



FCC TEST REPORT

Test report
On Behalf of
Shenzhen GMK Technology Co., Ltd
For
NucBox
Model No.: KB1

FCC ID: 2AXUD-KB1

Prepared for : **Shenzhen GMK Technology Co., Ltd**
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Date of Test: 2020/9/22 ~ 2020/10/13
Date of Report: 2020/10/13
Report Number: TZ200901687-E4

The test report apply only to the specific sample(s) tested under stated test conditions
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TEST RESULT CERTIFICATION

Applicant's name: **Shenzhen GMK Technology Co., Ltd**
Address.....: 3/F, #5Bldg, HuaLian Industrial Park, XinShi Community, Dalang St,
Longhua Dist, 518109, Shenzhen, China
Manufacture's Name: **Shenzhen GMK Technology Co., Ltd**
Address.....: 3/F, #5Bldg, HuaLian Industrial Park, XinShi Community, Dalang St,
Longhua Dist, 518109, Shenzhen, China

Product description

Trade Mark: GMK
Product name.....: NucBox
Model and/or type reference : KB1

Standards.....: FCC Rules and Regulations Part 15 Subpart E Section 15.407
ANSI C63.10: 2013

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Date of Test :
Date (s) of performance of tests..... : 2020/9/22 ~ 2020/10/13
Date of Issue : 2020/10/13
Test Result..... : **Pass**

Testing Engineer :

Anna Hu

(Anna Hu)

Technical Manager :

Hugo Chen

(Hugo Chen)

Authorized Signatory :

Andy Zhang

(Andy Zhang)



Revision History

Revision	Issue Date	Revisions	Revised By
000	2020/10/13	Initial Issue	Andy Zhang



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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	: NucBox
Model Number	: KB1
Model Declaration	: N/A
Test Model	: KB1
Power Supply	: DC 12V by adapter
Hardware version	: GB01_MB_V300
Software version	: Windows 10
Sample ID	: TZ200901687-1#

Bluetooth

Bluetooth Version	: V4.2+EDR
Channel Number	: 79 Channels for Bluetooth BR/EDR(DSS) : 40 Channels for BLE (DTS)
Modulation Technology	: GFSK, $\pi/4$ -DQPSK, 8-DPSK for Bluetooth BR/EDR (DSS) : GFSK for BLE (DTS)
Data Rates	: Bluetooth BR/EDR (DSS): 1/2/3Mbps : BLE (DTS): 1Mbps
Antenna Type And Gain	Internal Antenna /1.41 dBi(Max.)

WiFi

WLAN	: Supported IEEE 802.11a/b/g/n
WLAN FCC Operation Frequency	: IEEE 802.11b:2412-2462MHz : IEEE 802.11g:2412-2462MHz : IEEE 802.11n HT20:2412-2462MHz / 5180-5240MHz : IEEE 802.11n HT40:2422-2452MHz / 5190-5230MHz : IEEE 802.11a: 5180-5240MHz
WLAN Channel Number	: 11 Channels for 2412-2462MHz(IEEE 802.11b/g/n HT20) : 7 Channels for 2422-2452MHz(IEEE 802.11n HT40) : 4 Channels for 5180-5240MHz (IEEE 802.11a/n HT20) : 2 Channels for 5190-5230MHz (IEEE 802.11n HT40)
WLAN Modulation Technology	: IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) : IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) : IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) : IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Type And Gain	: Internal Antenna : Wlan2.4G: 1.41 dBi(Max.) : Wlan5G:1.49 dBi(Max.)

Note1: Antenna position refer to EUT Photos.



1.2 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

☐ supplied by the lab ☒ supplied by the manufacturer

Manufacturer	Description	Model	Serial Number	Certificate
Shenzhen Jihongda Power Co.,Ltd.	Adapter	JHD-AP030U-120200-AS	N/A	N/A

1.3. External I/O Cable

I/O Port Description	Quantity	Cable
USB Port	2	N/A
Earphone Port	1	N/A
HDMI Port	1	N/A
Type-c Port	1	N/A
SD Card Port	1	N/A

1.4. Description of Test Facility

FCC

Designation Number: CN1275

Test Firm Registration Number: 167722

Shenzhen Tongzhou Testing Co.,Ltd has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA

Certificate Number: 5463.01

Shenzhen Tongzhou Testing Co.,Ltd has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

IC

ISED#: 22033

CAB identifier: CN0099

Shenzhen Tongzhou Testing Co.,Ltd has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010



1.5. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the Shenzhen Tongzhou Testing Co.,Ltd quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6. Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	9KHz~30MHz	±3.08dB	(1)
		30MHz~1000MHz	±4.42dB	(1)
		1GHz~40GHz	±4.06dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±2.23dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.7. Description of Test Modes

The EUT has been tested under operating condition.

Worst-case mode and channel used for 150 kHz-30 MHz power line conducted emissions was the mode and channel with the highest output power that was determined to be IEEE 802.11n HT40 mode (Low Channel).

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be IEEE 802.11n HT40 mode (Low Channel).

Worst-Case data rates were utilized from preliminary testing of the Chipset, worst-case data rates used during the testing are as follows:

IEEE 802.11a Mode : 6 Mbps, OFDM.

IEEE 802.11n HT20 Mode: MCS0, OFDM.

IEEE 802.11n HT40 Mode: MCS0, OFDM.

Antenna & Bandwidth

Antenna	Single (Port.1)			Two (Port.1 + Port.2)		
Bandwidth Mode	20MHz	40MHz	80MHz	20MHz	40MHz	80MHz
IEEE 802.11a	☒	☐	☐	☐	☐	☐
IEEE 802.11n	☒	☒	☐	☐	☐	☐
IEEE 802.11ac	☒	☒	☒	☐	☐	☐



2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen Tongzhou Testing Co.,Ltd

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to FCC's request, Test Procedure 789033 D02 General UNII Test Procedures New Rules v02r01 and KDB 662911 are required to be used for this kind of FCC 15.407 UII device.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E

2.3. General Test Procedures

2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10-2013

2.4. Test Sample

The application provides 1 sample to meet requirement;

Sample ID	Description
TZ200901687-1#	Engineer sample – continuous transmit



3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmits condition.

3.2. EUT Exercise Software

The system was configured for testing in a continuous transmits condition and change test channels by software (DRTU) provided by application.

3.3. Special Accessories

No.	Equipment	Manufacturer	Model No.	Serial No.	Length	shielded/ unshielded	Notes
1	/	/	/	/	/	/	/

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen Tongzhou Testing Co.,Ltd has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.



4. SUMMARY OF TEST RESULTS

Applied Standard: FCC Part 15 Subpart E			
FCC Rules	Description of Test	Test Sample	Result
§15.407(a)	Maximum Conducted Output Power	TZ200901687-1#	Compliant
§15.407(a)	Power Spectral Density	TZ200901687-1#	Compliant
§15.407(a)	26dB Bandwidth	TZ200901687-1#	Compliant
§15.407(a)	99% Occupied Bandwidth	TZ200901687-1#	Compliant
§15.407(b)	Radiated Emissions	TZ200901687-1#	Compliant
§15.407(b)	Band edge Emissions	TZ200901687-1#	Compliant
§15.205	Emissions at Restricted Band	TZ200901687-1#	Compliant
§15.407(g)	Frequency Stability	TZ200901687-1#	Compliant
§15.207(a)	Line Conducted Emissions	TZ200901687-1#	Compliant
§15.203	Antenna Requirements	TZ200901687-1#	Compliant
§2.1093	RF Exposure	N/A	Compliant

5. TEST RESULT

5.1. On Time and Duty Cycle

5.1.1. Standard Applicable

None; for reporting purpose only.

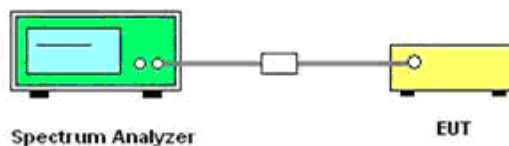
5.1.2. Measuring Instruments and Setting

Please refer to section 6 of equipment list in this report. The following table is the setting of the spectrum analyzer.

5.1.3. Test Procedures

1. Set the centre frequency of the spectrum analyzer to the transmitting frequency;
2. Set the span=0MHz, RBW=10MHz, VBW=10MHz, Sweep time=5ms;
3. Detector = peak;
4. Trace mode = Single hold.

5.1.4. Test Setup Layout



5.1.5. EUT Operation during Test

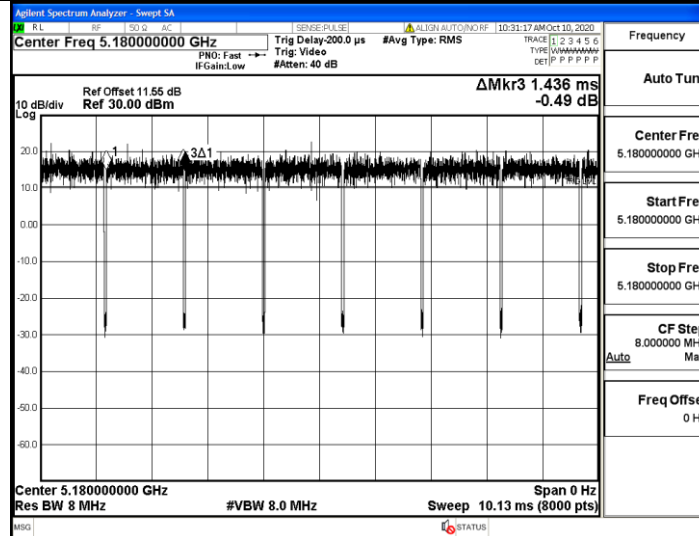
The EUT was programmed to be in continuously transmitting mode.

