

9 6dB&99% Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.247

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.

9.1 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 = 100kHz, VBW = 300kHz

9.2 Test Result

Test CH	-6dB Occupy Bandwidth (MHz)					Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)	Limit(KHz)	
Lowest	8.141	16.03	16.85	35.79	>500	Pass
Middle	8.596	16.09	16.87	35.58		
Highest	9.068	16.33	17.00	35.57		

-6dB Occupy Bandwidth
802.11b Low Channel



802.11b Middle Channel



802.11b High Channel



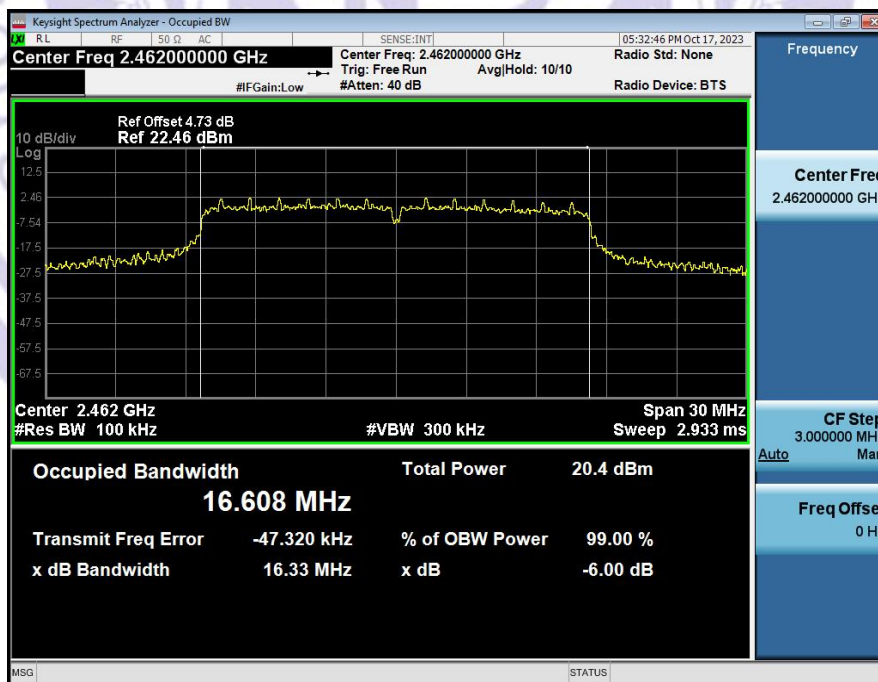
802.11g Low Channel



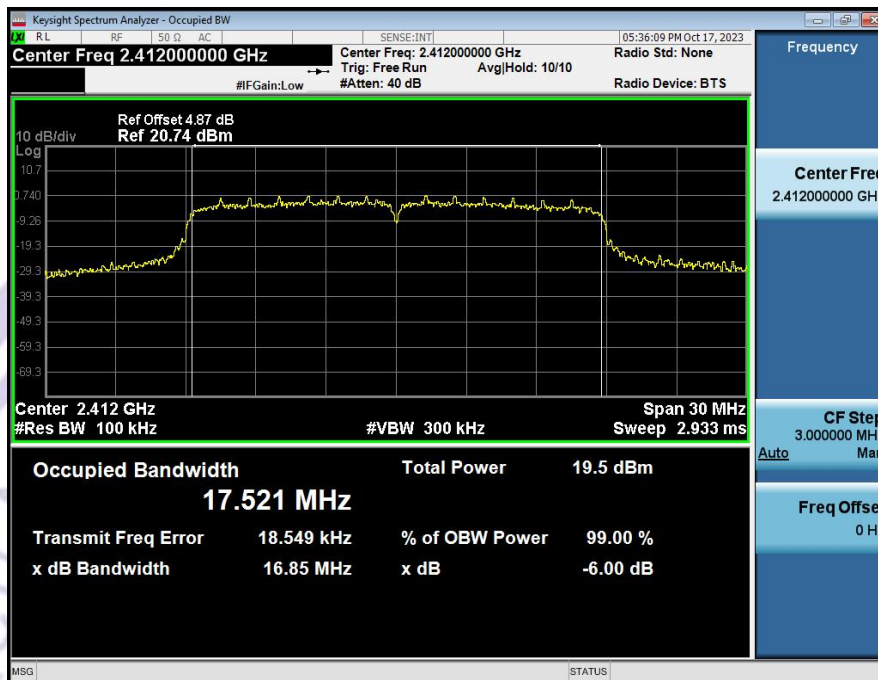
802.11g Middle Channel



