8 6dB&99% Bandwidth Measurement

Test Requirement	:	FCC CFR47 Part 15 Section 15.247, RSS-GEN §6.7& RSS-247 §5.2
Test Method	:	ANSI C63.10:2013
Test Limit		Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

8.1 Test Procedure

For 6dB Bandwidth Measurement

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

For 99% Bandwidth Measurement

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1%-5% OBW, VBW ≥ 3RBW

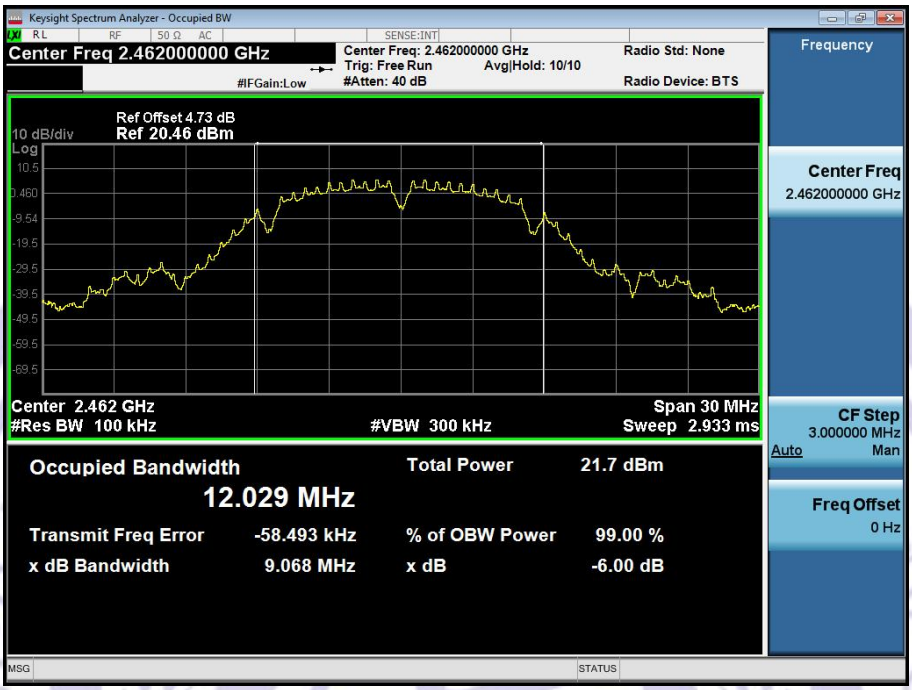
8.2 Test Result

Modulation	Frequency (MHz)	-6dB BW(MHz)	limit(kHz)	Result
802.11b	2412.00	8.14	500	Pass
802.11b	2437.00	8.60	500	Pass
802.11b	2462.00	9.07	500	Pass
802.11g	2412.00	16.03	500	Pass
802.11g	2437.00	16.09	500	Pass
802.11g	2462.00	16.33	500	Pass
802.11n(HT20)	2412.00	16.85	500	Pass
802.11n(HT20)	2437.00	16.87	500	Pass
802.11n(HT20)	2462.00	17.00	500	Pass
802.11n(HT40)	2422.00	35.79	500	Pass
802.11n(HT40)	2437.00	35.58	500	Pass
802.11n(HT40)	2452.00	35.57	500	Pass

