

TEST REPORT

Product : Portable PC
Trade mark : CHUWI
Model/Type reference : GemiBook
Serial Number : N/A
Report Number : EED32M00298804
FCC ID : 2AHLZ-GEMIBOOK
Date of Issue : Nov. 09, 2020
Test Standards : 47 CFR Part 15 Subpart E
Test result : PASS

Prepared for:

CHUWI TECHNOLOGY (ShenZhen) CO., LIMITED
2 Floor Building 3 LiJinCheng Industrial park
the east of Gongye road LongHua, Shenzhen, China

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Date:

Nov. 09, 2020



Check No: 4762111346

2 Version

Version No.	Date	Description
00	Nov. 09, 2020	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart E Section 15.407 (b)(6)	ANSI C63.10-2013	PASS
Conducted Output Power and transmit power control mechanism	47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(4)(h)(1)	ANSI C63.10-2013	PASS
26dB emission bandwidth	47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)	ANSI C63.10-2013	PASS
Peak Power Spectral Density	47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(5)	ANSI C63.10-2013	PASS
Peak power excursion	47 CFR Part 15 Subpart E Section 15.407 (a)(6)	ANSI C63.10-2013	PASS
Frequency stability	47 CFR Part 15 Subpart E Section 15.407 (g)	ANSI C63.10-2013	PASS
Operation in the absence of information to the transmit	47 CFR Part 15 Subpart E Section 15.407 (c)	47 CFR Part 15 Subpart E	PASS
Unwanted Emissions that fall Outside of the Restricted Bands	47 CFR Part 15 Subpart E Section 15.407 (b)(1)(2)(3)(5)	ANSI C63.10-2013	PASS
Unwanted Emissions in the Restricted Bands	47 CFR Part 15 Subpart E Section 15.407 (b)(6)(7)(8)	ANSI C63.10-2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15 Subpart E Section 15.407 (b)(6)(7)(8)	ANSI C63.10-2013	PASS

Remark:

Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

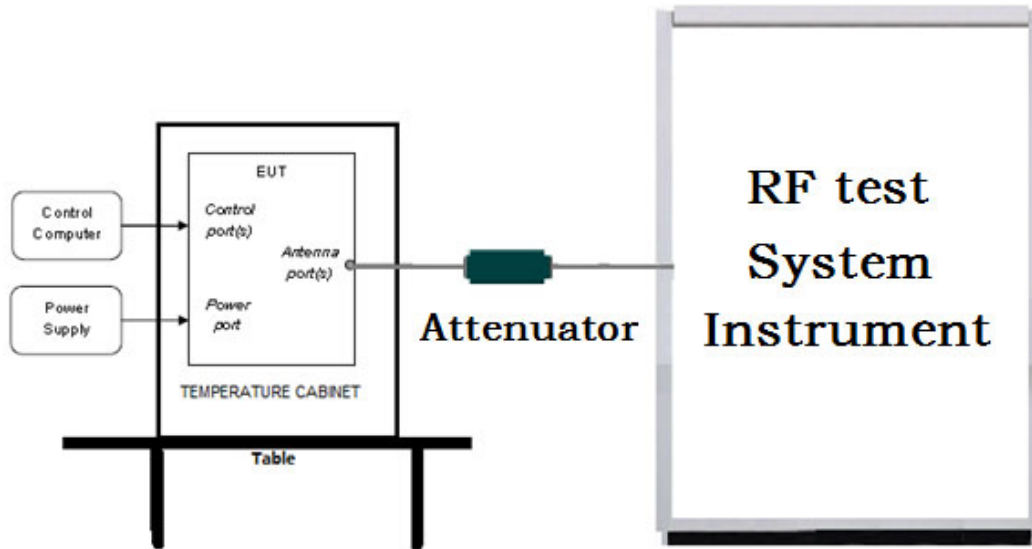
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5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

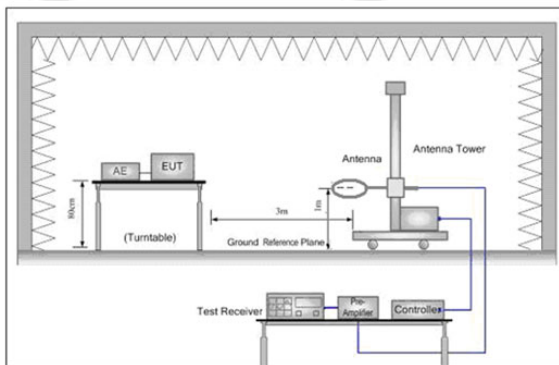


Figure 1. Below 30MHz

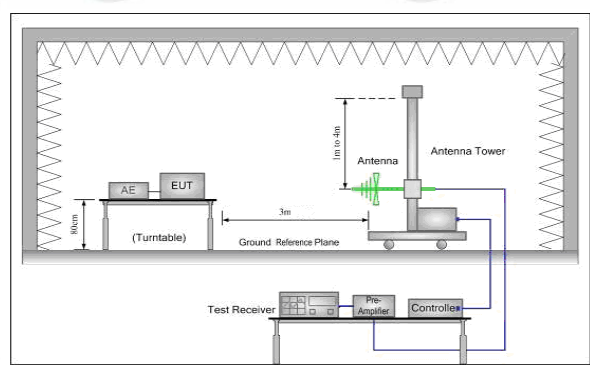


Figure 2. 30MHz to 1GHz

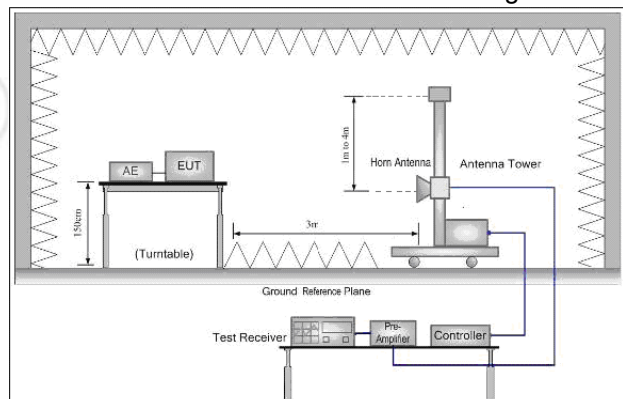
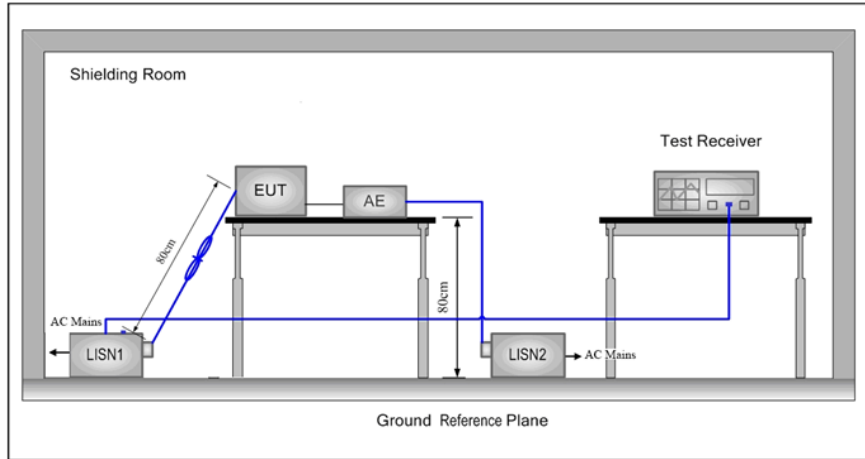