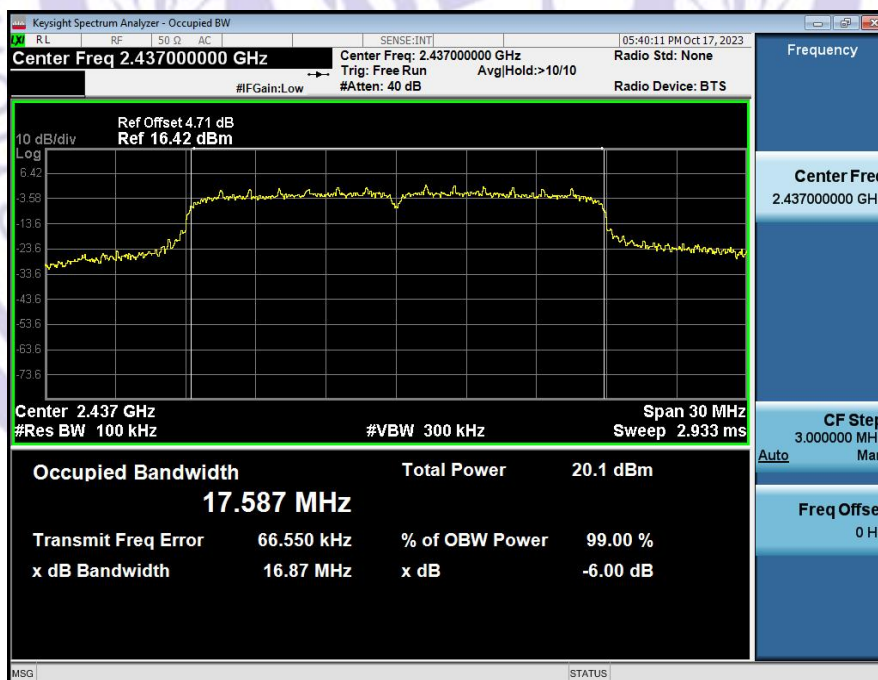
802.11g High Channel



802.11n20 Low Channel



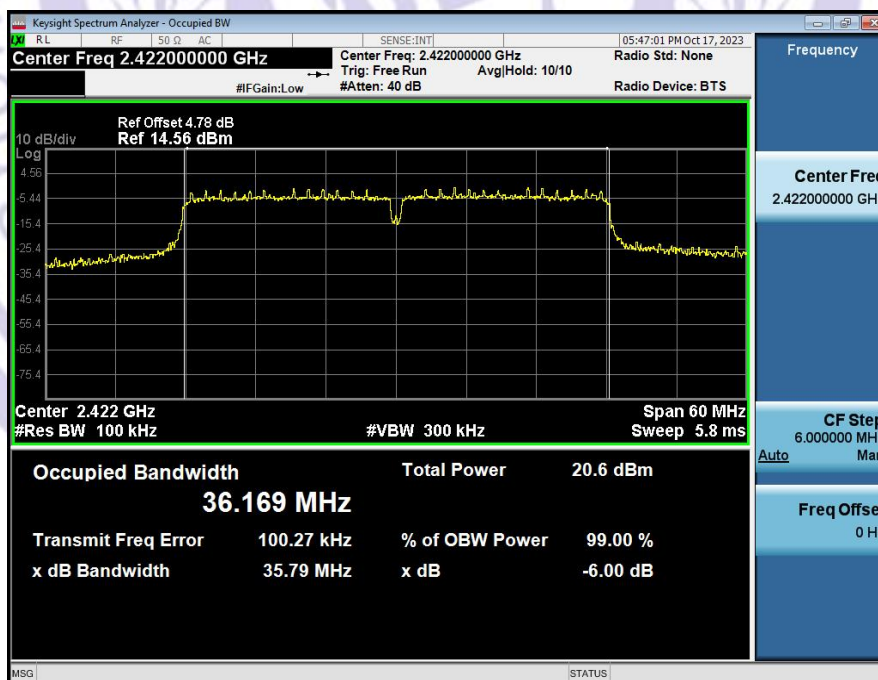
802.11n20 Middle Channel



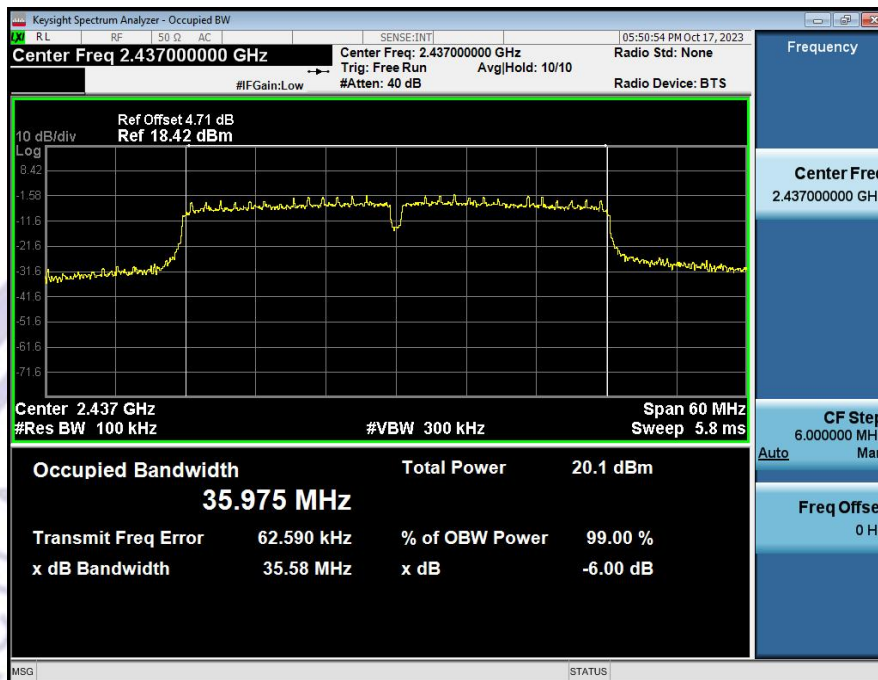
802.11n20 High Channel



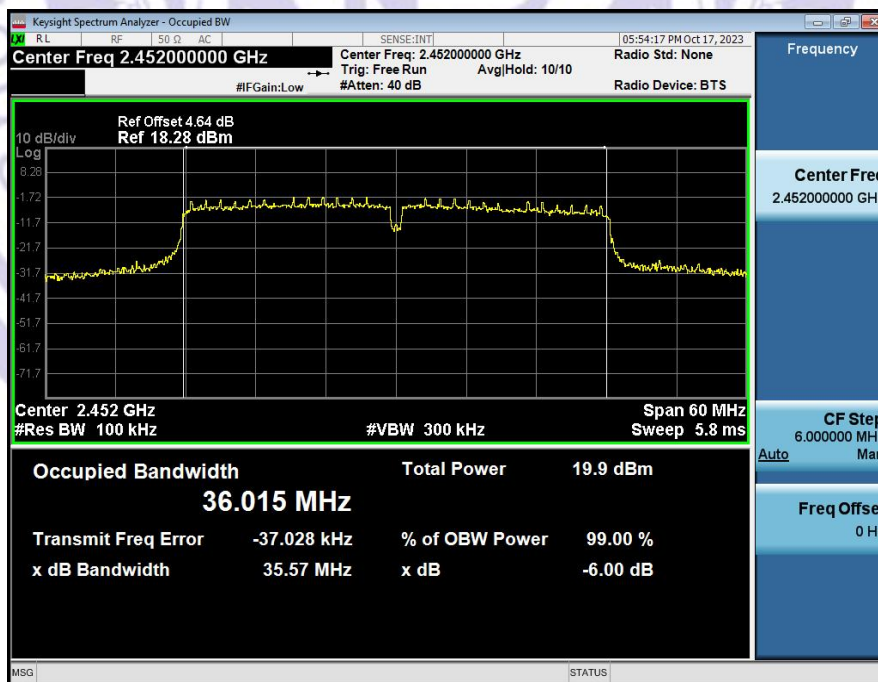
802.11n40 Low Channel



802.11n40 Middle Channel



802.11n40 High Channel



10 Maximum Peak Output Power

Test Requirement : FCC CFR47 Part 15 Section 15.247

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.

10.1 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.

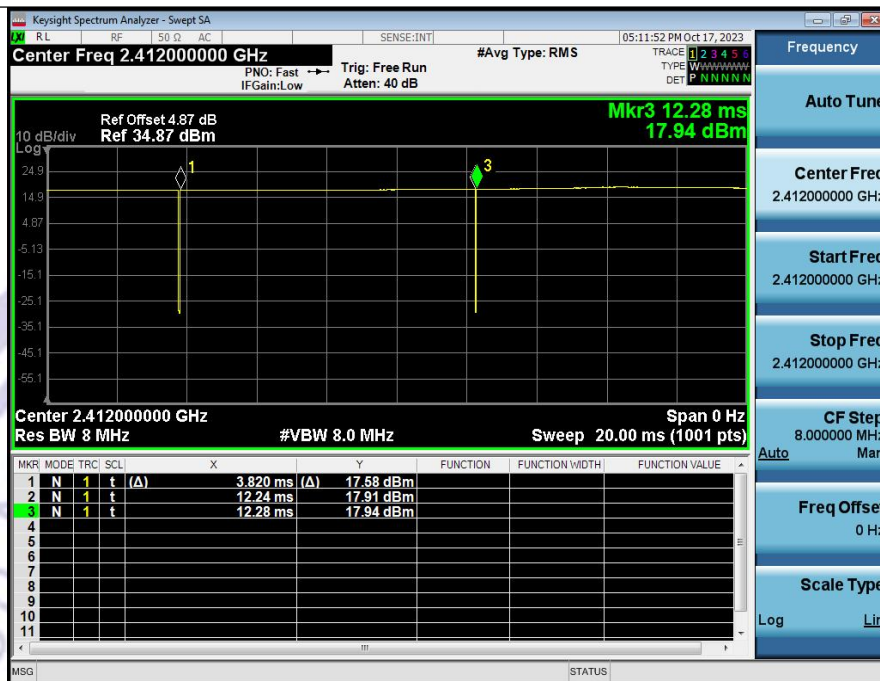
10.2 Test Result

Modulation	Frequency (MHz)	Peak Output Power (dBm)	Duty cycle(%)	Duty factor(dB)	Maximum Peak Output Power (dBm)	Limit
802.11b	2412.00	17.47	99.76	0.00	17.47	1W(30dBm)
802.11b	2437.00	17.84	99.76	0.00	17.84	1W(30dBm)
802.11b	2462.00	18.40	99.53	0.00	18.40	1W(30dBm)
802.11g	2412.00	16.11	97.26	0.12	16.23	1W(30dBm)
802.11g	2437.00	16.66	98.61	0.00	16.66	1W(30dBm)
802.11g	2462.00	16.20	97.26	0.12	16.32	1W(30dBm)
802.11n(HT20)	2412.00	15.96	96.77	0.14	16.10	1W(30dBm)
802.11n(HT20)	2437.00	15.49	96.77	0.14	15.63	1W(30dBm)
802.11n(HT20)	2462.00	15.82	96.77	0.14	15.96	1W(30dBm)
802.11n(HT40)	2422.00	15.75	96.87	0.14	15.89	1W(30dBm)
802.11n(HT40)	2437.00	15.06	96.88	0.14	15.20	1W(30dBm)
802.11n(HT40)	2452.00	15.19	93.75	0.28	15.47	1W(30dBm)