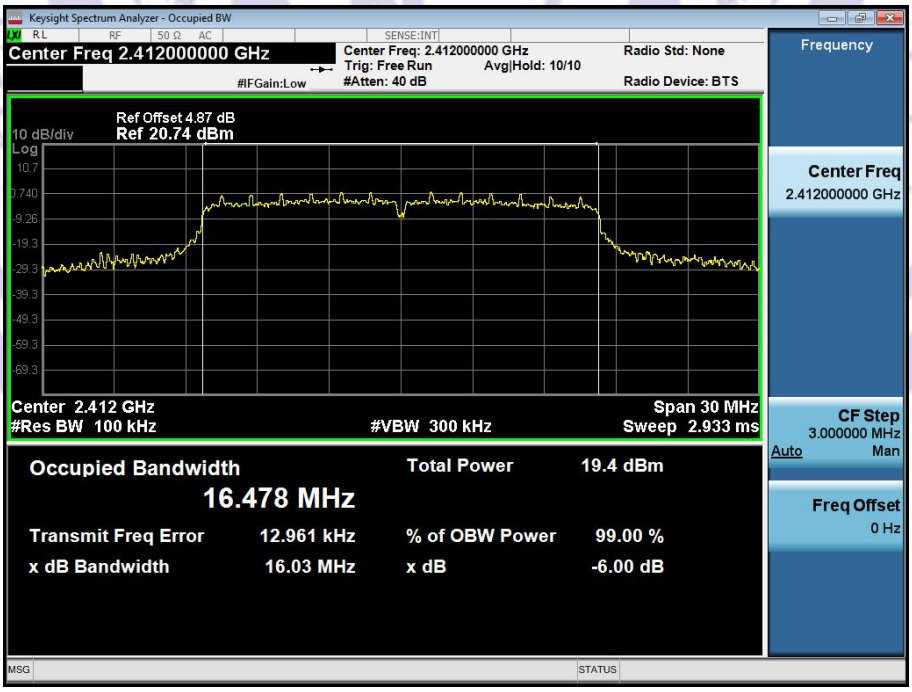
802.11b 2412MHz

802.11b 2437MHz

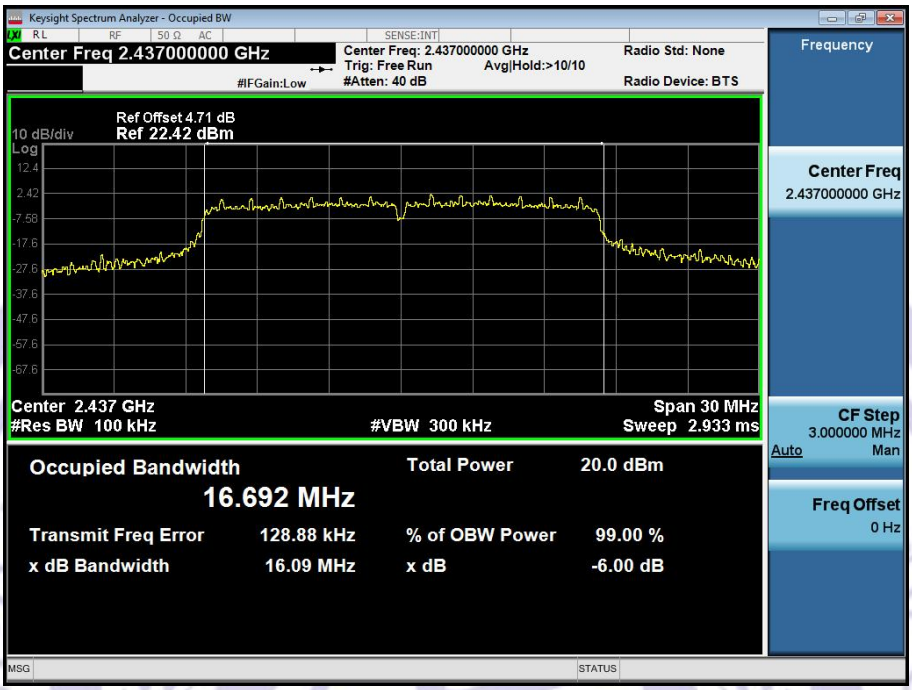
802.11b 2462MHz



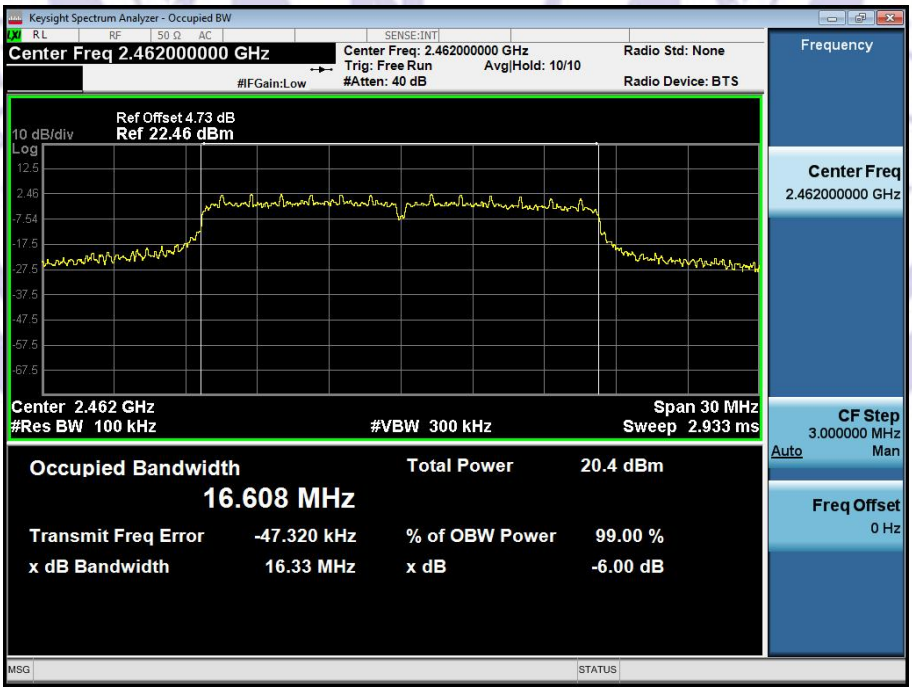
802.11g 2412MHz



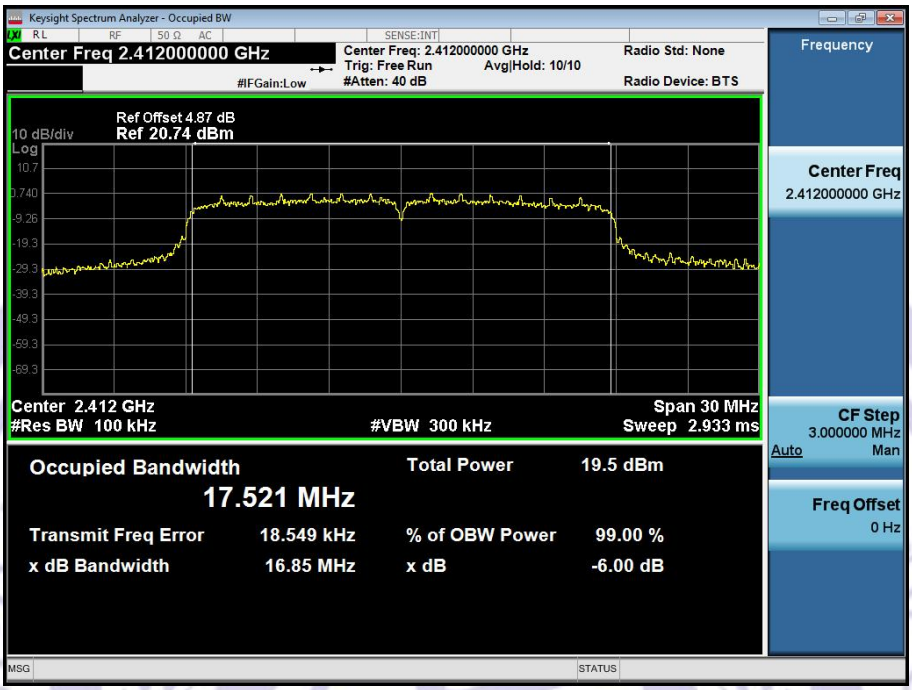