Figure 3. Above 1GHz

5.1.3 For Conducted Emissions test setup
Conducted Emissions setup



5.2 Test Environment

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010mbar

5.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
802.11a/n(HT20)/ac(VHT20)	5150MHz ~5250 MHz	Channel 36	Channel 40	Channel 48
		5180MHz	5200MHz	5240MHz
802.11n(HT40)/ac(VHT40)	5150MHz ~5250 MHz	Channel 38	N/A	Channel 46
		5190MHz	N/A	5230MHz
802.11ac(VHT80)	5150MHz ~5250 MHz	Channel 42	N/A	N/A
		5210MHz	N/A	N/A
802.11a/n(HT20)/ac(VHT20)	5725MHz ~5850 MHz	Channel 149	Channel157	Channel165
		5745MHz	5785MHz	5825MHz
802.11n(HT40)/ac(VHT40)	5725MHz ~5850 MHz	Channel 151	N/A	Channel159
		5755MHz	N/A	5795MHz
802.11ac(VHT80)	5725MHz ~5850 MHz	Channel 155	N/A	N/A
		5775MHz	N/A	N/A

6 General Information

6.1 Client Information

Applicant:	CHUWI TECHNOLOGY (ShenZhen) CO., LIMITED
Address of Applicant:	2 Floor Building 3 LiJinCheng Industrial park the east of Gongye road LongHua, Shenzhen, China
Manufacturer:	CHUWI TECHNOLOGY (ShenZhen) CO., LIMITED
Address of Manufacturer:	2 Floor Building 3 LiJinCheng Industrial park the east of Gongye road LongHua, Shenzhen, China
Factory:	JIANGSU LUCKYSTAR INTELLIGENT & TECHNOLOGY CO., LTD
Address of Factory:	Intelligent Terminal Pioneer Park (D), Yanlong Street Office, Yandu District, Yancheng City, Jiangsu Province

6.2 General Description of EUT

Product Name:	Portable PC	
Model No.(EUT):	GemiBook	
Trade mark:	CHUWI	
Type of Modulation:	IEEE 802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11n(HT20/HT40): OFDM (BPSK, QPSK, 16QAM, 64QAM) IEEE 802.11ac(VHT20/VHT40/VHT80): OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)	
Frequency Range of Operation	U-NII-1 : 5150-5250MHz; U-NII-3:5725-5850MHz	
Operating Frequency	U-NII-1 : 5180-5240MHz; U-NII-3:5745-5825MHz	
Test Power Grade:	Default	
Test Software of EUT:	DRTU	
Antenna Type:	FPC antenna	
Antenna Gain:	Antenna gain:2.97dBi	
Power Supply:	Adapter	Model:A241-1202000D Input:100-240V~ 50/60Hz 0.8A Output:12.0V---2.0A 24.0W
	Battery	Model:5059B4-2S-1 2ICP5/59/115 Norminal Voltage:7.6Vd.c. Rated Capacity:5000mAh 38Wh
Test voltage:	Battery 7.6V	
Sample Received Date:	Sep. 21, 2020	
Sample tested Date:	Sep. 21, 2020 to Oct.22, 2020	

Operation Frequency each of channel

802.11a/802.11n/802.11ac(20MHz) Frequency/Channel Operations:

U-NII-1		U-NII-3	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
36	5180	149	5745
40	5200	153	5765
44	5220	157	5785
48	5240	161	5805
-	-	165	5825
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

802.11n/802.11ac(40MHz) Frequency/Channel Operations:

U-NII-1		U-NII-3	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
38	5190	151	5755
46	5230	159	5795
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

802.11ac(80MHz) Frequency/Channel Operations:

U-NII-1		U-NII-3	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
42	5210	155	5775
-	-	-	-
-	-	-	-

6.3 Description of Support Units

The EUT has been tested independently

6.4 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

6.5 Deviation from Standards

None.

6.6 Abnormalities from Standard Conditions

None.

6.7 Other Information Requested by the Customer

None.

6.8 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-12.75GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

7 Equipment List

RF test system					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Spectrum Analyzer	Keysight	N9010A	MY54510339	02-17-2020	02-16-2021
Signal Generator	Keysight	N5182B	MY53051549	02-17-2020	02-16-2021
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	06-29-2020	06-28-2021
High-pass filter	Sinoscite	FL3CX03WG18N M12-0398-002	---	---	---
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	---	---
DC Power	Keysight	E3642A	MY56376072	02-17-2020	02-16-2021
PC-1	Lenovo	R4960d	---	---	---
BT&WI-FI Automatic control	R&S	OSP120	101374	02-17-2020	02-16-2021
RF control unit	JS Tonscend	JS0806-2	158060006	02-17-2020	02-16-2021
BT&WI-FI Automatic test software	JS Tonscend	JS1120-3	---	---	---

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100435	04-28-2020	04-27-2021
Temperature/ Humidity Indicator	Defu	TH128	/	---	---
LISN	R&S	ENV216	100098	03-05-2020	03-04-2021
Barometer	changchun	DYM3	1188	---	---

3M Semi/full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05-24-2019	05-23-2022
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-618	05-16-2020	05-15-2021
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04-25-2018	04-24-2021
Receiver	R&S	ESCI7	100938-003	10-21-2019 10-16-2020	10-20-2020 10-15-2021
Multi device Controller	matur	NCD/070/107 11112	---	---	---
Temperature/ Humidity Indicator	Shanghai qixiang	HM10	1804298	06-29-2020	06-28-2021
Cable line	Fulai(7M)	SF106	5219/6A	---	---
Cable line	Fulai(6M)	SF106	5220/6A	---	---
Cable line	Fulai(3M)	SF106	5216/6A	---	---
Cable line	Fulai(3M)	SF106	5217/6A	---	---