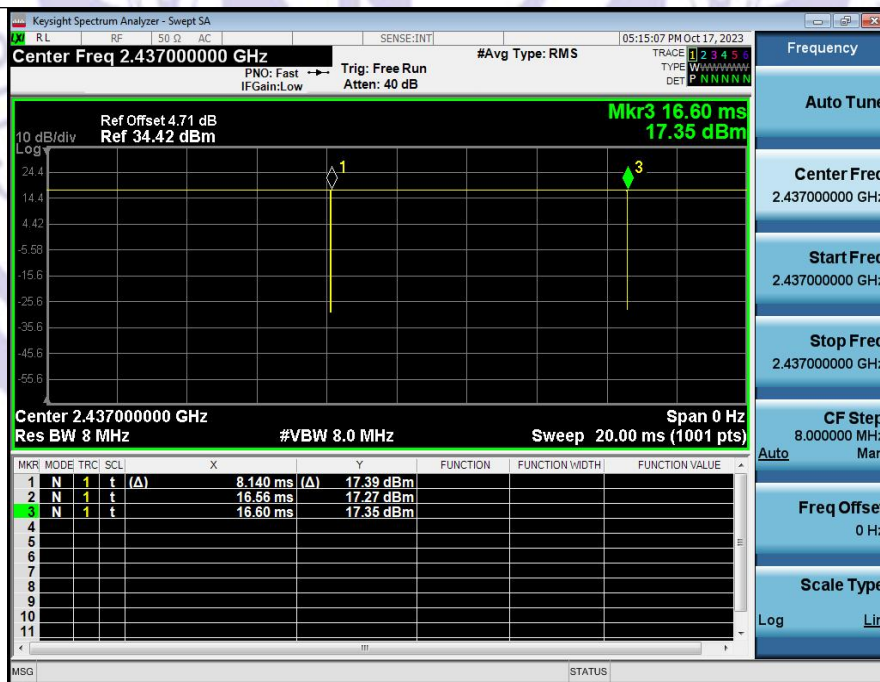
Note:

