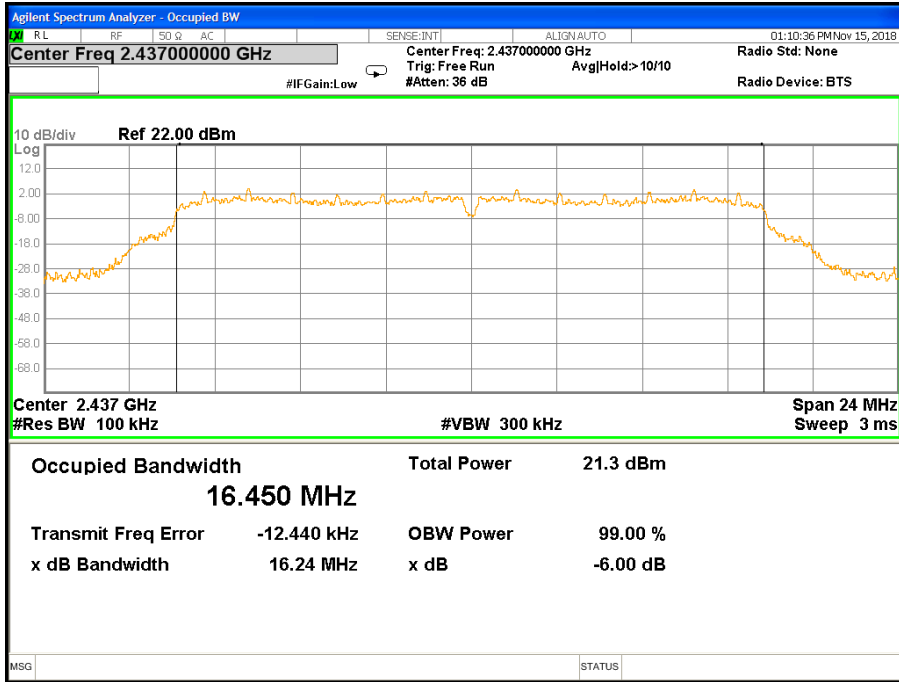
Test Mode	Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit of 6dB Bandwidth (MHz)	Result
g mode (6 Mbps)	2412.00	15.67	16.620	≥ 0.50	PASS
	2437.00	16.24	16.625	≥ 0.50	PASS
	2462.00	16.05	16.635	≥ 0.50	PASS