3M full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
RSE Automatic test software	JS Tonscend	JS36-RSE	10166	---	---
Receiver	Keysight	N9038A	MY57290136	03-05-2020	03-04-2021
Spectrum Analyzer	Keysight	N9020B	MY57111112	03-05-2020	03-04-2021
Spectrum Analyzer	Keysight	N9030B	MY57140871	03-05-2020	03-04-2021
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-25-2018	04-24-2021
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-25-2018	04-24-2021
Horn Antenna	ETS-LINDGREN	3117	00057407	07-10-2018	07-09-2021
Preamplifier	EMCI	EMC184055SE	980596	05-20-2020	05-19-2021
Preamplifier	EMCI	EMC001330	980563	04-22-2020	04-21-2021
Preamplifier	JS Tonscend	980380	EMC051845 SE	01-09-2020	01-08-2021
Temperature/Humidity Indicator	biaozhi	GM1360	EE1186631	04-27-2020	04-26-2021
Fully Anechoic Chamber	TDK	FAC-3	---	01-17-2018	01-16-2021
Filter bank	JS Tonscend	JS0806-F	188060094	04-10-2018	04-09-2021
Cable line	Times	SFT205-NMSM-2.50M	394812-0001	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0002	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0003	---	---
Cable line	Times	SFT205-NMSM-2.50M	393495-0001	---	---
Cable line	Times	EMC104-NMNM-1000	SN160710	---	---
Cable line	Times	SFT205-NMSM-3.00M	394813-0001	---	---
Cable line	Times	SFT205-NMNM-1.50M	381964-0001	---	---
Cable line	Times	SFT205-NMSM-7.00M	394815-0001	---	---
Cable line	Times	HF160-KMKM-3.00M	393493-0001	---	---

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15E (2015)	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
3	KDB789033 D02 General UNII Test Procedures New Rules v01	Guidelines for compliance testing of unlicensed national information infrastructure (U-NII) device part 15 subpart E

Test Results List:

Test Requirement	Test method	Test item	Verdict	Note
Part15E Section 15.407 (a)(1)(2)	KDB789033 D02v01	26dB Occupied Bandwidth	PASS	Appendix A)
Part15E Section 15.407 (a)(1)(2)(4)(h)(1)	KDB789033 D02v01	Conducted Output Power and transmit power control mechanism	PASS	Appendix B)
Part15E Section 15.407 (a)(1)(2)(5)	KDB789033 D02v01	Power Spectral Density	PASS	Appendix C)
Part15E Section 15.407 (a)(6)	KDB789033 D02v01	Peak power excursion	PASS	N/A
47 CFR Part 15 Subpart E Section 15.407(b)(1)to(6)	ANSI C63.10-2013	Conducted Band-edge Measurements	PASS	Appendix D)
Part15E Section 15.407 (g)	KDB789033 D02v01	Frequency stability	PASS	Appendix E)
Part15C Section 15.203	ANSI C63.10	Antenna Requirement	PASS	Appendix F)
Part15E Section 15.407 (c)	Section 15.407	Operation in the absence of information to the transmit	PASS	N/A
Part15E Section 15.407 (b)(6)	ANSI C63.10	AC Power Line Conducted Emission	PASS	Appendix G)
Part15E Section 15.407 (b)(6)(7)(8)	KDB789033 D02v01	Restricted bands around fundamental frequency (Radiated Emission)	PASS	Appendix H)
Part15E Section 15.407 (b)(6)(7)(8)	KDB789033 D02v01	Unwanted Emissions in the Restricted Bands	PASS	Appendix I)
Part15E Section 15.407 (b)(1)(2)(3)(5)	KDB789033 D02v01	Unwanted Emissions that fall Outside of the Restricted Bands	PASS	Appendix J)

Duty Cycle

ANT1			
Test Mode	Channel	Duty Cycle[%]	Verdict
11A	5180	97.7	PASS
11A	5200	97.7	PASS
11A	5240	97.7	PASS
11A	5745	97.58	PASS
11A	5785	97.58	PASS
11A	5825	97.58	PASS
11N20SISO	5180	97.54	PASS
11N20SISO	5200	97.41	PASS
11N20SISO	5240	97.53	PASS
11N20SISO	5745	97.41	PASS
11N20SISO	5785	97.54	PASS
11N20SISO	5825	97.41	PASS
11N40SISO	5190	95.09	PASS
11N40SISO	5230	94.83	PASS
11N40SISO	5755	94.83	PASS
11N40SISO	5795	94.83	PASS
11AC20SISO	5180	97.42	PASS
11AC20SISO	5200	97.55	PASS
11AC20SISO	5240	97.42	PASS
11AC20SISO	5745	97.55	PASS
11AC20SISO	5785	97.42	PASS
11AC20SISO	5825	97.42	PASS
11AC40SISO	5190	94.87	PASS
11AC40SISO	5230	95.13	PASS
11AC40SISO	5755	95.13	PASS
11AC40SISO	5795	95.13	PASS
11AC80SISO	5210	90	PASS
11AC80SISO	5775	89.95	PASS