1. For the test has contain the duty factor ;
2. TX means Transmit, RX means Receive.

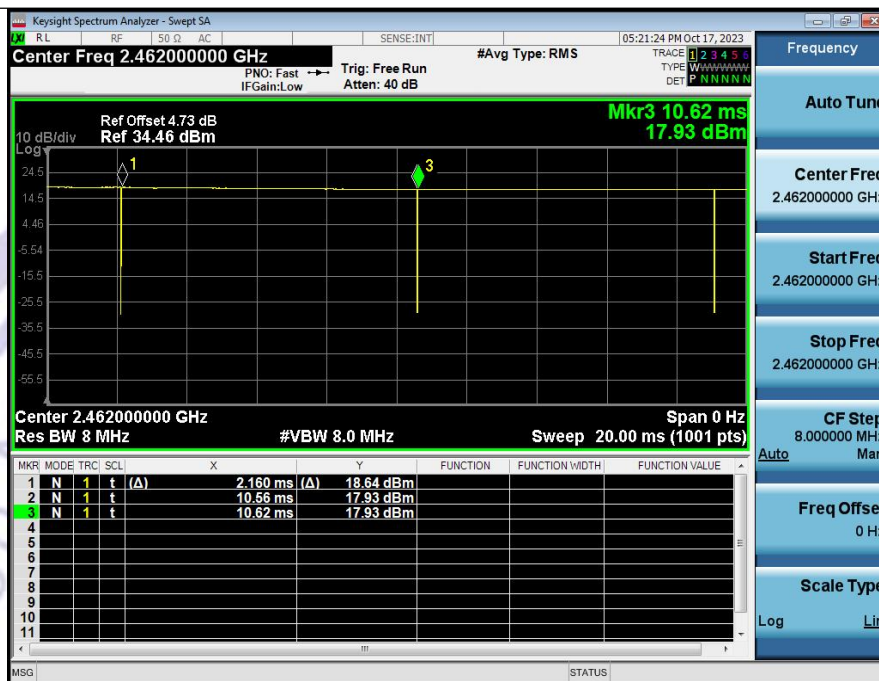
Duty_Cycle_NVNT_ANT1_802_11b_2412



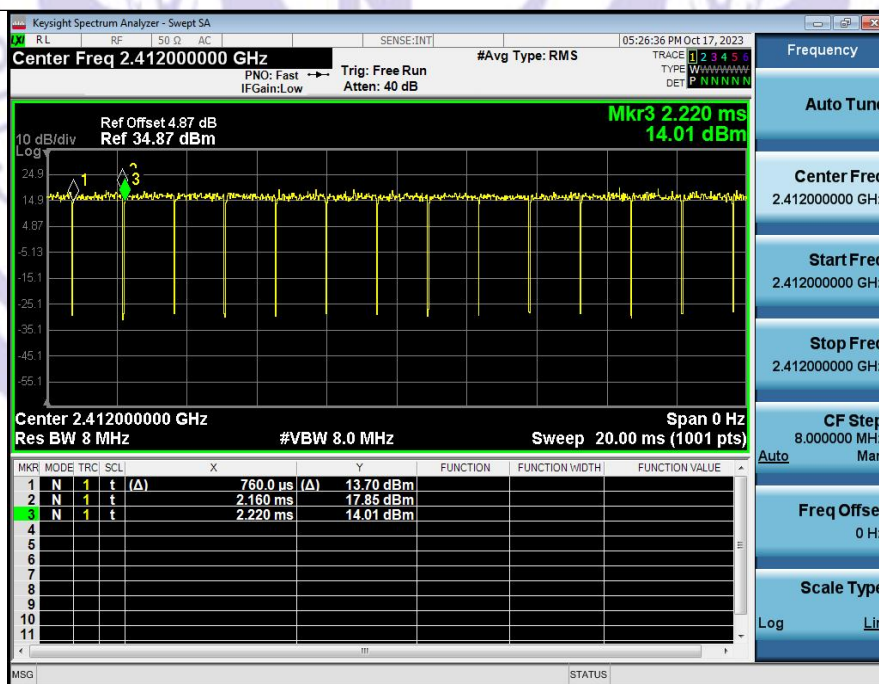
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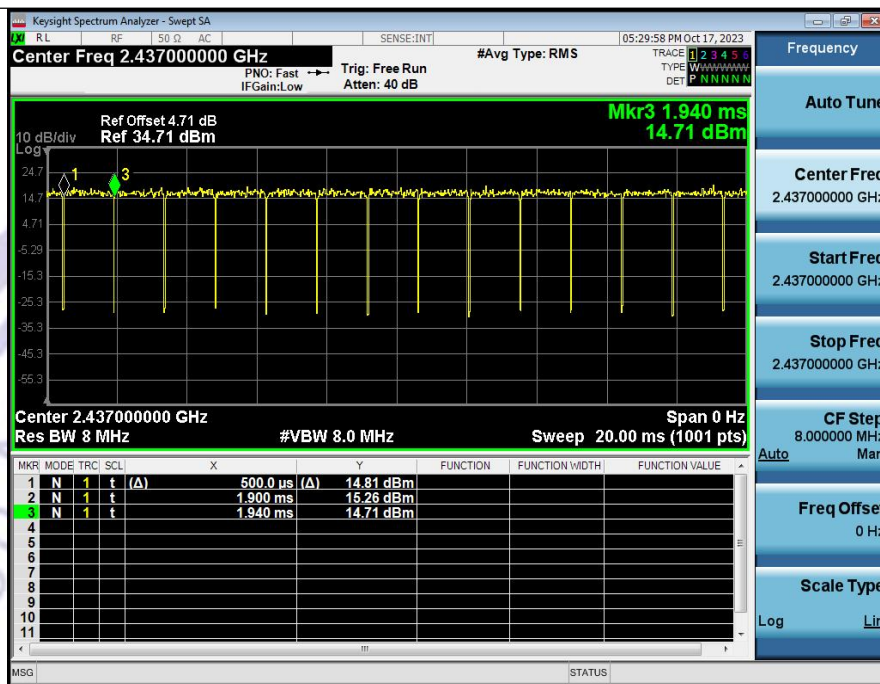
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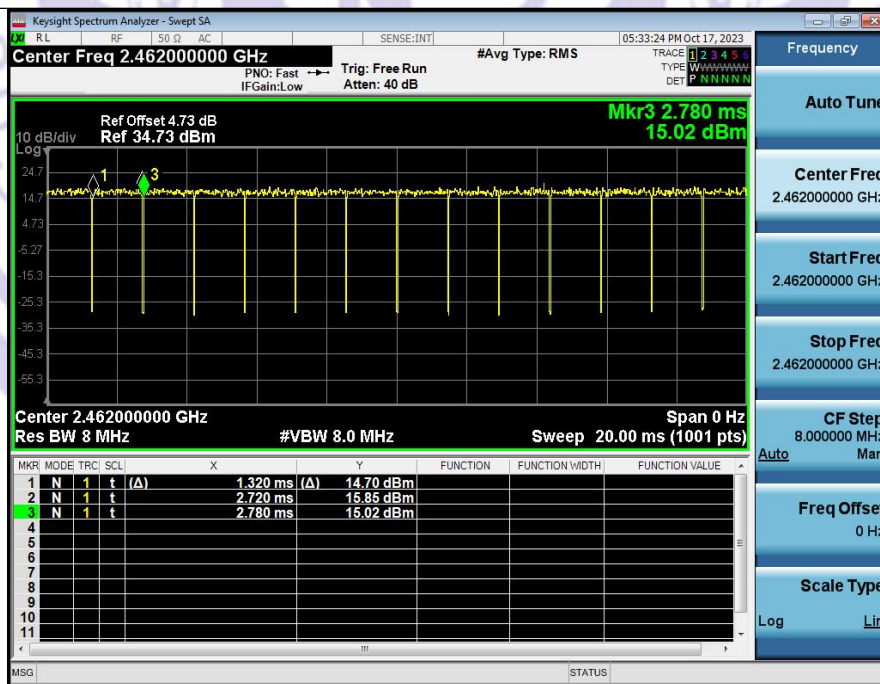
Duty_Cycle_NVNT_ANT1_802_11g_2412