5.1.6. Test result

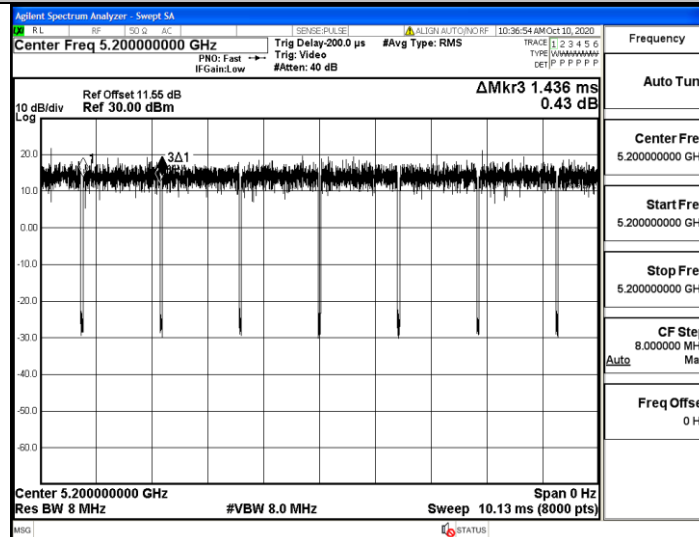
TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/B Minimum VBW (KHz)
11A	Ant1	5180	1.39	1.44	96.74	0.69
		5200	1.39	1.44	96.74	0.69
		5240	1.39	1.44	96.74	0.69
11N20SISO	Ant1	5180	1.30	1.35	96.42	0.74
		5200	1.30	1.35	96.52	0.74
		5240	1.30	1.35	96.52	0.74
11N40SISO	Ant1	5190	0.65	0.69	93.24	1.45
		5230	0.65	0.69	93.24	1.45
11AC20SISO	Ant1	5180	1.31	1.36	96.55	0.74
		5200	1.31	1.36	96.55	0.74
		5240	1.31	1.36	96.55	0.74
11AC40SISO	Ant1	5190	0.65	0.70	93.27	1.43
		5230	0.65	0.70	93.26	1.43
11AC80SISO	Ant1	5210	0.32	0.37	87.29	2.70



