FCC 47 CFR PART 15 SUBPART C: 2014 AND ANSI C63.10: 2013

TEST REPORT

For

Smart Cooker

Model: CK8522

Brand: AIONE

Test Report Number:
T180717N01-RP1

Issued for

ST＆T Electric Corp.

1F, No.18, Lane 31, Sec 1, HuanDong Road, Tainan Science Park, Tainan City, TAIWAN

Issued by

Compliance Certification Services Inc.
Tainan Lab.
No.8,Jiucengling, Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)

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Date of Issue: September 13, 2018

REVISION HISTORY

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	August 06, 2018	Initial Issue	ALL	Gina Lin
01	September 05, 2018	See the following note rev.01	ALL	Gina Lin
02	September 13, 2018	See the following note rev.02	ALL	Gina Lin

Note:

※ Rev.00 Issue Date: August 06, 2018
Original Report

※ Rev.01 Issue Date: September 05, 2018
Update typo.

※ Rev.02 Issue Date: September 13, 2018
Update typo.

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1. TEST REPORT CERTIFICATION

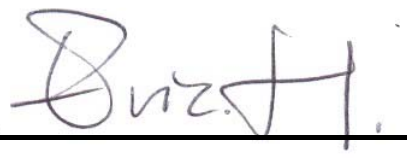
Applicant	:	**ST＆T Electric Corp.** 1F, No.18, Lane 31, Sec 1, HuanDong Road, Tainan Science Park, Tainan City, TAIWAN
Manufacturer	:	**ST＆T Electric Corp. Kaohsiung Site** No.6,East 12th Street, CianJhen District, KEPZ, Kaohsiung City
Equipment Under Test	:	Smart Cooker
Model	:	CK8522
Brand	:	AIONE
Date of Test	:	July 24, 2018 ~ July 25, 2018

APPLICABLE STANDARD	
STANDARD	**TEST RESULT**
FCC Part 15 Subpart C: 2014 AND ANSI C63.10: 2013	No non-compliance noted

FCC Standard Section	Report Section	Test Item	Result
15.247(a)	8.1	6dB BANDWIDTH	Pass
15.247(b)	8.2	MAXIMUM PEAK OUTPUT POWER	Pass
-	8.3	DUTY CYCLE	-
15.247(e)	8.4	POWER SPECTRAL DENSITY	Pass
15.247(d)	8.5	CONDUCTED SPURIOUS EMISSION	Pass
15.205(a)	8.6	RADIATED EMISSIONS	Pass
15.207(a)	8.7	POWERLINE CONDUCTED EMISSIONS	Pass

Approved by: ***Reviewed by:***

Jeter Wu
Assistant Manager



Eric Huang
Section Manager

2. EUT DESCRIPTION

Product Name	Smart Cooker
Model	CK8522
Brand	AIONE
Received Date	July 17, 2018
Frequency Range	IEEE 802.11b/g, 802.11n HT20 : 2412MHz～2462MHz IEEE 802.11n HT40 : 2422MHz～2452MHz
Transmit Power	IEEE 802.11b Mode : 13.08dBm (DTS Band) (20.3236mW) IEEE 802.11g Mode : 15.13dBm (DTS Band) (32.5837mW) IEEE 802.11n HT20 Mode : 14.59dBm (DTS Band) (28.774W) IEEE 802.11n HT40 Mode : 13.55dBm (DTS Band) (22.6464mW)
Channel Spacing	IEEE 802.11b/g, 802.11n HT20/HT40 : 5MHz
Channel Number	IEEE 802.11b/g, 802.11n HT20:11 Channels IEEE 802.11n HT40 :7 Channels
Transmit Data Rate	IEEE 802.11b : 11, 5.5, 2, 1 Mbps IEEE 802.11g : 54, 48 ,36, 24, 18, 12, 9, 6 Mbps IEEE 802.11n HT20 : 65, 58.5, 52, 39, 26, 19.5, 13, 6.5 Mbps IEEE 802.11n HT40 : 135, 121.5, 108, 81, 54, 40.5, 27, 13.5 Mbps
Type of Modulation	DSSS (CCK, DQPSK, DBPSK) for 802.11b OFDM (64QAM, 16QAM, QPSK, BPSK) for 802.11g, 802.11n
Antenna Type	**Antenna (1TX1RX)** Manufacturer: Master Wave Technology Co., Ltd. Type: PCB Mode: 98P8ZMIPF001 Gain：3.96dBi
Power Rating	AC 120V, 60Hz, 1100W
Test Voltage	AC 120V, 60Hz
Firmware Version	V1.0
Software Version	V2.0
Temperature Range	0°C ~ +40°C

REMARK:

1. *The sample **(CK8522)** selected for test was engineering sample that approximated to production product and was provided by manufacturer.*
2. *This submittal(s) (test report) is intended for FCC ID:QBL-CK8522 filing to comply with Section 15.207,15.209 and 15.247 of the FCC Part 15, Subpart C Rules.*
3. *For more details, please refer to the User's manual of the EUT.*

3. DESCRIPTION OF TEST MODES

The EUT is a Smart Cooker. It has one transmitter chains and one receive chains (1x1 configurations). The 1x1 configuration is implemented with one outside chains (Chain 0).

The RF chipset is manufactured by Ralink

The antenna peak gain 3.96dBi (highest gain) were chosen for full testing.

IEEE 802.11 b ,802.11g ,802.11n HT20 mode (DTS Band)

The EUT had been tested under operating condition.

There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2412
Middle	2437
High	2462

IEEE 802.11b mode: 1Mbps long data rate (worst case) were chosen for full testing.

IEEE 802.11g mode: 6Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11n HT20 mode: 6.5Mbps data rate (worst case) were chosen for full testing.

IEEE 802.11n HT40 mode (DTS Band)

The EUT had been tested under operating condition.

There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2422
Middle	2437
High	2452

IEEE 802.11n HT40 mode: 13Mbps data rate (worst case) were chosen for full testing.

The worst-case data rates are determined according to the description above, based on the investigations by measuring the PSD, peak power and average power across all the data rates, bandwidths, modulations and spatial stream modes.

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10 and FCC CFR 47 15.207, 15.209 and 15.247.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No.8,Jiucengling, Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3 LABORATORY ACCREDITATIONS LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by Taiwan Accreditation Foundation for the specific scope of accreditation under Lab Code: 1109 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by TAF or any agency of the Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: TW-1109).

5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

Taiwan	TAF

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
Germany	TUV NORD
Taiwan	BSMI
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccsrf.com

6. CALIBRATION AND UNCERTAINTY

6.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

6.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

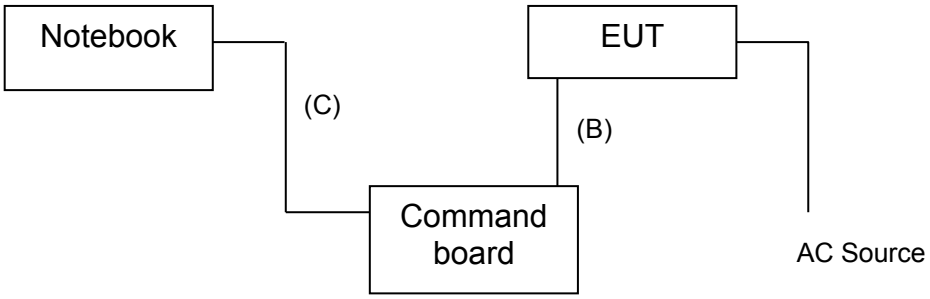
Parameter	Uncertainty
Radiated Emission, 30 to 200 MHz Test Site : OATS-6	±3.21dB
Radiated Emission, 200 to 1000 MHz Test Site : OATS-6	±3.09dB
Radiated Emission, 1 to 8 GHz	± 2.65dB
Radiated Emission, 8 to 18 GHz	± 2.66dB
Radiated Emission, 18 to 26.5 GHz	± 2.65dB
Radiated Emission, 26 to 40 GHz	± 3.03dB
Power Line Conducted Emission	±1.91dB
Band Width	136.49kHz
Peak Output Power MU	±1.34dB
Band Edge MU	±0.30dBuV
Channel Separation MU	361.69Hz
Duty Cycle MU	0.064ms
Frequency Stability MU	0.223kHz

Uncertainty figures are valid to a confidence level of 95%, K=2

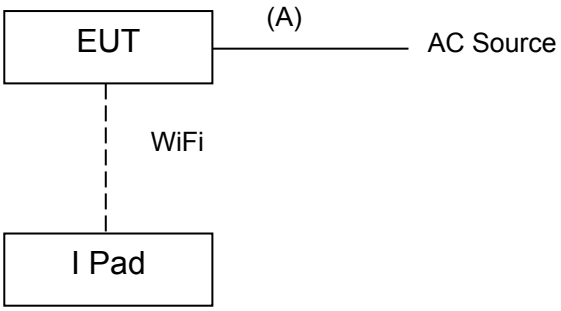
7. SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

For RF test



For EMI test (for Con test setup)



7.2 SUPPORT EQUIPMENT

RF test

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1.	Notebook	Acer	AS 3830TG	DOC	Power cable, unshd, 1.6m

No.	Signal cable description	
A	Power	Unshielded, 1.2m, 1pcs.
B	Command	Unshielded, 0.2m, 1pcs.
C	LAN	Unshielded, 10m, 1pcs.

EMI test

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1.	iPad	Apple	A1219	DOC	N/A

No.	Signal cable description	
A	AC Power	Unshielded, 1.2m, 1pcs.

REMARK:

1. All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

7.3 EUT OPERATING CONDITION

RF Setup

1. Set up all computers like the setup diagram.
2. The “Ralink QA Test Program for “RT5350QA ” software was used for testing
   The EUT driver software installed in the host support equipment during testing was Ralink QA Test Program for “RT5350QA” Drive

TX Mode:

⇨ **Tx Mode:CCK 、OFDM、 HT MixMode** (Bandwidth: 20、40)

⇨ **Tx Data Rate: 1Mbps long** (IEEE 802.11b mode ,chain 0 TX)
6Mbps (IEEE 802.11g mode ,chain 0 TX)
6.5Mbps (IEEE 802.11n HT20 mode ,chain 0)
13Mbps (IEEE 802.11n HT40 mode, chain 0**)**

Power control mode

Target Power: IEEE 802.11b Channel Low (2412MHz) =12 **(Chain 0)**
IEEE 802.11b Channel Middle (2437MHz) =14 **(Chain 0)**
IEEE 802.11b Channel High (2462MHz) = 16 **(Chain 0)**
Target Power: IEEE 802.11g Channel Low (2412MHz) = 1A **(Chain 0)**
IEEE 802.11g Channel Middle (2437MHz) = 18 **(Chain 0)**
IEEE 802.11g Channel High (2462MHz) = 16**(Chain 0)**
Target Power: IEEE 802.11 n HT20 Channel Low (2412MHz) = 18**(Chain 0)**
IEEE 802.11 n HT20 Channel Middle (2437MHz) = 16 **(Chain 0)**
IEEE 802.11 n HT20 Channel High (2462MHz) = 14**(Chain 0)**
Target Power: IEEE 802.11 n HT40 Channel Low (2422MHz) = 15 **(Chain 0)**
IEEE 802.11 n HT40 Channel Middle (2437MHz) = 13 **(Chain 0)**
IEEE 802.11 n HT40 Channel High (2452MHz) = 11 **(Chain 0)**

RX Mode：

Start RX

3. All of the function are under run.
4. Start test.

8. APPLICABLE LIMITS AND TEST RESULTS

8.1 6dB BANDWIDTH

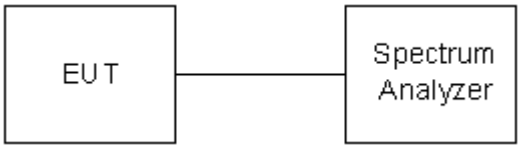
LIMIT

§ 15.247(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

TEST EQUIPMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/05/2018	07/04/2019
SMA Cable + 10dB Attenuator	CCS	SMA + 10dB Att	O6	01/22/2018	01/21/2019

TEST SETUP



TEST PROCEDURE

1. Set resolution bandwidth (RBW) = 1-5 % of the emission bandwidth (EBW).
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. Compare the resultant bandwidth with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is 1-5 %.

TEST RESULTS

No non-compliance noted.

Model Name	CK8522	Test By	Ted Huang
Temp & Humidity	26.5°C, 54%	Test Date	2018/07/25

IEEE 802.11b mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	12.15	500	PASS
Middle	2437	12.12	500	PASS
High	2462	12.13	500	PASS

NOTE : 1. At finial test to get the worst-case emission at 1Mbps long.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11g mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16.60	500	PASS
Middle	2437	16.60	500	PASS
High	2462	16.60	500	PASS

NOTE : 1. At finial test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

IEEE 802.11n HT20 mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
		Chain 0		
Low	2412	17.71	500	PASS
Middle	2437	17.72	500	PASS
High	2462	17.70	500	PASS

NOTE : 1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

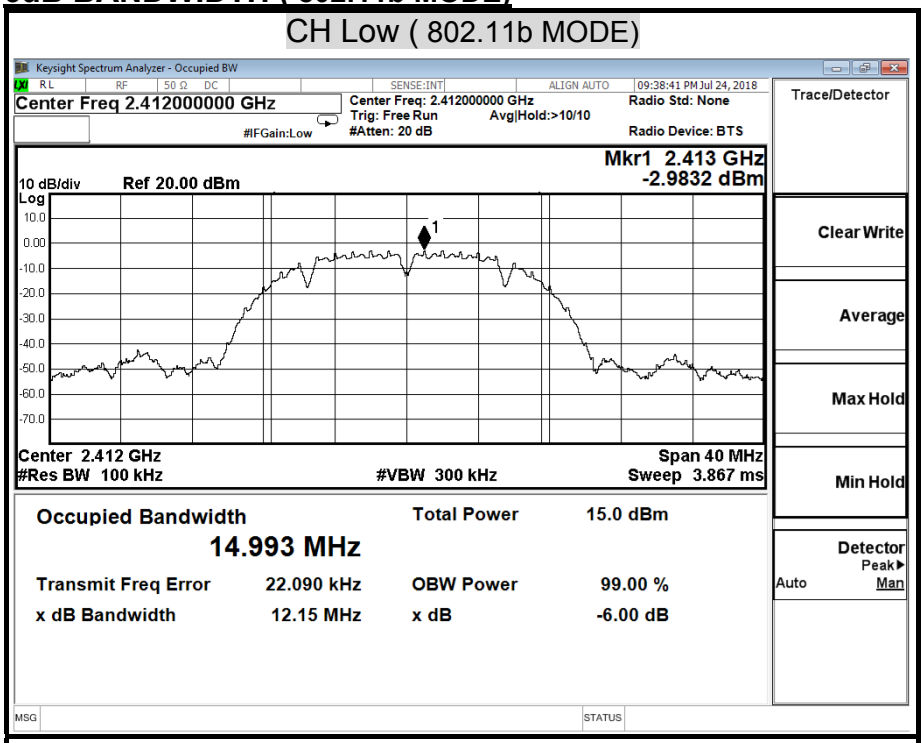
IEEE 802.11n HT40 mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
		Chain 0		
Low	2422	36.46	500	PASS
Middle	2437	36.46	500	PASS
High	2452	36.46	500	PASS

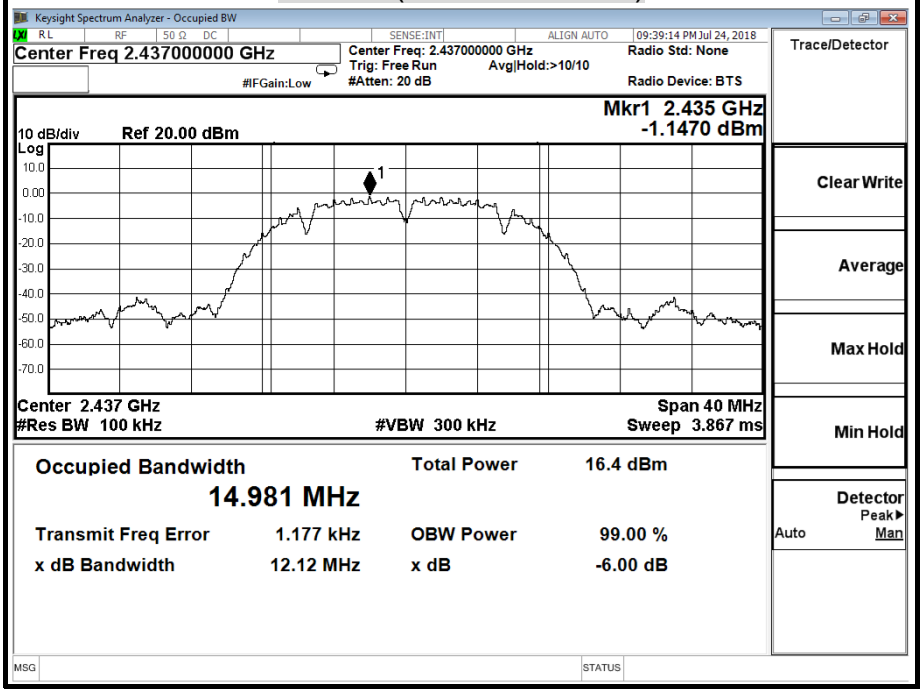
NOTE : 1. At finial test to get the worst-case emission at 13Mbps.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.