802.11g 2437MHz



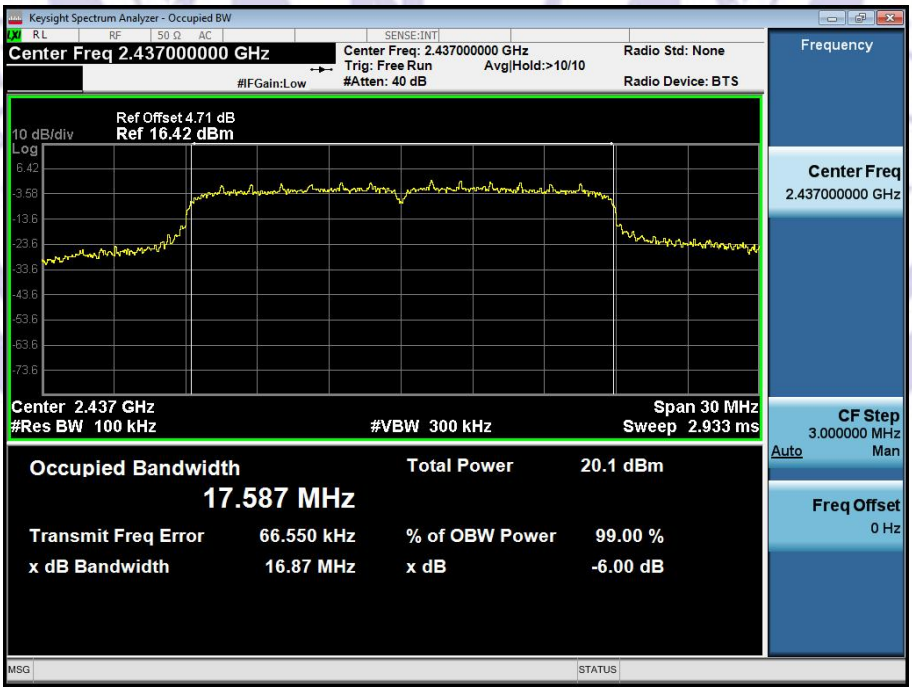
802.1g 2462MHz



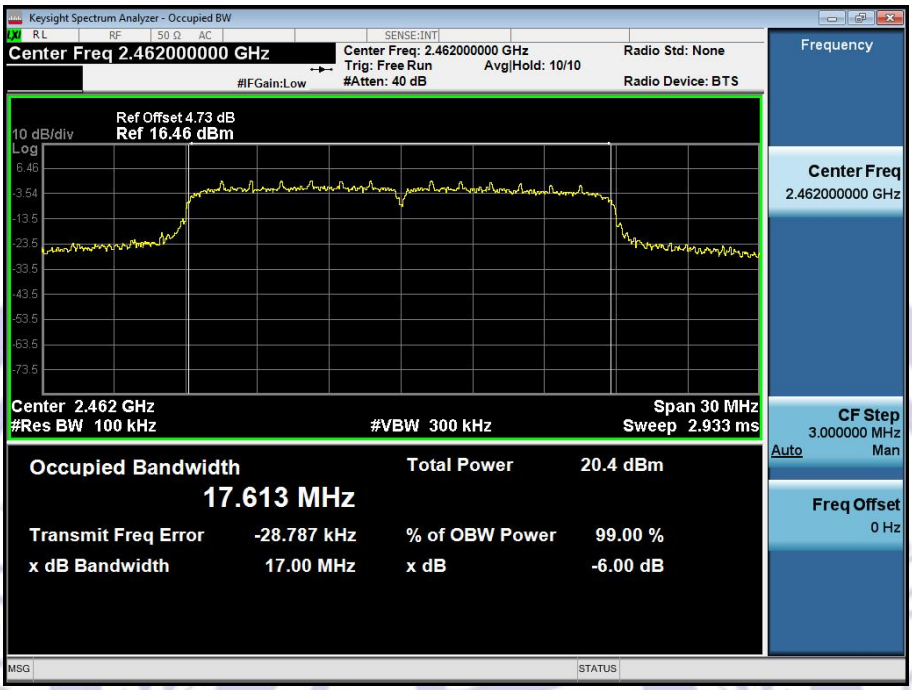
802.11n20 2412MHz



802.11n20 2437MHz

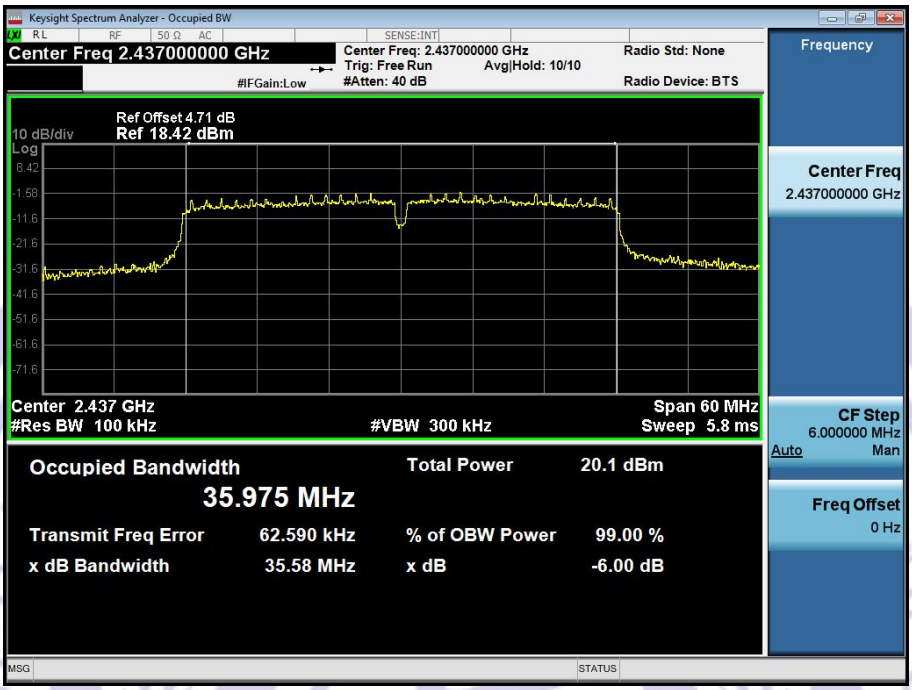


802.1n20 2462MHz

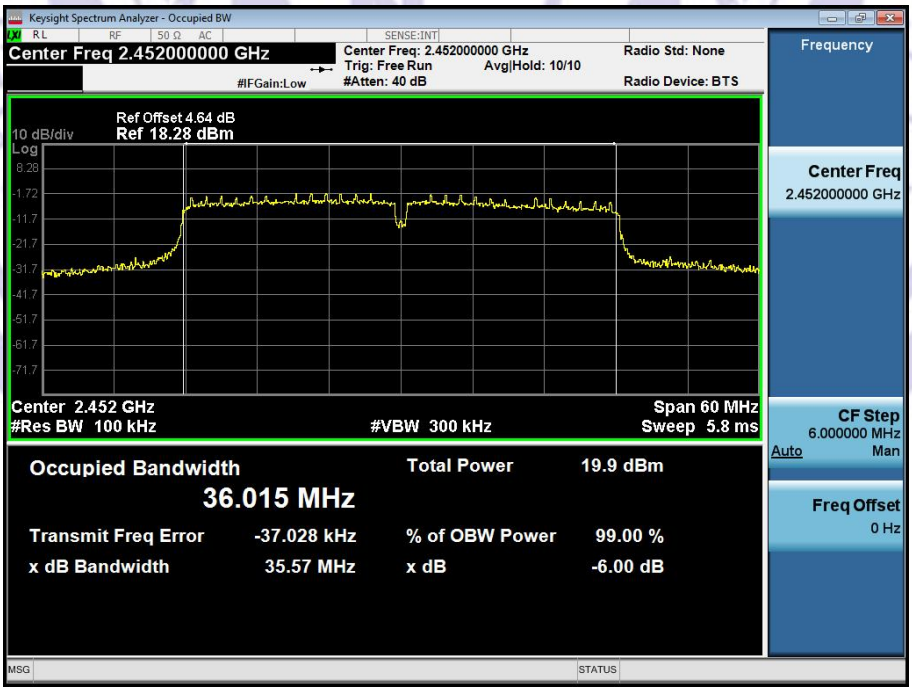


802.11n40 2422MHz

802.11n40 2437MHz



802.1n40 2452MHz



9 Maximum Peak Output Power

Test Requirement : FCC CFR47 Part 15 Section 15.247, RSS-247 § 5.4

Test Method : ANSI C63.10:2013

Test Limit : Regulation 15.247 (b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power.

RSS-247 § 5.4 (d)

For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

9.1 Test Procedure

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 utilize a fast-responding diode detector.