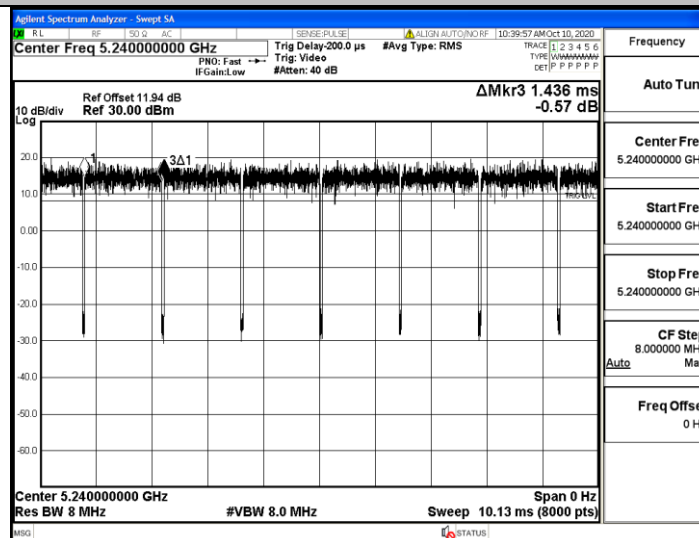
11A_Ant1_5180



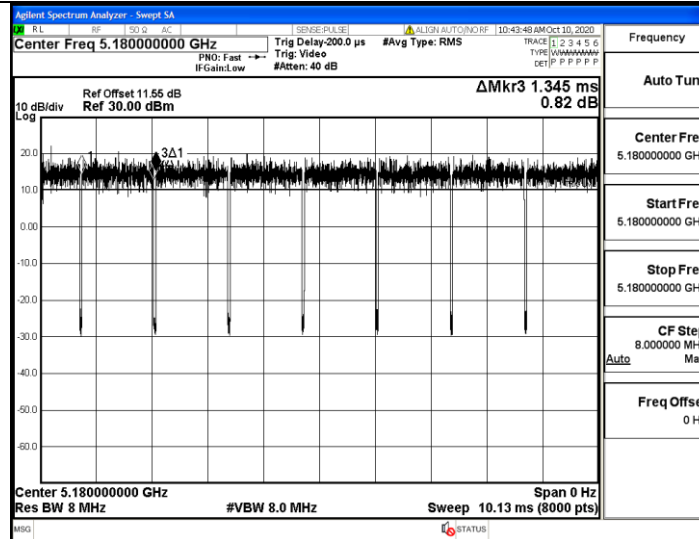
11A_Ant1_5200



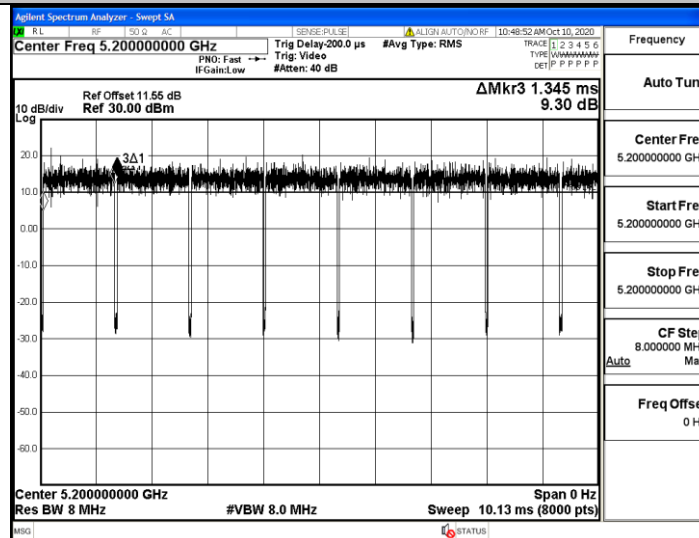
11A_Ant1_5240



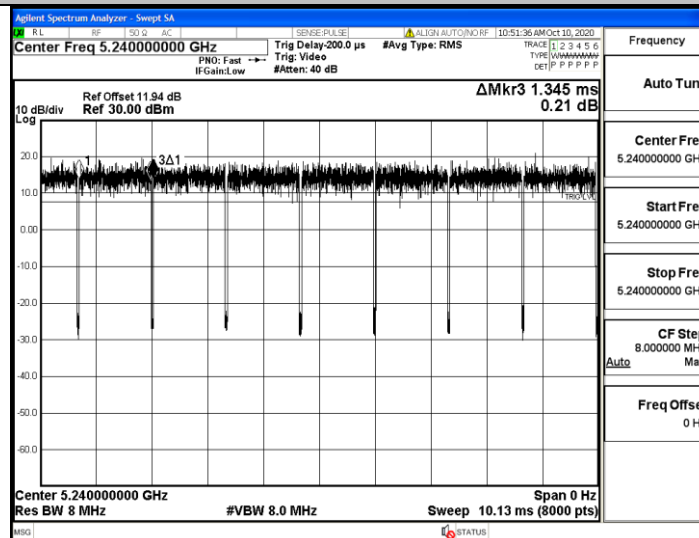
11N20SISO_Ant1_5180



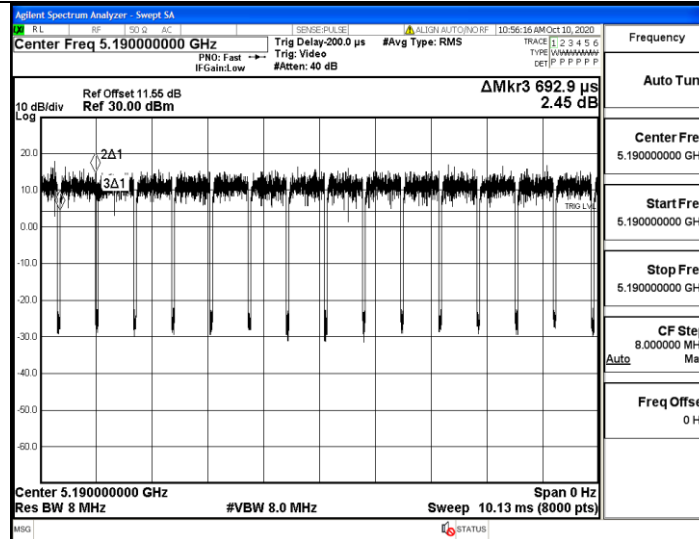
11N20SISO_Ant1_5200



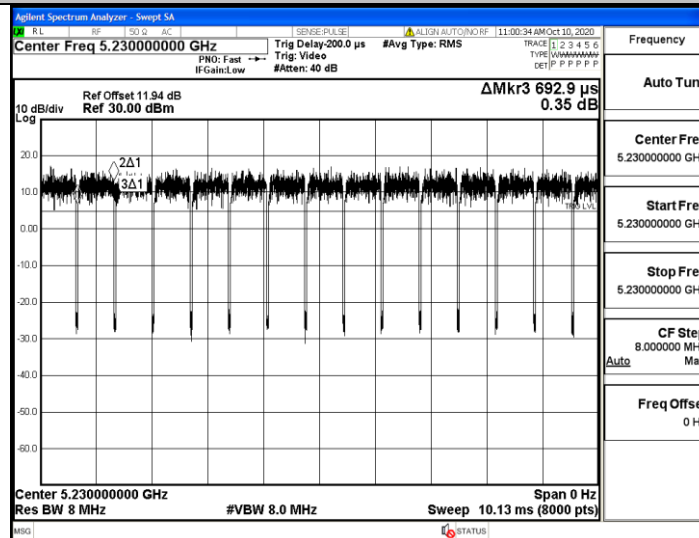
11N20SISO_Ant1_5240



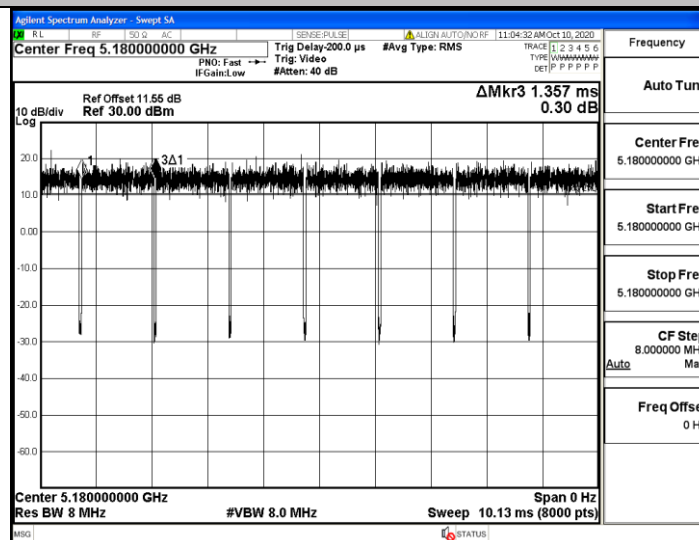
11N40SISO_Ant1_5190



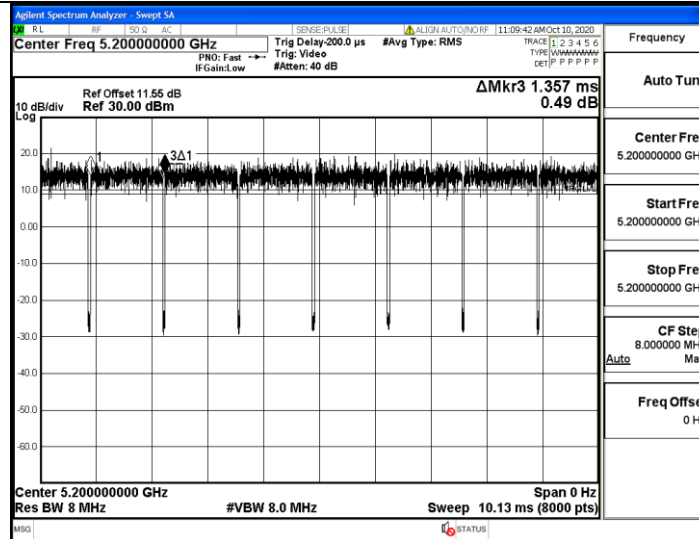
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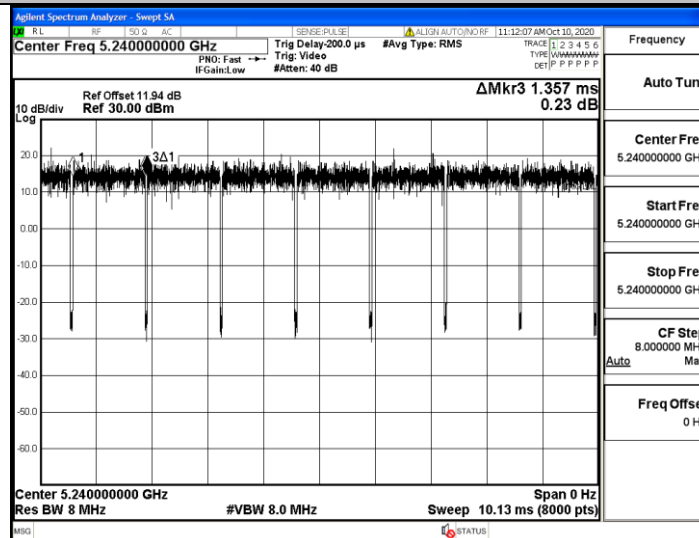
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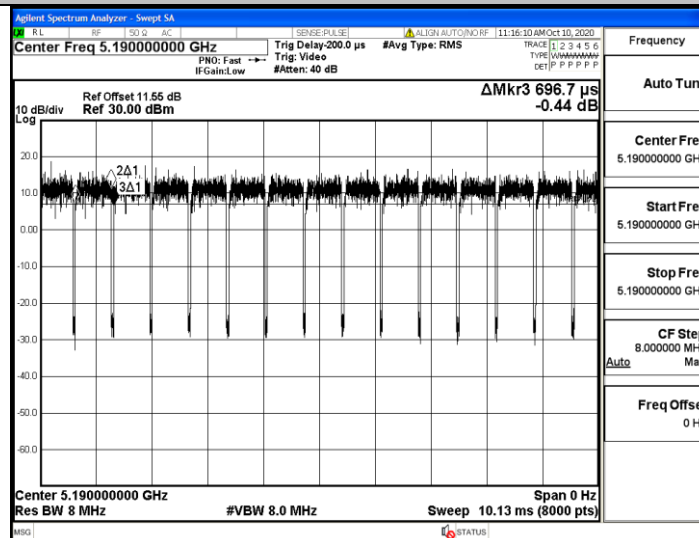
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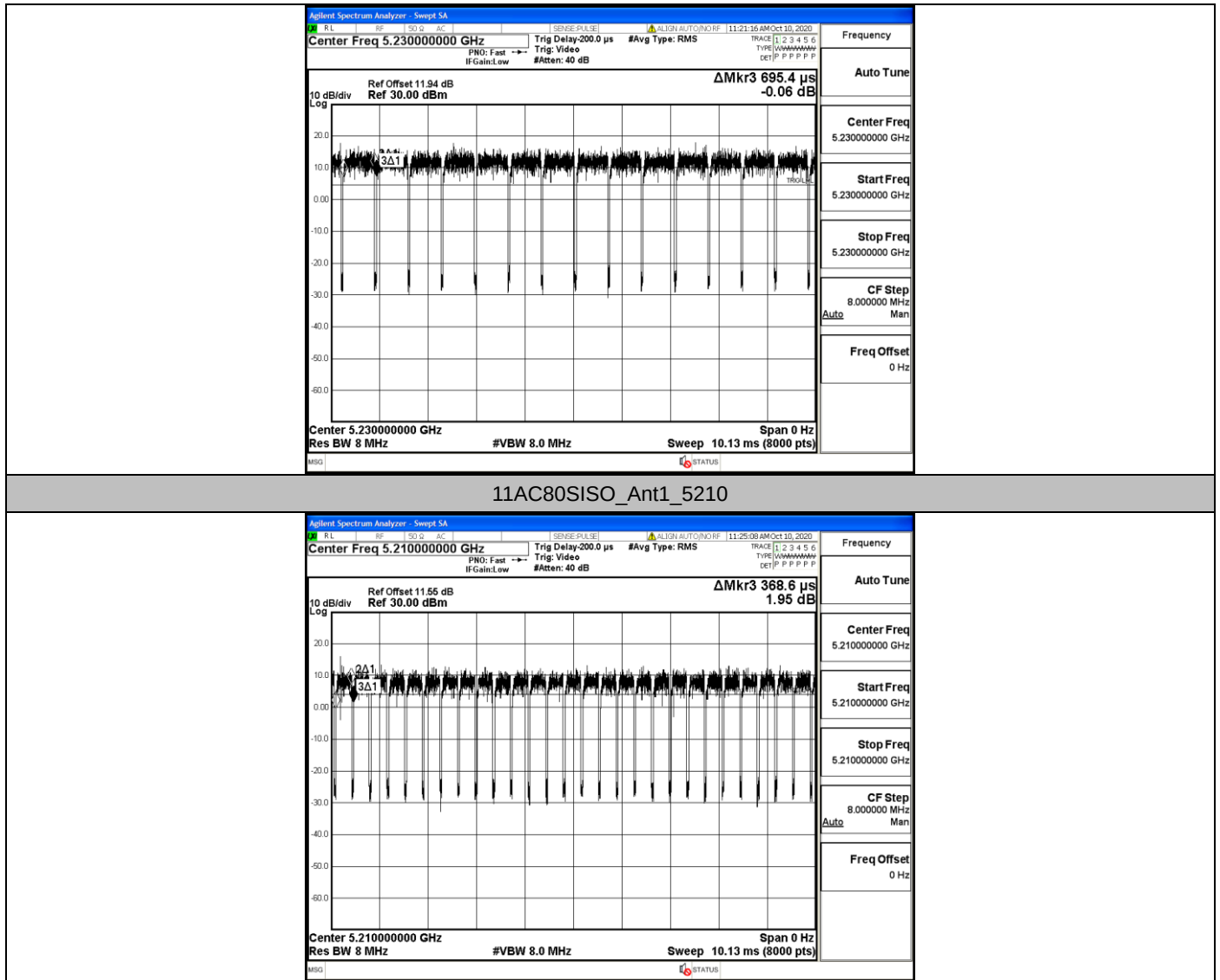
11AC20SISO_Ant1_5240



11AC40SISO_Ant1_5190



11AC40SISO_Ant1_5230



5.2. Maximum Conducted Output Power Measurement

5.2.1. Standard Applicable

(1) For the band 5.15-5.25 GHz.

- (i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).
- (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
- (iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1dB reduction in maximum conducted output power is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
- (iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2.2. Measuring Instruments and Setting

Please refer to section 6 of equipment list in this report. The following table is the setting of the power meter.

5.2.3. Test Procedures

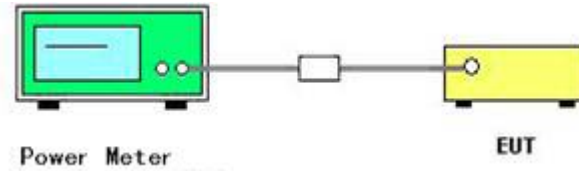
The transmitter output (antenna port) was connected to the power meter.

According to KDB 789033 D02 Section 3 (a) Method PM (Measurement using an RF average power meter):

- (i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.
 - The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
 - At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
 - The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
- (ii) If the transmitter does not transmit continuously, measure the duty cycle, x , of the transmitter output signal as described in section II.B.

- (iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
- (iv) Adjust the measurement in dBm by adding $10 \log (1/x)$ where x is the duty cycle (e.g., $10 \log (1/0.25)$ if the duty cycle is 25%).

5.2.4. Test Setup Layout



5.1.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.2.6. Test Result of Maximum Conducted Output Power

Temperature	22.8°C	Humidity	50%
Test Engineer	Anna Hu	Configurations	IEEE 802.11a/n

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11A	Ant1	5180	12.86	<=23.98	PASS
		5200	11.69	<=23.98	PASS
		5240	12.20	<=23.98	PASS
11N20SISO	Ant1	5180	12.28	<=23.98	PASS
		5200	11.62	<=23.98	PASS
		5240	12.11	<=23.98	PASS
11N40SISO	Ant1	5190	12.22	<=23.98	PASS
		5230	12.62	<=23.98	PASS
11AC20SISO	Ant1	5180	12.39	<=23.98	PASS
		5200	11.74	<=23.98	PASS
		5240	12.17	<=23.98	PASS
11AC40SISO	Ant1	5190	12.24	<=23.98	PASS
		5230	12.67	<=23.98	PASS
11AC80SISO	Ant1	5210	12.31	<=23.98	PASS

Remark:

1. Measured output power at difference data rate for each mode and recorded worst case for each mode.
2. Test results including cable loss;
3. Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40
4. Directional Gain =1.49 dBi < 6dBi; no need reduce power limit;
5. Report conducted power = Measured conducted average power + Duty Cycle factor;



5.3. Power Spectral Density Measurement

5.3.1. Standard Applicable

For 5150~5250MHz

- (i) For an outdoor access point operating in the band 5.15 - 5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band.^{note1}
- (ii) For an indoor access point operating in the band 5.15 - 5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band.^{note1}
- (iii) For fixed point-to-point access points operating in the band 5.15 - 5.25 GHz, transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.
- (iv) For mobile and portable client devices in the 5.15 - 5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 MHz band.^{note1}

Note1: If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

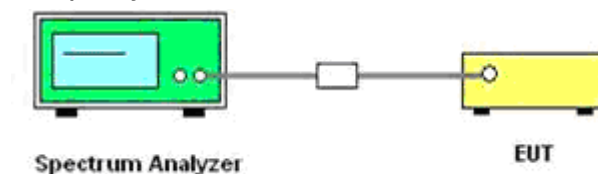
5.3.2. Measuring Instruments and Setting

Please refer to section 6 of equipment list in this report. The following table is the setting of Spectrum Analyzer.

5.3.3. Test Procedures

1. The transmitter was connected directly to a Spectrum Analyzer through a directional couple.
2. The power was monitored at the coupler port with a Spectrum Analyzer. The power level was set to the maximum level.
3. Set the RBW = 1MHz.
4. Set the VBW $\geq$ 3MHz
5. Span=Encompass the entire emissions bandwidth (EBW) of the signal (or, alternatively, the entire 99% occupied bandwidth) of the signal.
6. Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$. (This ensures that bin-to-bin spacing is $\leq \text{RBW}/2$, so that narrowband signals are not lost between frequency bins.)
7. Manually set sweep time $\geq 10 \times (\text{number of points in sweep}) \times (\text{total on/off period of the transmitted signal})$.
8. Set detector = power averaging (rms).
9. Sweep time = auto couple.
10. Trace mode = max hold.
11. Allow trace to fully stabilize.
12. Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively,
13. Add $10 \log (1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add $10 \log (1/0.25) = 6 \text{ dB}$ if the duty cycle is 25%.
14. Use the peak marker function to determine the maximum power level in any 1MHz band segment within the fundamental EBW.