6dB BANDWIDTH (802.11b MODE)

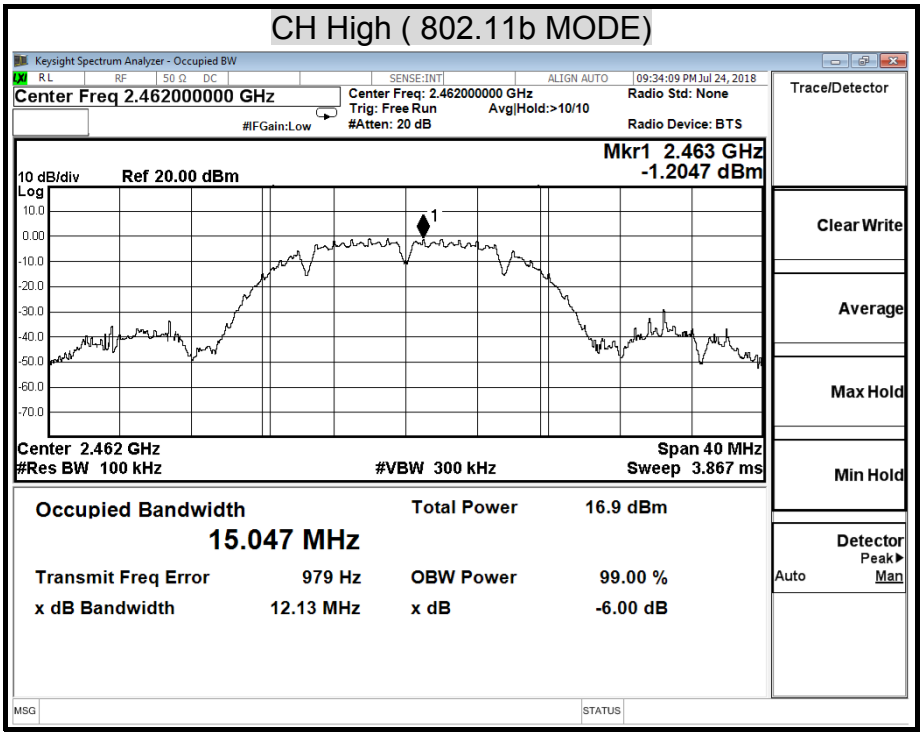
CH Low (802.11b MODE)



CH Mid (802.11b MODE)

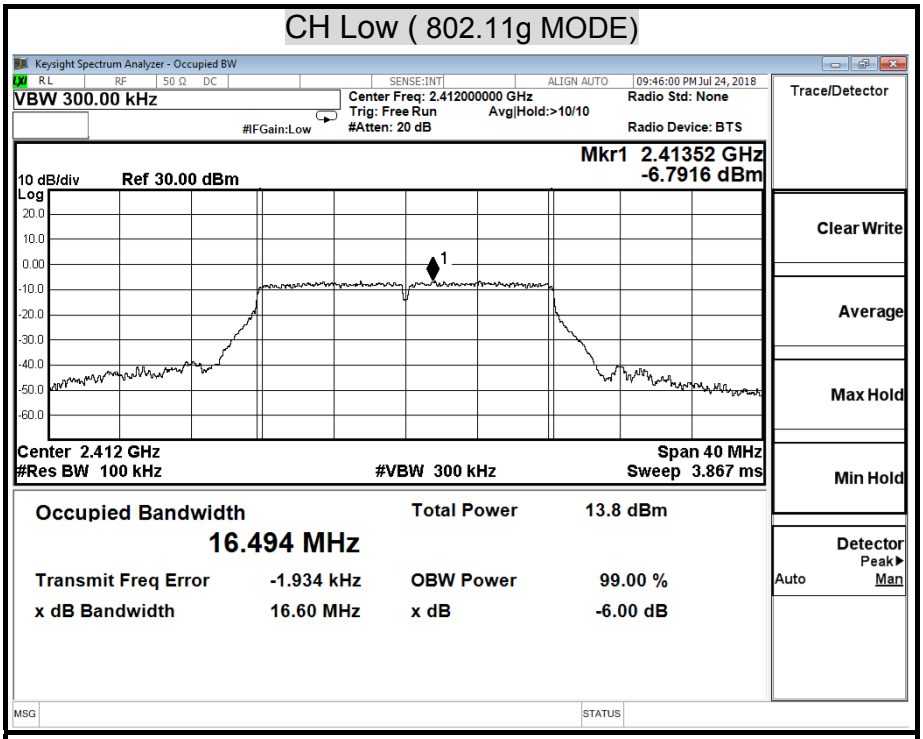


CH High (802.11b MODE)

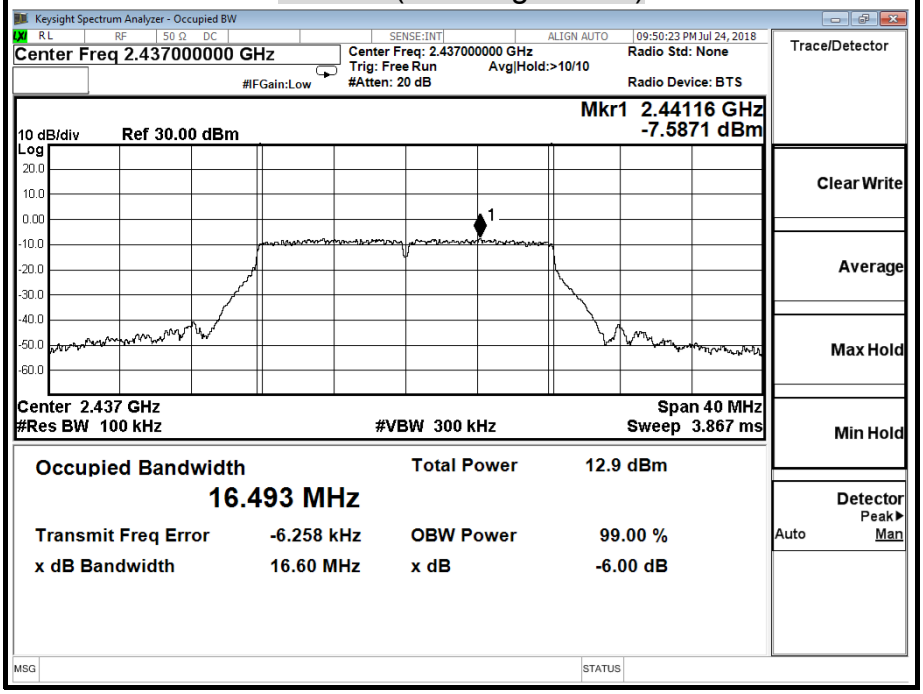


6dB BANDWIDTH (802.11g MODE)

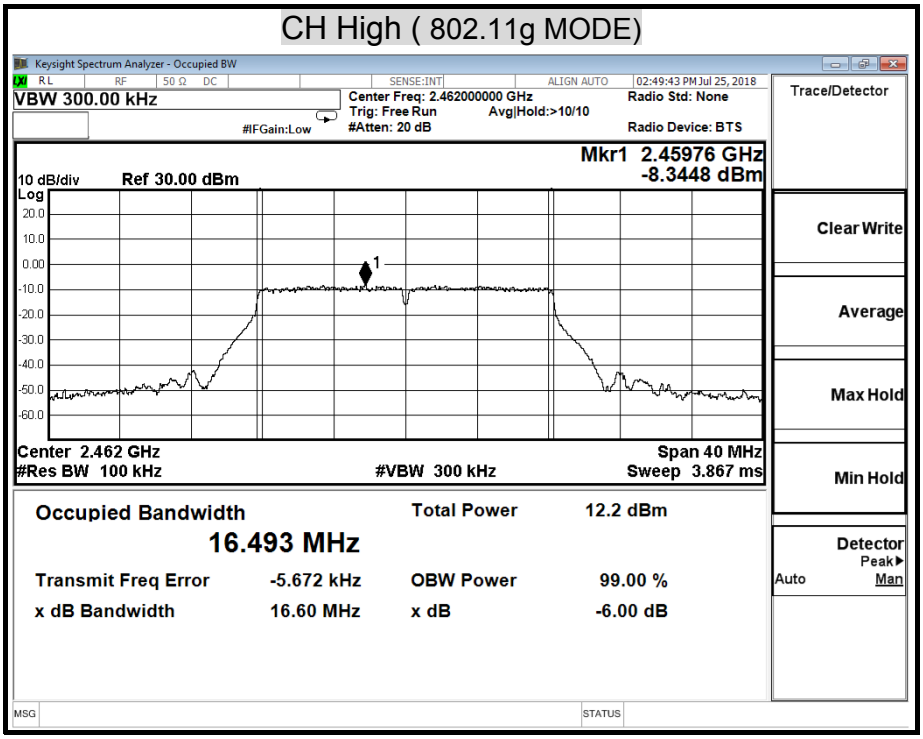
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

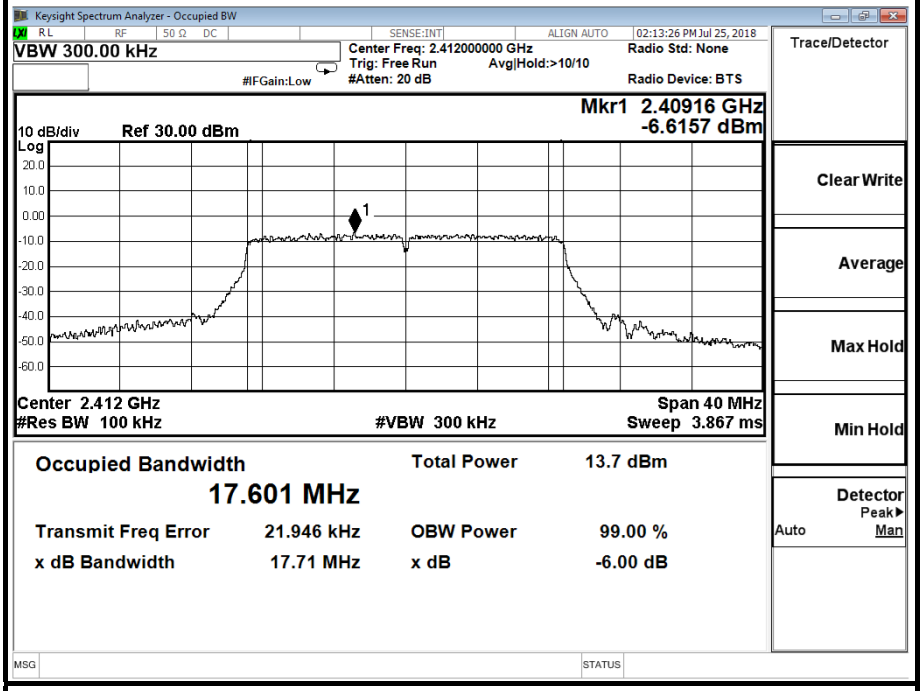


CH High (802.11g MODE)

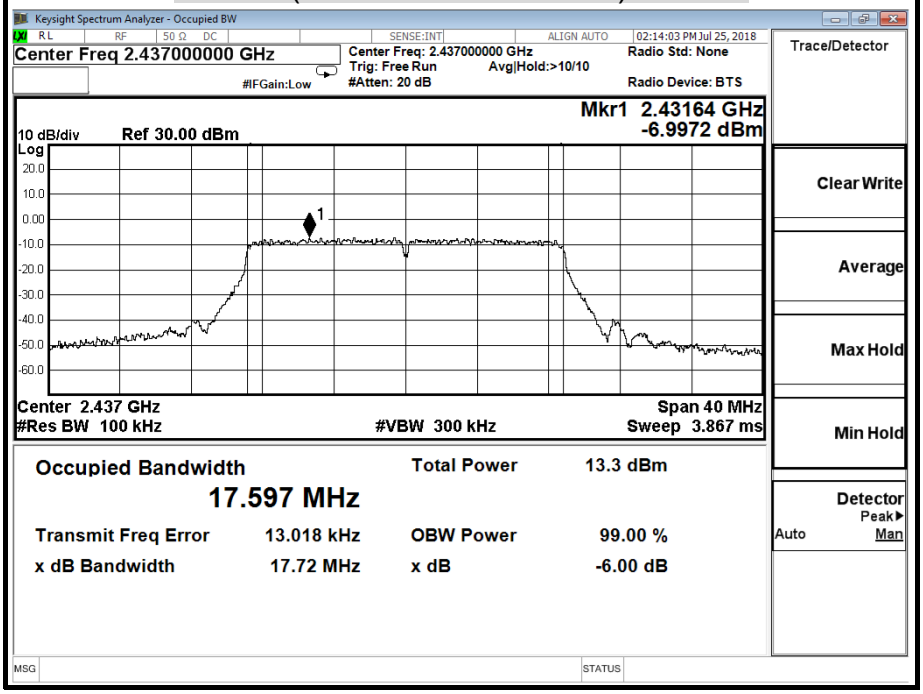


6dB BANDWIDTH (802.11n HT20 MODE) Chain 0

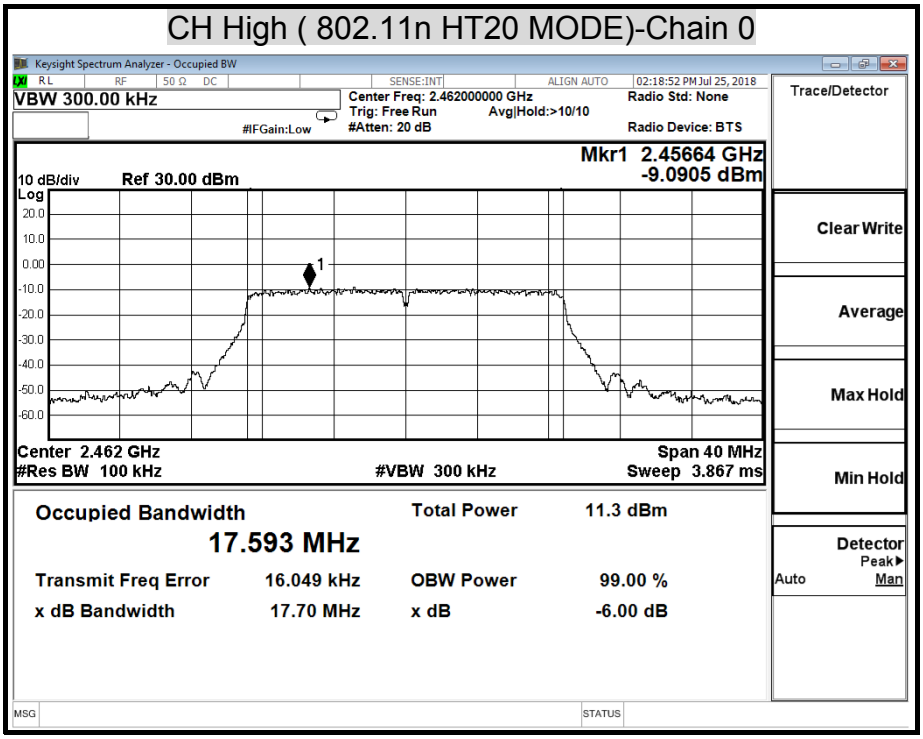
CH Low (802.11n HT20 MODE)-Chain 0



CH Mid (802.11n HT20 MODE)-Chain 0

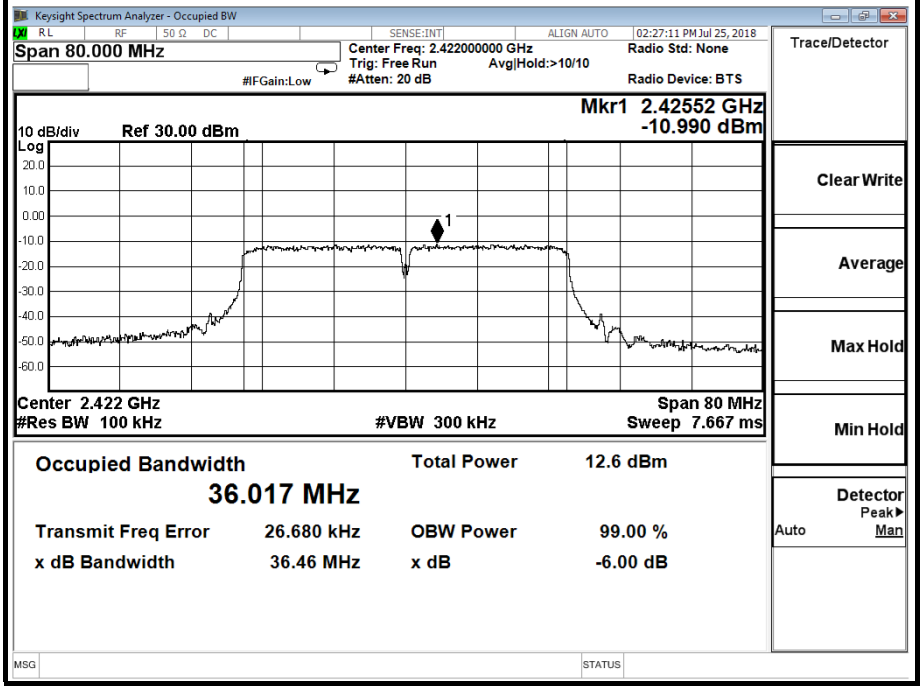


CH High (802.11n HT20 MODE)-Chain 0

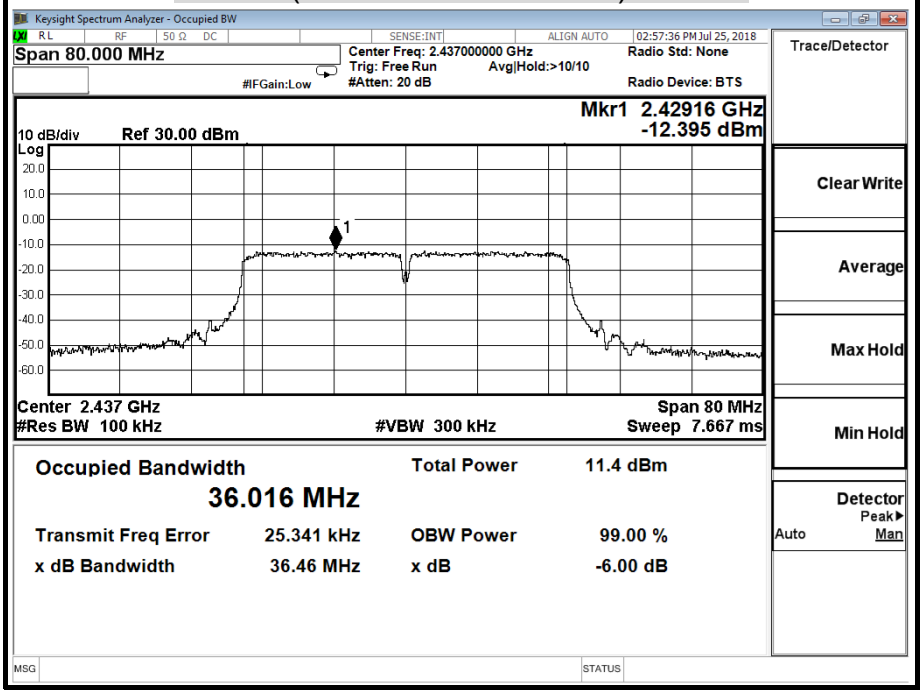


6dB BANDWIDTH (802.11n HT40 MODE) Chain 0

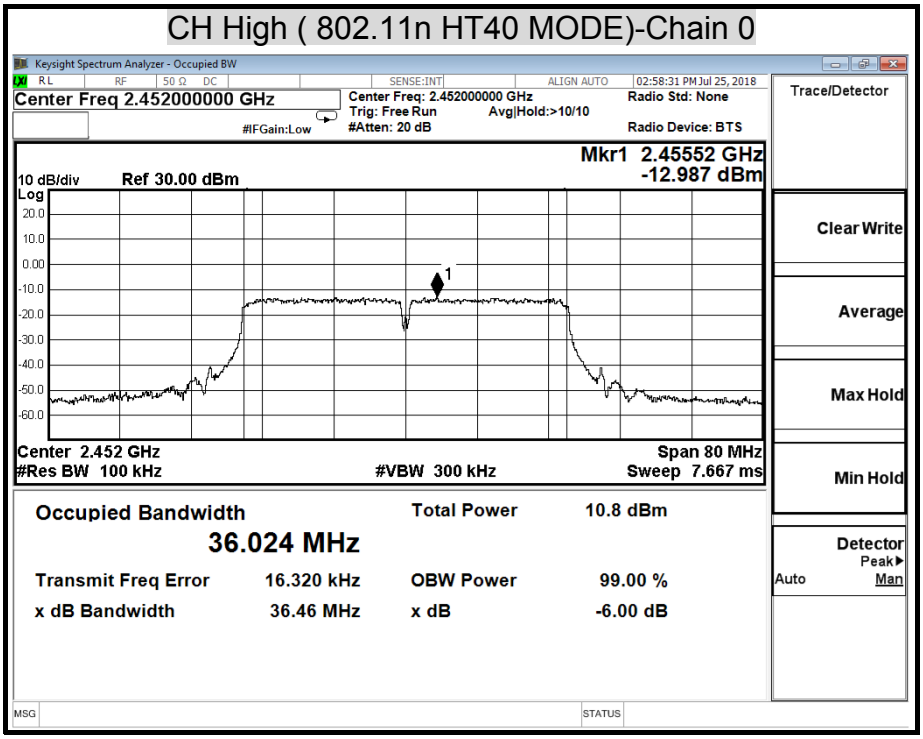
CH Low (802.11n HT40 MODE)-Chain 0



CH Mid (802.11n HT40 MODE)-Chain 0



CH High (802.11n HT40 MODE)-Chain 0



8.2 MAXIMUM PEAK OUTPUT POWER

LIMIT

§ 15.247(b) The maximum peak output power of the intentional radiator shall not exceed the following :

§ 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.

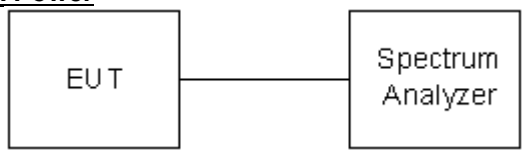
§ 15.247(b) (4) Except as shown in paragraphs (c) of this section , if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2), and (b)(3) of this section , as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST EQUIPMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/05/2018	07/04/2019
SMA Cable + 10dB Attenuator	CCS	SMA + 10dB Att	O6	01/22/2018	01/21/2019

TEST SETUP

For Peak Power



For Average Power

TEST PROCEDURE

The tests were performed in accordance with KDB 558074 5.2.1.2 and 5.2.2.1.

5.2.1.2 Measurement Procedure PK2:

1. Set the RBW = 1 MHz.
2. Set the VBW ≥ 3 RBW
3. Set the span ≥ 1.5 x DTS bandwidth.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. 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 peak detector). If the instrument does not have a band power function,
9. Sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS bandwidth.

5.2.2.1 Measurement Procedure AVG1(power averaging over the EBW with slow sweep speed):

1.Set the analyzer span to 5-30% greater than the EBW.
2.Set the RBW = 1 MHz.
3.Set the VBW ≥ 3 MHz.
4.Detector = power average (RMS).
5.Ensure that the number of measurement points in the sweep ≥ 2 x (span/RBW).
6.Manually set the sweep time to: ≥10 x (number of measurement points in sweep) x (transmission symbol period).
7.Perform the measurement over a single sweep.
8.Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges to determine the maximum conducted output power of the EUTover the EBW. Note: If the analyzer does not have a band power function, sum the spectral levels (in linear power units) at 1 MHz intervals extending across the entire EBW.