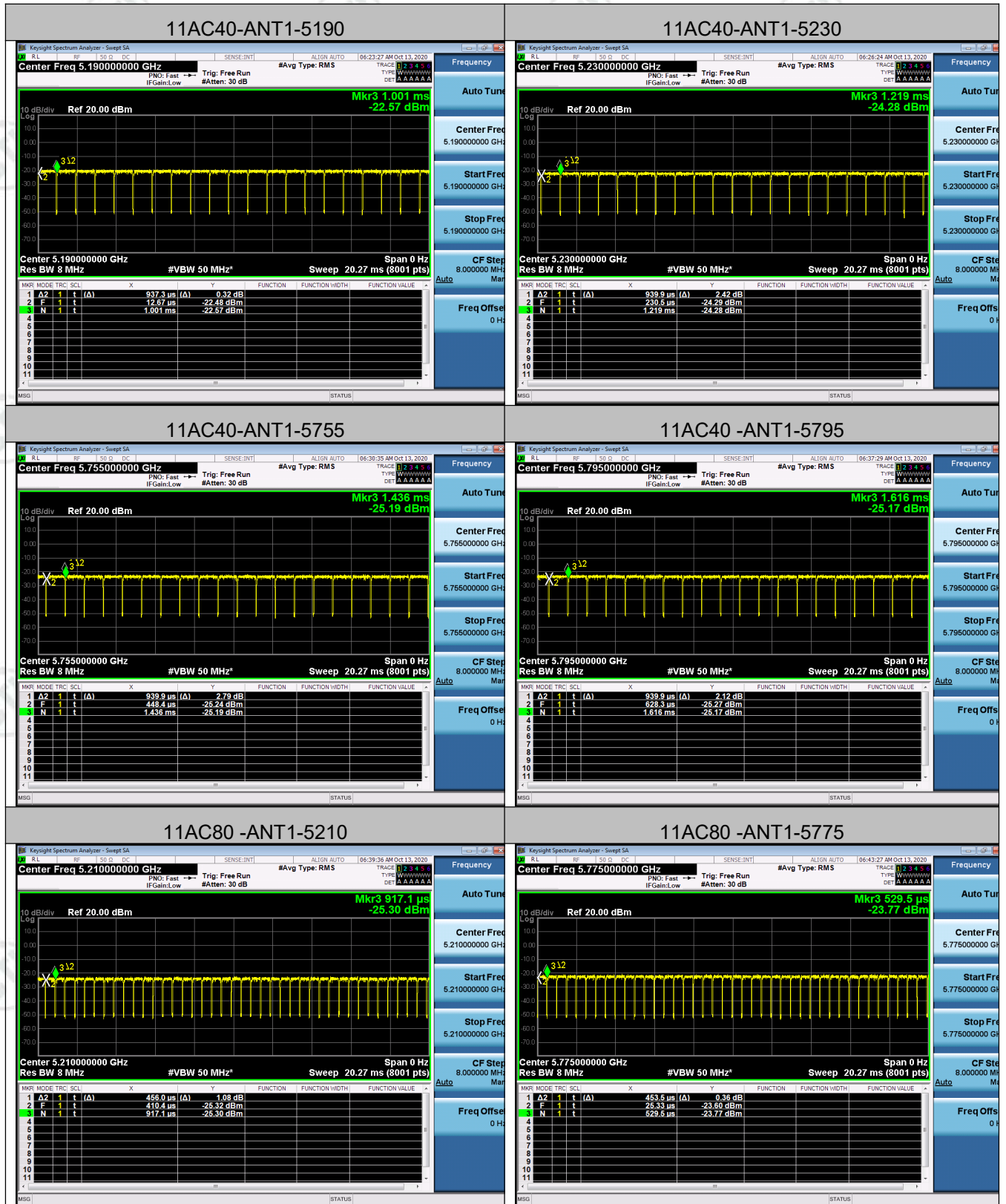
Test Graph











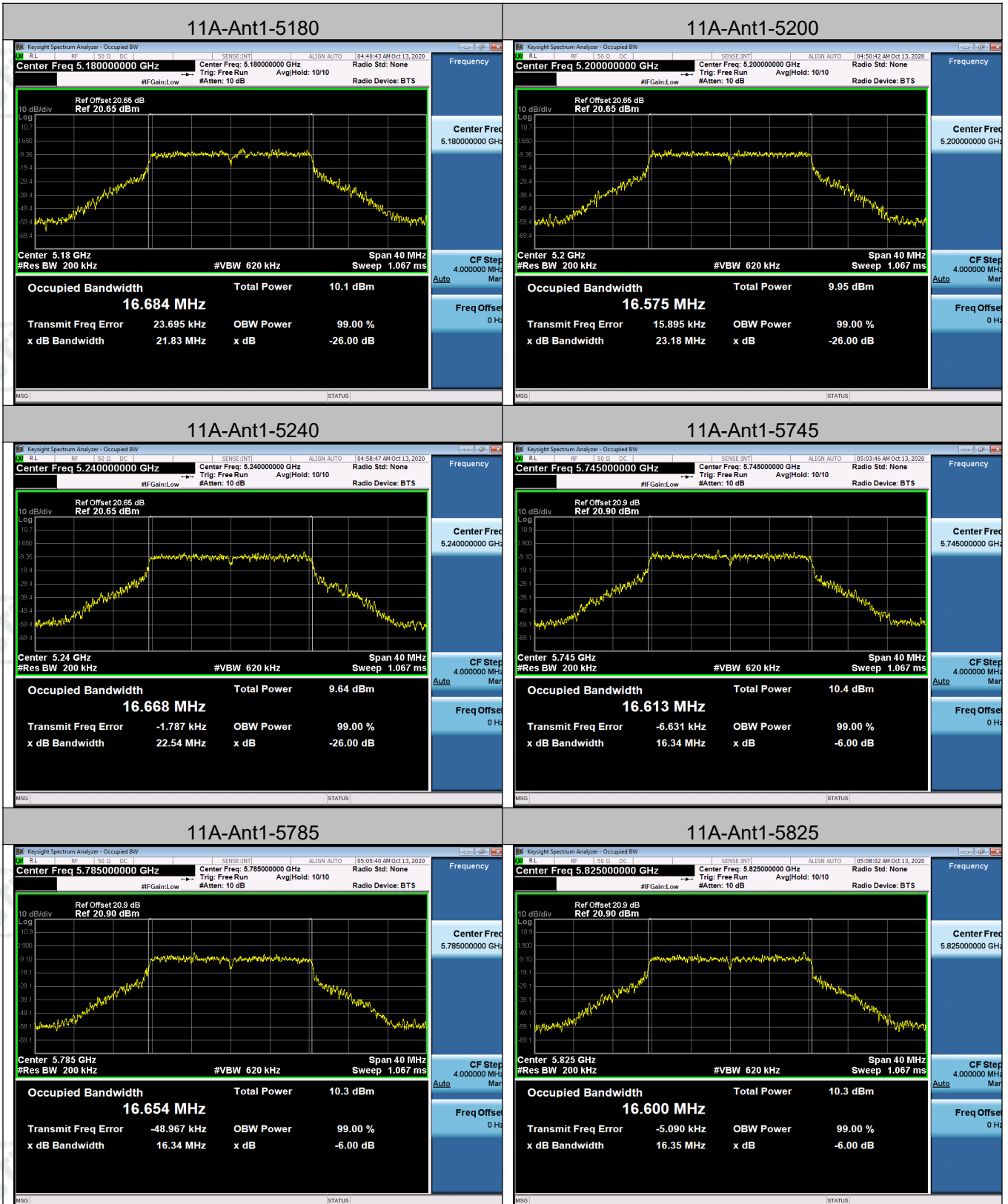
Appendix A): Emission Bandwidth

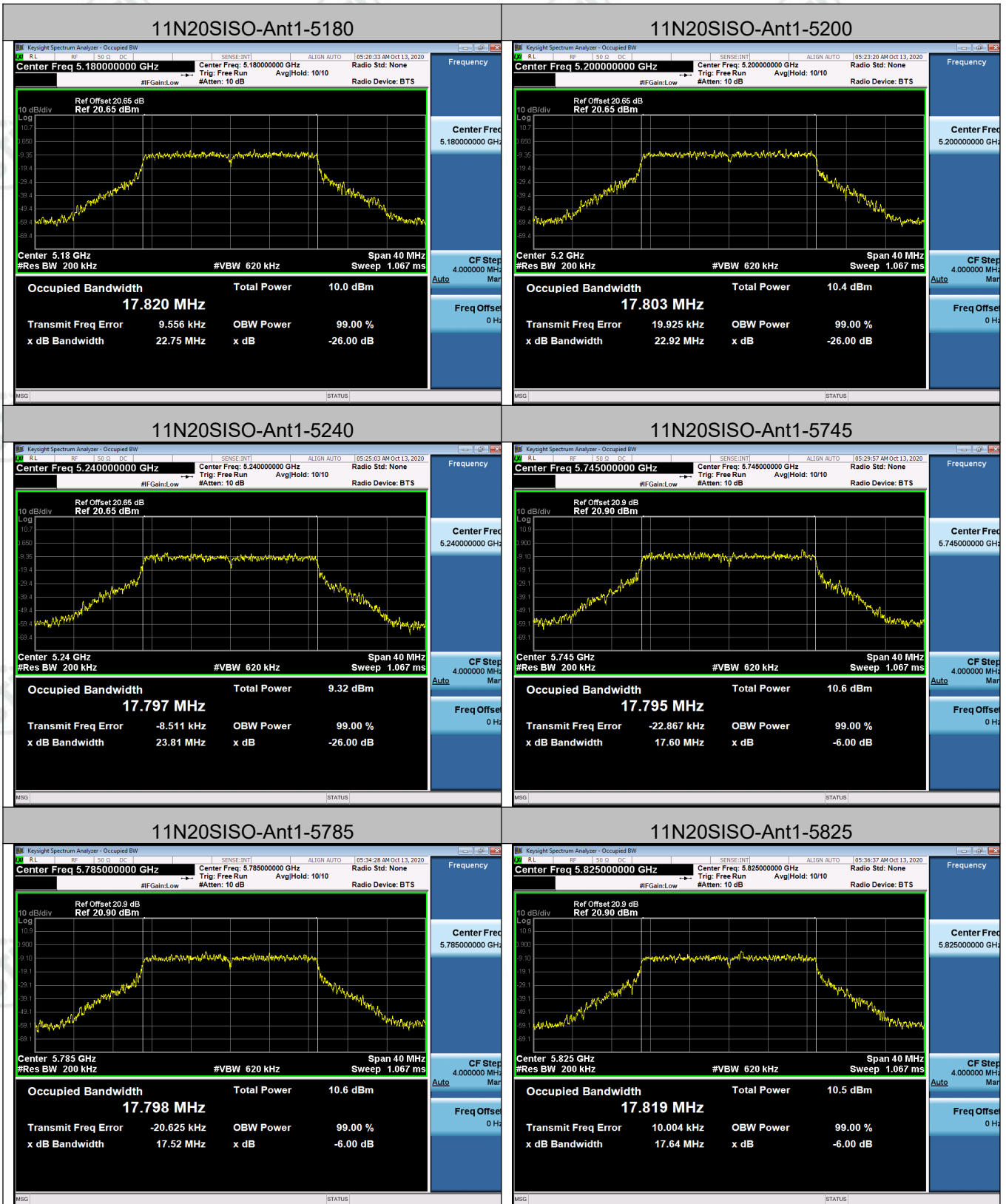
Result Table

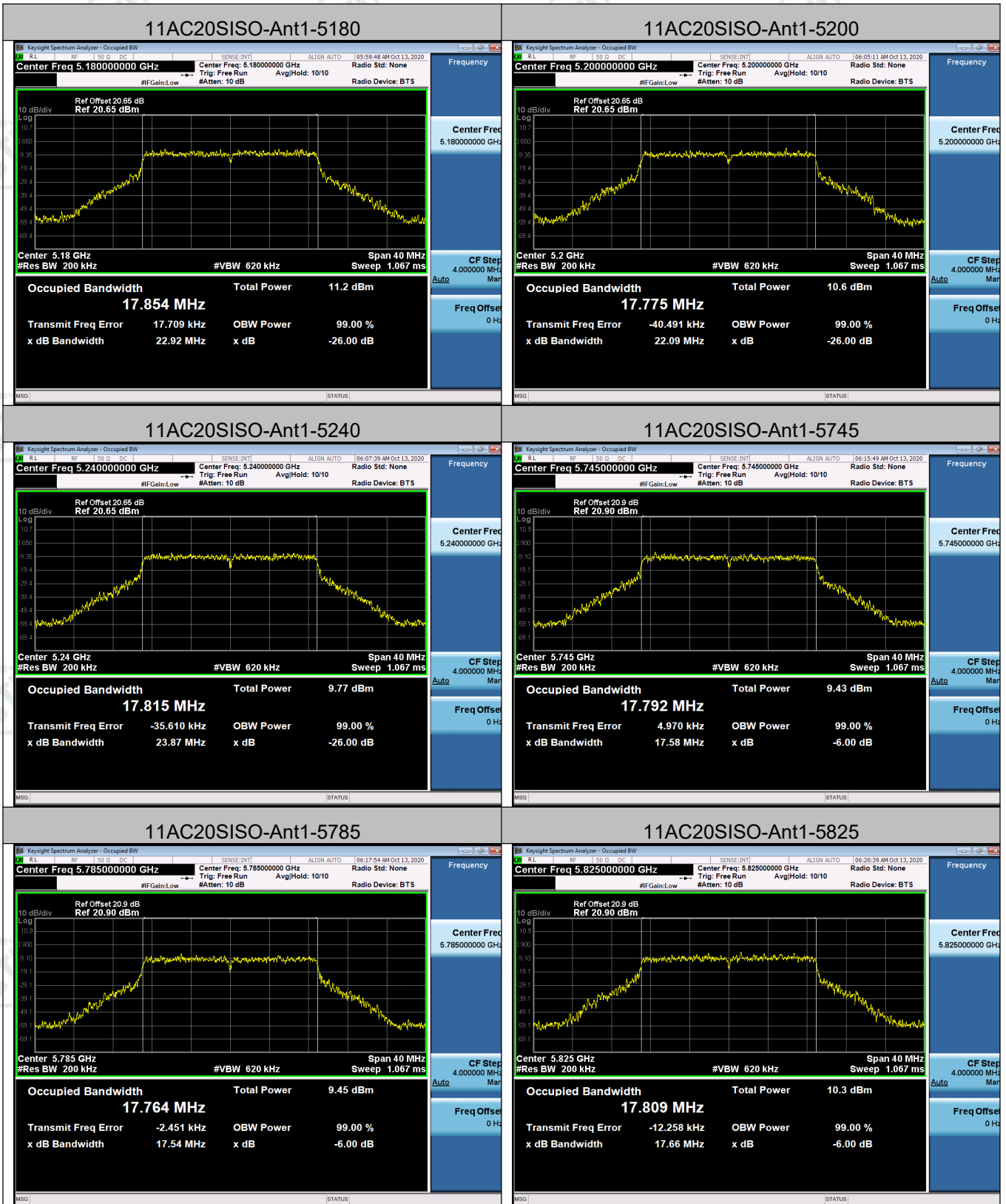
Test Mode	Antenna	Channel	EBW[MHz]	OBW[MHz]	Verdict
11A	Ant1	5180	23.11	16.684	PASS
11A	Ant1	5200	22.71	16.575	PASS
11A	Ant1	5240	23.23	16.668	PASS
11A	Ant1	5745	16.50	16.613	PASS
11A	Ant1	5785	16.52	16.654	PASS
11A	Ant1	5825	16.30	16.600	PASS
11N20SISO	Ant1	5180	23.99	17.820	PASS
11N20SISO	Ant1	5200	24.17	17.803	PASS
11N20SISO	Ant1	5240	22.84	17.797	PASS
11N20SISO	Ant1	5745	17.75	17.795	PASS
11N20SISO	Ant1	5785	17.66	17.798	PASS
11N20SISO	Ant1	5825	17.13	17.819	PASS
11AC20SISO	Ant1	5180	23.35	17.854	PASS
11AC20SISO	Ant1	5200	24.53	17.775	PASS
11AC20SISO	Ant1	5240	24.06	17.815	PASS
11AC20SISO	Ant1	5745	17.65	17.792	PASS
11AC20SISO	Ant1	5785	17.65	17.764	PASS
11AC20SISO	Ant1	5825	17.80	17.809	PASS
11N40SISO	Ant1	5190	43.46	36.301	PASS
11N40SISO	Ant1	5230	44.83	36.309	PASS
11N40SISO	Ant1	5755	36.35	36.316	PASS
11N40SISO	Ant1	5795	36.33	36.340	PASS
11AC40SISO	Ant1	5190	43.28	36.318	PASS
11AC40SISO	Ant1	5230	43.62	36.281	PASS
11AC40SISO	Ant1	5755	36.35	36.379	PASS
11AC40SISO	Ant1	5795	36.29	36.343	PASS