5.3.4. Test Setup Layout



5.3.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.3.6. Test Result of Power Spectral Density

Temperature	22.8°C	Humidity	50%
Test Engineer	Anna Hu	Configurations	IEEE 802.11a/n

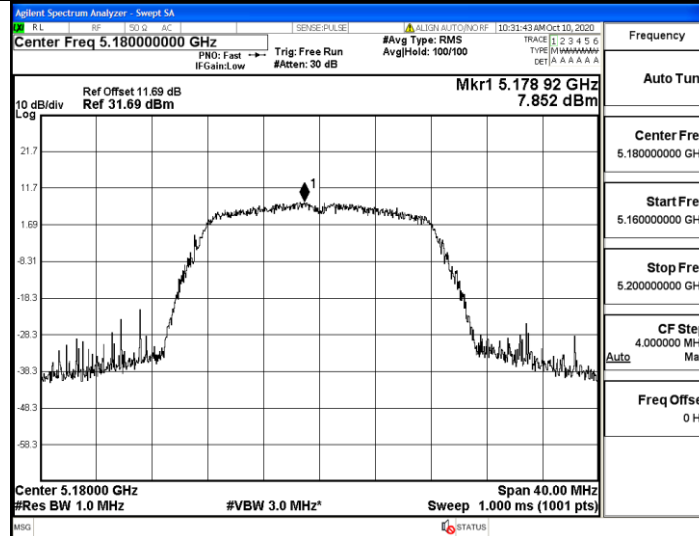
TestMode	Antenna	Channel	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	Ant1	5180	7.85	<=11	PASS
		5200	6.65	<=11	PASS
		5240	8.36	<=11	PASS
11N20SISO	Ant1	5180	7.16	<=11	PASS
		5200	6.31	<=11	PASS
		5240	6.93	<=11	PASS
11N40SISO	Ant1	5190	4.65	<=11	PASS
		5230	5.41	<=11	PASS
11AC20SISO	Ant1	5180	7.27	<=11	PASS
		5200	7.00	<=11	PASS
		5240	7.50	<=11	PASS
11AC40SISO	Ant1	5190	4.15	<=11	PASS
		5230	4.88	<=11	PASS
11AC80SISO	Ant1	5210	1.58	<=11	PASS

Remark:

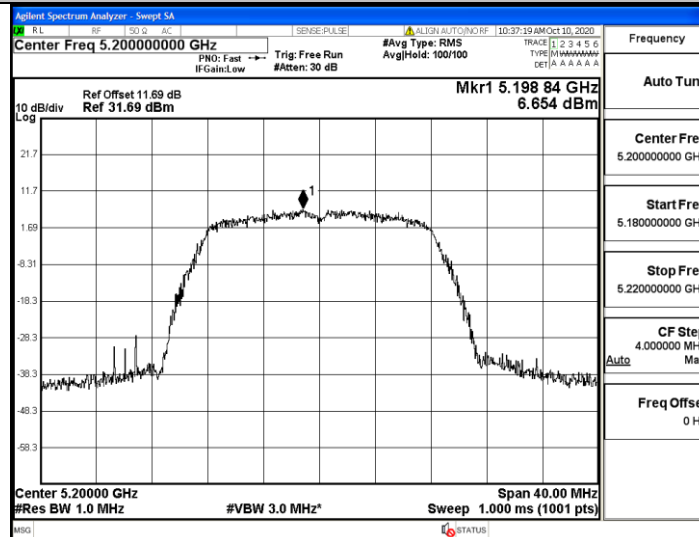
1. Measured power spectrum density at difference data rate for each mode and recorded worst case for each mode.
2. Test results including cable loss;
3. Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40
4. Directional Gain = 1.49dBi < 6dBi;; no need reduce power spectrum density limit;
5. Report conducted PSD = Measured conducted PSD + Duty Cycle factor;
6. Please refer to following test plots;