6dB BandwidthTX CH 01

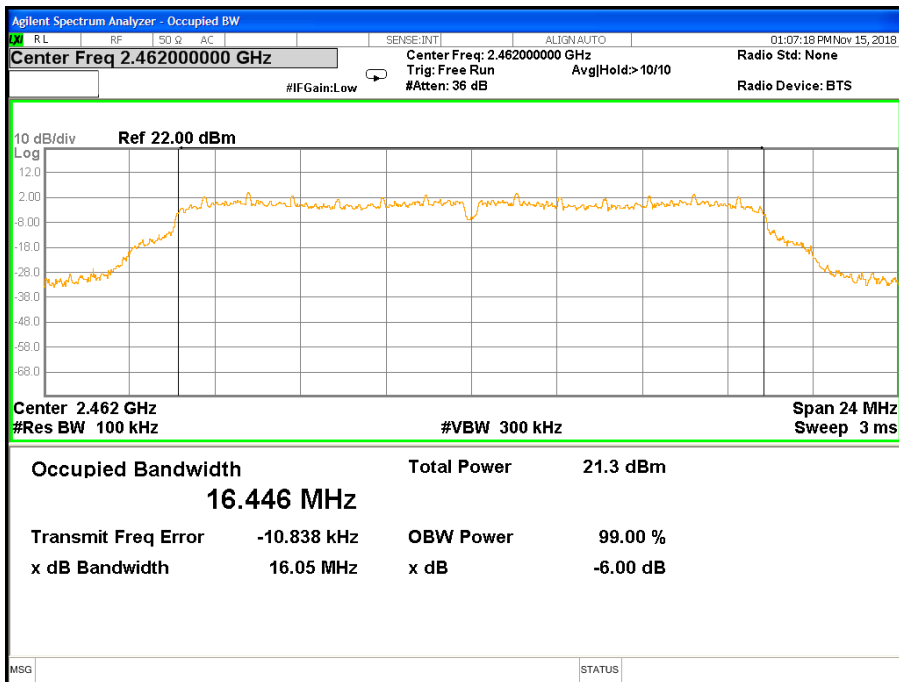




6dB BandwidthTX CH 06

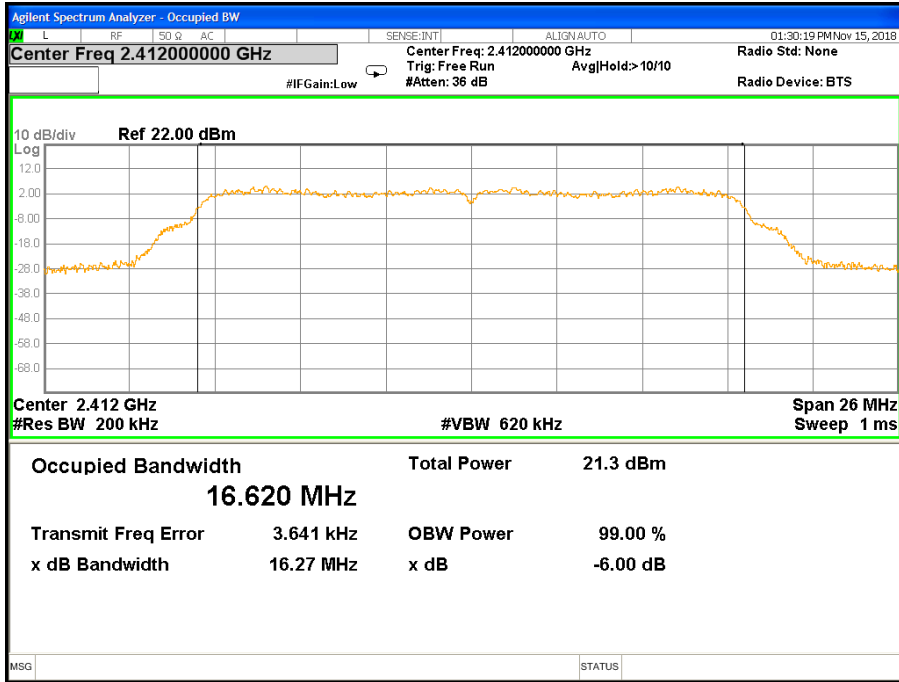


6dB BandwidthTX CH 11

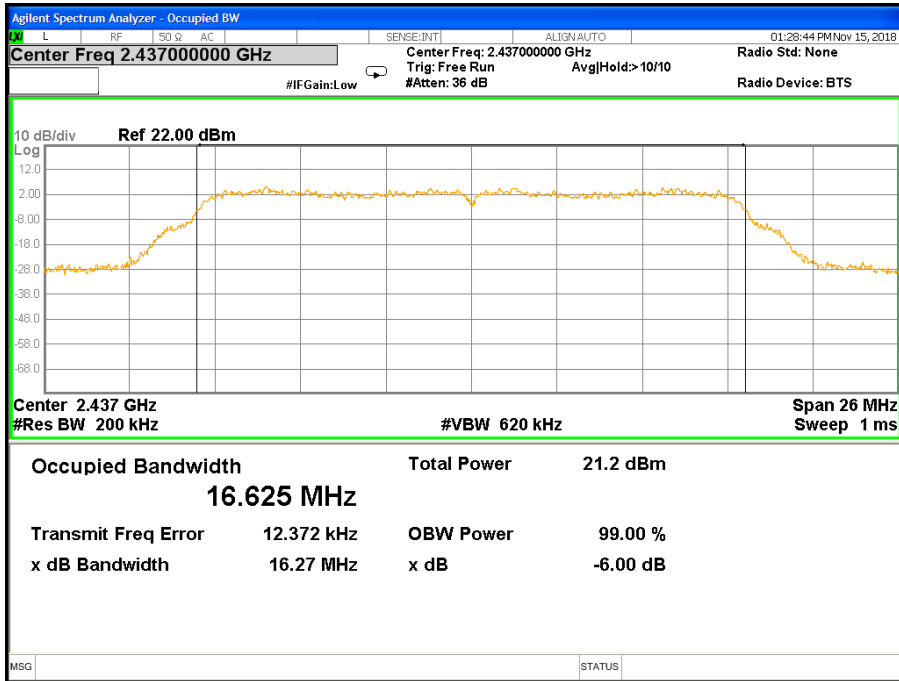




99%BandwidthTX CH 01