9.2 Test Result

Modulation	Frequency (MHz)	Conducted Power(dBm)	limit(dBm)	Result
802.11b	2412.00	17.47	30	Pass
802.11b	2437.00	17.84	30	Pass
802.11b	2462.00	18.40	30	Pass
802.11g	2412.00	16.99	30	Pass
802.11g	2437.00	16.66	30	Pass
802.11g	2462.00	17.08	30	Pass
802.11n(HT20)	2412.00	15.82	30	Pass
802.11n(HT20)	2437.00	15.35	30	Pass
802.11n(HT20)	2462.00	16.68	30	Pass
802.11n(HT40)	2422.00	14.61	30	Pass
802.11n(HT40)	2437.00	14.92	30	Pass
802.11n(HT40)	2452.00	15.91	30	Pass

Remark: duty cycle is100%

10 Power Spectral density

Test Requirement : FCC CFR47 Part 15 Section 15.247, RSS-247 §5.2

Test Method : ANSI C63.10:2013

Test Limit : Regulation 15.247(f) The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

10.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz, Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

10.2 Test Result

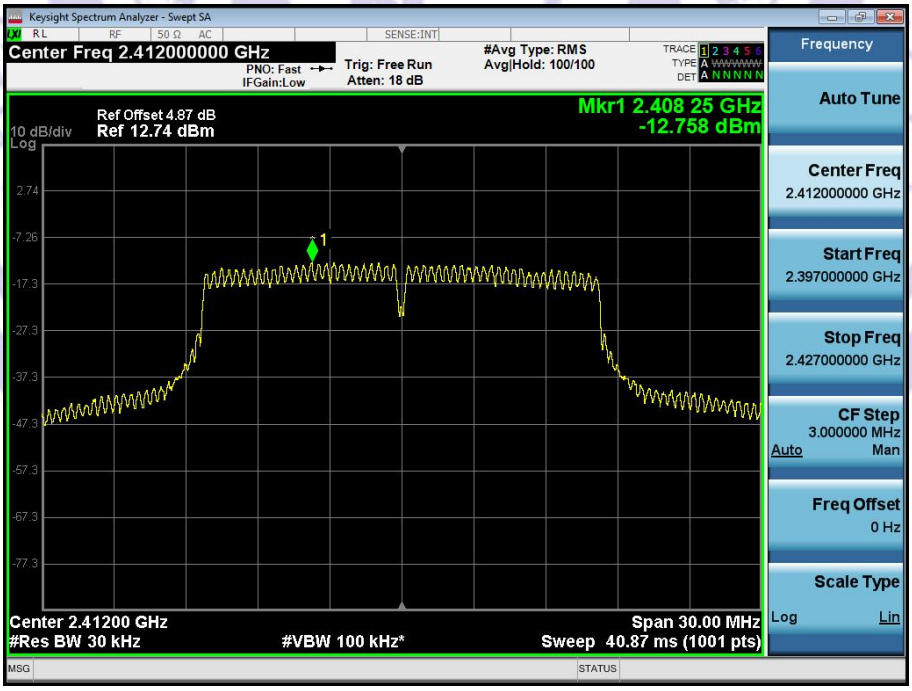
Modulation	Frequency (MHz)	PSD(dBm/30kHz)	PSD(dBm/3kHz)	limit(dBm/3kHz)	Result
802.11b	2412.00	-8.83	-18.83	8	Pass
802.11b	2437.00	-8.41	-18.41	8	Pass
802.11b	2462.00	-7.73	-17.73	8	Pass
802.11g	2412.00	-12.76	-22.64	8	Pass
802.11g	2437.00	-11.88	-21.88	8	Pass
802.11g	2462.00	-11.61	-21.49	8	Pass
802.11n(HT20)	2412.00	-13.46	-23.32	8	Pass
802.11n(HT20)	2437.00	-13.11	-22.97	8	Pass
802.11n(HT20)	2462.00	-12.81	-22.67	8	Pass
802.11n(HT40)	2422.00	-15.75	-25.61	8	Pass
802.11n(HT40)	2437.00	-16.05	-25.91	8	Pass
802.11n(HT40)	2452.00	-16.14	-25.86	8	Pass