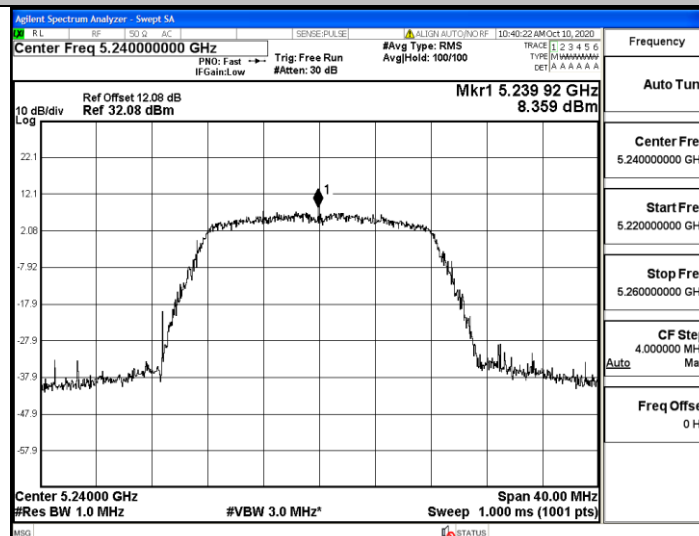
11A_Ant1_5180



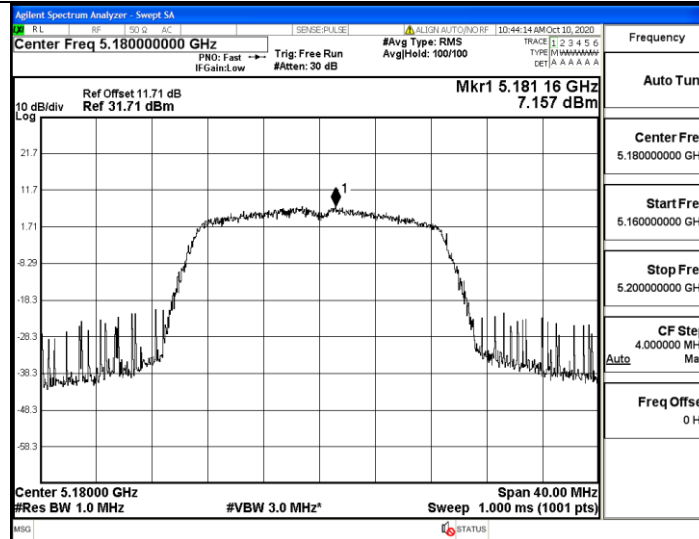
11A_Ant1_5200



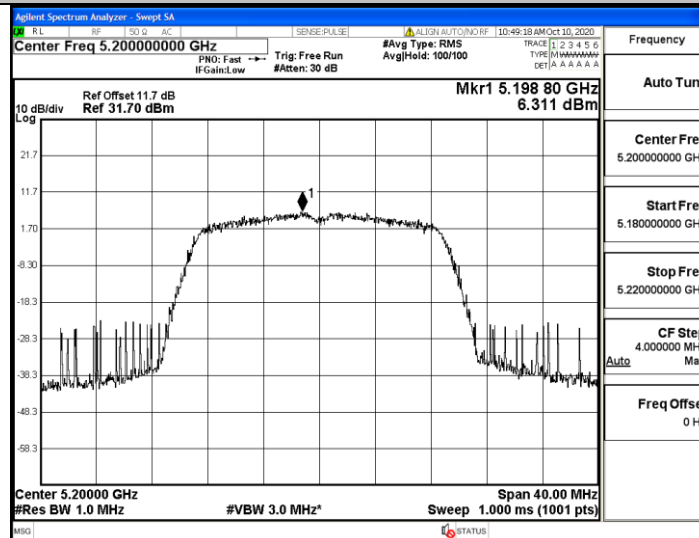
11A_Ant1_5240



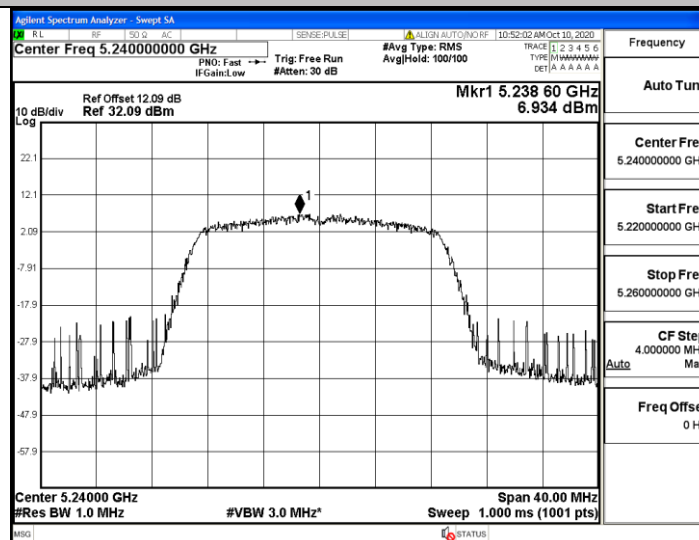
11N20SISO_Ant1_5180



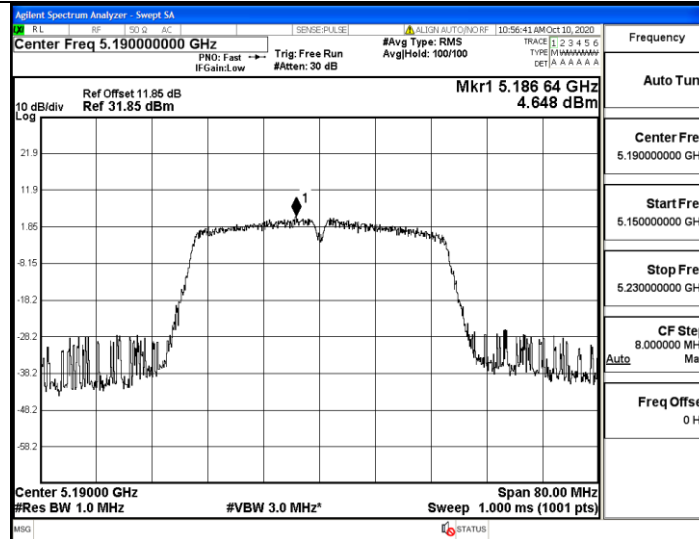
11N20SISO_Ant1_5200



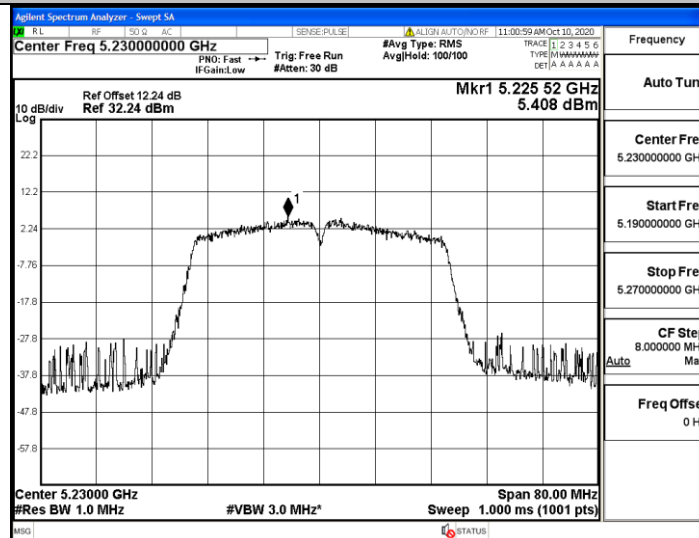
11N20SISO_Ant1_5240



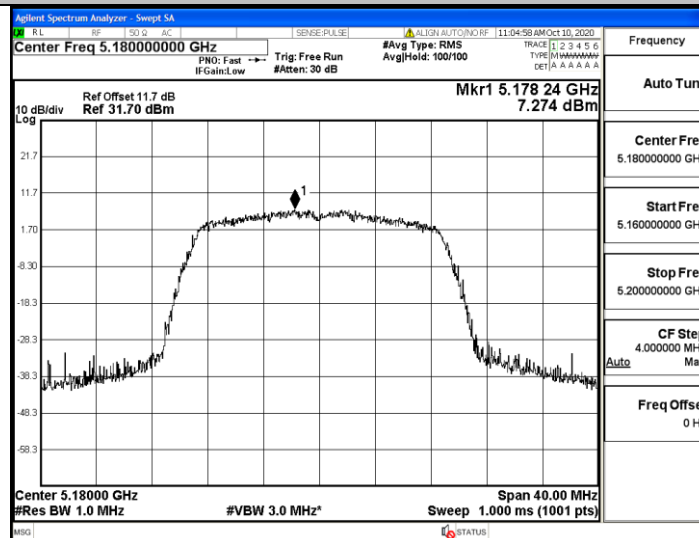
11N40SISO_Ant1_5190



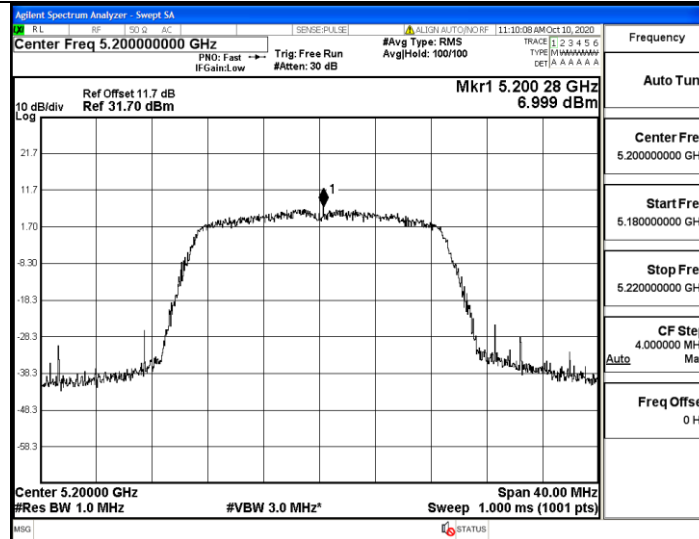
11N40SISO_Ant1_5230



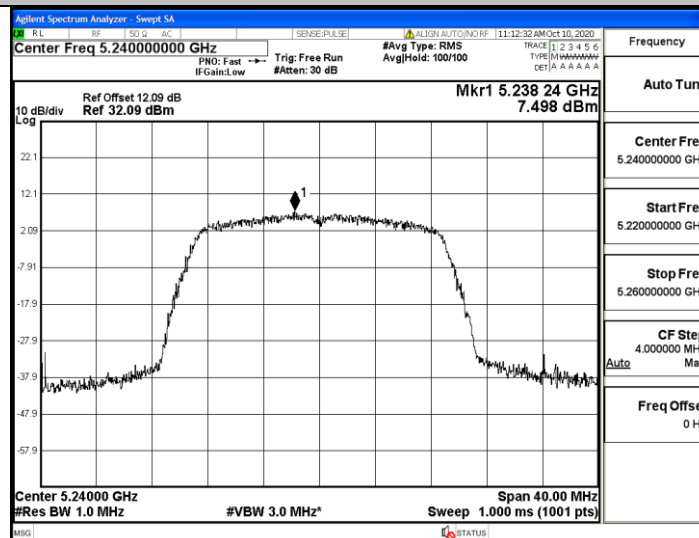
11AC20SISO_Ant1_5180



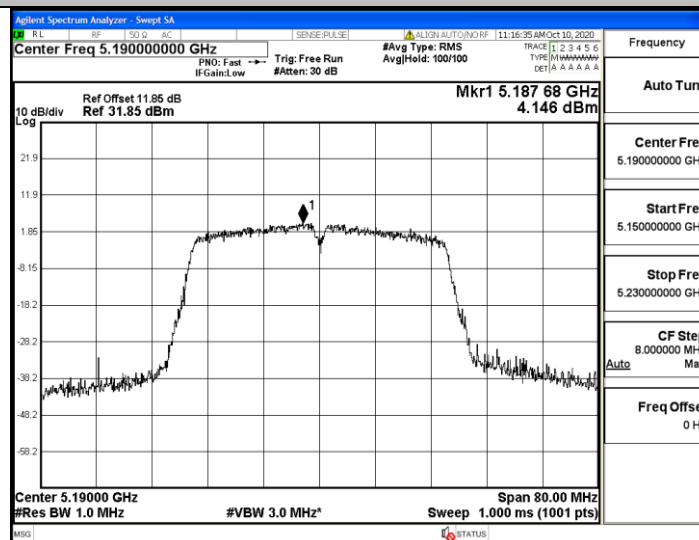
11AC20SISO_Ant1_5200



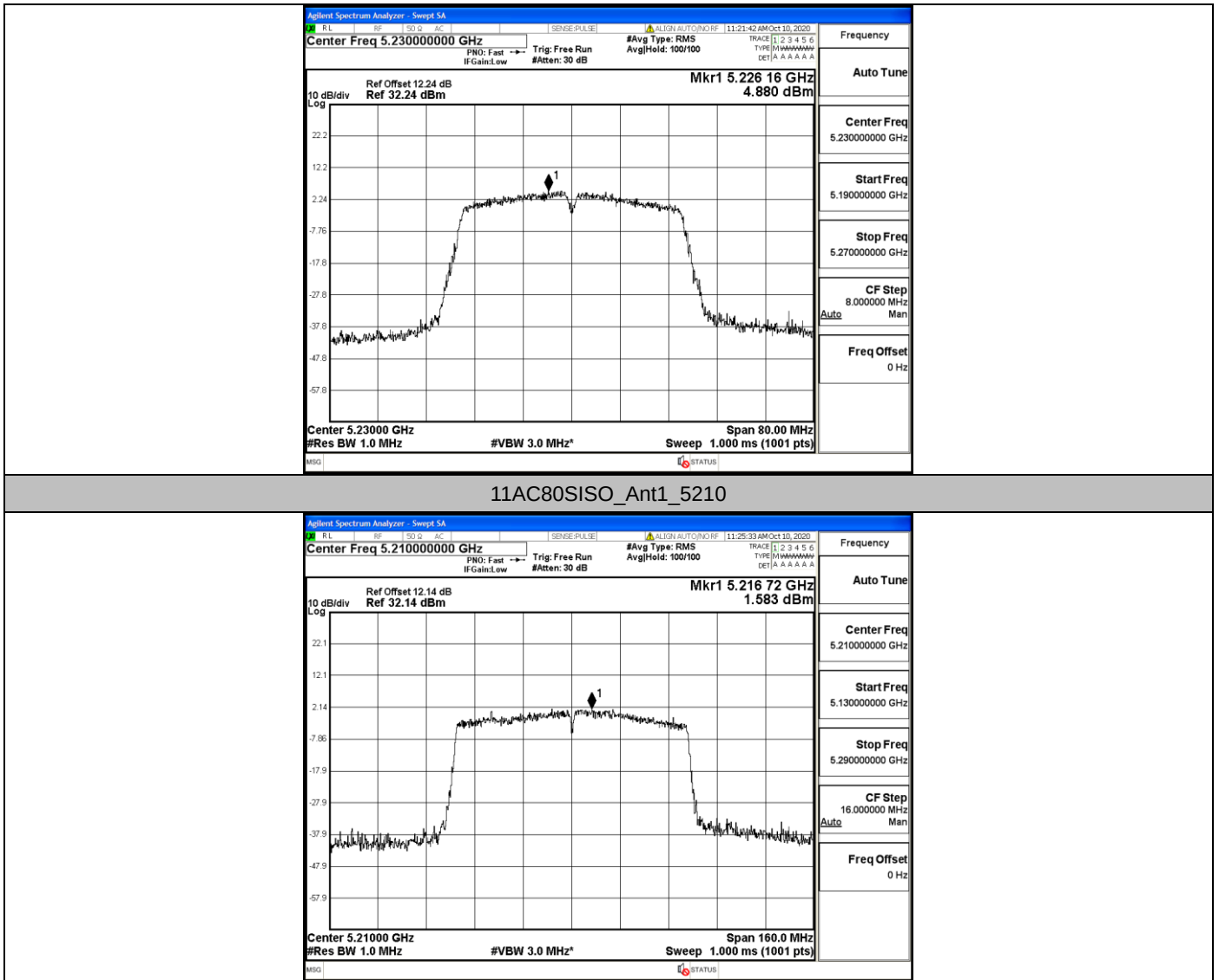
11AC20SISO_Ant1_5240



11AC40SISO_Ant1_5190



11AC40SISO_Ant1_5230



5.4. 99% Occupied Bandwidth and 26dB Emission Bandwidth Measurement

5.4.1. Standard Applicable

No restriction limits. But resolution bandwidth within band edge measurement is 1% of the 99% occupied bandwidth.

5.4.2. Measuring Instruments and Setting

Please refer to section 6 of equipment list in this report. The following table is the setting of the Spectrum Analyzer.

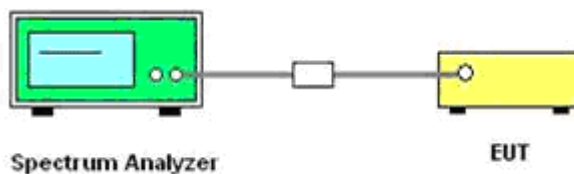
Spectrum Parameter	Setting
Attenuation	Auto
Span	> 26dB Bandwidth
Detector	Peak
Trace	Max Hold
Sweep Time	100ms

5

5.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. Set the RBW = approximately 1% of the emission bandwidth.
3. Set the VBW $\geq 3 * RBW$
4. Measured the spectrum width with power higher than 26dB below carrier.