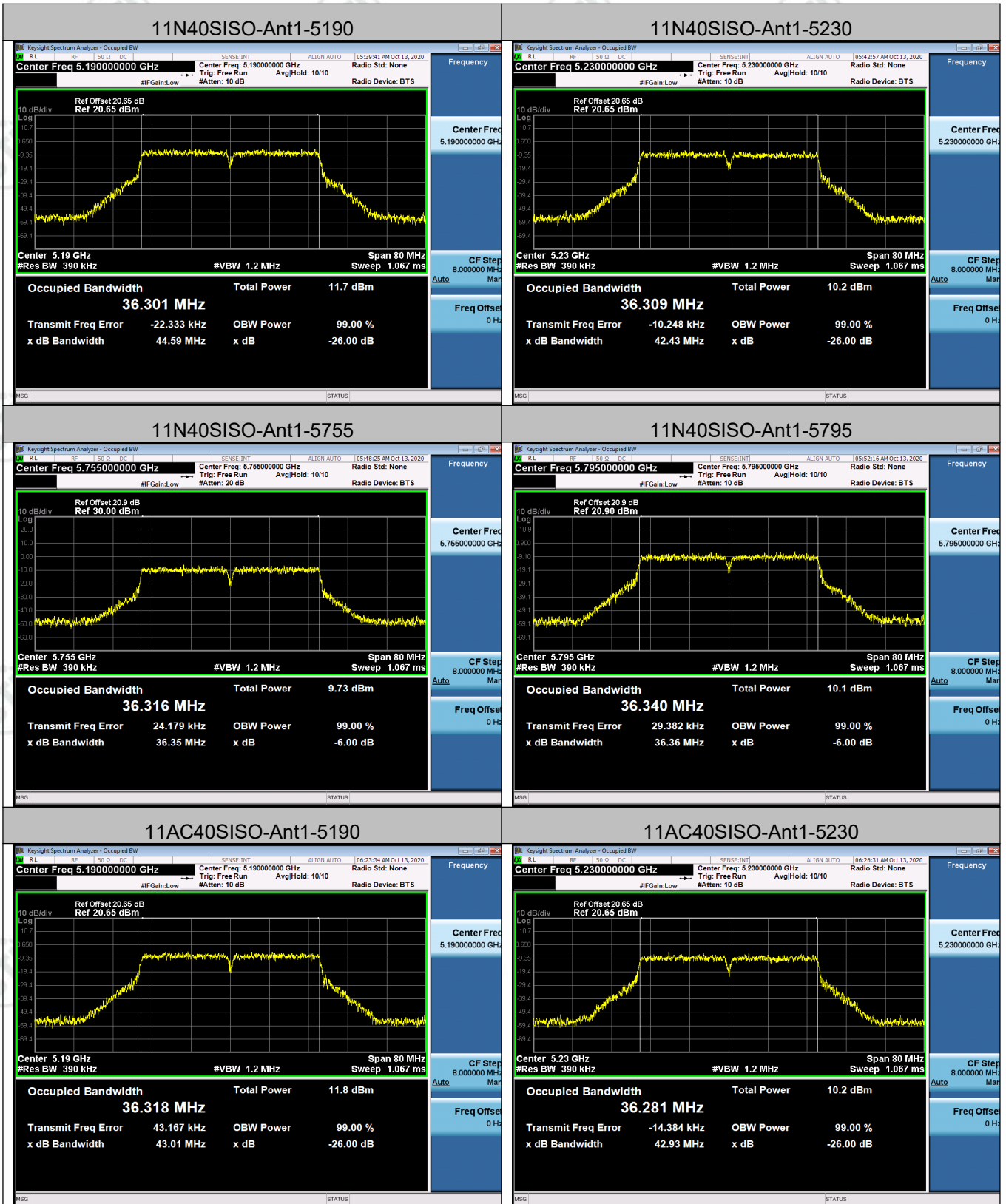
Test Mode	Antenna	Channel	EBW[MHz]	OBW[MHz]	Verdict
11AC80SISO	Ant1	5210	81.20	74.965	PASS
11AC80SISO	Ant1	5775	68.77	75.102	PASS