TEST RESULTS

No non-compliance noted.

Model Name	CK8522	Test By	Ted Huang
Temp & Humidity	26.5°C, 54%	Test Date	2018/07/25

IEEE 802.11b mode

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2412	11.59	30.00	PASS
Middle	2437	12.12	30.00	PASS
High	2462	13.08	30.00	PASS

NOTE : 1. At finial test to get the worst-case emission at 1Mbps long.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. This result is the largest measured value.

IEEE 802.11g mode

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2412	15.13	30.00	PASS
Middle	2437	14.30	30.00	PASS
High	2462	12.77	30.00	PASS

NOTE : 1.At finial test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. This result is the largest measured value.

IEEE 802.11n HT20 mode

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
		Chain 0		
Low	2412	14.59	30.00	PASS
Middle	2437	14.06	30.00	PASS
High	2462	12.88	30.00	PASS

NOTE : 1. At finial test to get the worst-case emission at 6.5Mbps.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. This result is the largest measured value.

IEEE 802.11n HT40 mode

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
		Chain 0		
Low	2422	13.55	30.00	PASS
Middle	2437	12.49	30.00	PASS
High	2452	11.50	30.00	PASS

NOTE : 1. At finial test to get the worst-case emission at 13Mbps.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. This result is the largest measured value.

Average Power Data

IEEE 802.11b mode

Channel	Channel Frequency (MHz)	Average Power (dBm)
Low	2412	8.53
Middle	2437	9.23
High	2462	9.91

IEEE 802.11g mode

Channel	Channel Frequency (MHz)	Average Power (dBm)
Low	2412	7.41
Middle	2437	6.61
High	2462	4.22

IEEE 802.11n HT20 mode

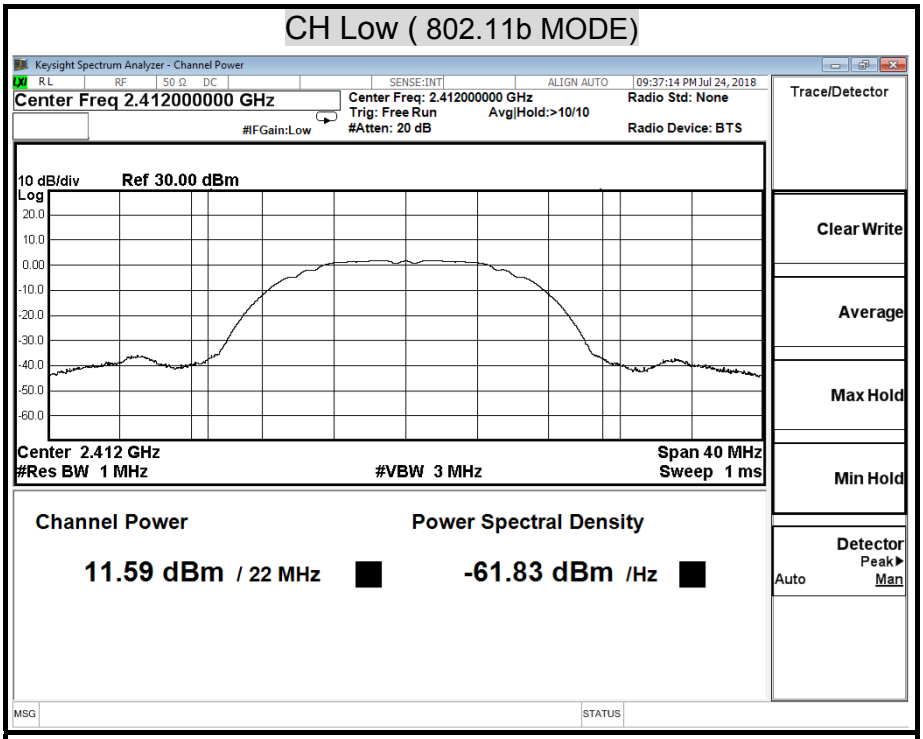
Channel	Channel Frequency (MHz)	Average Power (dBm)
		Chain 0
Low	2412	6.92
Middle	2437	6.27
High	2462	4.93

IEEE 802.11n HT40 mode

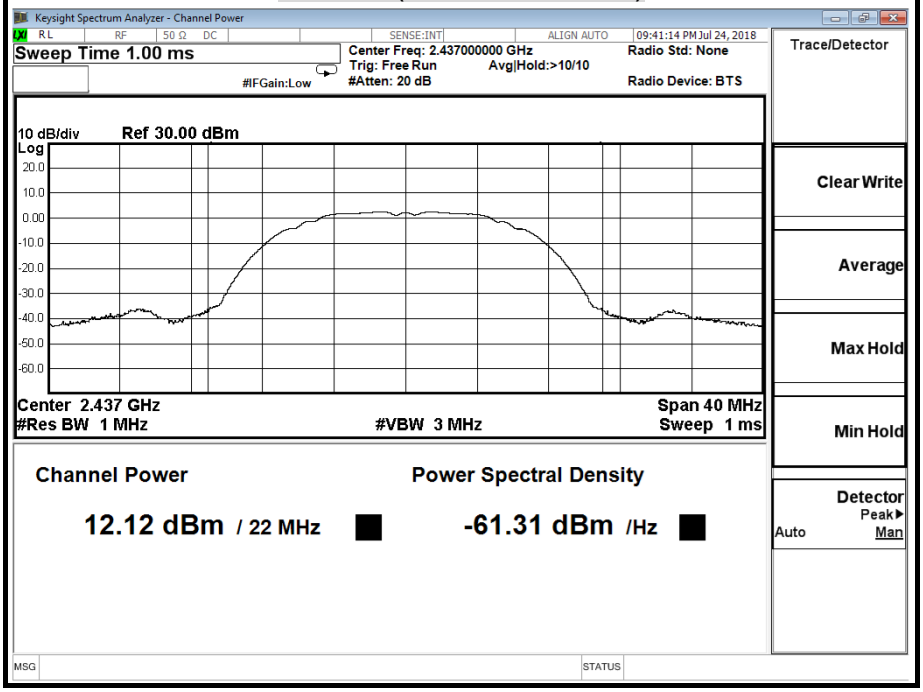
Channel	Channel Frequency (MHz)	Average Power (dBm)
		Chain 0
Low	2422	5.71
Middle	2437	4.59
High	2452	3.76

MAXIMUM PEAK OUTPUT POWER (802.11b MODE)

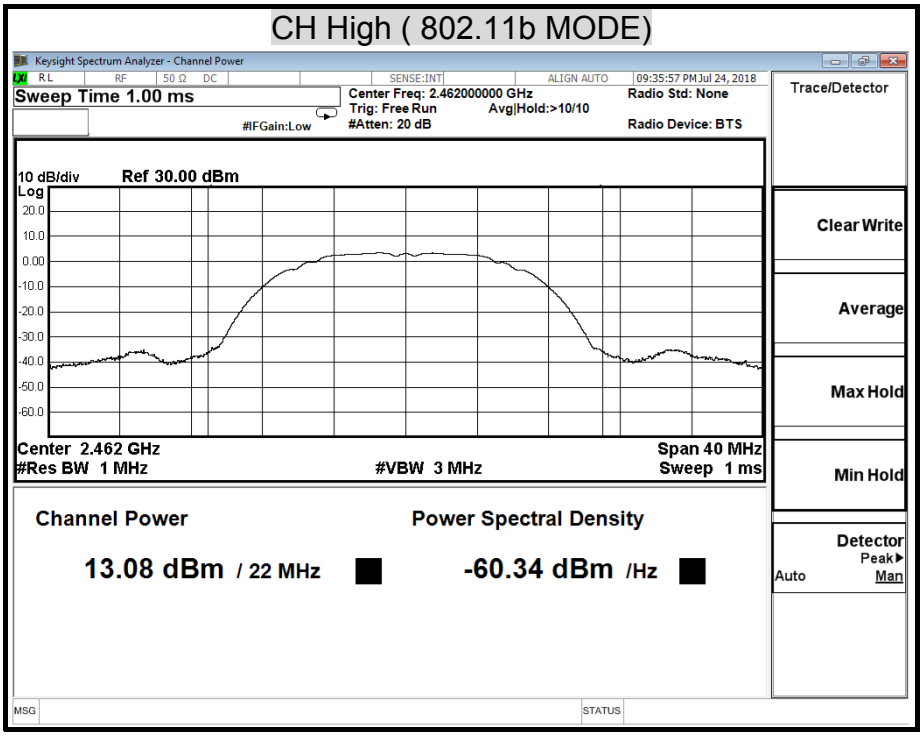
CH Low (802.11b MODE)



CH Mid (802.11b MODE)

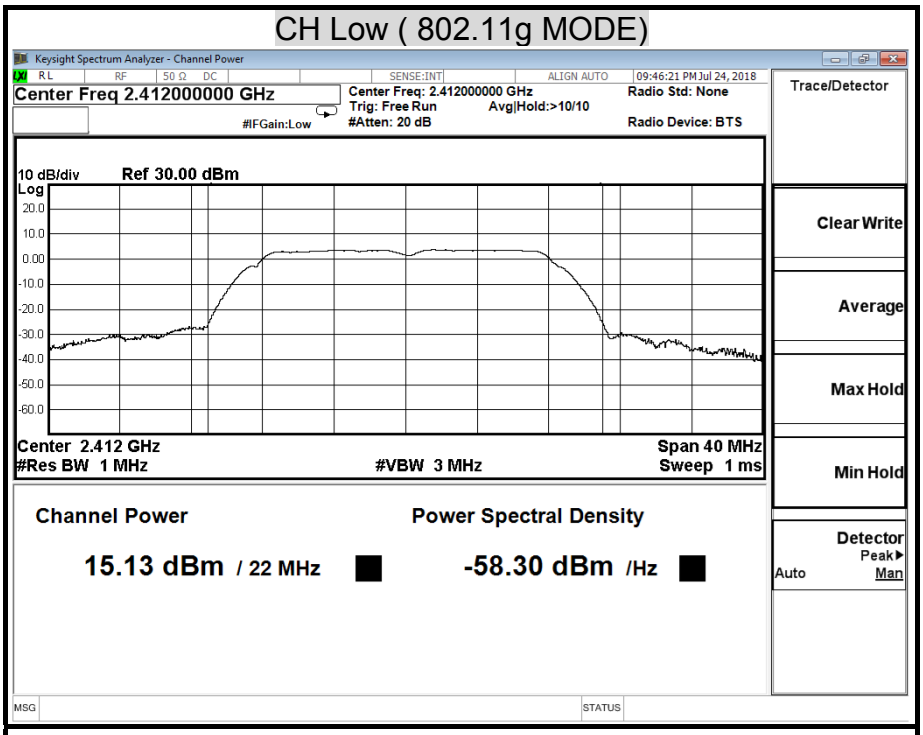


CH High (802.11b MODE)

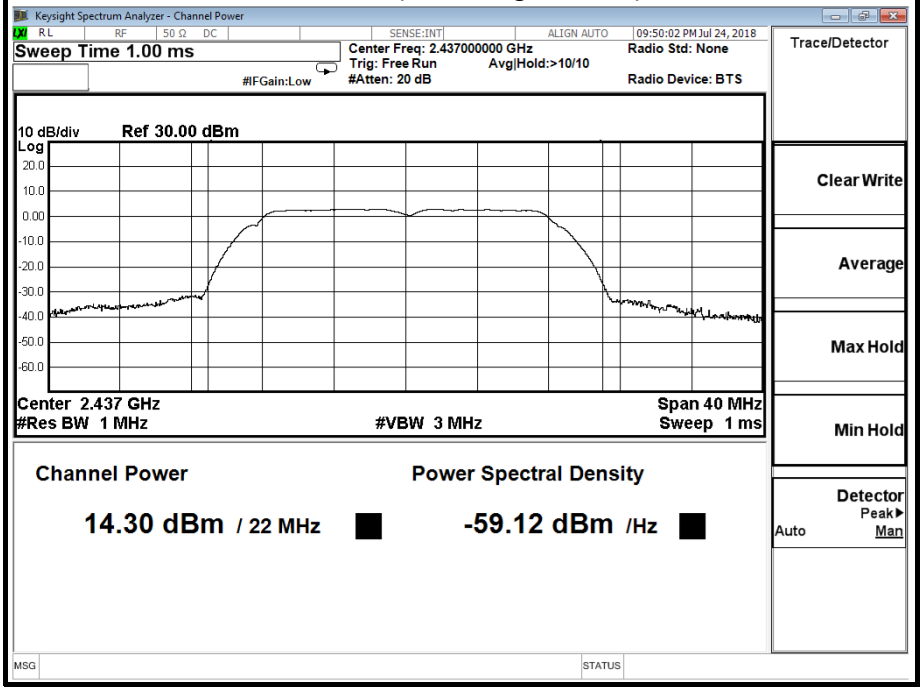


MAXIMUM PEAK OUTPUT POWER (802.11g MODE)

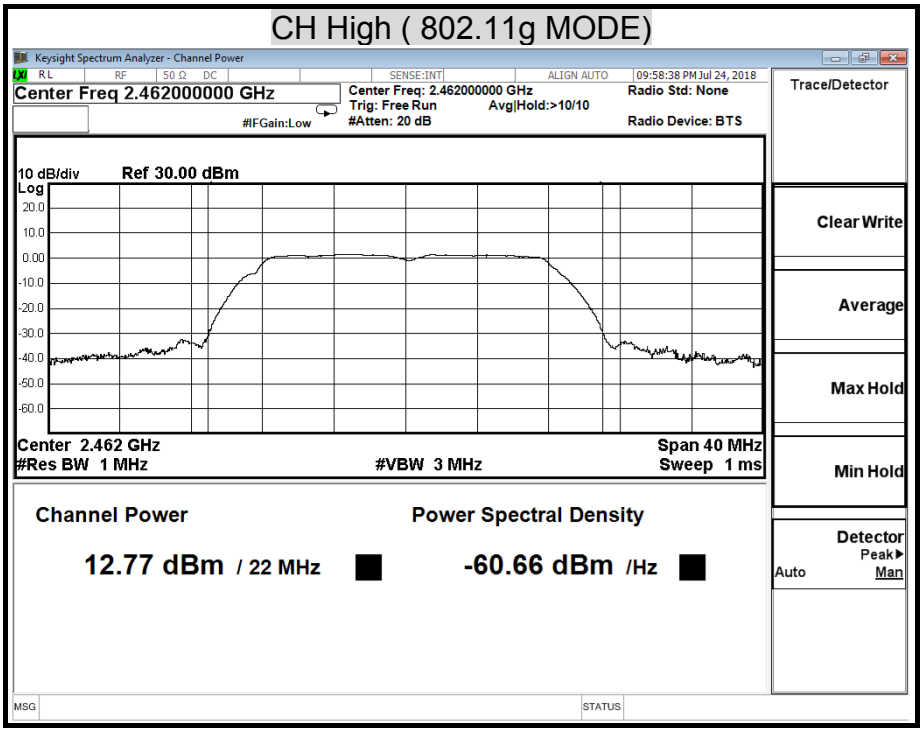
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

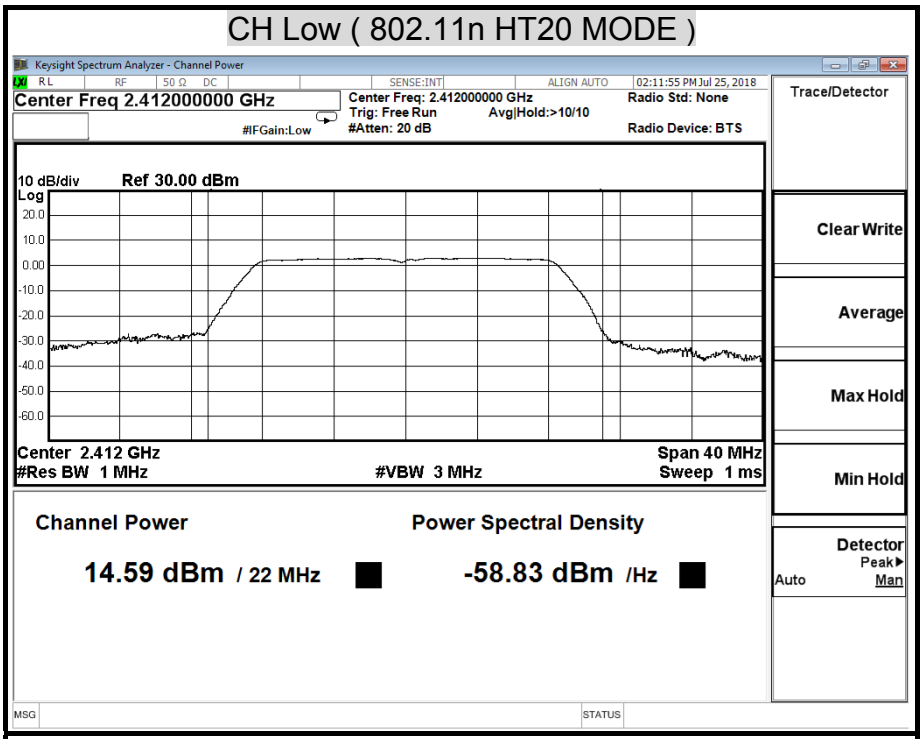


CH High (802.11g MODE)

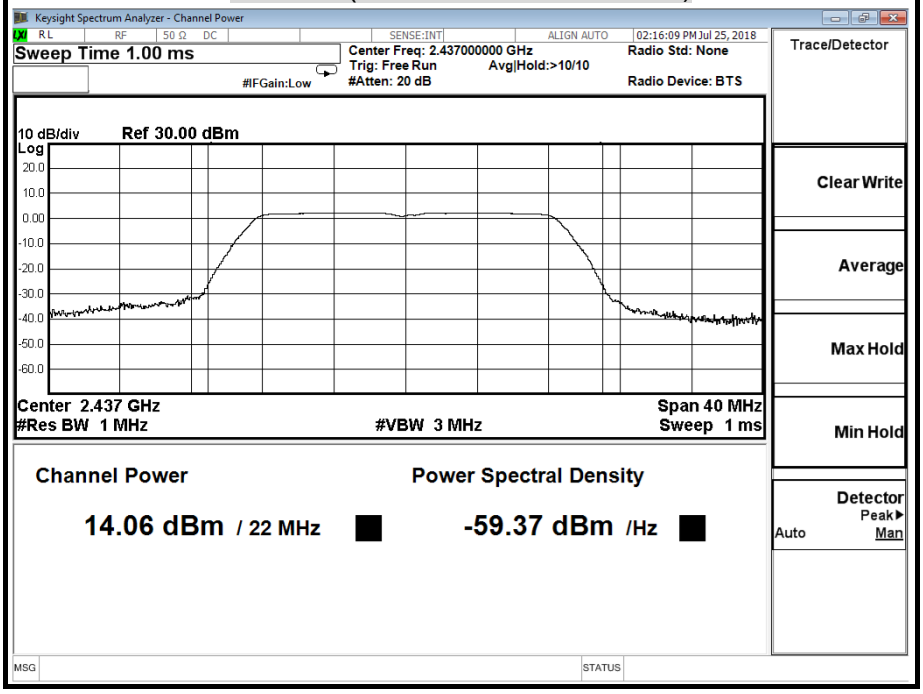


MAXIMUM PEAK OUTPUT POWER (802.11n HT20 MODE)