5.4.4. Test Setup Layout



5.4.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.4.6. Test Result of 99% Occupied Bandwidth and 26dB Emission Bandwidth

Temperature	22.8°C	Humidity	50%
Test Engineer	Anna Hu	Configurations	IEEE 802.11a/n



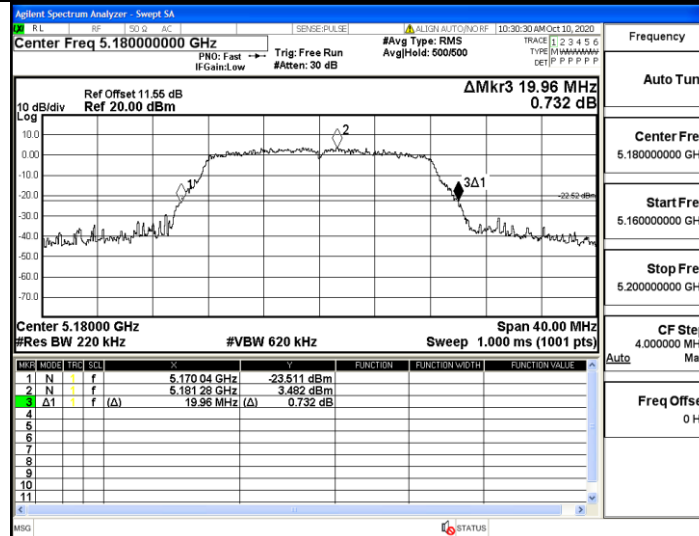
TestMode	Antenna	Channel	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	19.960	5170.040	5190.000	---	PASS
		5200	19.920	5190.120	5210.040	---	PASS
		5240	19.920	5230.040	5249.960	---	PASS
11N20SISO	Ant1	5180	20.240	5169.920	5190.160	---	PASS
		5200	20.320	5189.920	5210.240	---	PASS
		5240	20.360	5229.760	5250.120	---	PASS
11N40SISO	Ant1	5190	40.560	5169.680	5210.240	---	PASS
		5230	40.240	5210.000	5250.240	---	PASS
11AC20SISO	Ant1	5180	20.240	5169.880	5190.120	---	PASS
		5200	20.520	5189.840	5210.360	---	PASS
		5240	20.440	5229.840	5250.280	---	PASS
11AC40SISO	Ant1	5190	41.040	5169.520	5210.560	---	PASS
		5230	40.640	5209.840	5250.480	---	PASS
11AC80SISO	Ant1	5210	81.120	5169.520	5250.640	---	PASS

Remark:

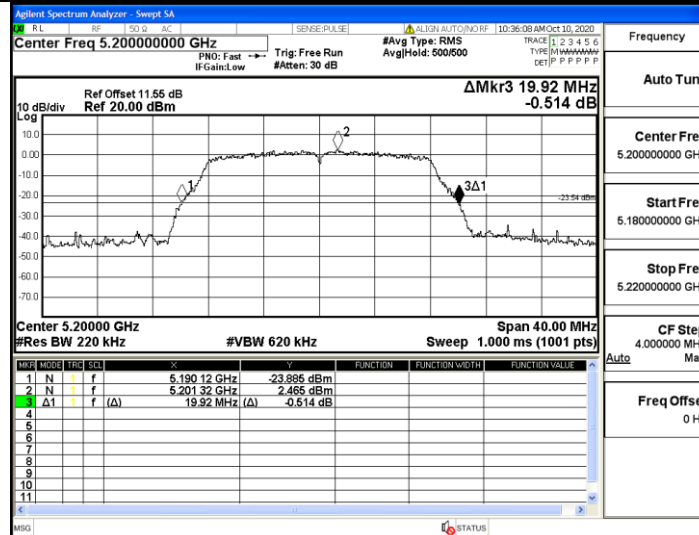
1. Measured 99% and 26dB bandwidth at difference data rate for each mode and recorded worst case for each mode.
2. Test results including cable loss;
3. Worst case data at 6Mbps at IEEE 802.11a; MCS0 at IEEE 802.11n HT20, IEEE 802.11n HT40
4. Please refer to following test plots;