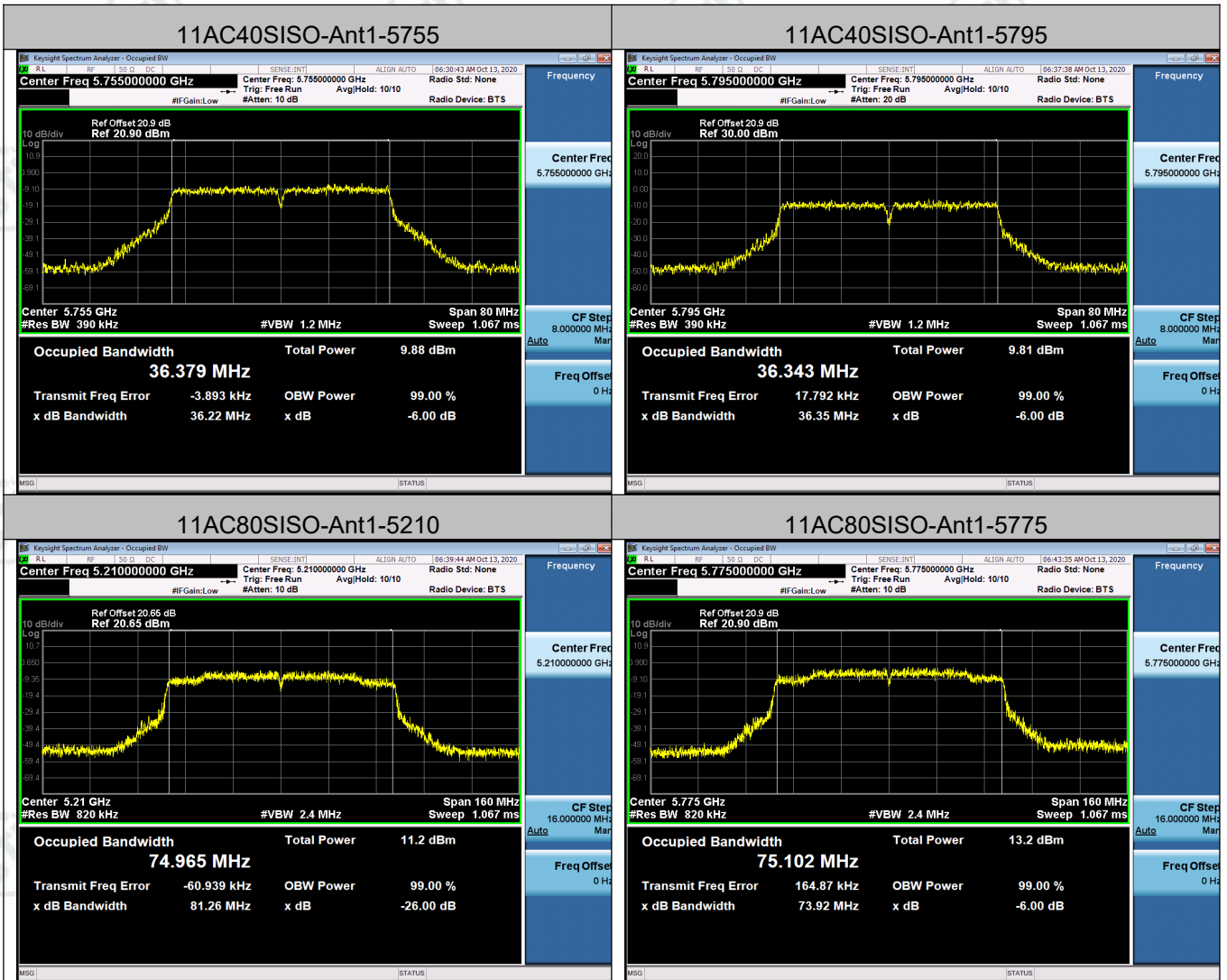
Test Graph
OBW



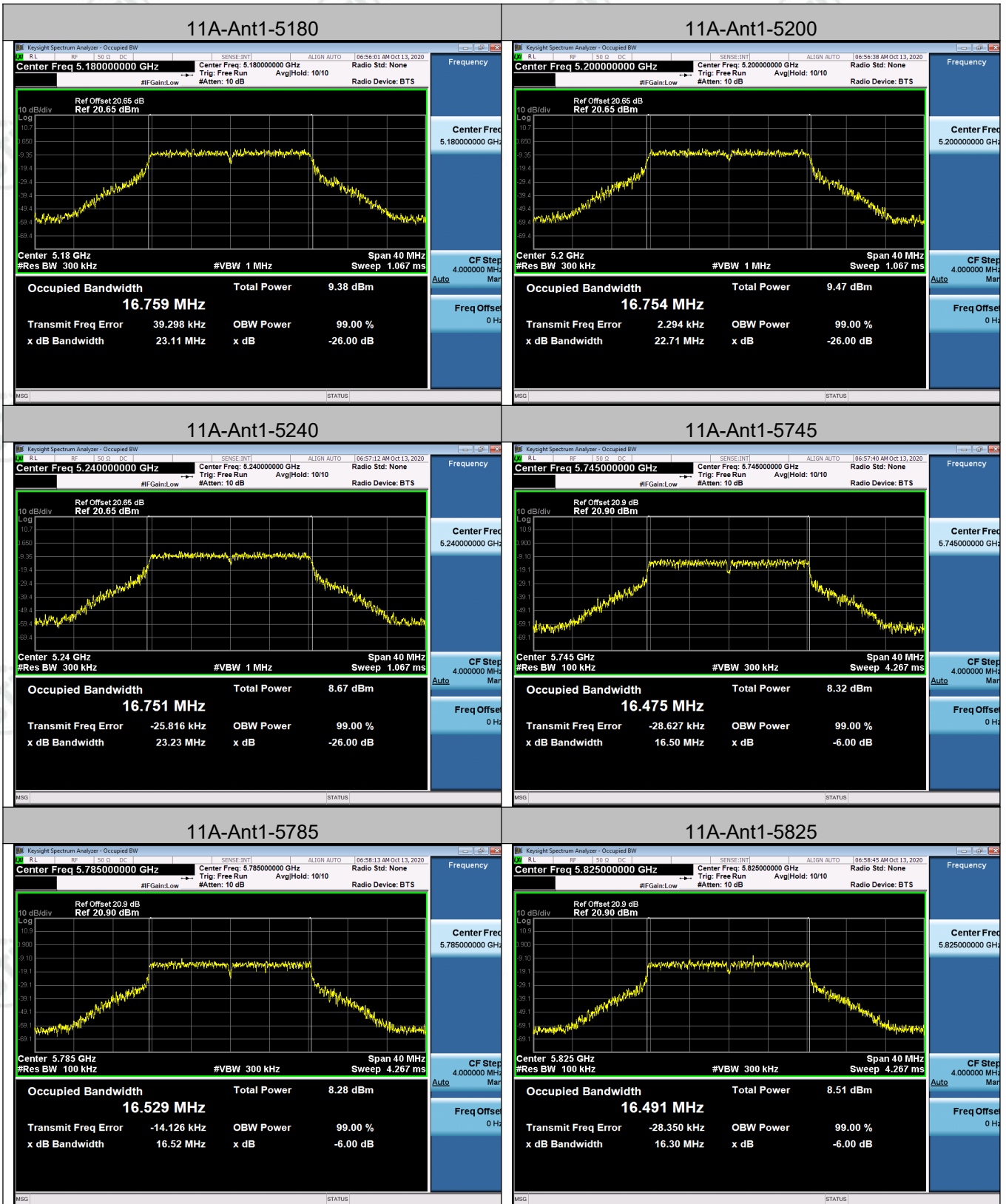