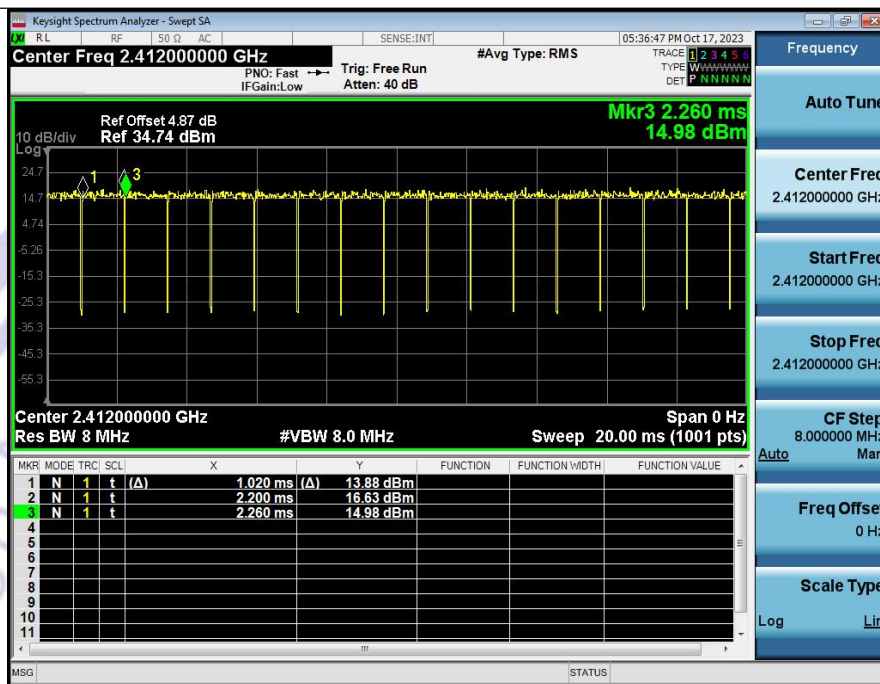
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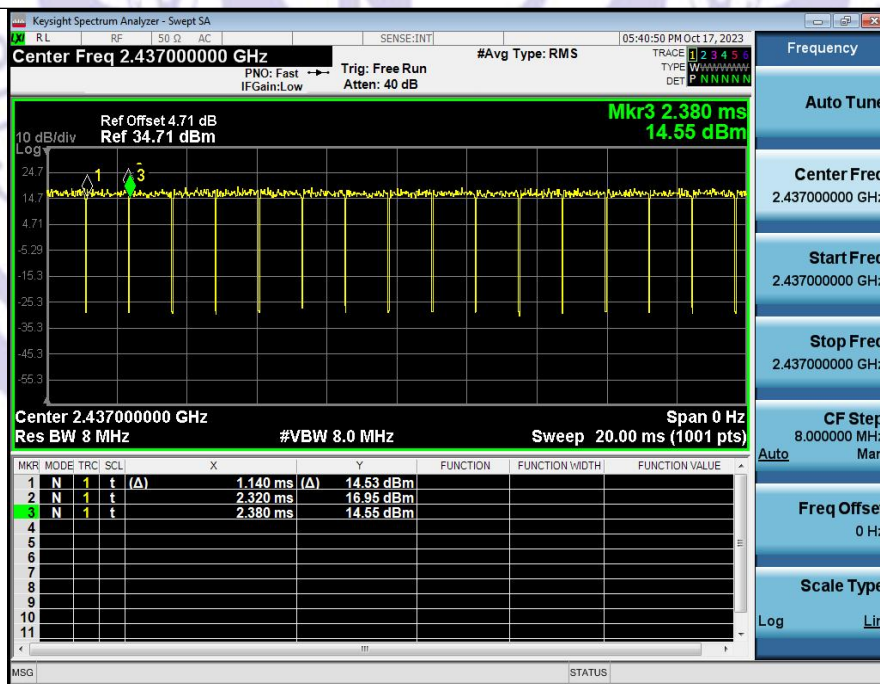
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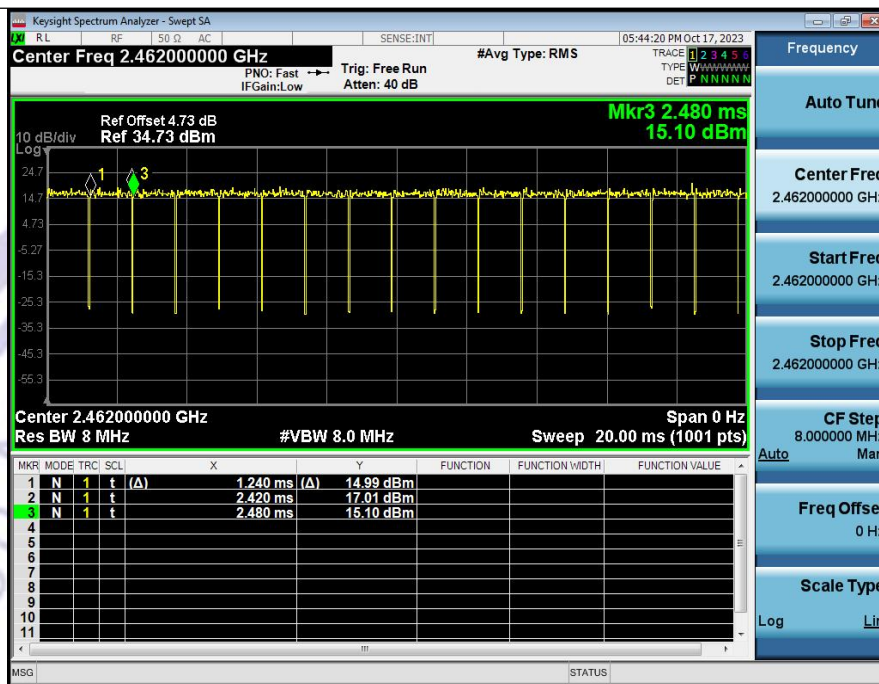
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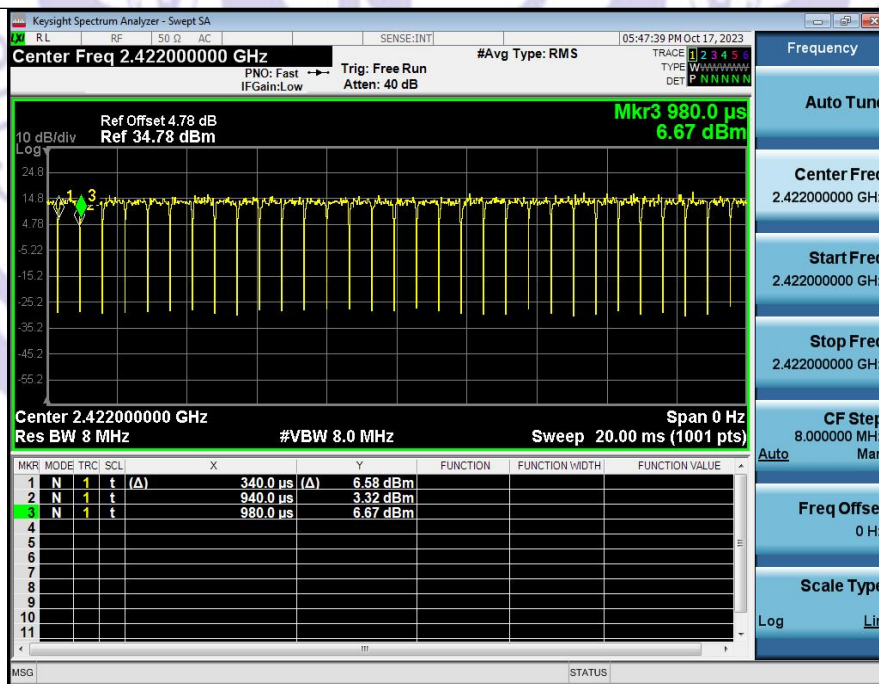
Duty_Cycle_NVNT_ANT1_802_11n(HT20)_2437