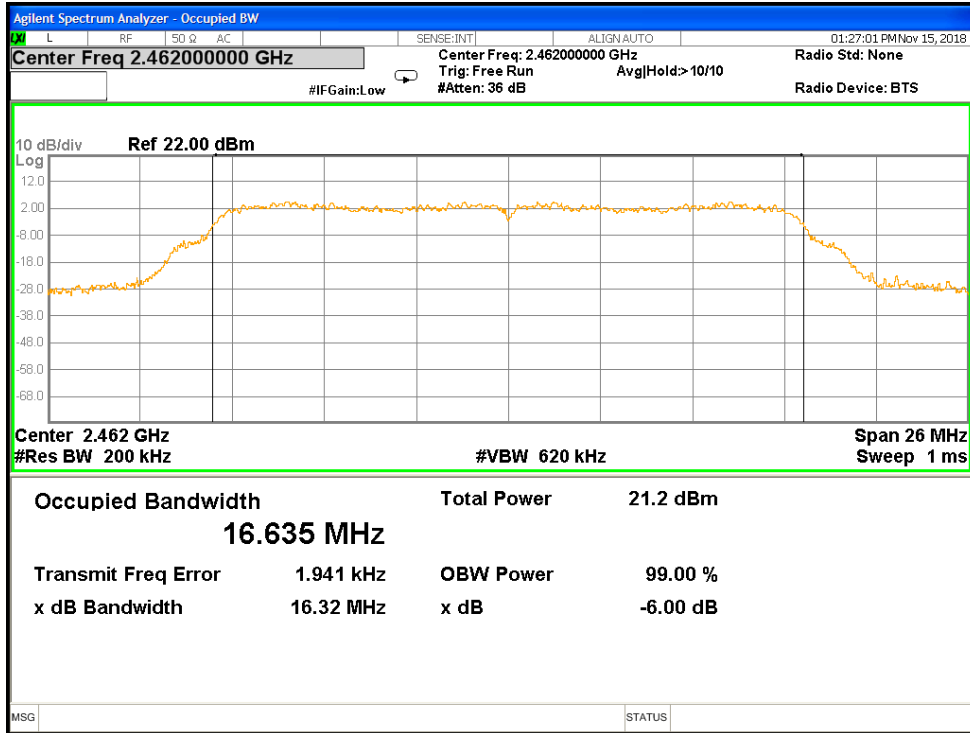


99%BandwidthTX CH 06





99%Bandwidth TX CH 11

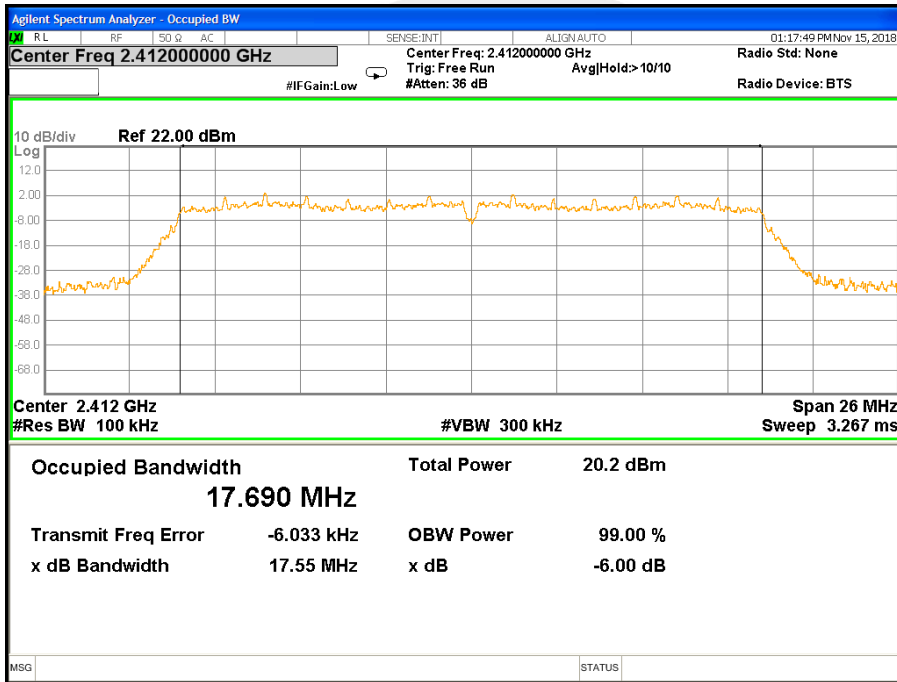




Temperature:	25°C	Relative Humidity:	60%
Test Voltage:	DC 12V	Test Mode:	TX n Mode(20M) /CH01, CH06, CH11