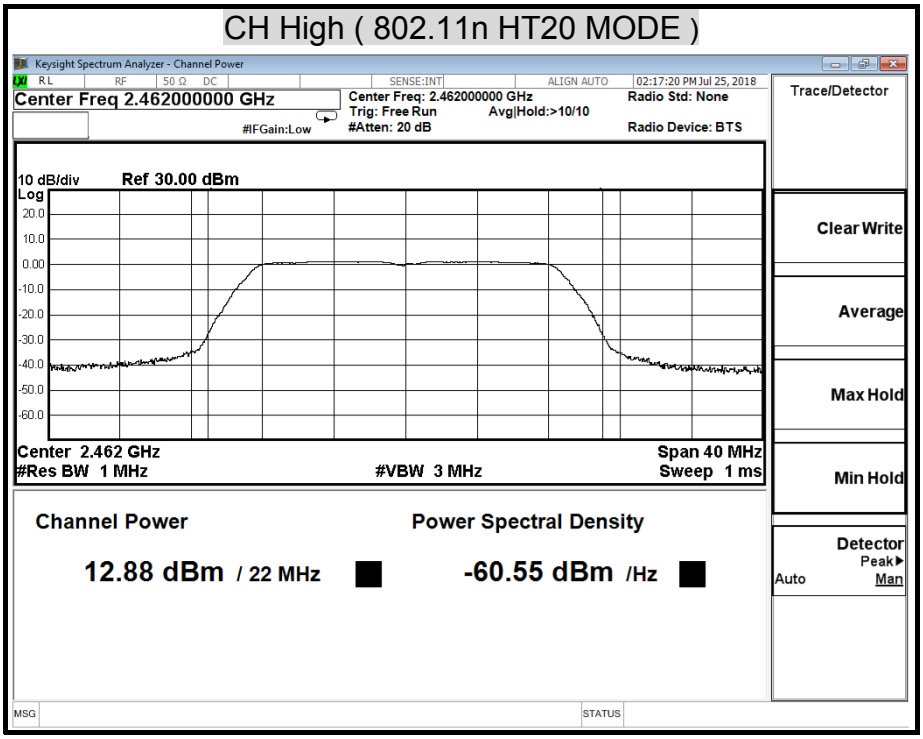
CH Low (802.11n HT20 MODE)



CH Mid (802.11n HT20 MODE)

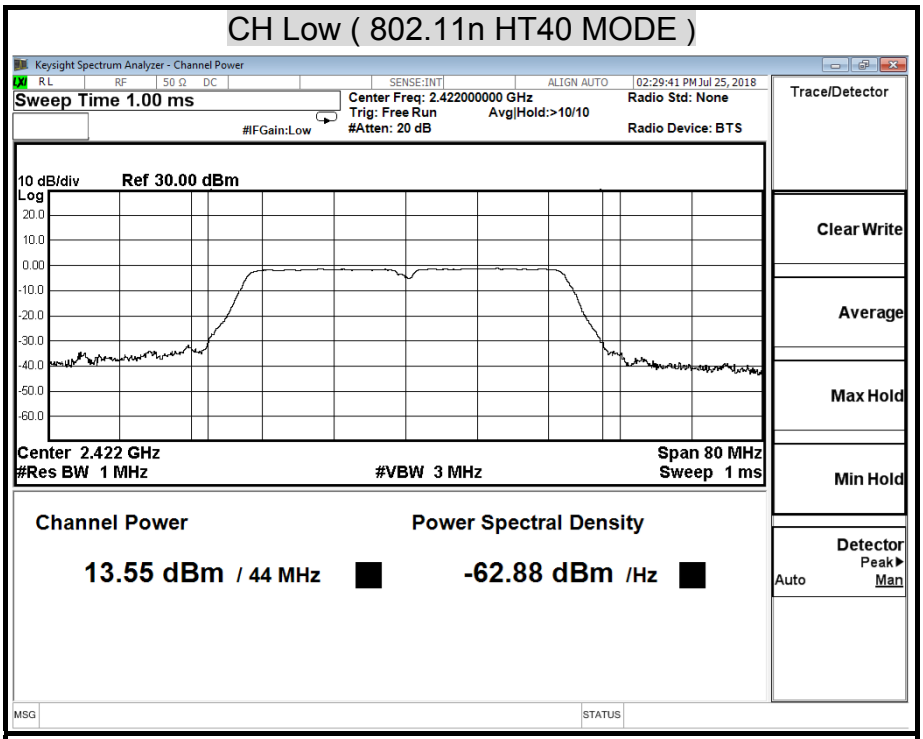


CH High (802.11n HT20 MODE)

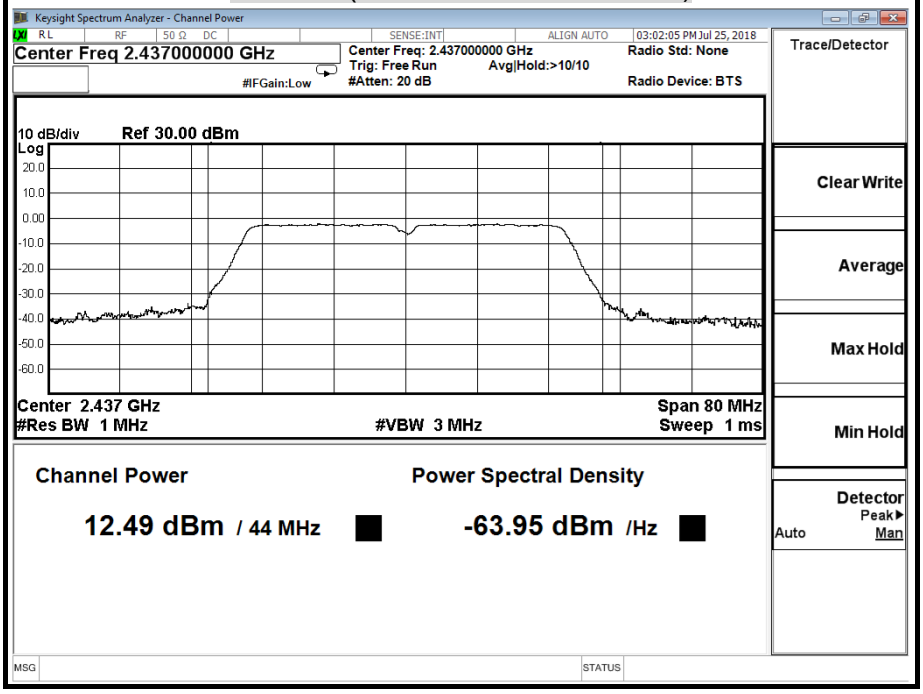


MAXIMUM PEAK OUTPUT POWER (802.11n HT40 MODE)

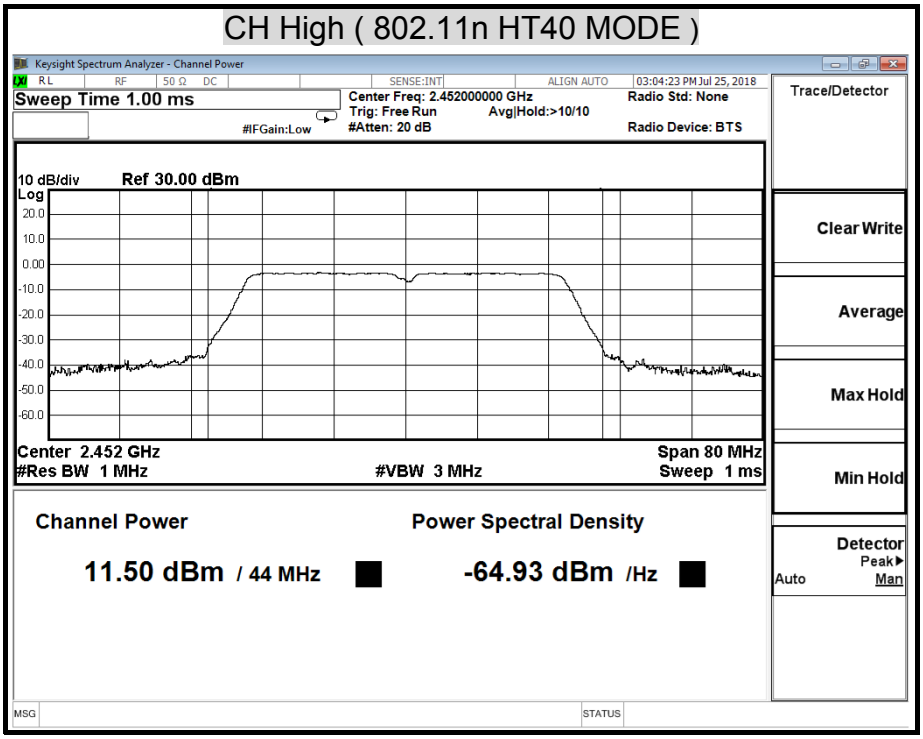
CH Low (802.11n HT40 MODE)



CH Mid (802.11n HT40 MODE)

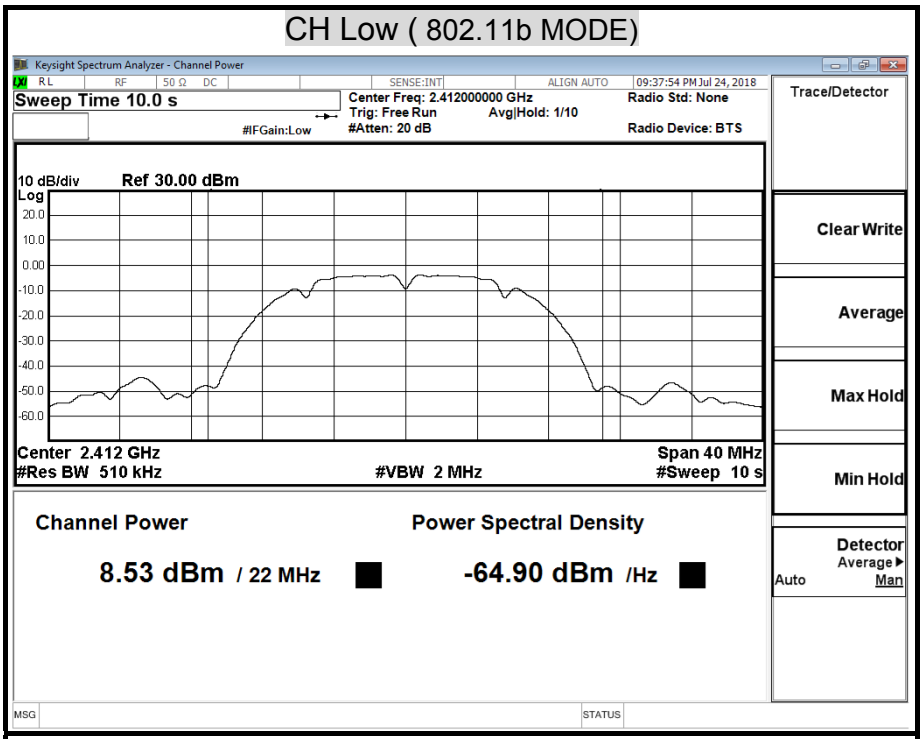


CH High (802.11n HT40 MODE)

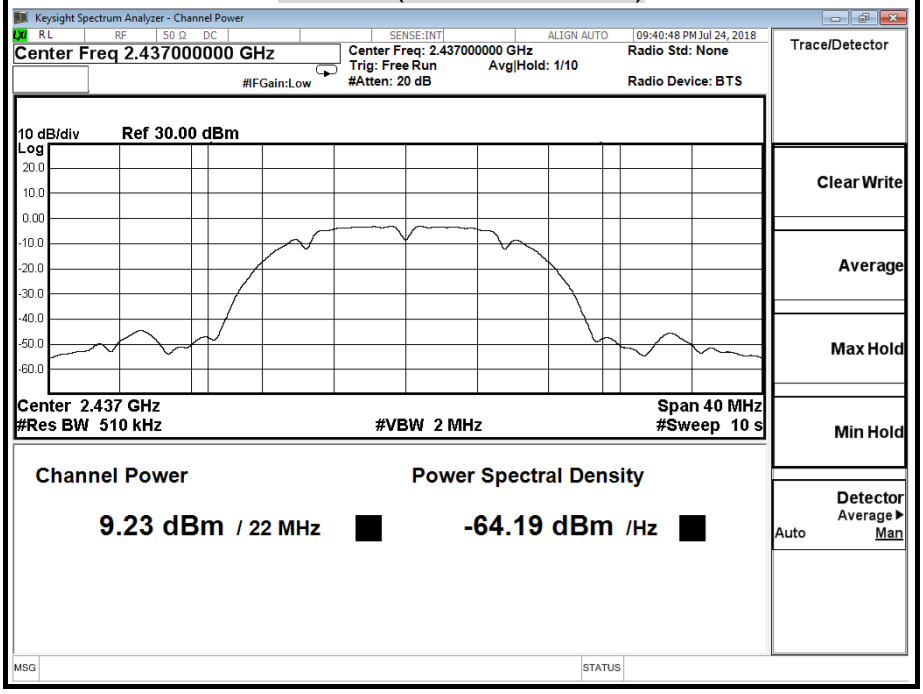


AVERAGE POWER (802.11b MODE)

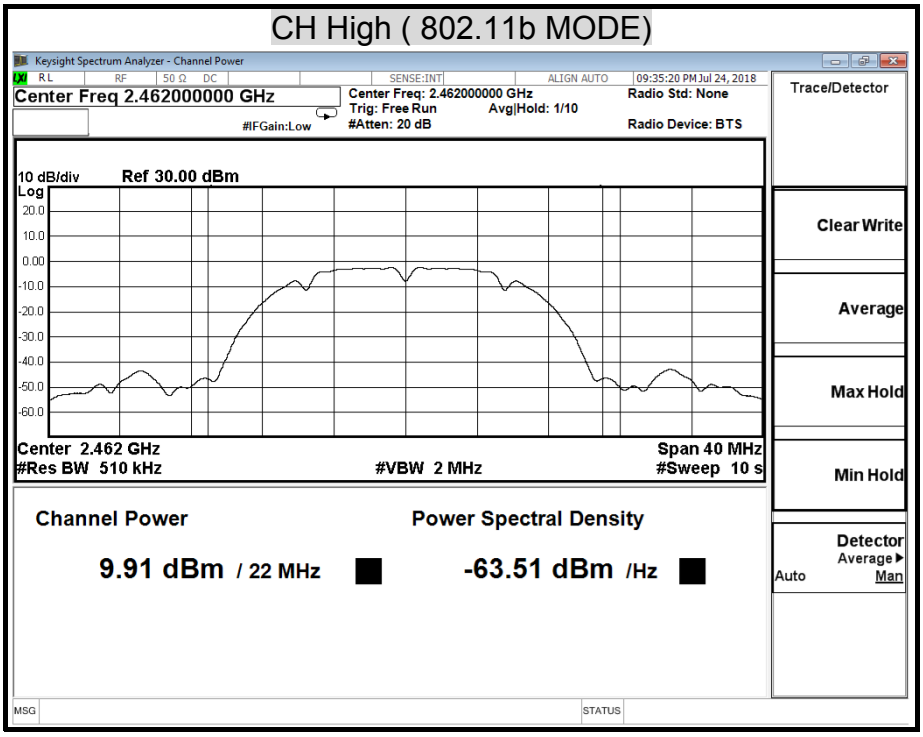
CH Low (802.11b MODE)



CH Mid (802.11b MODE)

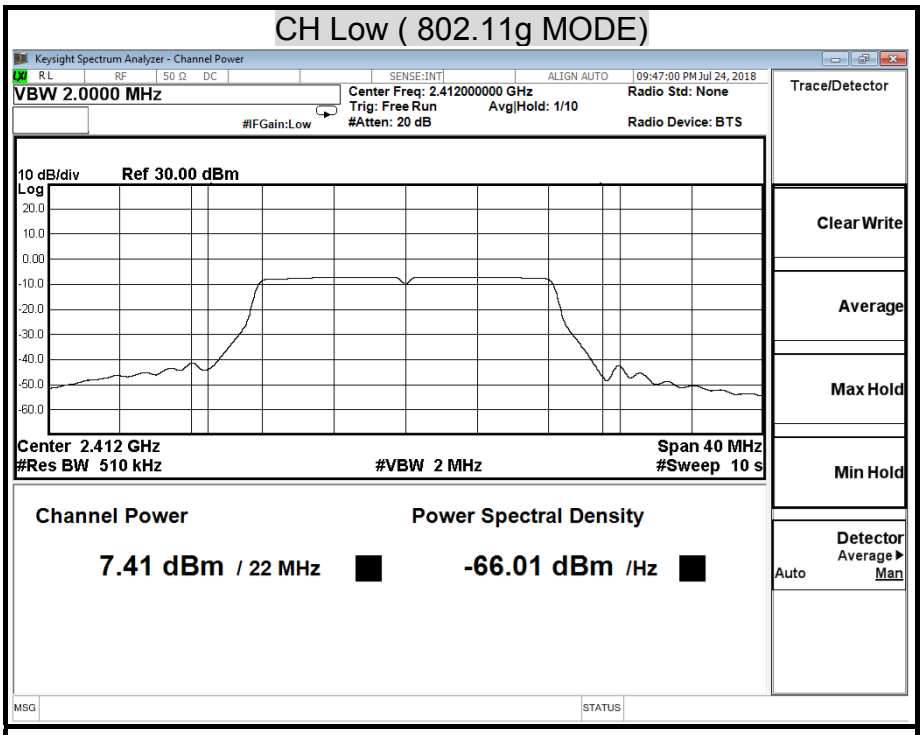


CH High (802.11b MODE)

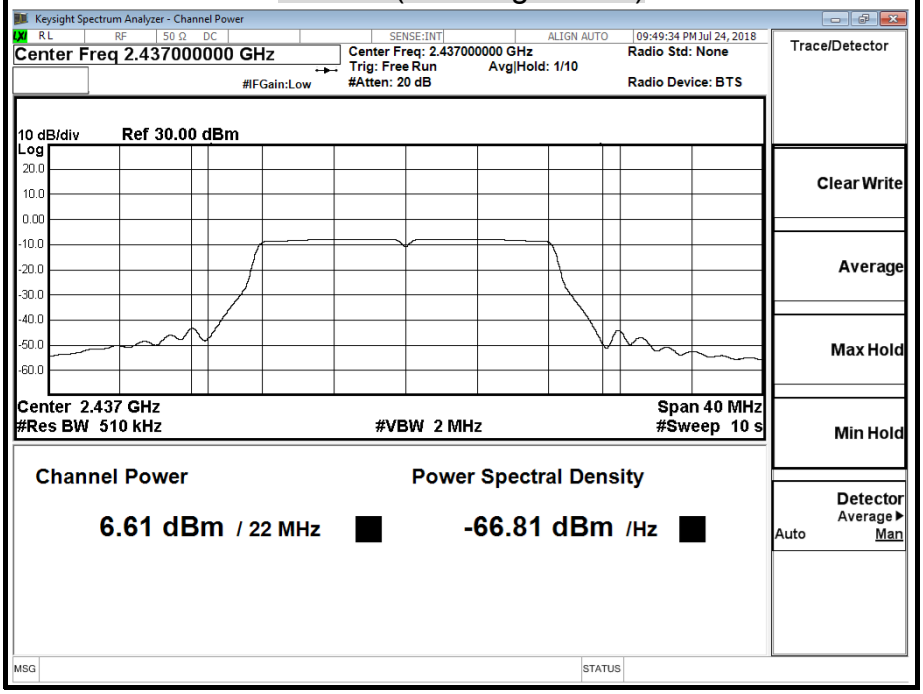


AVERAGE POWER (802.11g MODE)

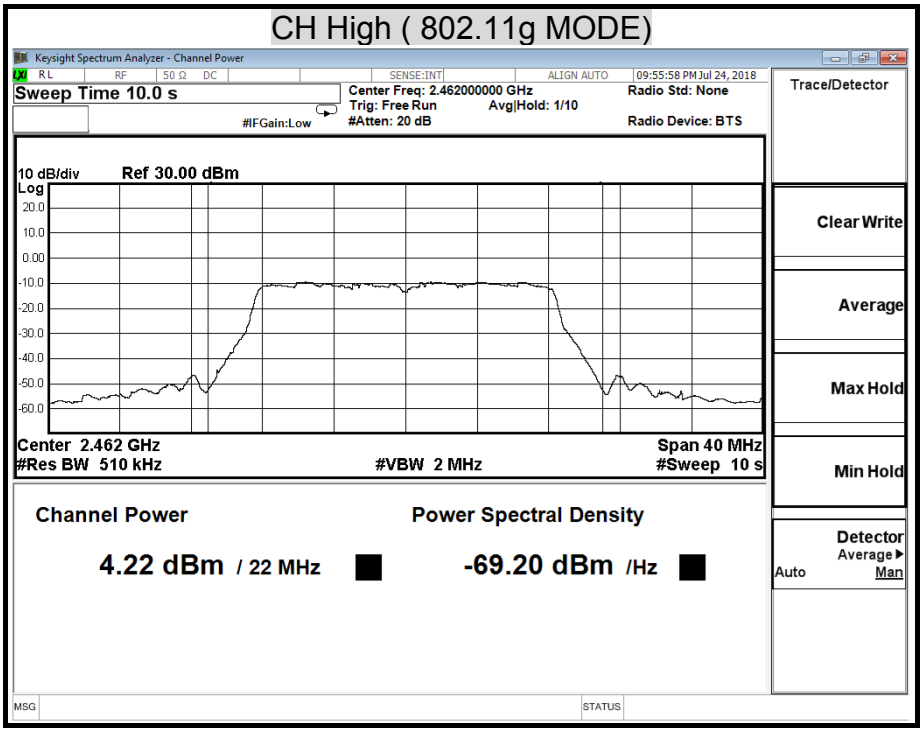
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