802.11b 2412MHz

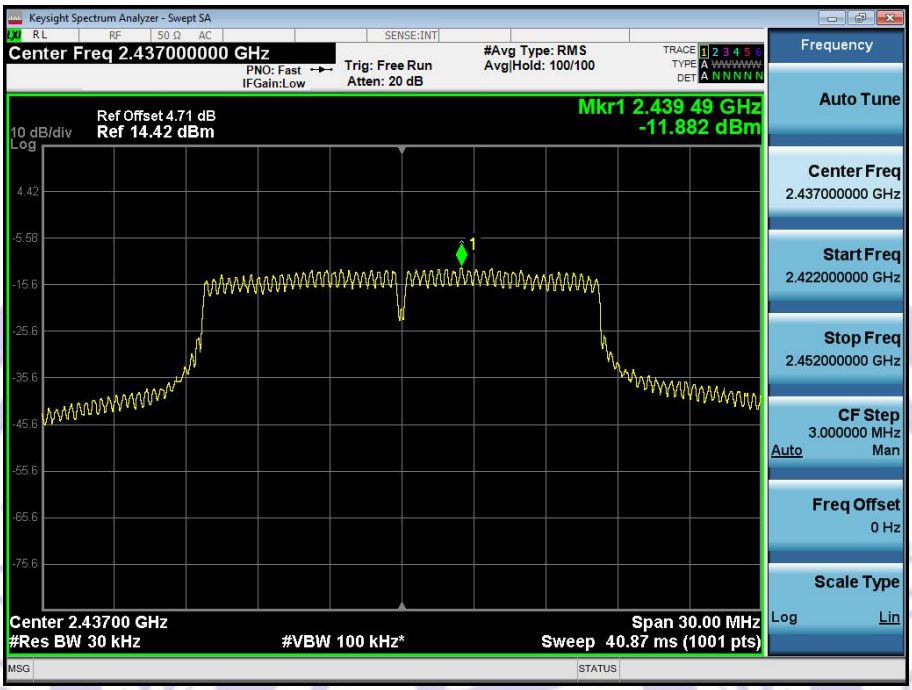
802.11b 2437MHz

802.11b 2462MHz

802.11g 2412MHz



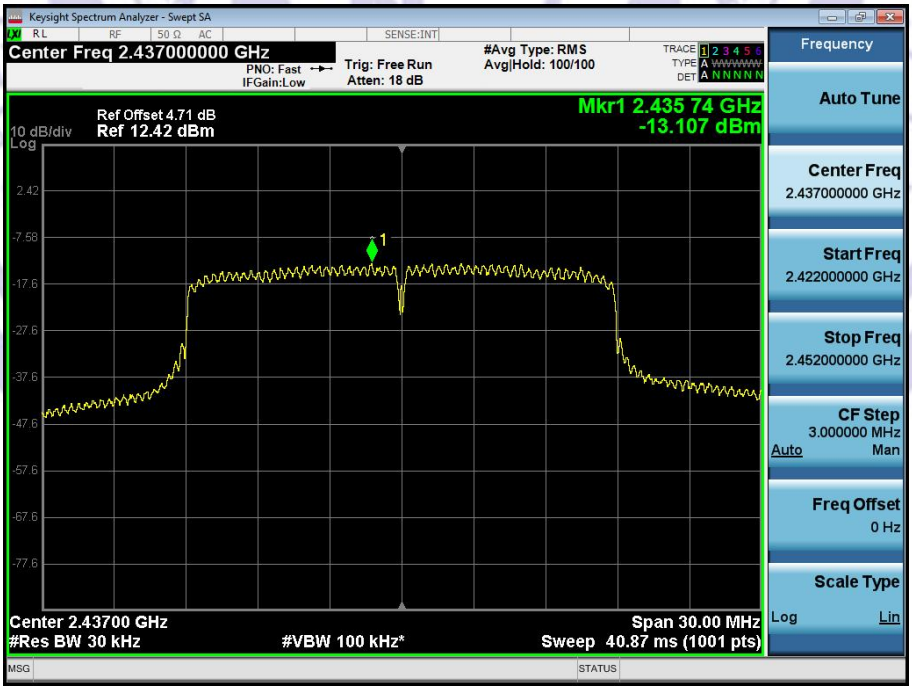
802.11g 2437MHz



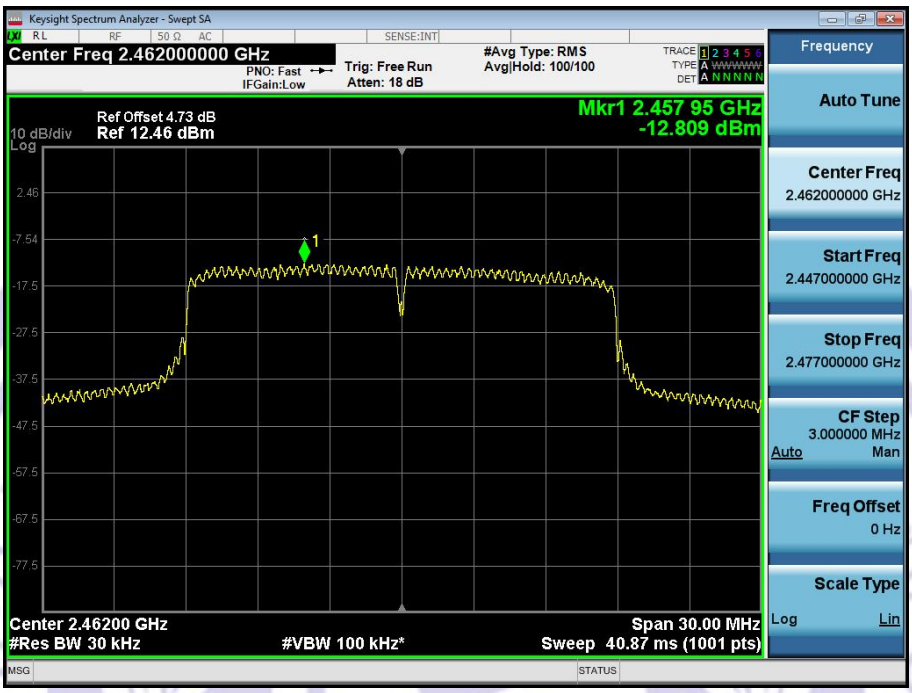
802.11g 2462MHz

802.11n20 2412MHz

802.11n20 2437MHz

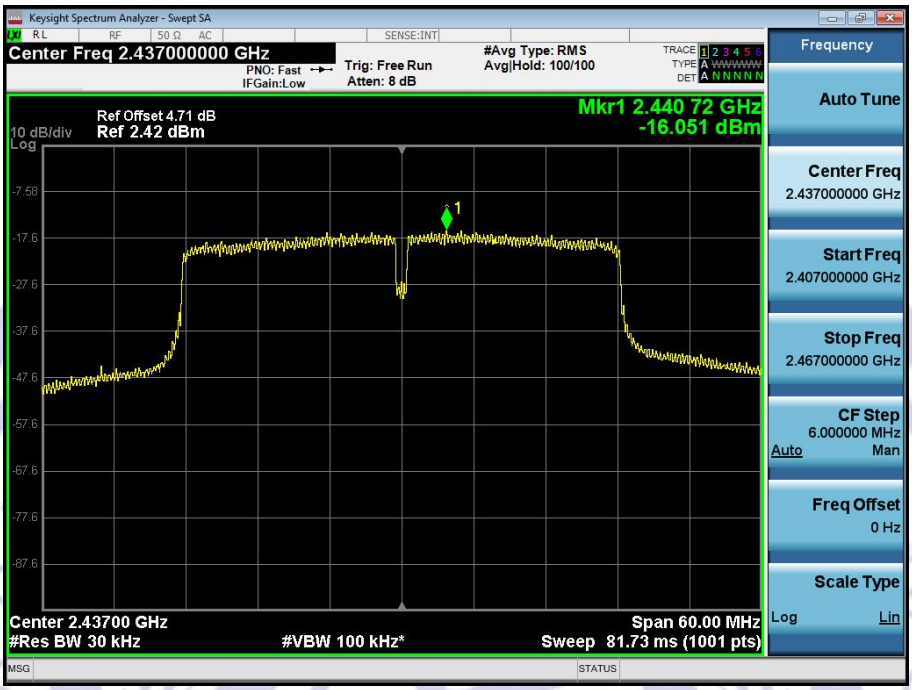


802.11n20 2462MHz



802.11n40 2422MHz

802.11n40 2437MHz



802.11n40 2452MHz

11 Antenna Application

11.1 Antenna Requirement

For intentional device, according to FCC 47 CFR Section 15.203, 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

According to RSS-GEN section 6.8

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

11.2 Result

The antenna is FPCB antenna, the Max gain of the antennas is 1.59 dBi, reference to the attachment for details.

12 Test Setup and EUT Photos

Reference to the attachment for details.

******THE END REPORT******