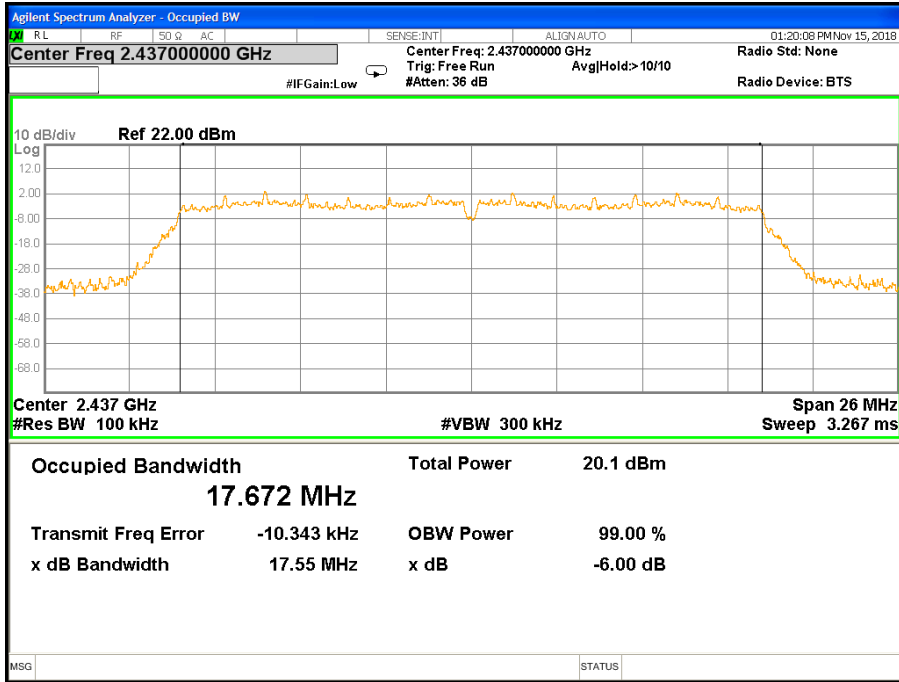
Test Mode	Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit of 6dB Bandwidth (MHz)	Result
n(HT20) mode (MCS0)	2412.00	17.55	17.821	≥ 0.50	PASS
	2437.00	17.55	17.819	≥ 0.50	PASS
	2462.00	17.51	17.845	≥ 0.50	PASS