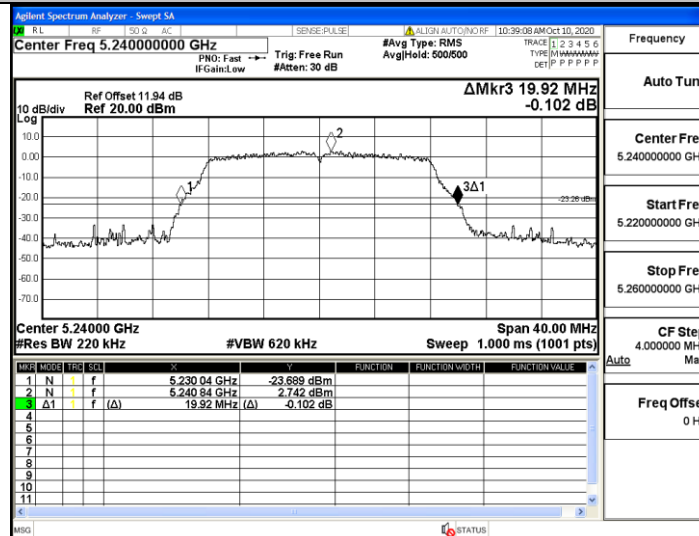
11A_Ant1_5180



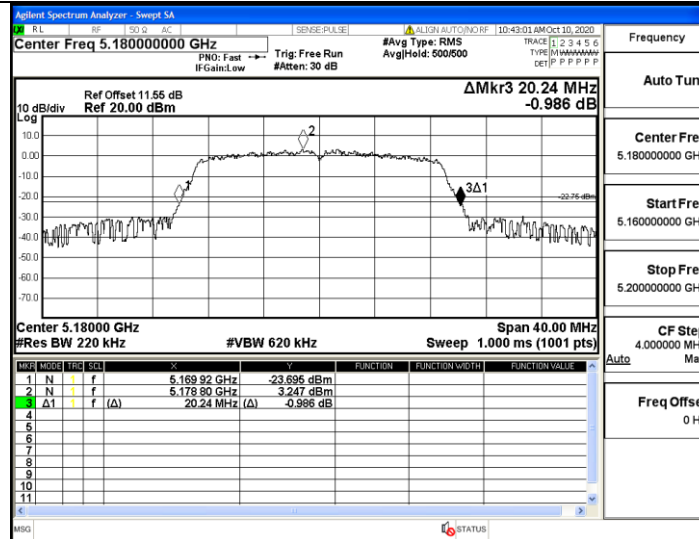
11A_Ant1_5200



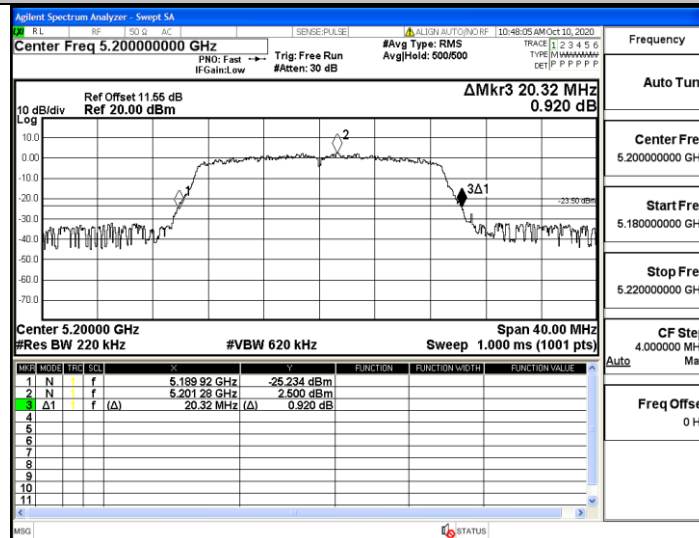
11A_Ant1_5240



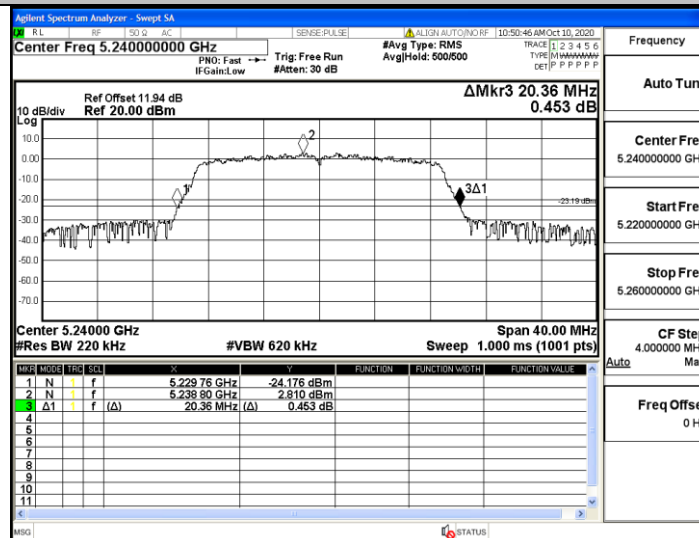
11N20ISO_Ant1_5180



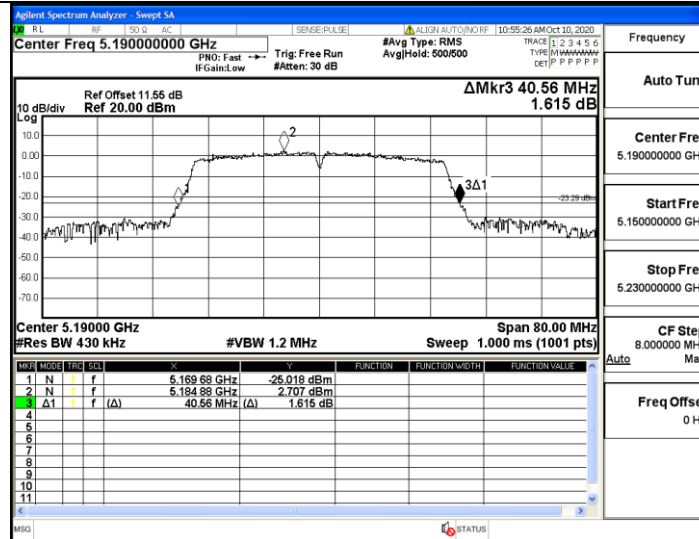
11N20SISO_Ant1_5200



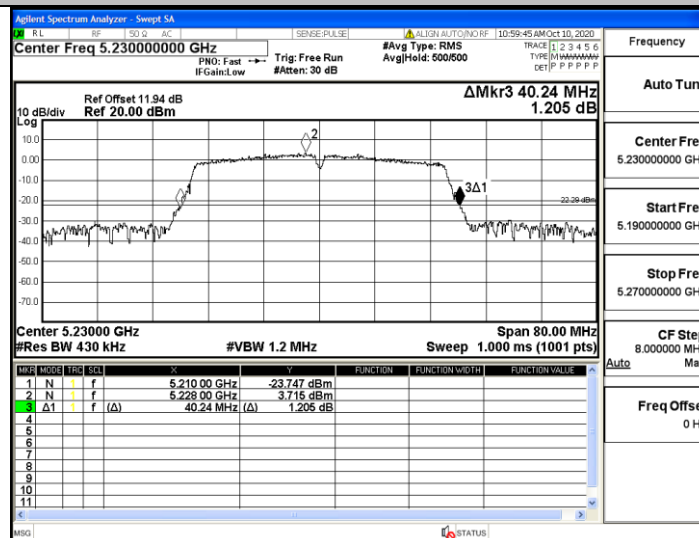
11N20SISO_Ant1_5240



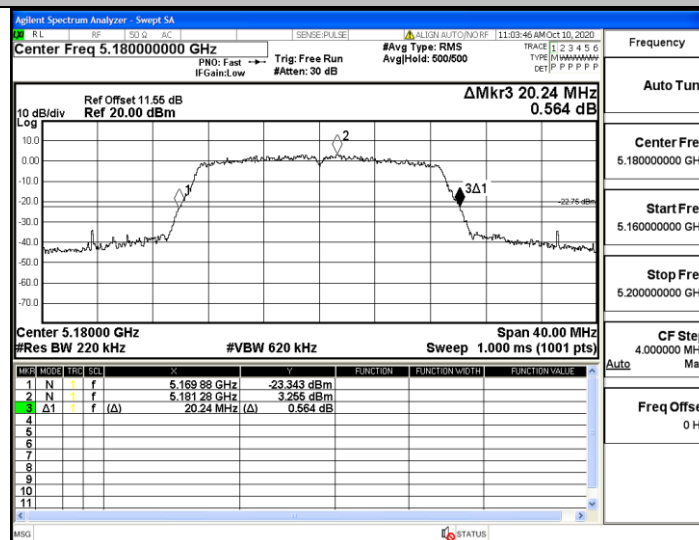
11N40SISO_Ant1_5190



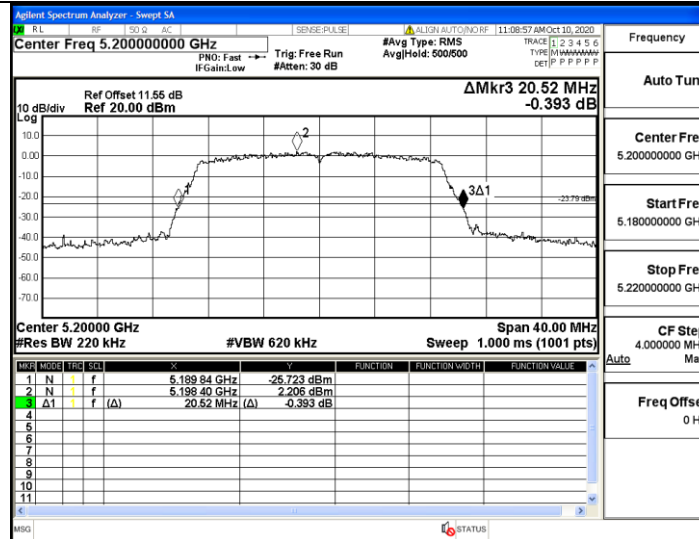
11N40SISO_Ant1_5230



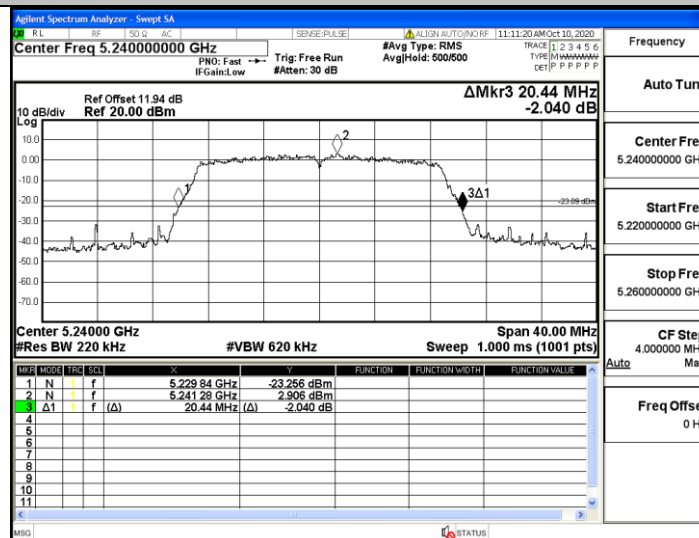
11AC20SISO_Ant1_5180



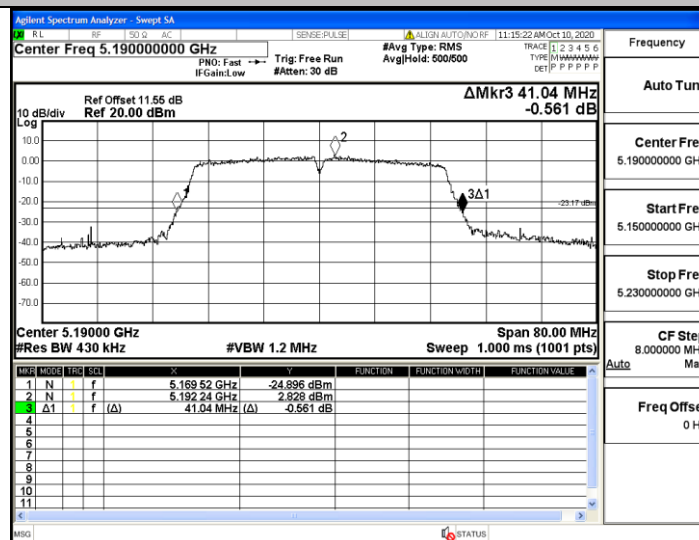
11AC20SISO_Ant1_5200



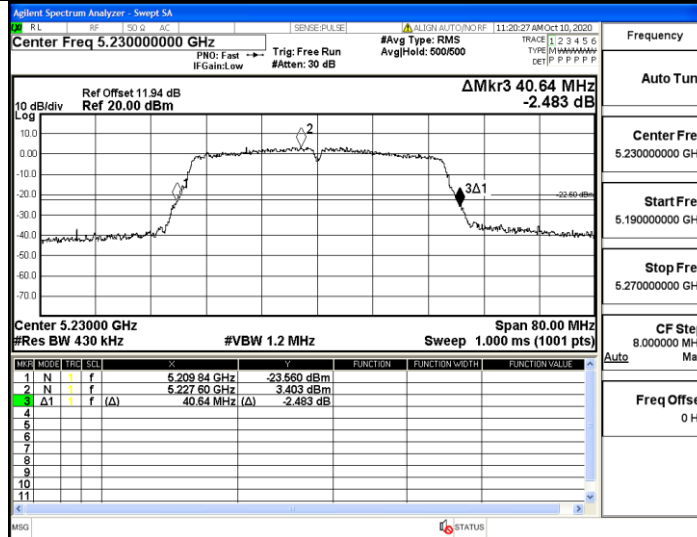
11AC20SISO_Ant1_5240



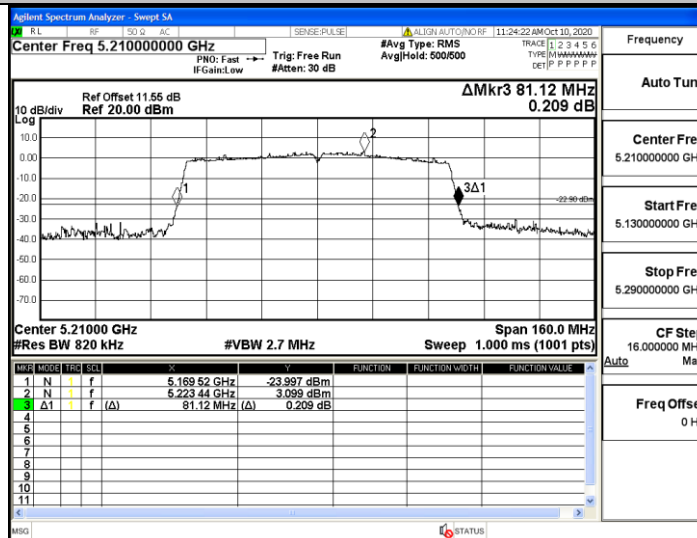
11AC40SISO_Ant1_5190



11AC40SISO_Ant1_5230