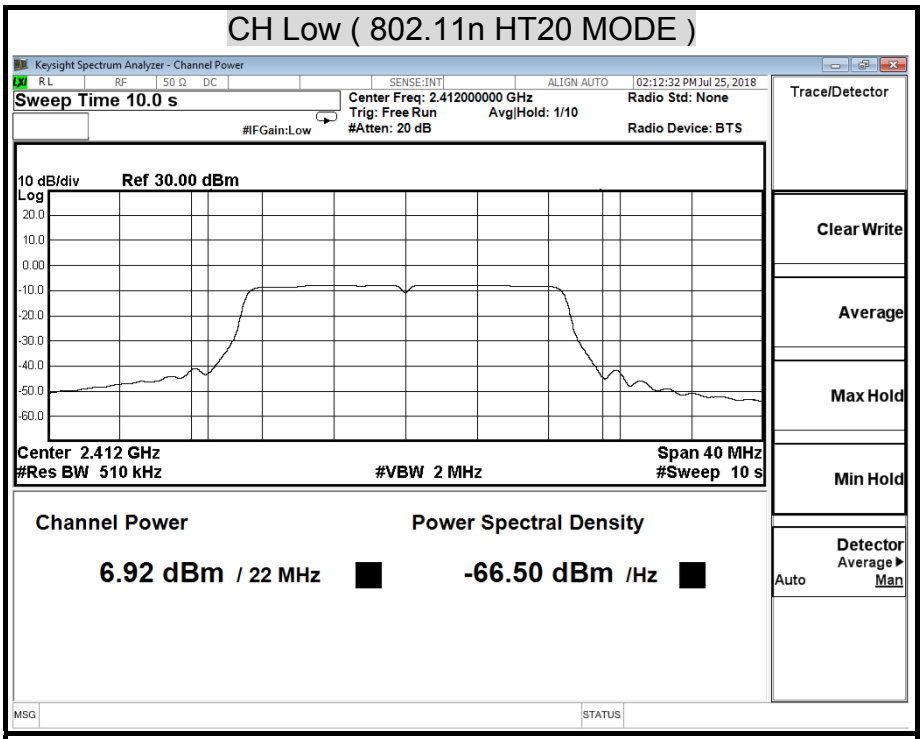


CH High (802.11g MODE)

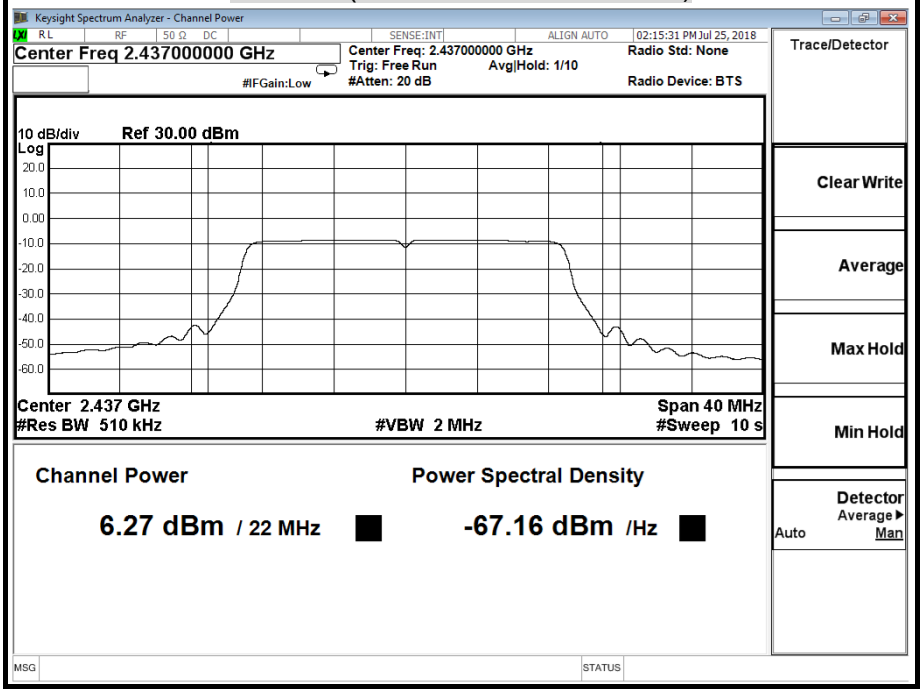


AVERAGE POWER (802.11n HT20 MODE)

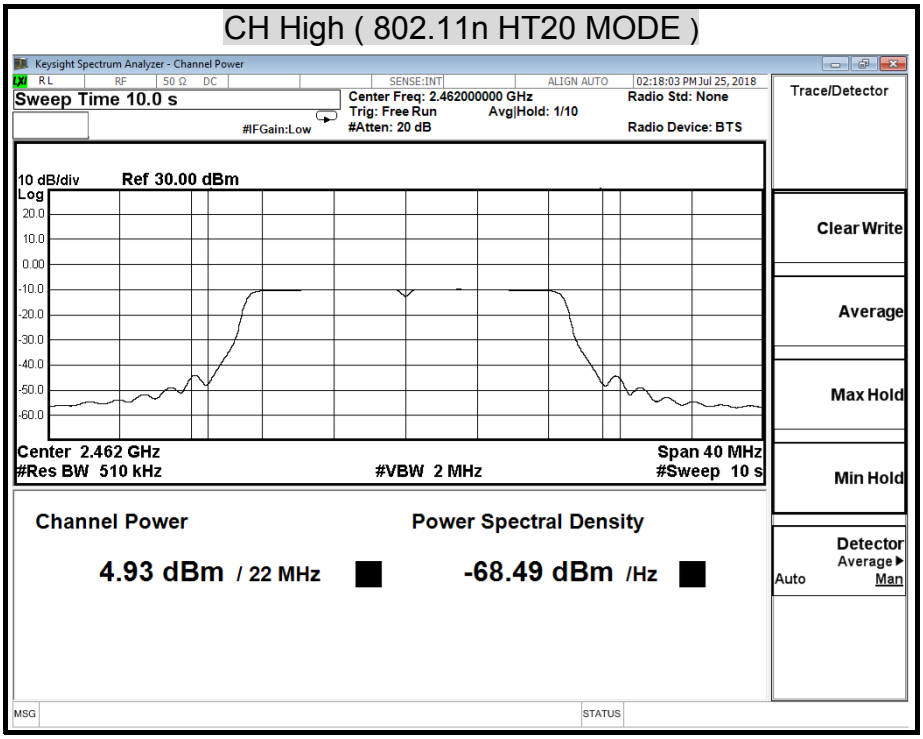
CH Low (802.11n HT20 MODE)



CH Mid (802.11n HT20 MODE)

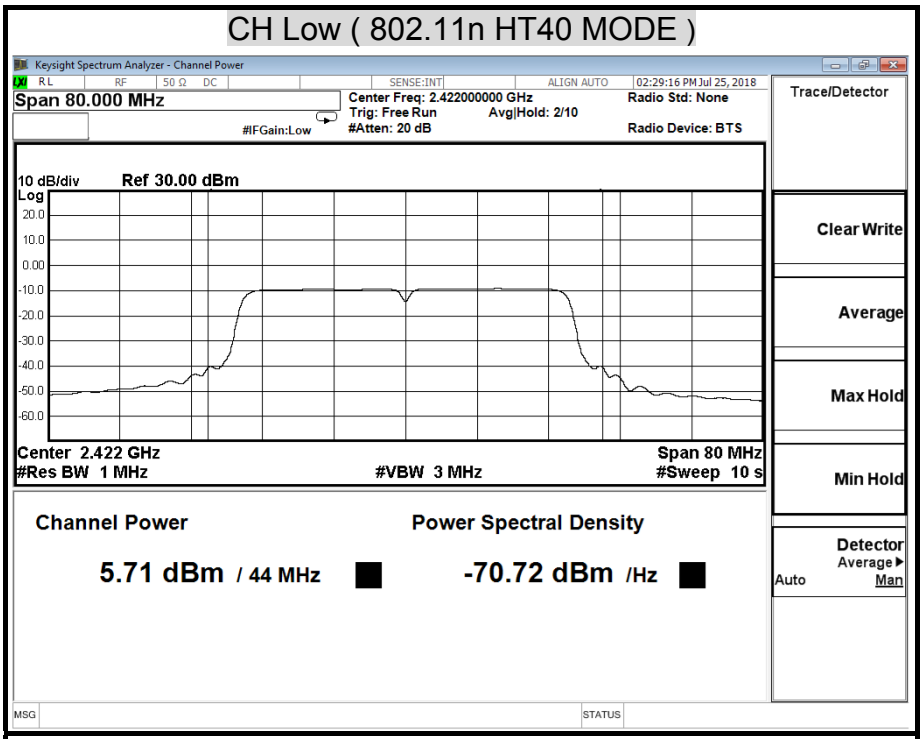


CH High (802.11n HT20 MODE)

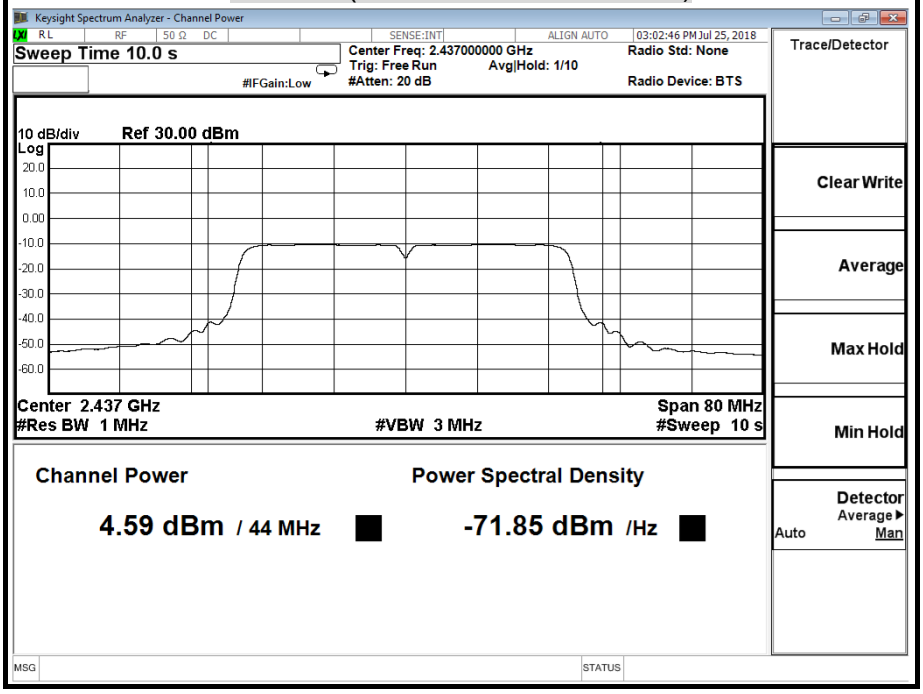


AVERAGE POWER (802.11n HT40 MODE)

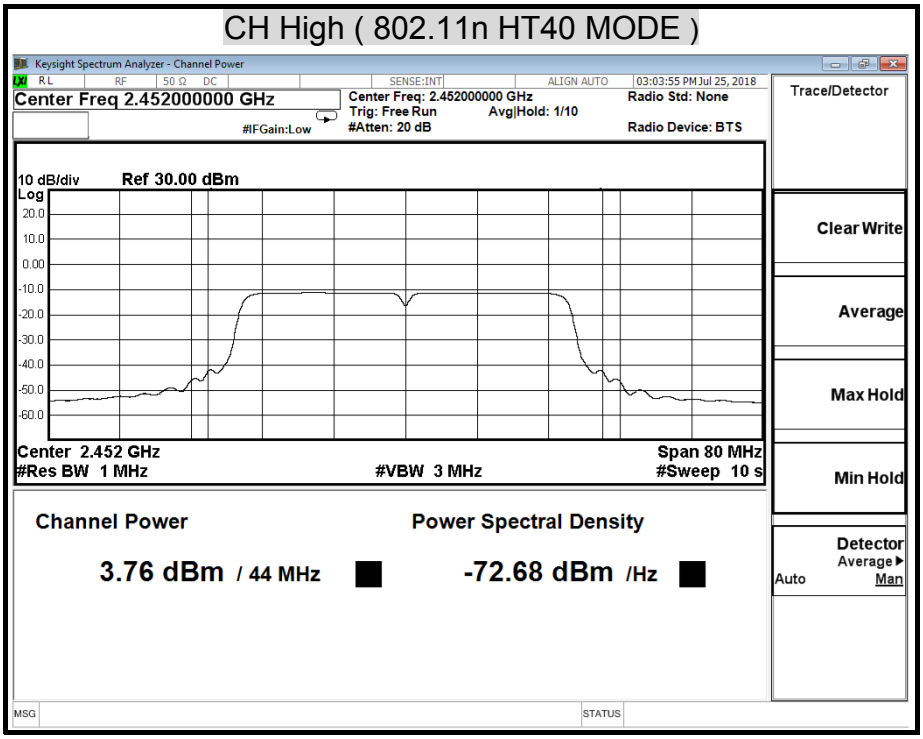
CH Low (802.11n HT40 MODE)



CH Mid (802.11n HT40 MODE)



CH High (802.11n HT40 MODE)



8.3 DUTY CYCLE

LIMIT

Nil (No dedicated limit specified in the Rules)

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/05/2018	07/04/2019
SMA Cable + 10dB Attenuator	CCS	SMA + 10dB Att	O6	01/22/2018	01/21/2019

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP

TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)

TEST RESULTS

No non-compliance noted.

Model Name	CK8522	Test By	Ted Huang
Temp & Humidity	26.5°C, 54%	Test Date	2018/07/25

TEST DATA

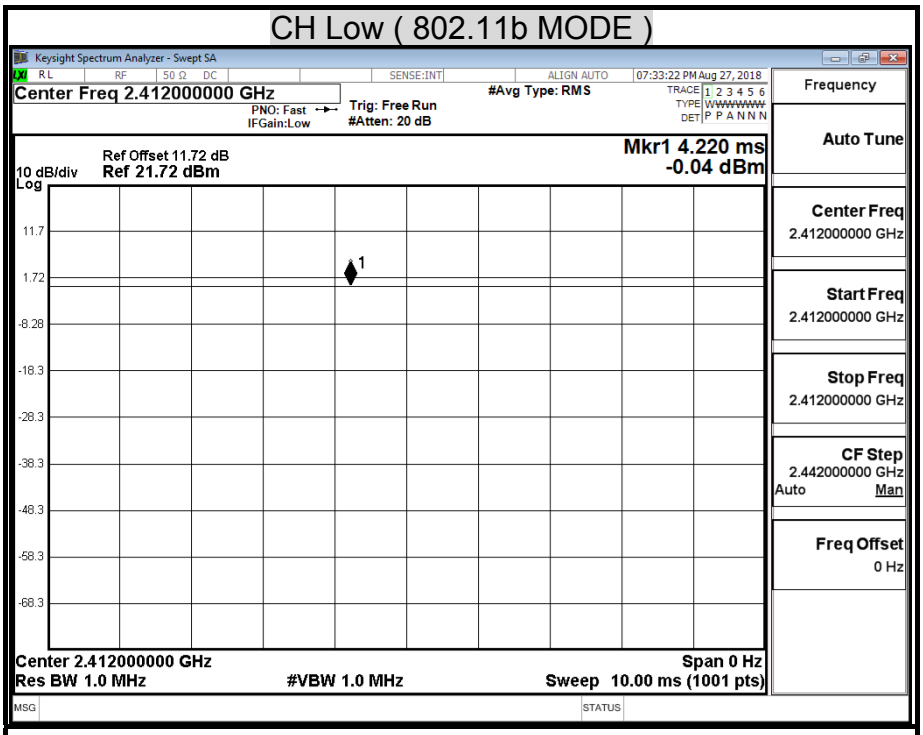
	us	Times	Ton	Total Ton time(ms)
Ton1	10000.000	1	10000	
Ton2		0	0	
Ton3			0	10
Tp				10

Ton	10		
Tp(Ton+Toff)	10		
Duty Cycle	1	100	%
Duty Factor	0		

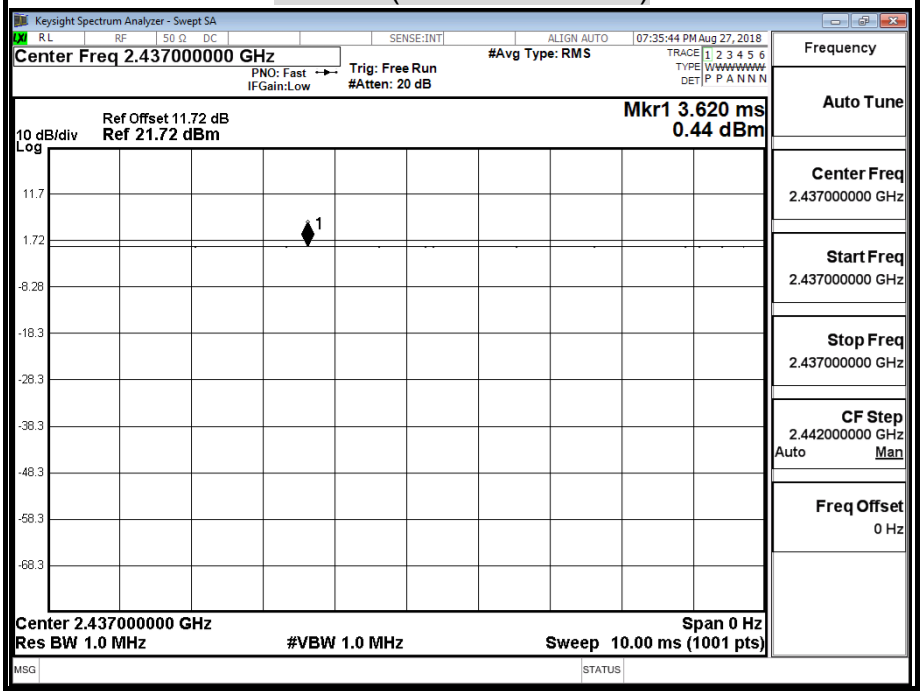
TEST PLOT

Duty Cycle (IEEE 802.11b MODE)

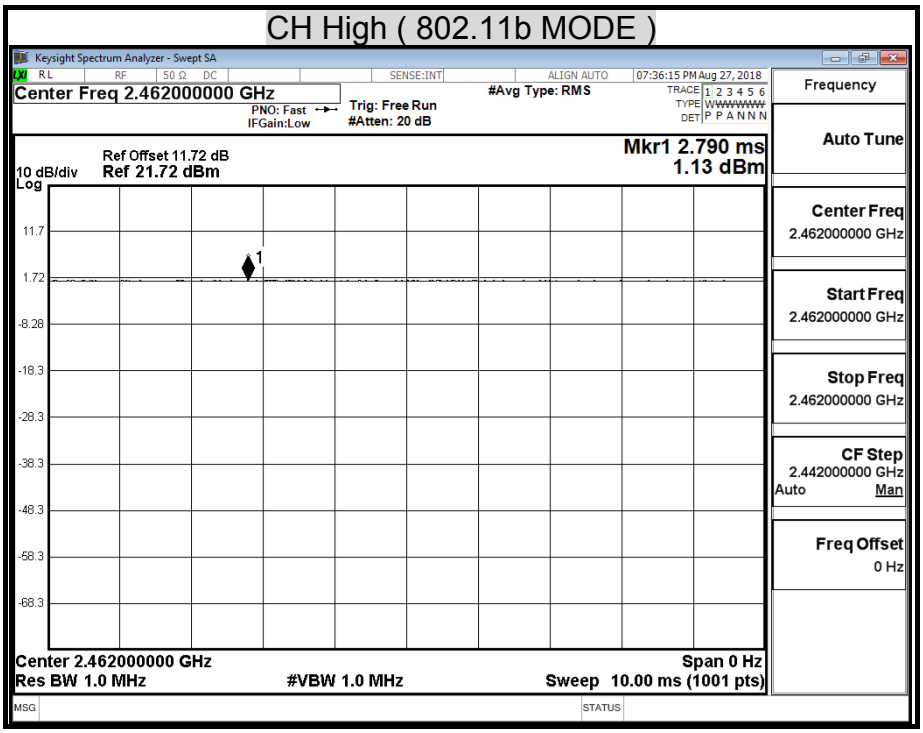
CH Low (802.11b MODE)