6dB BandwidthTX CH 01

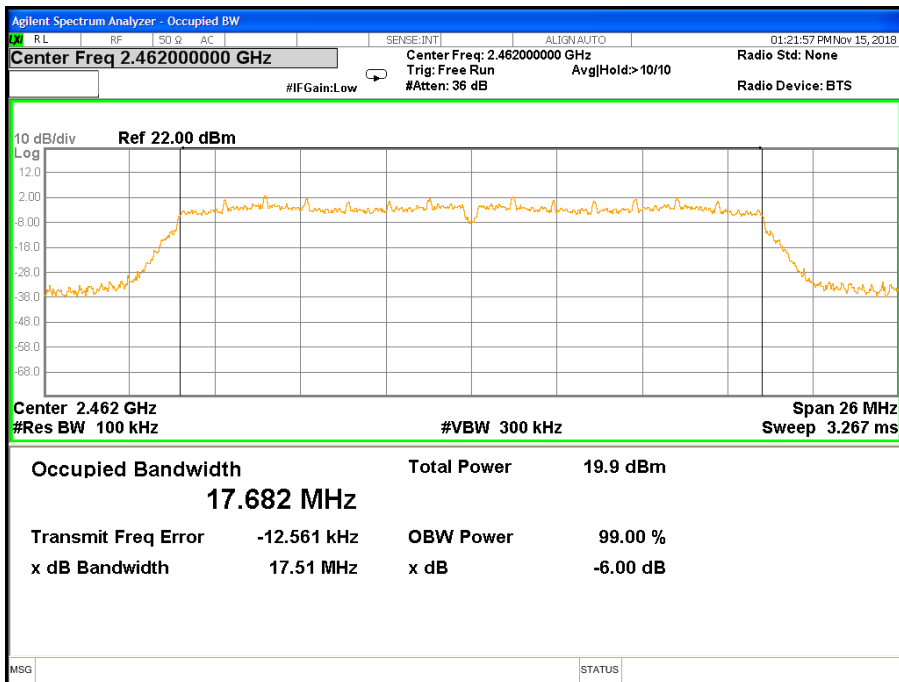




6dB BandwidthTX CH 06

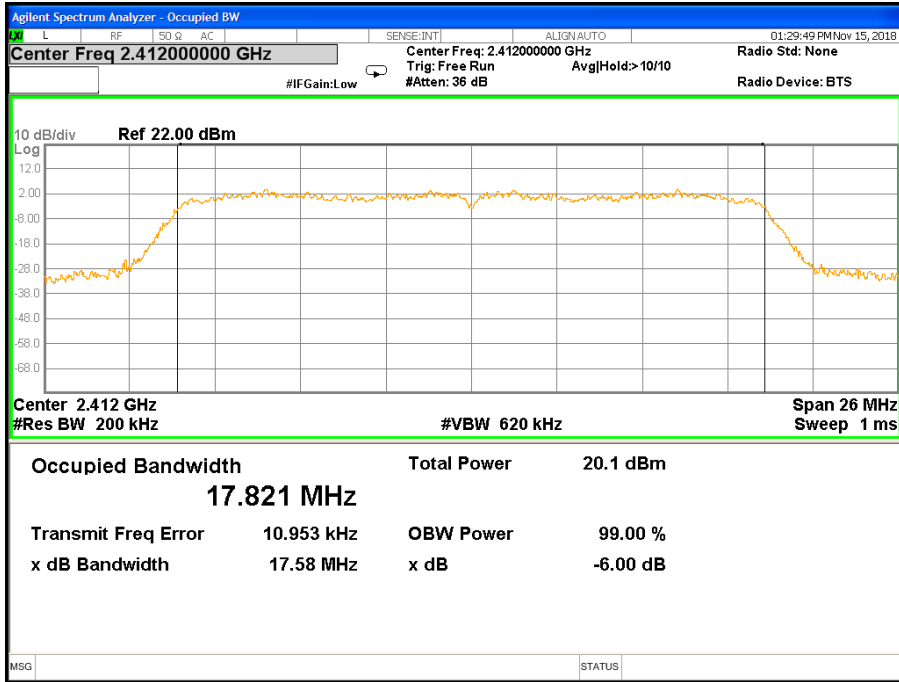


6dB BandwidthTX CH 11

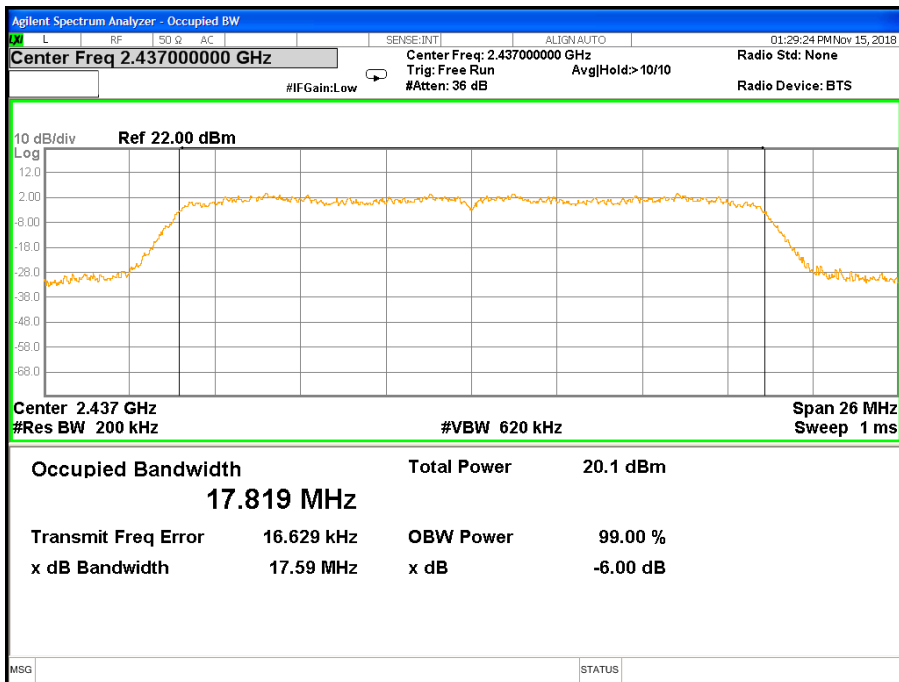




99%BandwidthTX CH 01

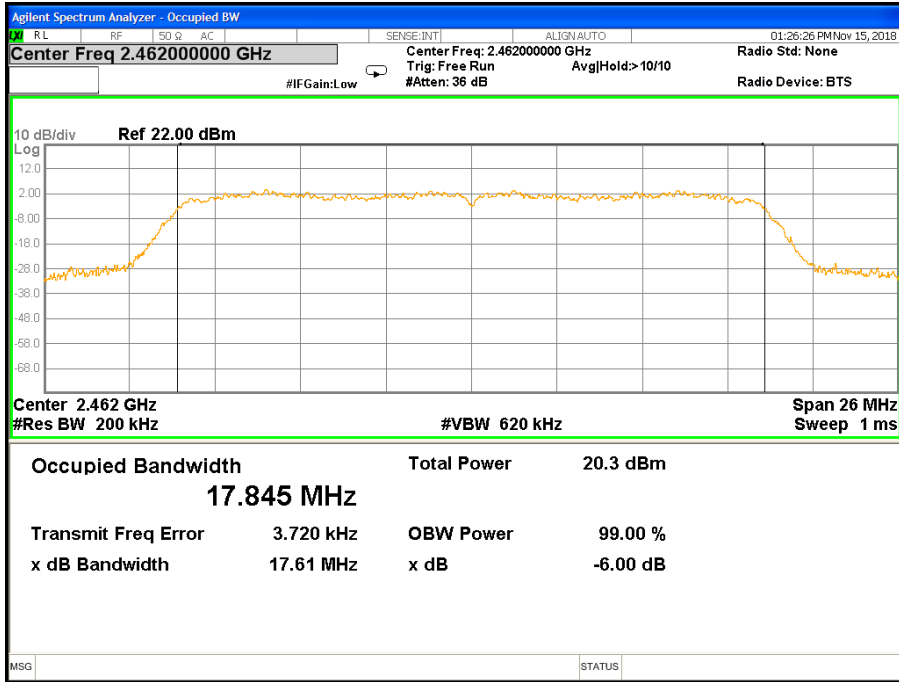


99%BandwidthTX CH 06





99%Bandwidth TX CH 11





7 PEAK OUTPUT POWER TEST

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15.247,Subpart C RSS-247 Issue 2				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3) RSS-247 Clause 5.4(d)	Output Power	1 watt or 30dBm	2400-2483.5	PASS
RSS-247 Clause 5.4(d)	e.i.r.p.	4 watt or 36.02dBm	2400-2483.5	PASS

7.2 TEST PROCEDURE

- a. The EUT was directly connected to the Power Meter

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 12V		

TX 802.11 b mode (1 Mbps)						