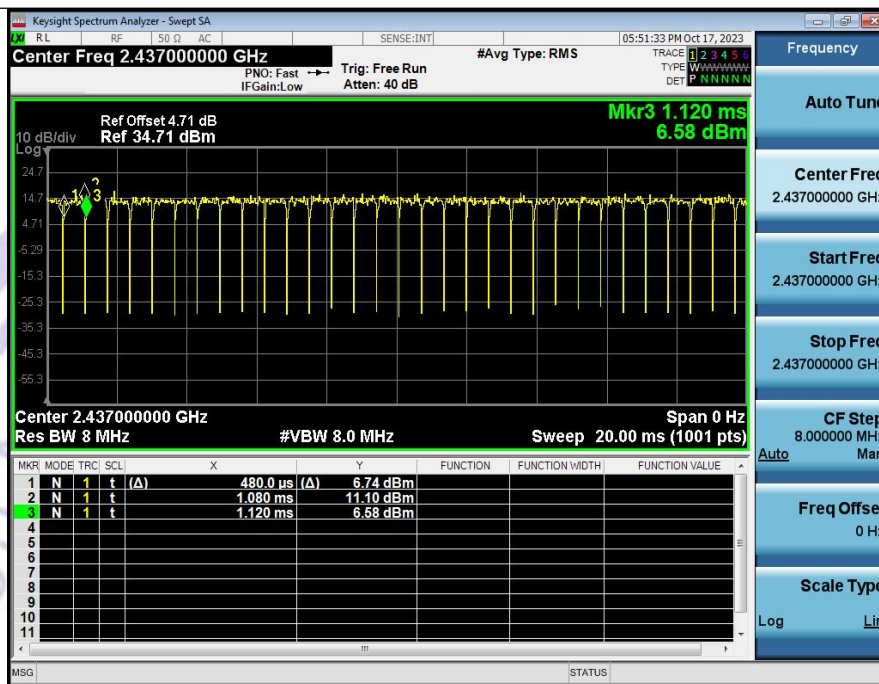
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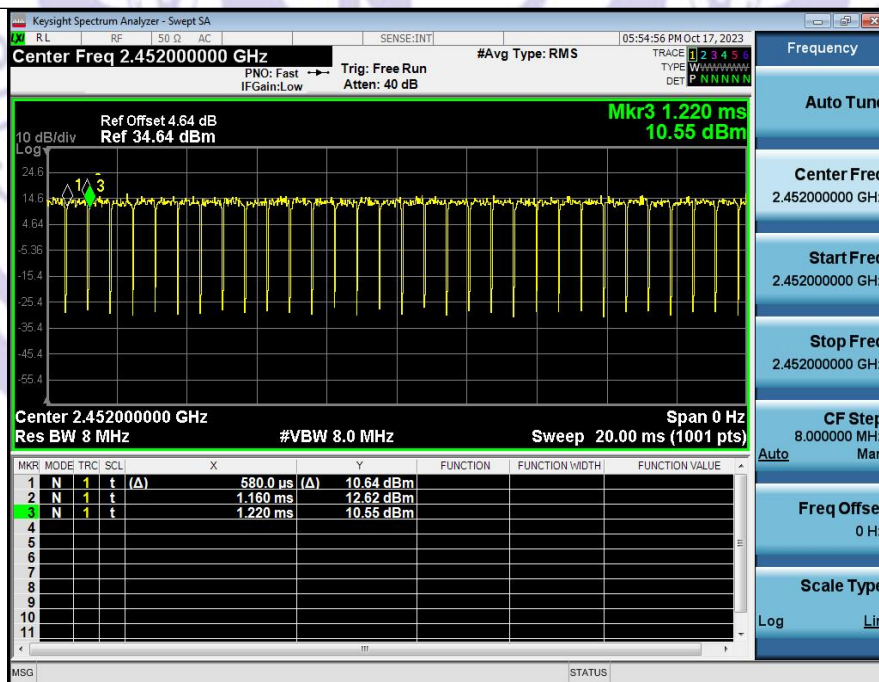
Duty_Cycle_NVNT_ANT1_802_11n(HT40)_2422



Duty_Cycle_NVNT_ANT1_802_11n(HT40)_2437



Duty_Cycle_NVNT_ANT1_802_11n(HT40)_2452



11 Power Spectral density

Test Requirement	: FCC CFR47 Part 15 Section 15.247
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.

11.1 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.