CH Mid (802.11b MODE)

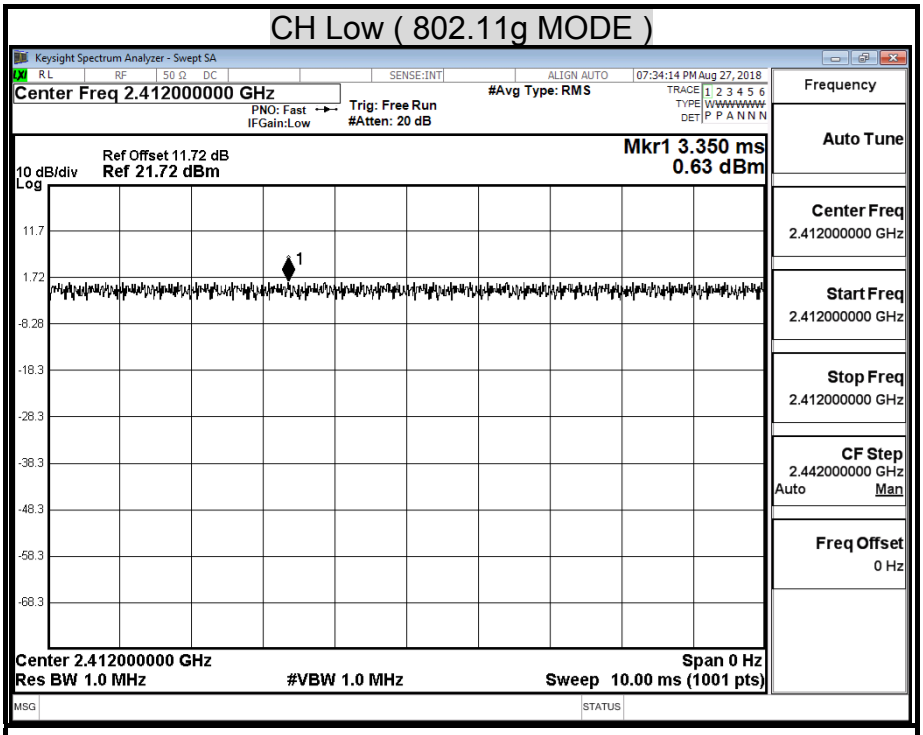


CH High (802.11b MODE)

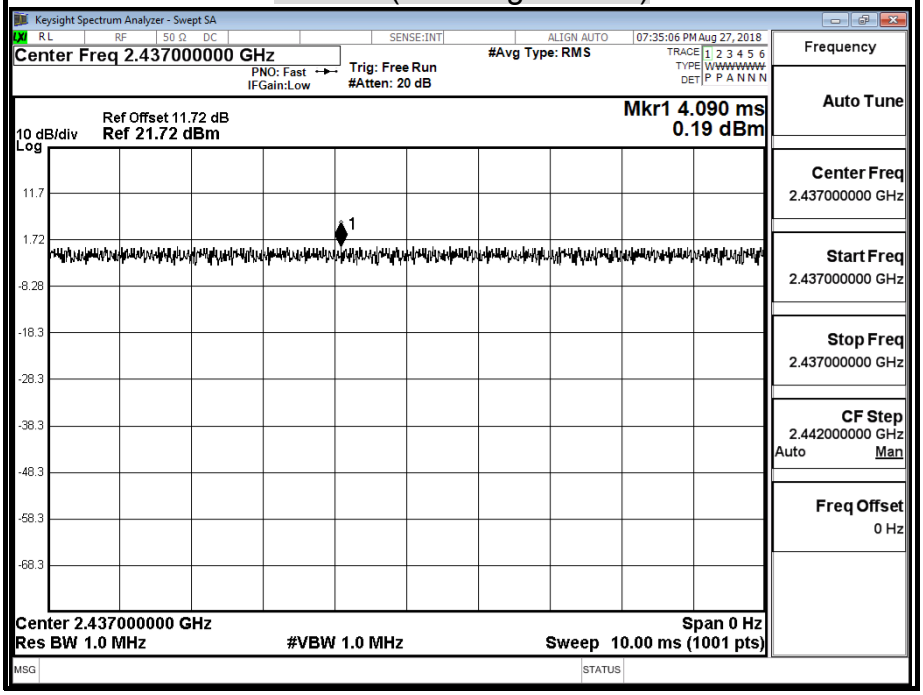


Duty Cycle (IEEE 802.11g MODE)

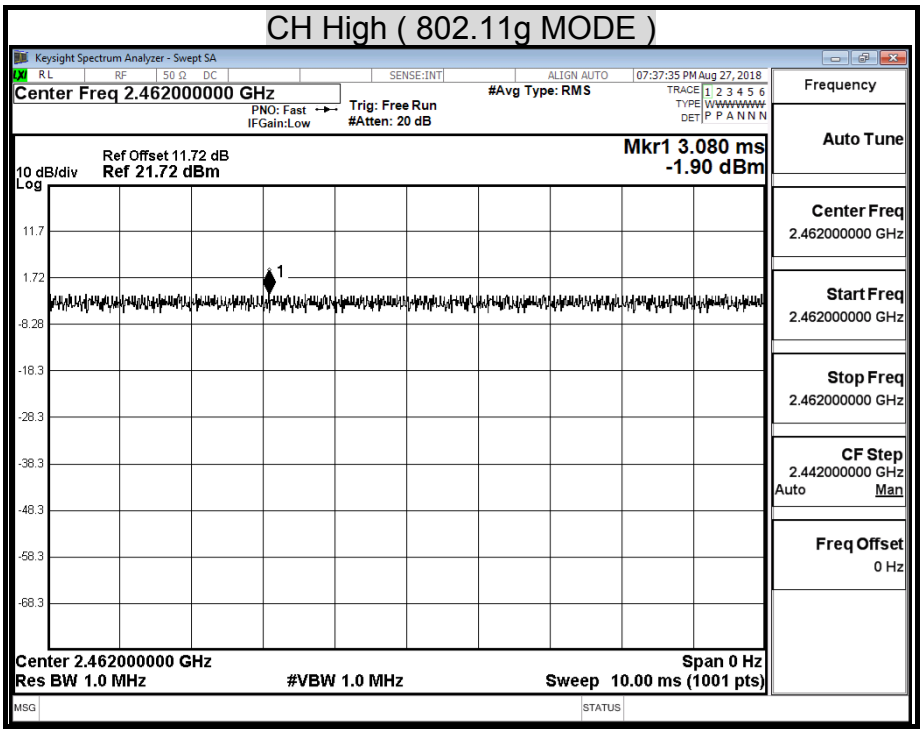
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

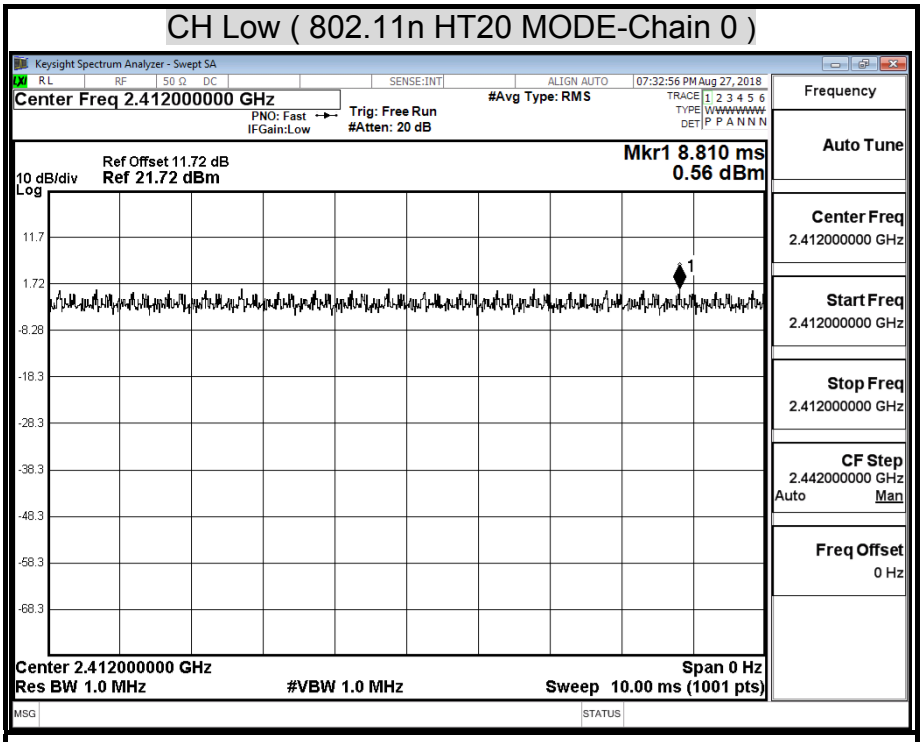


CH High (802.11g MODE)

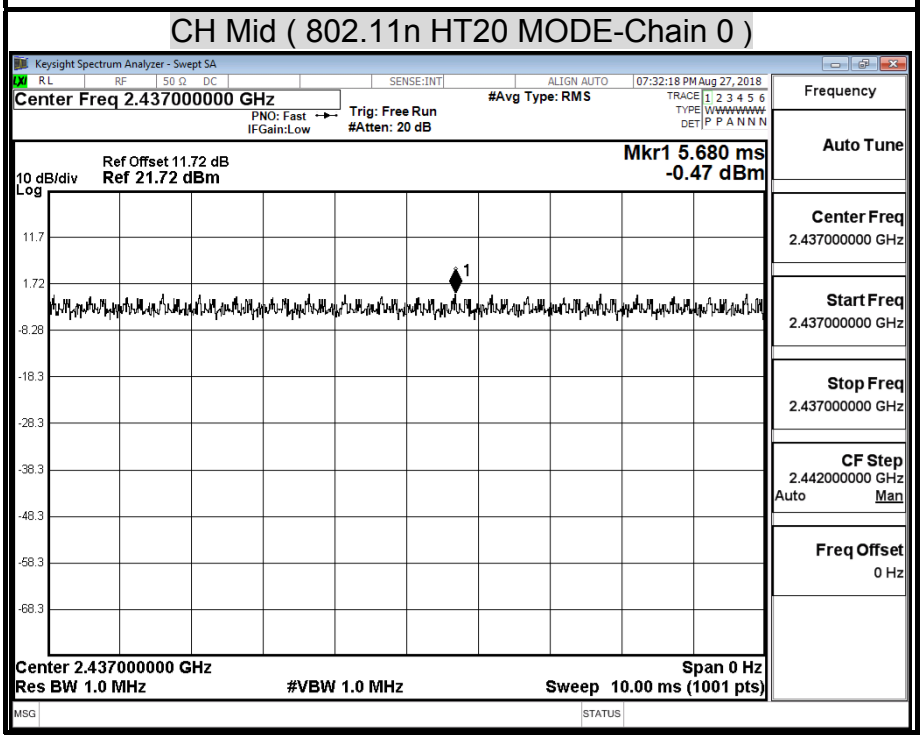


Duty Cycle (802.11n HT20 MODE)

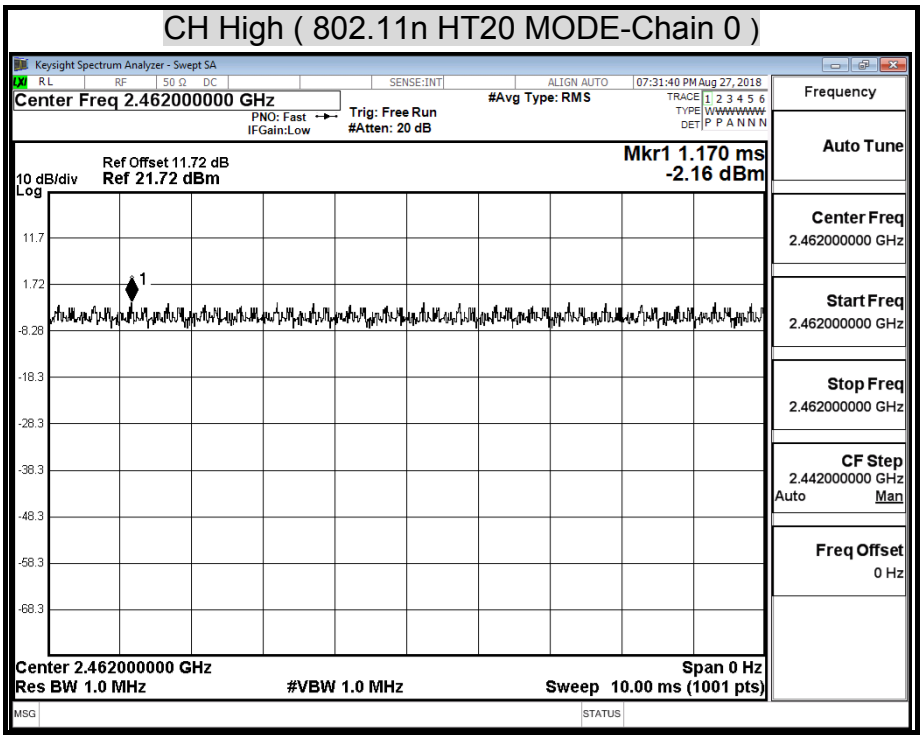
CH Low (802.11n HT20 MODE-Chain 0)



CH Mid (802.11n HT20 MODE-Chain 0)

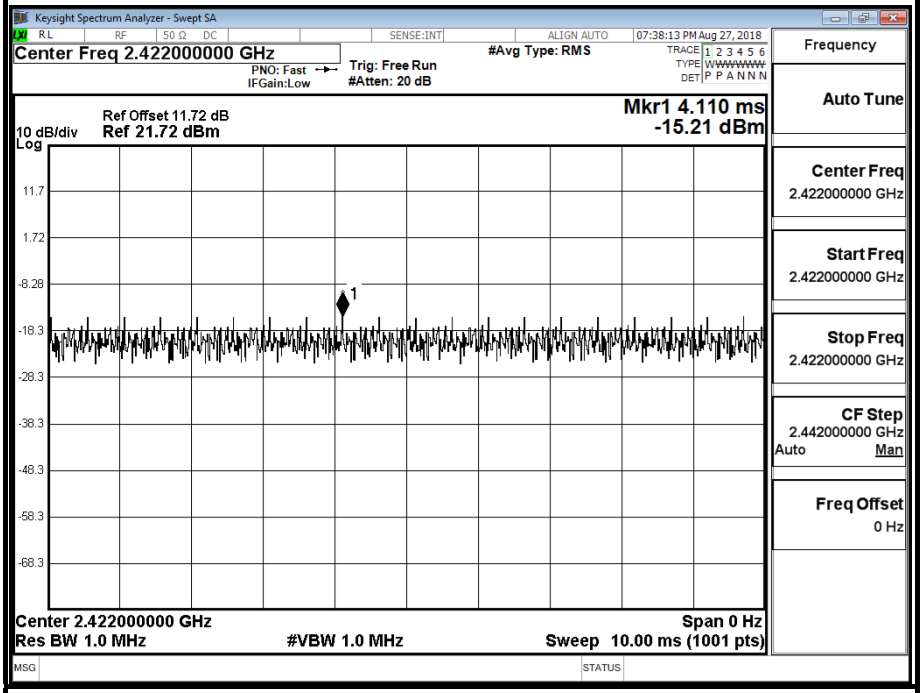


CH High (802.11n HT20 MODE-Chain 0)

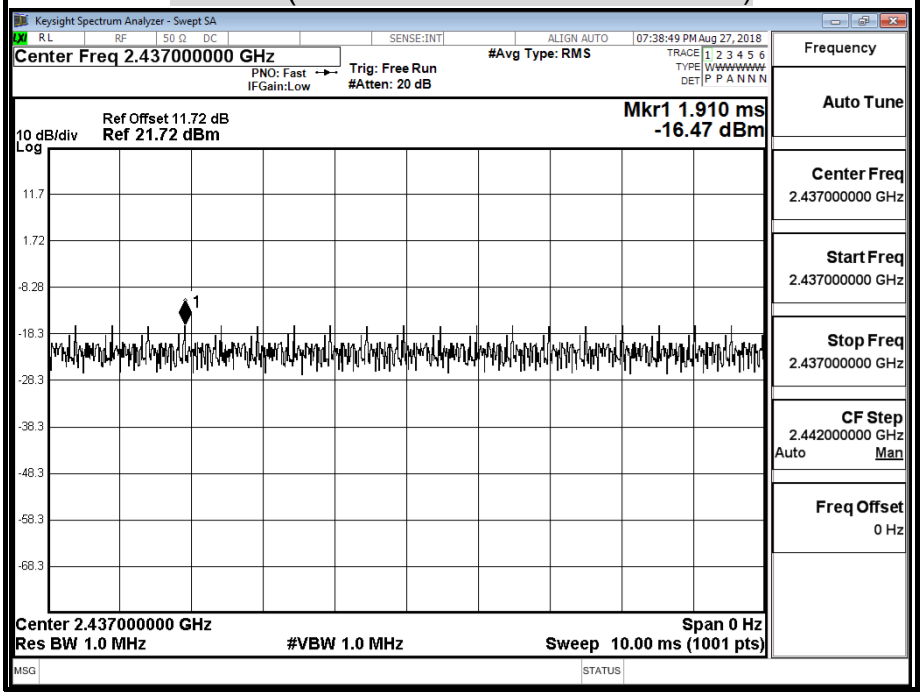


Duty Cycle (802.11n HT40 MODE)

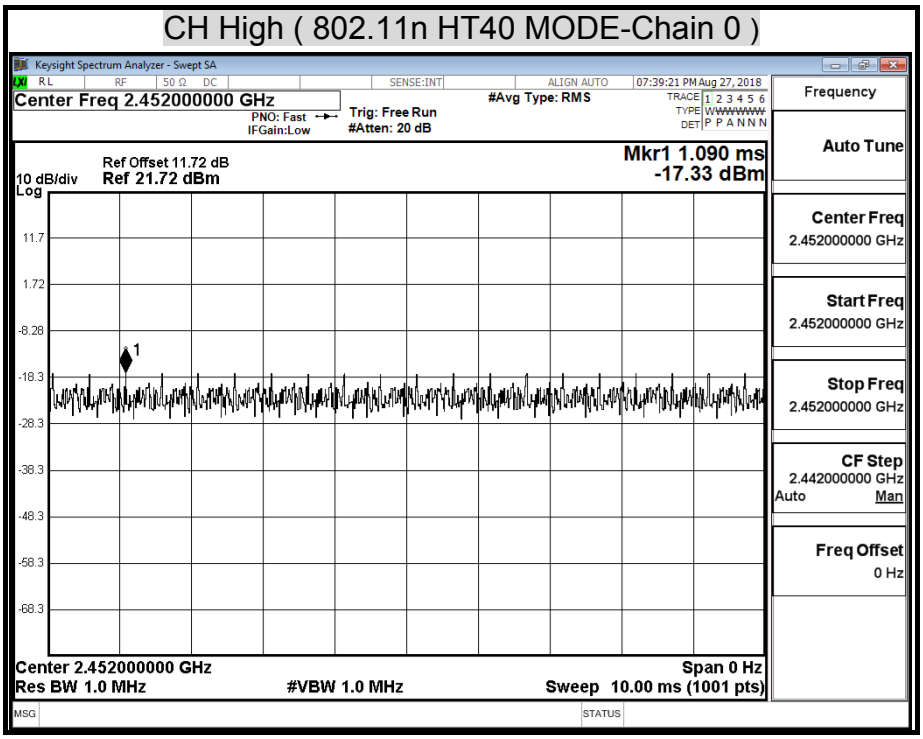
CH Low (802.11n HT40 MODE-Chain 0)



CH Mid (802.11n HT40 MODE-Chain 0)



CH High (802.11n HT40 MODE-Chain 0)



8.4 POWER SPECTRAL DENSITY

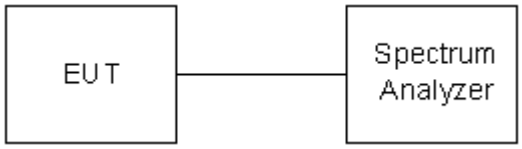
LIMIT

§ 15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST EQUIPMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/05/2018	07/04/2019
SMA Cable + 10dB Attenuator	CCS	SMA + 10dB Att	O6	01/22/2018	01/21/2019

TEST SETUP



TEST PROCEDURE

The tests were performed in accordance with KDB 558074 5.3.1.