Test Channel	Frequency (MHz)	Conducted Output Power		Limit (dBm)	e.i.r.p. (dBm)	e.i.r.p. Limit (dBm)
		Peak(dBm)	AVG(dBm)			
CH01	2412.00	19.42	18.31	30.00	22.92	36.02
CH06	2437.00	19.23	18.14	30.00	22.73	36.02
CH11	2462.00	19.07	17.96	30.00	22.57	36.02

TX 802.11 g mode (6 Mbps)						
Test Channel	Frequency (MHz)	Conducted Output Power		Limit (dBm)	e.i.r.p. (dBm)	e.i.r.p. Limit (dBm)
		Peak(dBm)	AVG(dBm)			
CH01	2412.00	22.64	21.52	30.00	26.14	36.02
CH06	2437.00	22.34	21.26	30.00	25.84	36.02
CH11	2462.00	21.19	20.17	30.00	24.69	36.02

TX 802.11 n(HT20) mode (MCS0)						
Test Channel	Frequency (MHz)	Conducted Output Power		Limit (dBm)	e.i.r.p. (dBm)	e.i.r.p. Limit (dBm)
		Peak(dBm)	AVG(dBm)			
CH01	2412.00	21.54	19.41	30.00	25.04	36.02
CH06	2437.00	21.30	19.26	30.00	24.80	36.02
CH11	2462.00	21.04	19.02	30.00	24.54	36.02



8 ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

15.203 and RSS-Gen Issue 5 requirement: For intentional device, according to 15.203 and RSS-Gen Issue 5: 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 Eternal FPC Antenna. It complies 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 +/-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 vs. Frequency Stability Voltage(V)	Measurement Frequency(MHz)
12.77	2437.0025
11.1	2437.0016
9.44	2437.0021
Max.Deviation(MHz)	0.0025
Max.Deviation(ppm)	1.03

Rated working voltage:DC 11.1V

Temperature vs. Frequency Stability

Temperature(°C)	Measurement Frequency(MHz)
-30	2437.0036
-20	2437.0031
-10	2437.0035
0	2437.0033
10	2437.0036
20	2437.0035
30	2437.0032
40	2437.0027
50	2437.0035
Max.Deviation(MHz)	0.0036
Max.Deviation(ppm)	1.48