11.2 Test Result

		Power Spectral density (dBm/30kHz)	Duty_factor	Power Spectral density (dBm/3kHz)	Limit
802.11 b	Low Channel	-8.83	0.00	-18.83	8dBm/3kHz
	Middle Channel	-8.41	0.00	-18.41	8dBm/3kHz
	High Channel	-7.73	0.00	-17.73	8dBm/3kHz
802.11 g	Low Channel	-12.76	0.12	-22.64	8dBm/3kHz
	Middle Channel	-11.88	0.00	-21.88	8dBm/3kHz
	High Channel	-11.61	0.12	-21.49	8dBm/3kHz
802.11 n20	Low Channel	-13.46	0.14	-23.32	8dBm/3kHz
	Middle Channel	-13.11	0.14	-22.97	8dBm/3kHz
	High Channel	-12.81	0.14	-22.67	8dBm/3kHz
802.11 n40	Low Channel	-15.75	0.14	-25.61	8dBm/3kHz
	Middle Channel	-16.05	0.14	-25.91	8dBm/3kHz
	High Channel	-16.14	0.28	-25.86	8dBm/3kHz

802.11b Low Channel



802.11b Middle Channel



802.11b High Channel



802.11g Low Channel



802.11g Middle Channel



802.11g High Channel



802.11n20 Low Channel



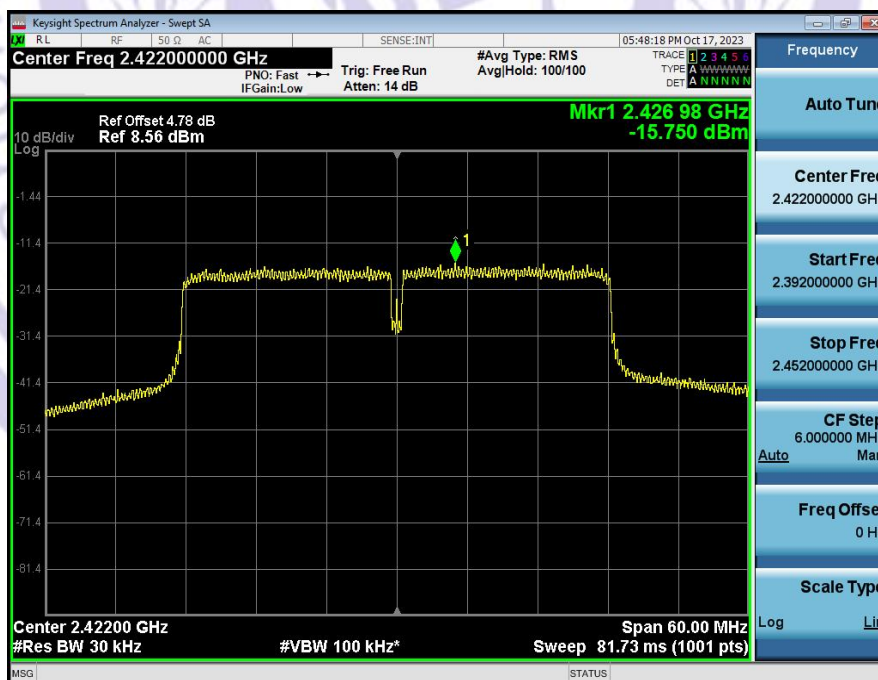
802.11n20 Middle Channel



802.11n20 High Channel



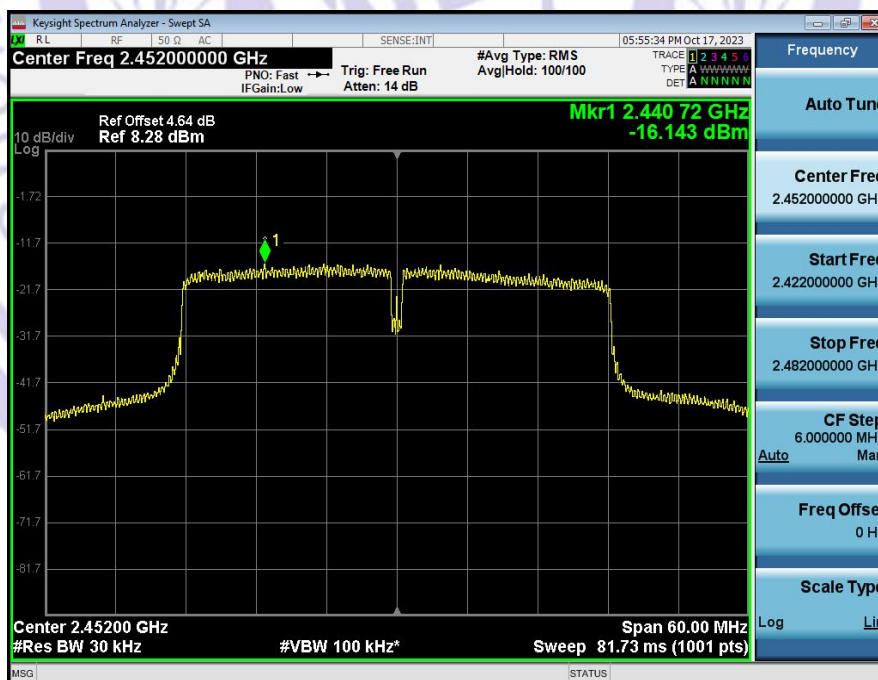
802.11n40 Low Channel



802.11n40 Middle Channel



802.11n40 High Channel



12 Antenna Application

12.1 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.

12.2 Result

The antenna is PCB antenna, the best case gain of the antennas is 1.64 dBi, reference to the attachment for details.

13 Test Setup and EUT Photos

Reference to the attachment for details.

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