5.3.1 Measurement Procedure PKPSD:

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the *DTS bandwidth*.
3. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 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 within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST RESULTS

No non-compliance noted.

Model Name	CK8522	Test By	Ted Huang
Temp & Humidity	26.5°C, 54%	Test Date	2018/07/25

IEEE 802.11b mode

Channel	Frequency (MHz)	PPSD/100kHz (dBm)	PPSD/3kHz (dBm)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	2412	-2.98	-18.21	8.00	-26.21	PASS
Middle	2437	-1.15	-16.38	8.00	-24.38	PASS
High	2462	-1.20	-16.43	8.00	-24.43	PASS

NOTE : 1. At finial test to get the worst-case emission at 1long Mbps long.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. PPSD/3kHz=PPSD/100kHz+10*(log3/100)

IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD/100kHz (dBm)	PPSD/3kHz (dBm)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	2412	-6.79	-22.02	8.00	-30.02	PASS
Middle	2437	-7.59	-22.82	8.00	-30.82	PASS
High	2462	-9.01	-24.24	8.00	-32.24	PASS

NOTE : 1. At finial test to get the worst-case emission at 6Mbps long.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. PPSD/3kHz=PPSD/100kHz+10*(log3/100)

IEEE 802.11n HT20 mode

Channel	Frequency (MHz)	PPSD/100kHz (dBm)	PPSD/3kHz (dBm)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	2412	-6.62	-21.84	8.00	-29.84	PASS
Middle	2437	-7.00	-22.23	8.00	-30.23	PASS
High	2462	-9.09	-24.32	8.00	-32.32	PASS

NOTE : 1. At finial test to get the worst-case emission at 6.5Mbps long.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. PPSD/3kHz=PPSD/100kHz+10*(log3/100)

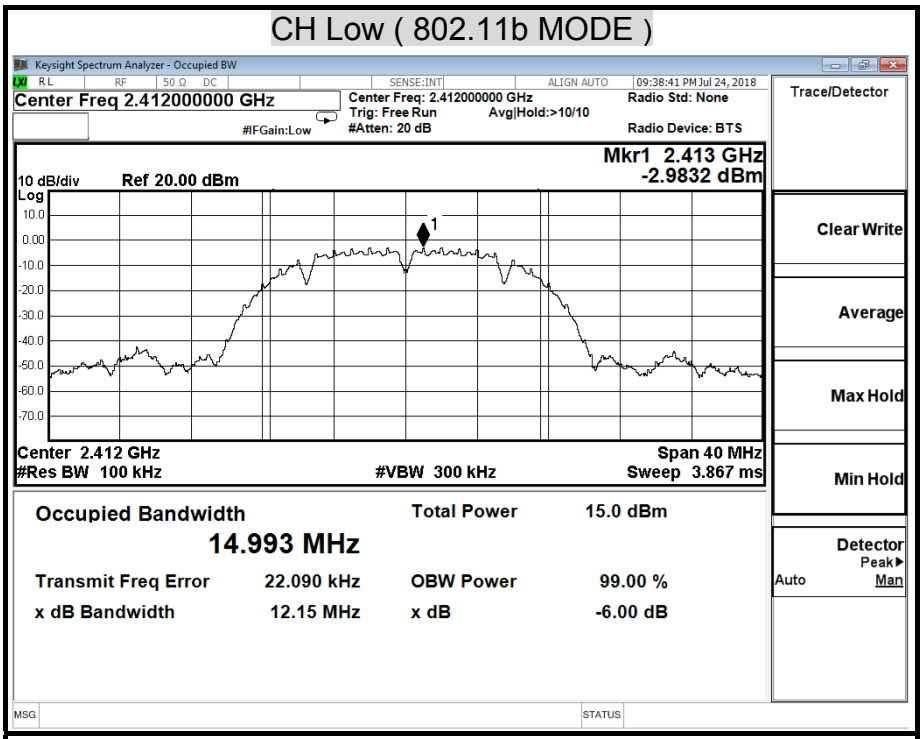
IEEE 802.11n HT40 mode

Channel	Frequency (MHz)	PPSD/100kHz (dBm)	PPSD/3kHz (dBm)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	2422	-10.99	-26.22	8.00	-34.22	PASS
Middle	2437	-15.08	-30.30	8.00	-38.30	PASS
High	2452	-16.48	-31.71	8.00	-39.71	PASS

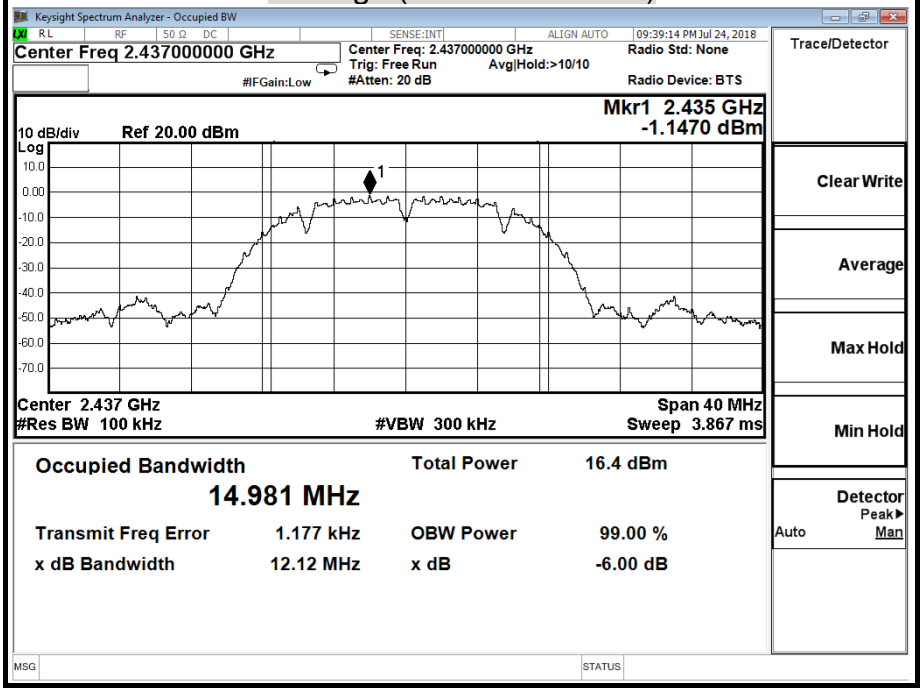
NOTE : 1. At finial test to get the worst-case emission at 13Mbps long.
2. The cable assembly insertion loss of 11.1dB (including 10 dB pad and 1.1 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.
3. PPSD/3kHz=PPSD/100kHz+10*(log3/100)

POWER SPECTRAL DENSITY (IEEE 802.11b MODE)

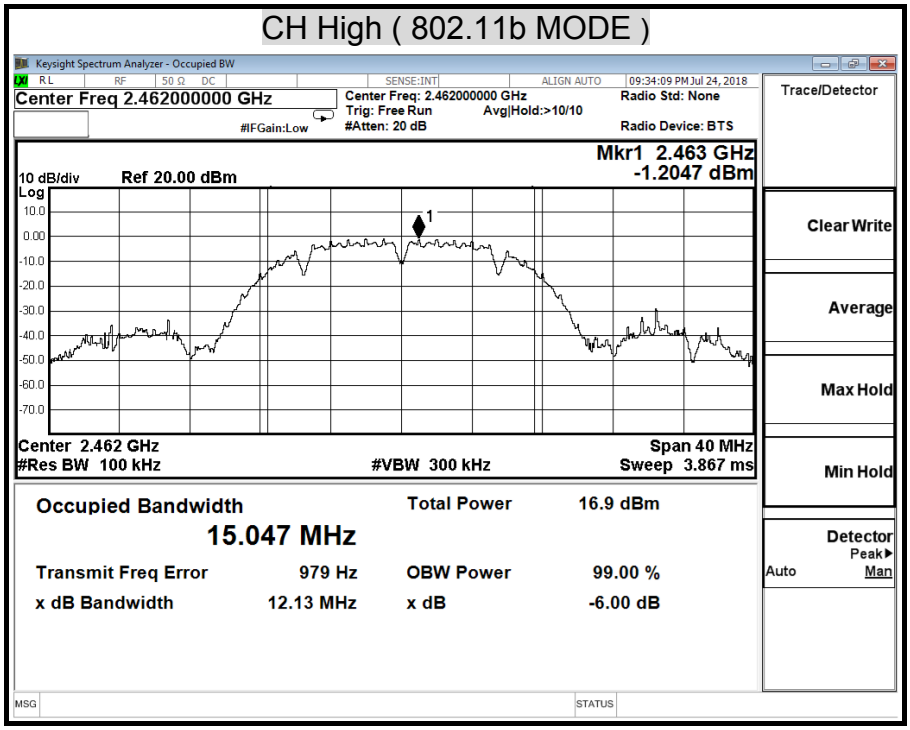
CH Low (802.11b MODE)



CH High (802.11b MODE)

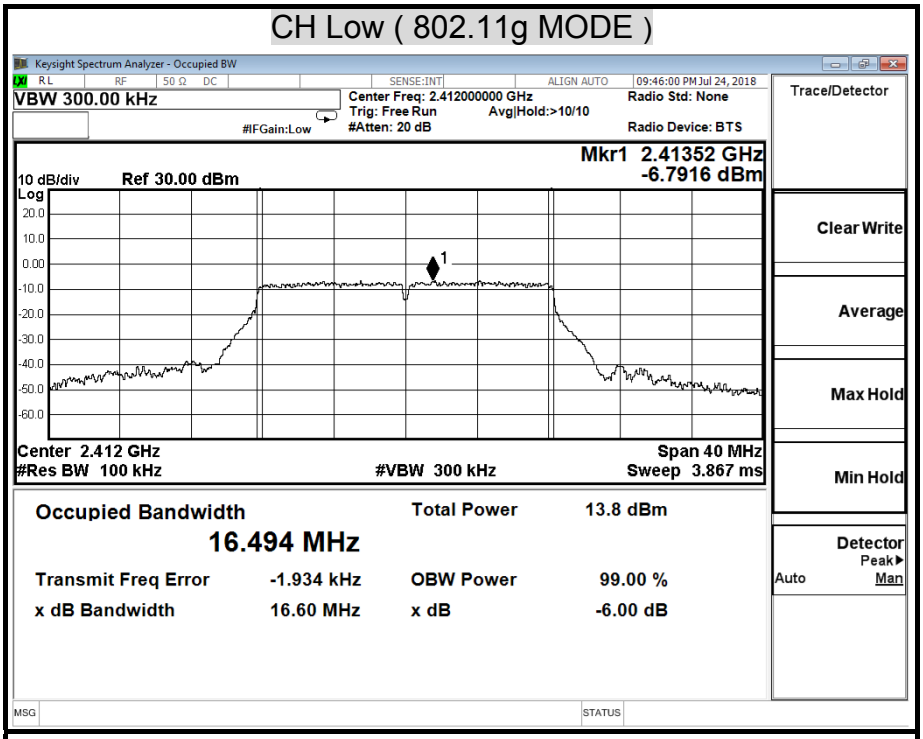


CH High (802.11b MODE)

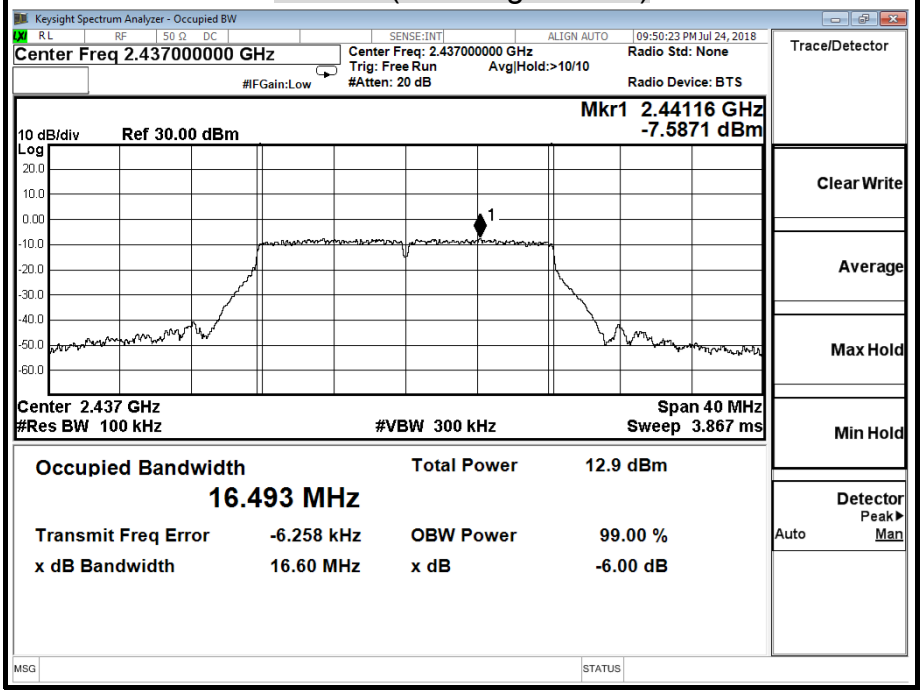


POWER SPECTRAL DENSITY (IEEE 802.11g MODE)

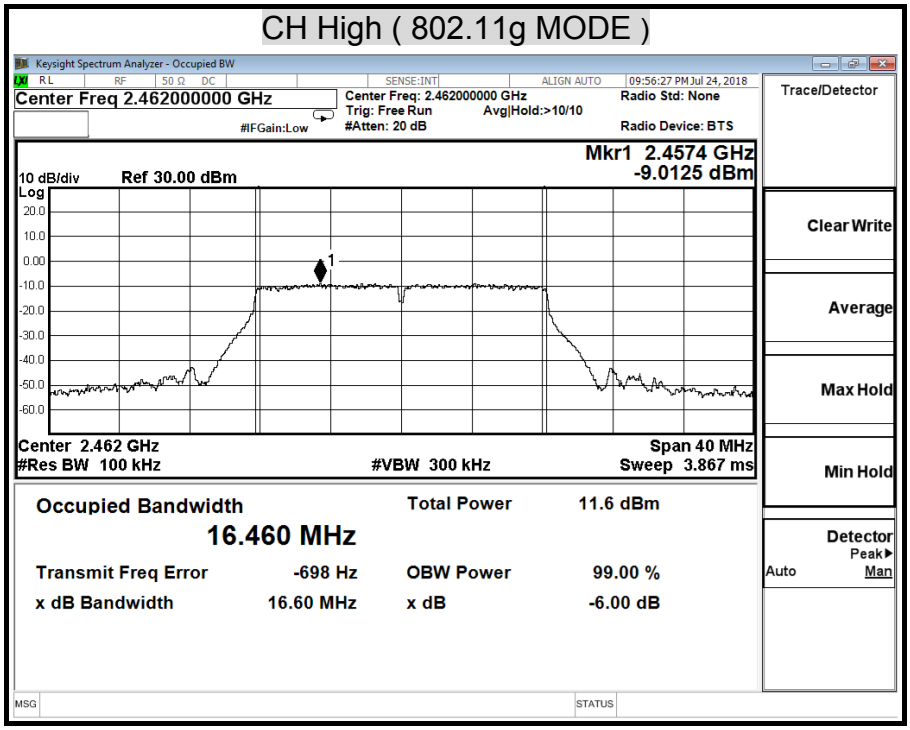
CH Low (802.11g MODE)



CH Mid (802.11g MODE)

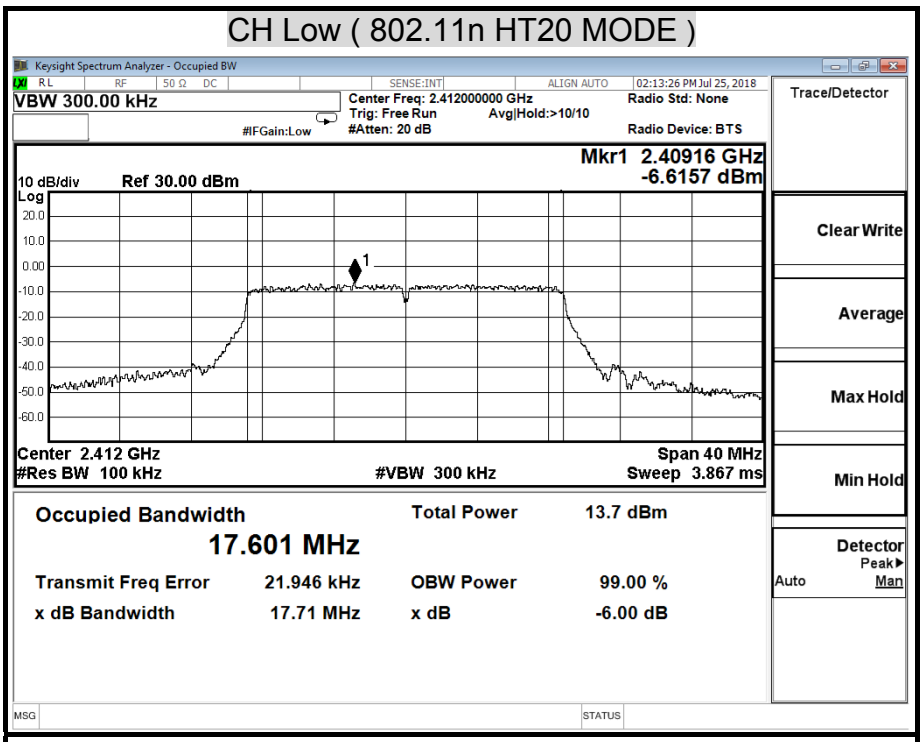


CH High (802.11g MODE)

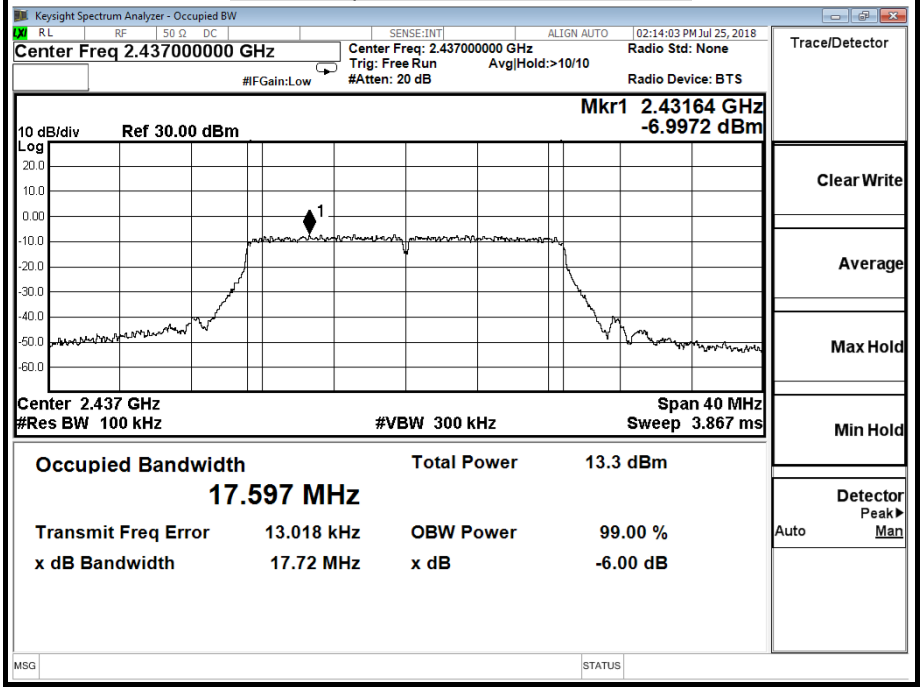


POWER SPECTRAL DENSITY (802.11n HT20 MODE)