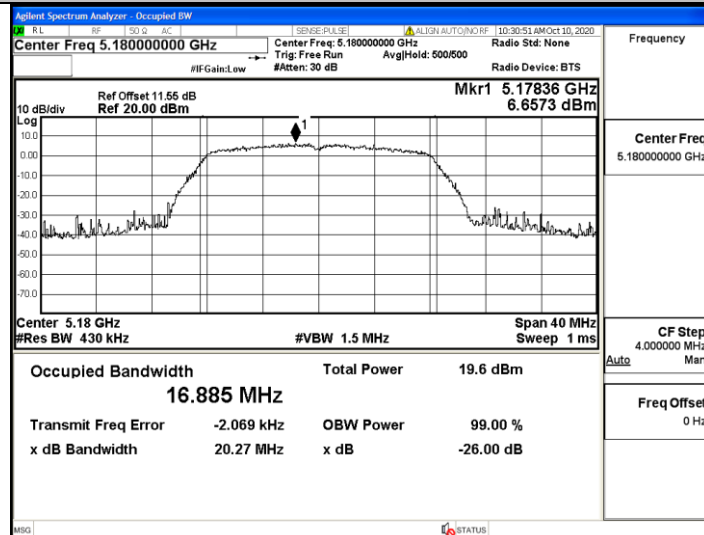


11AC80SISO_Ant1_5210

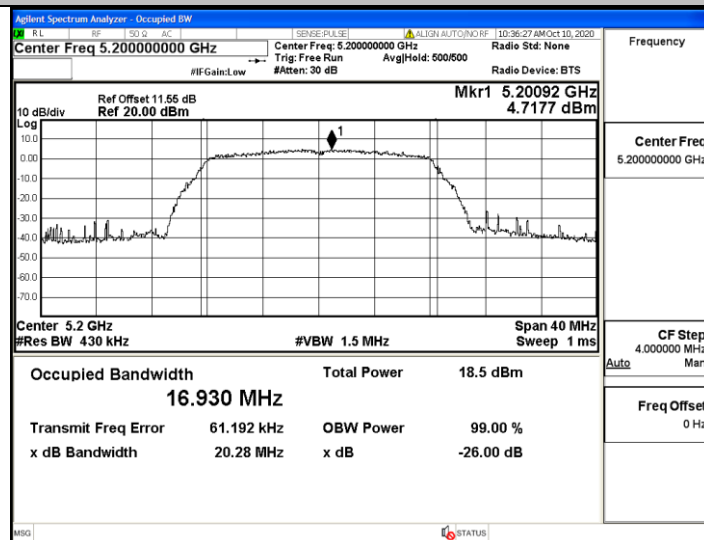




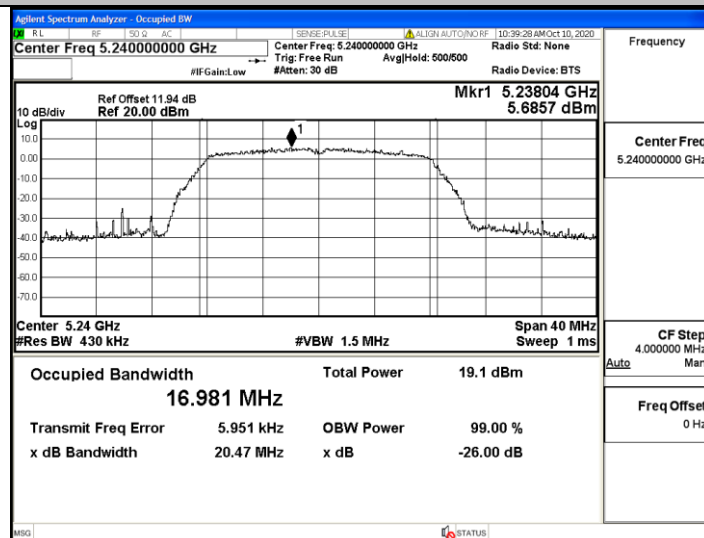
11A_Ant1_5180



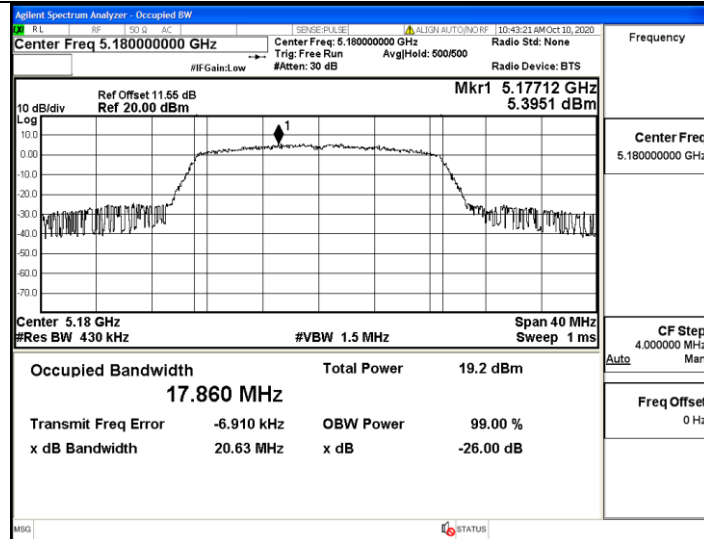
11A_Ant1_5200



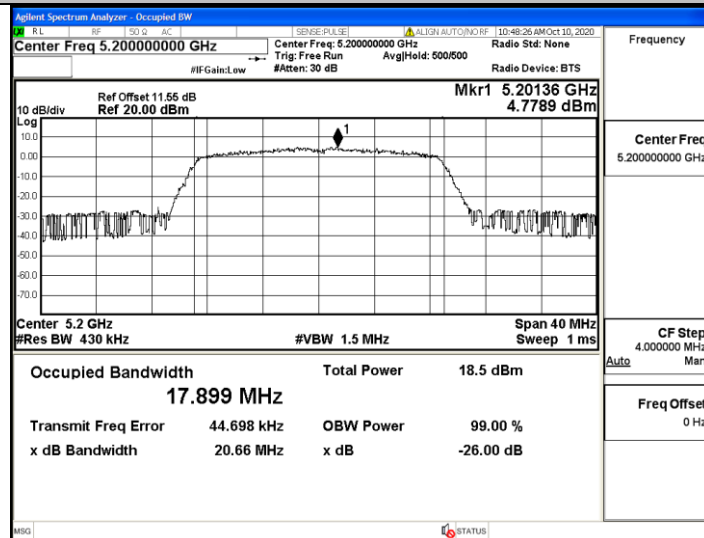
11A_Ant1_5240



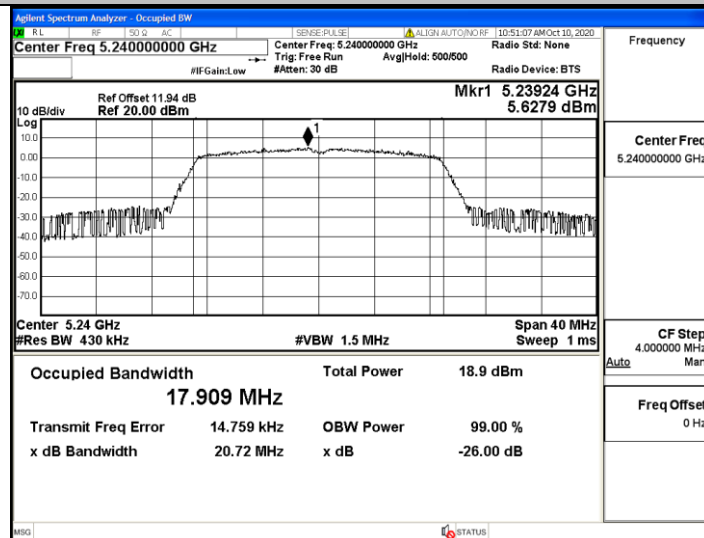
11N20ISO_Ant1_5180



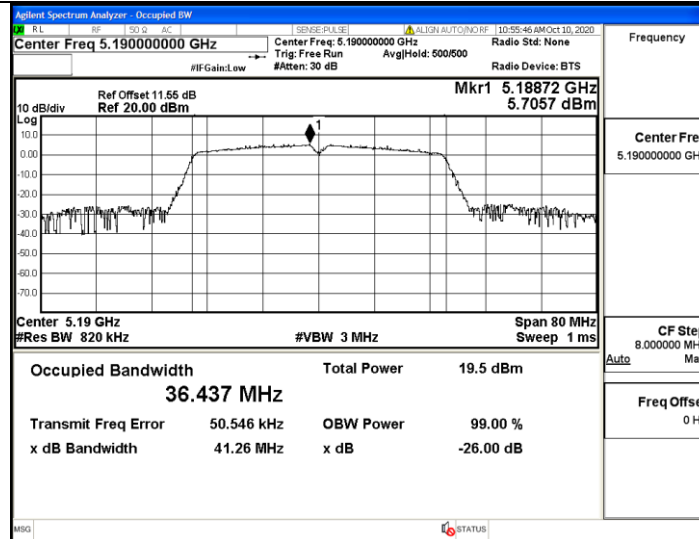
11N20SISO_Ant1_5200



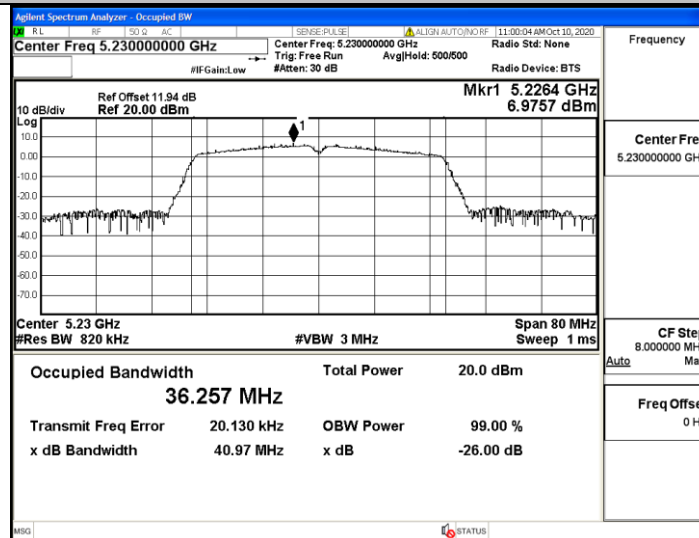
11N20SISO_Ant1_5240



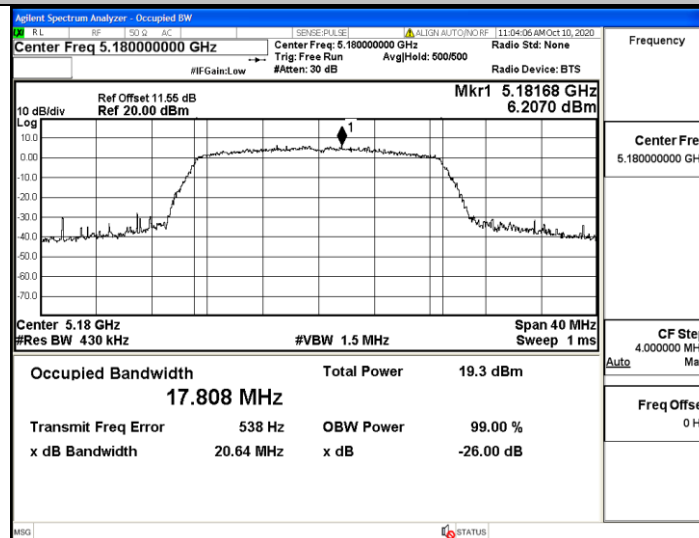
11N40SISO_Ant1_5190



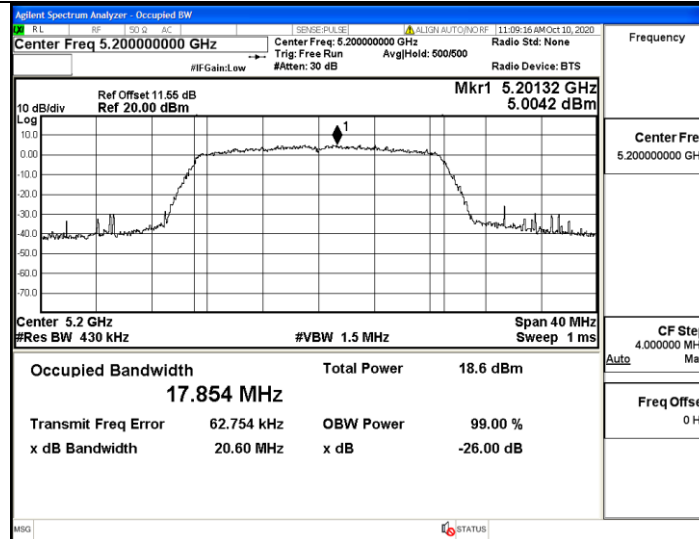
11N40SISO_Ant1_5230



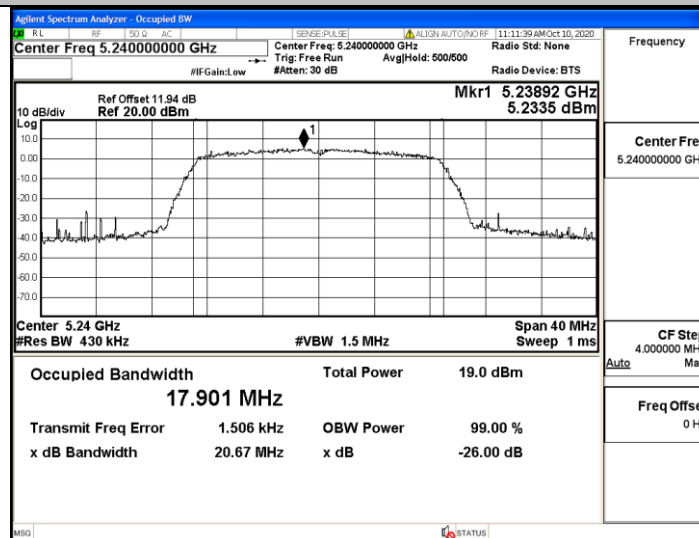
11AC20SISO_Ant1_5180



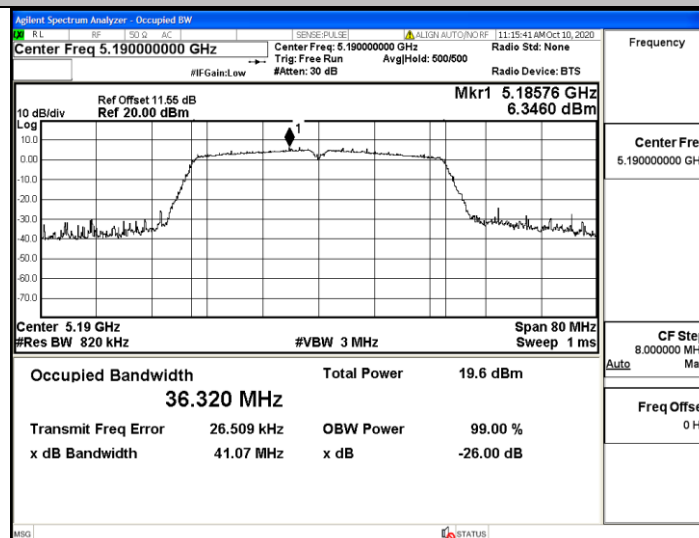
11AC20SISO_Ant1_5200



11AC20SISO_Ant1_5240



11AC40SISO_Ant1_5190



11AC40SISO_Ant1_5230