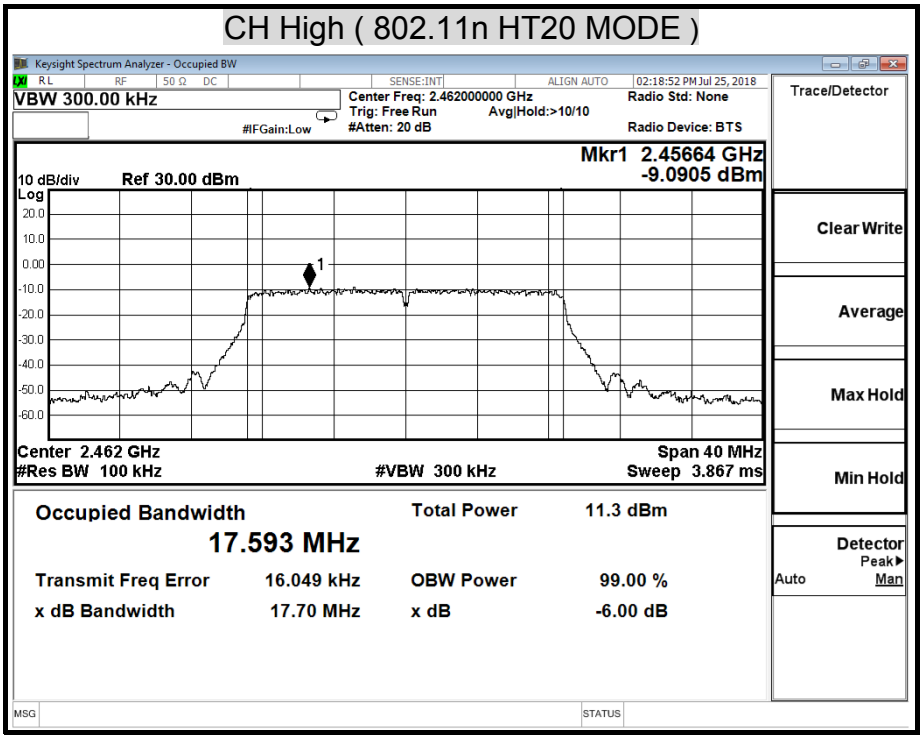
CH Low (802.11n HT20 MODE)



CH Mid (802.11n HT20 MODE)

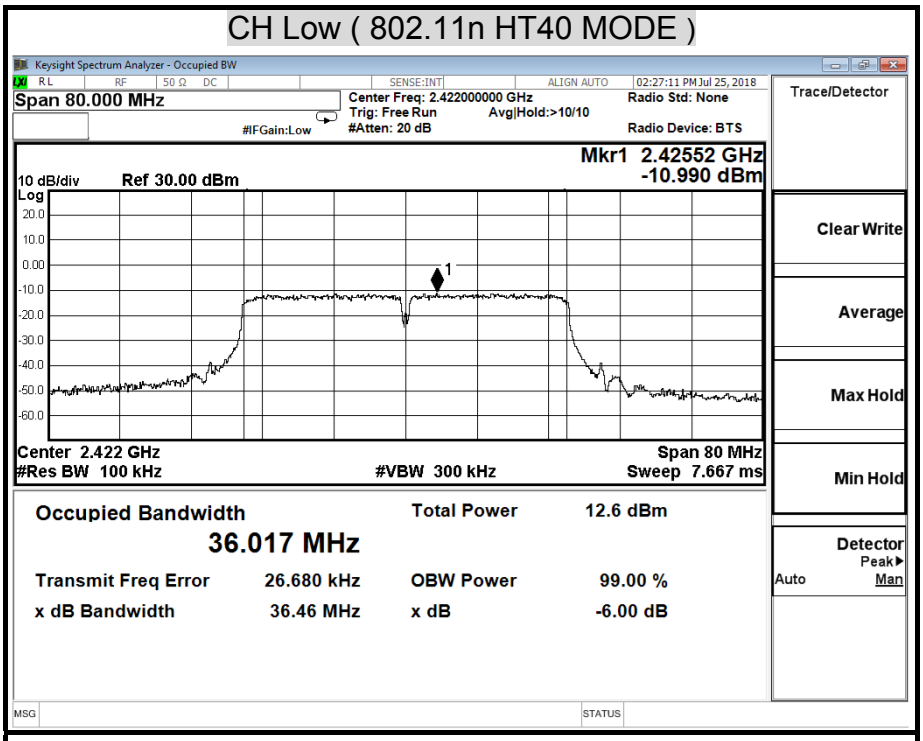


CH High (802.11n HT20 MODE)

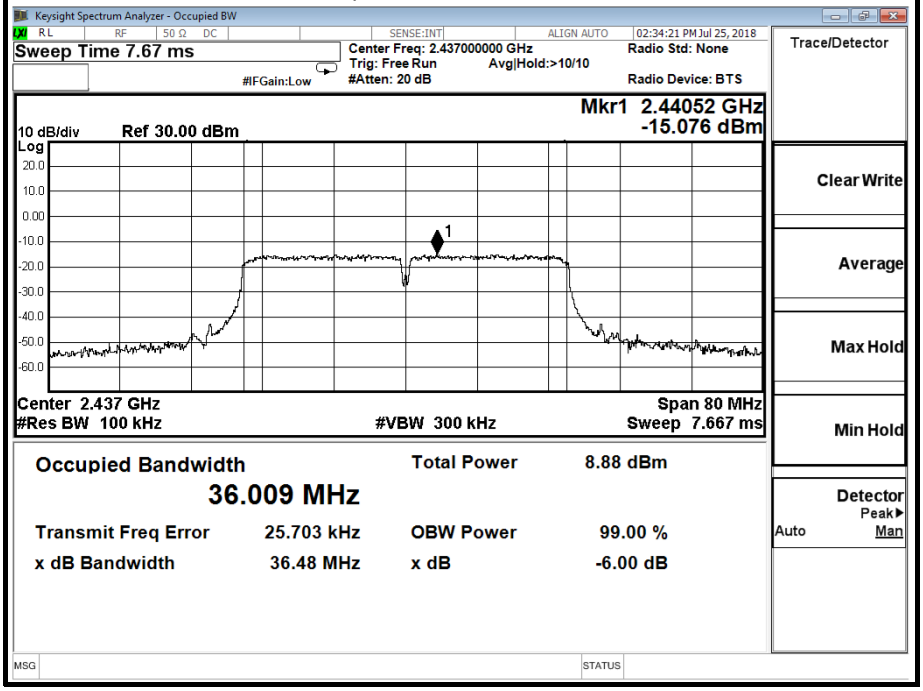


POWER SPECTRAL DENSITY (802.11n HT40 MODE)

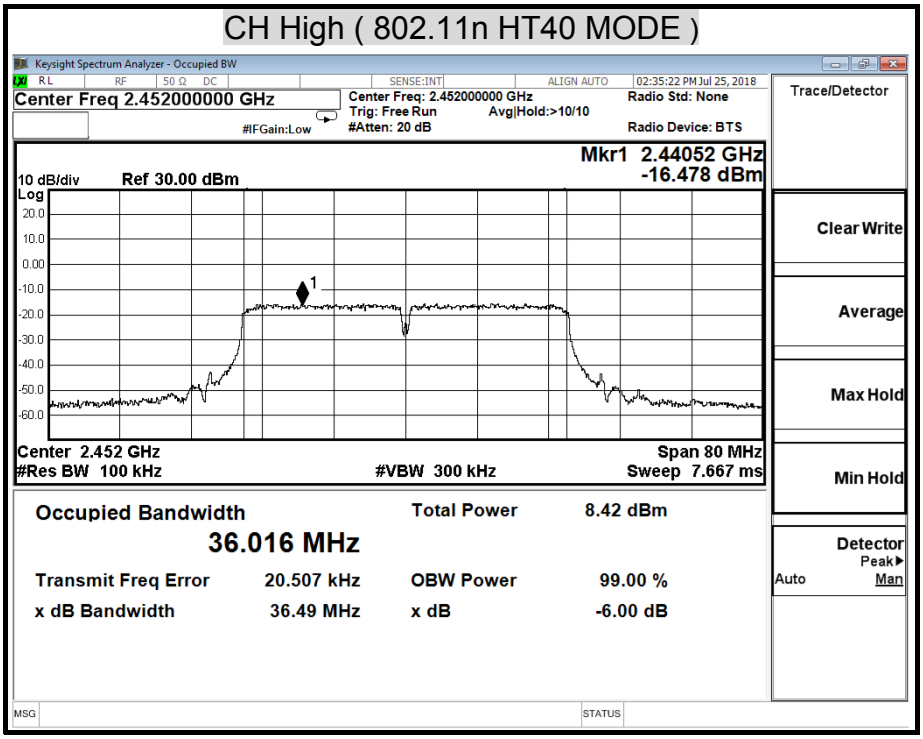
CH Low (802.11n HT40 MODE)



CH Mid (802.11n HT40 MODE)



CH High (802.11n HT40 MODE)



8.5 CONDUCTED SPURIOUS EMISSION

LIMITS

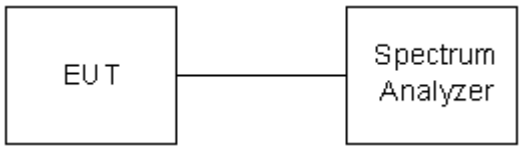
§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the and that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/05/2018	07/04/2019
SMA Cable + 10dB Attenuator	CCS	SMA + 10dB Att	O6	01/22/2018	01/21/2019

Remark: *Each piece of equipment is scheduled for calibration once a year.*

TEST SETUP



TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

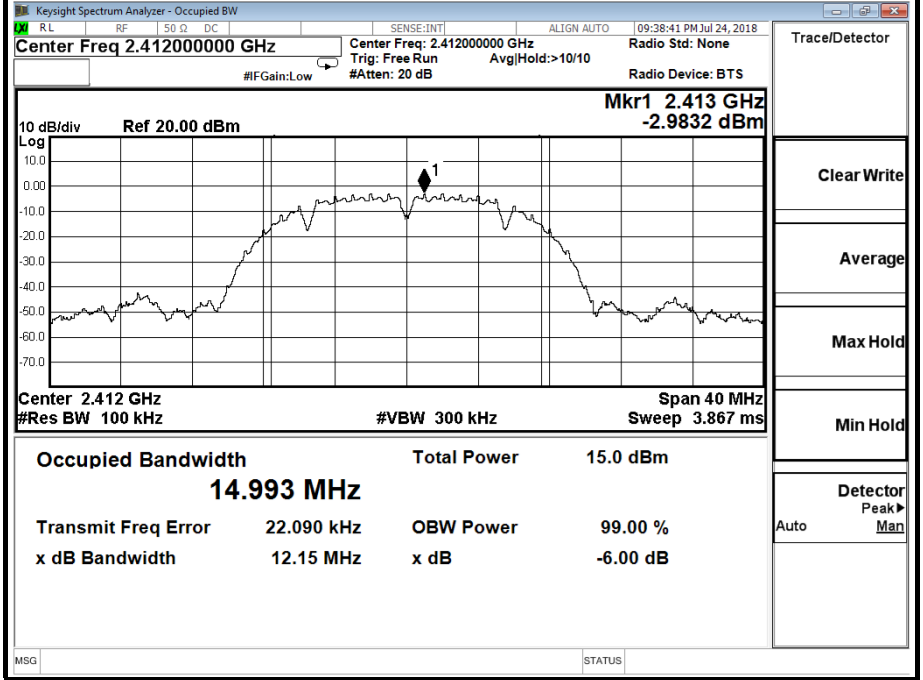
TEST RESULTS

No non-compliance noted.

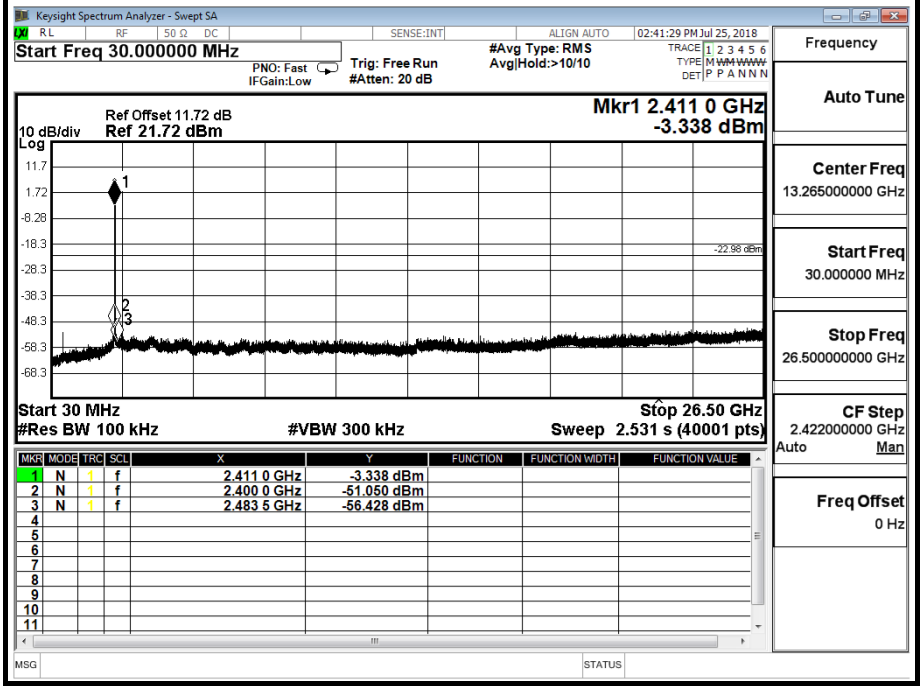
Model Name	CK8522	Test By	Ted Huang
Temp & Humidity	26.5°C, 54%	Test Date	2018/07/25

OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT
(IEEE 802.11b MODE)

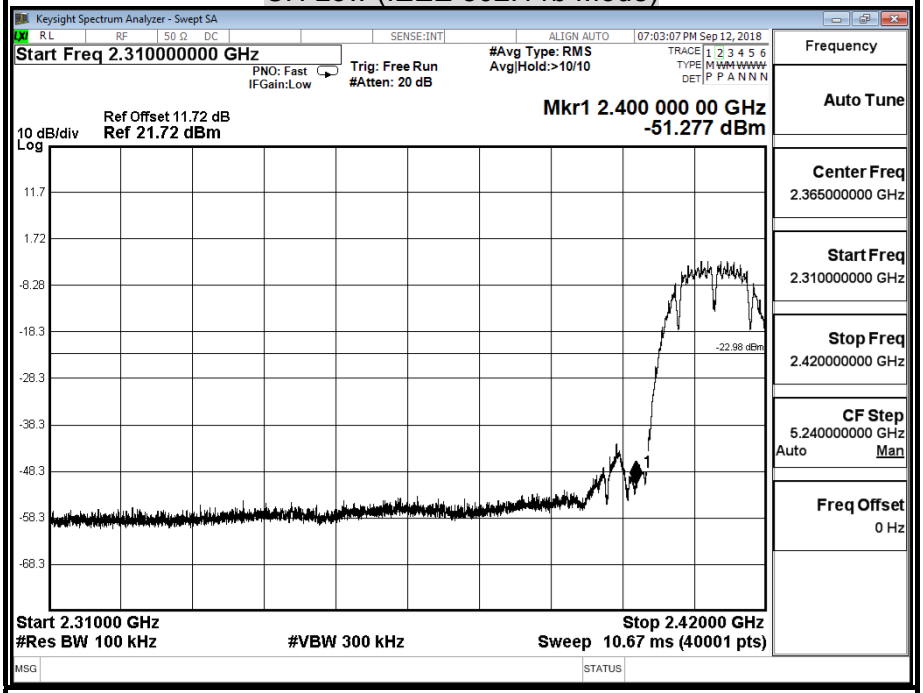
CH Low (IEEE 802.11b Mode)



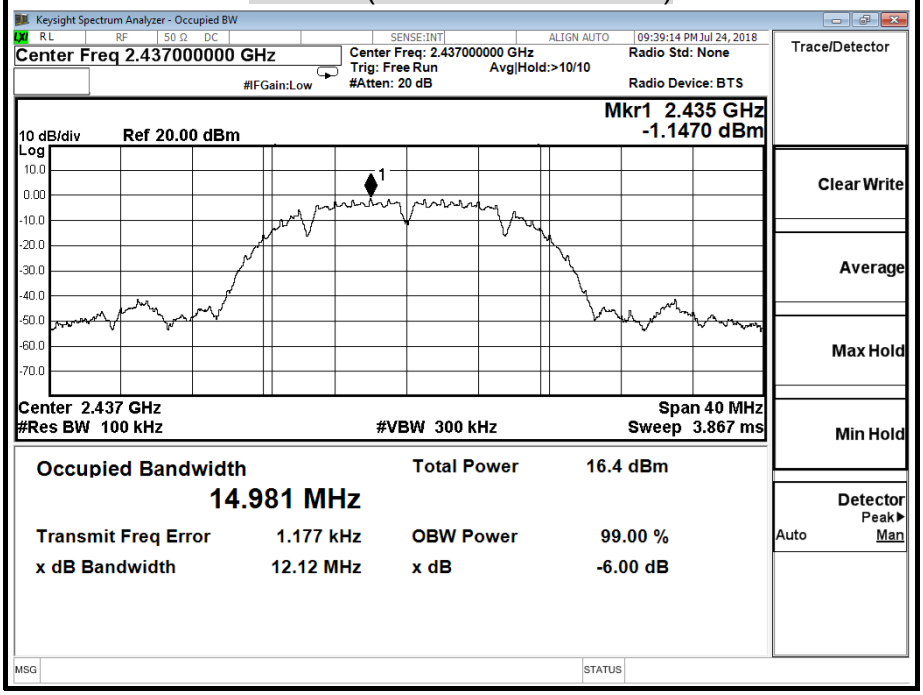
CH Low (IEEE 802.11b Mode)



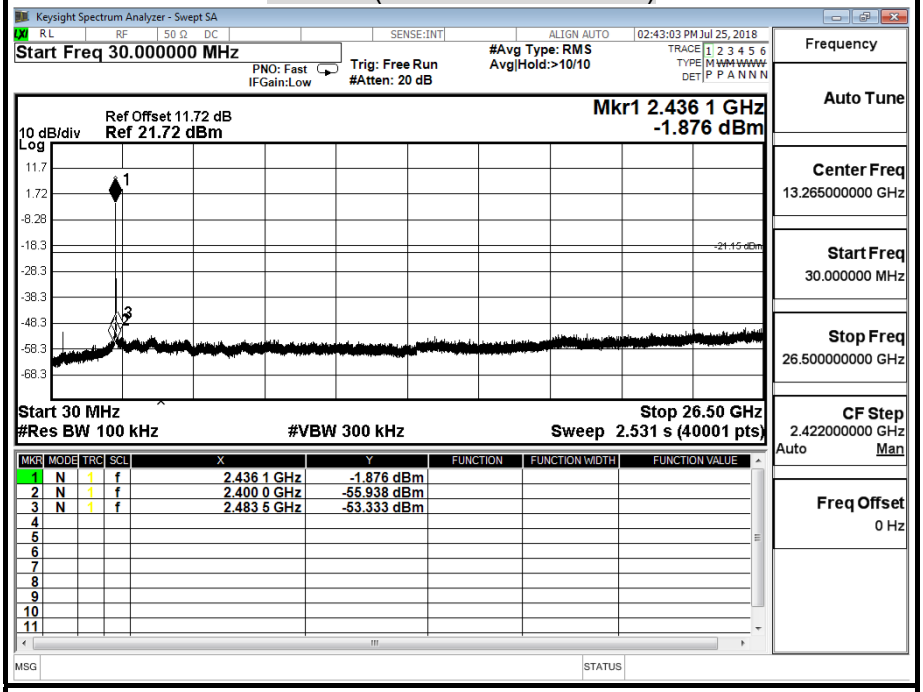
CH Low (IEEE 802.11b Mode)



CH Mid (IEEE 802.11b Mode)



CH Mid (IEEE 802.11b Mode)



CH High (IEEE 802.11b Mode)