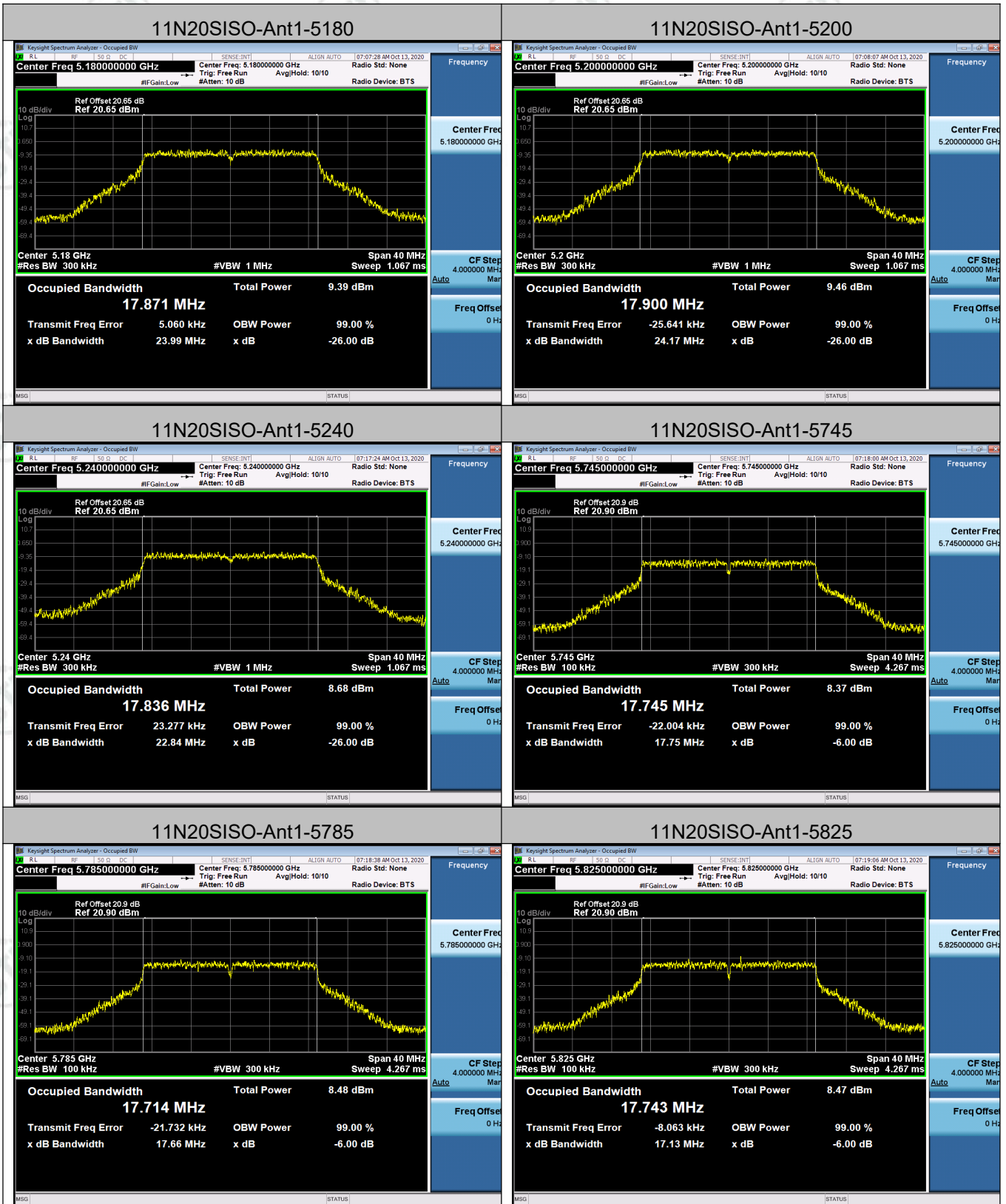


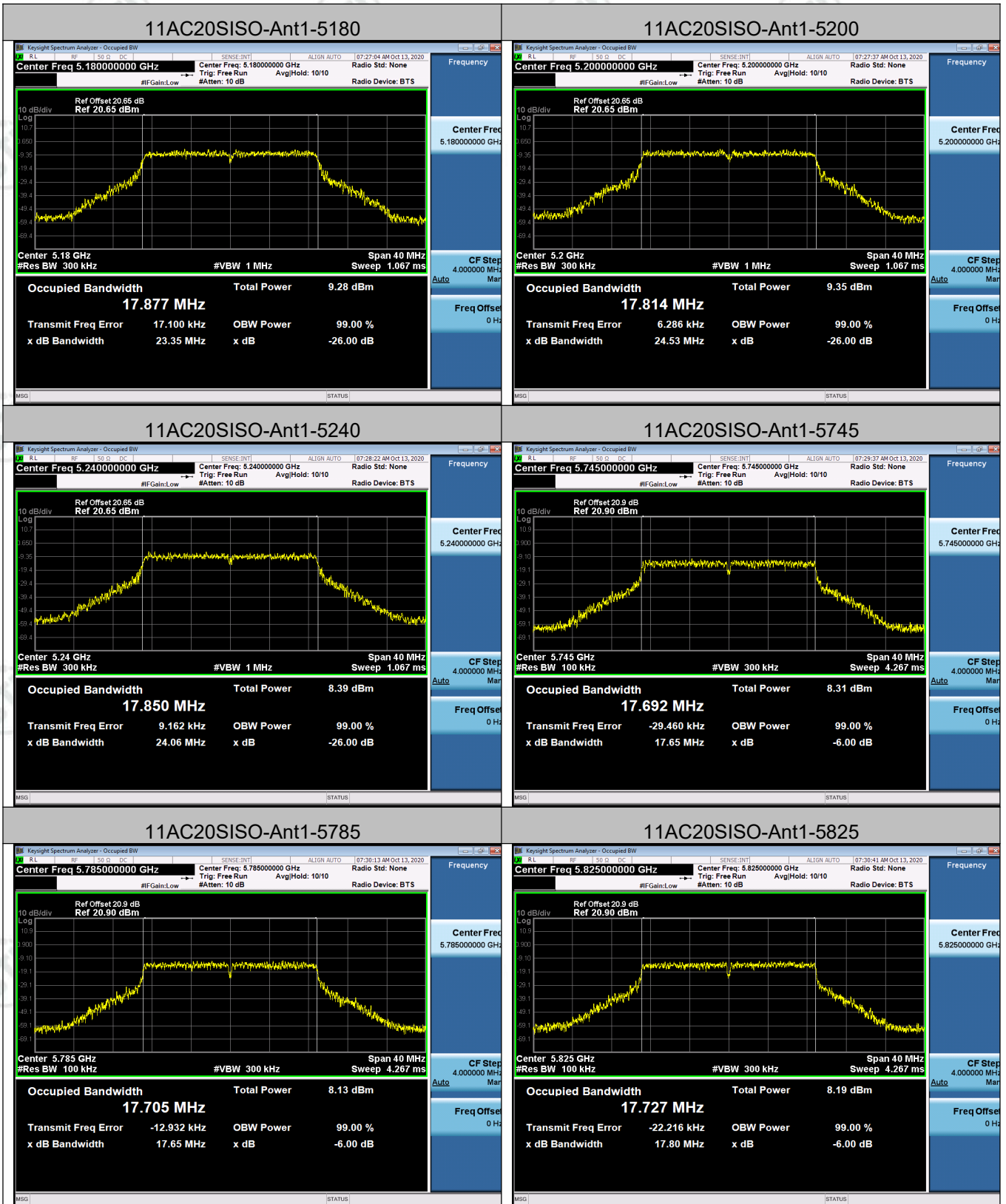


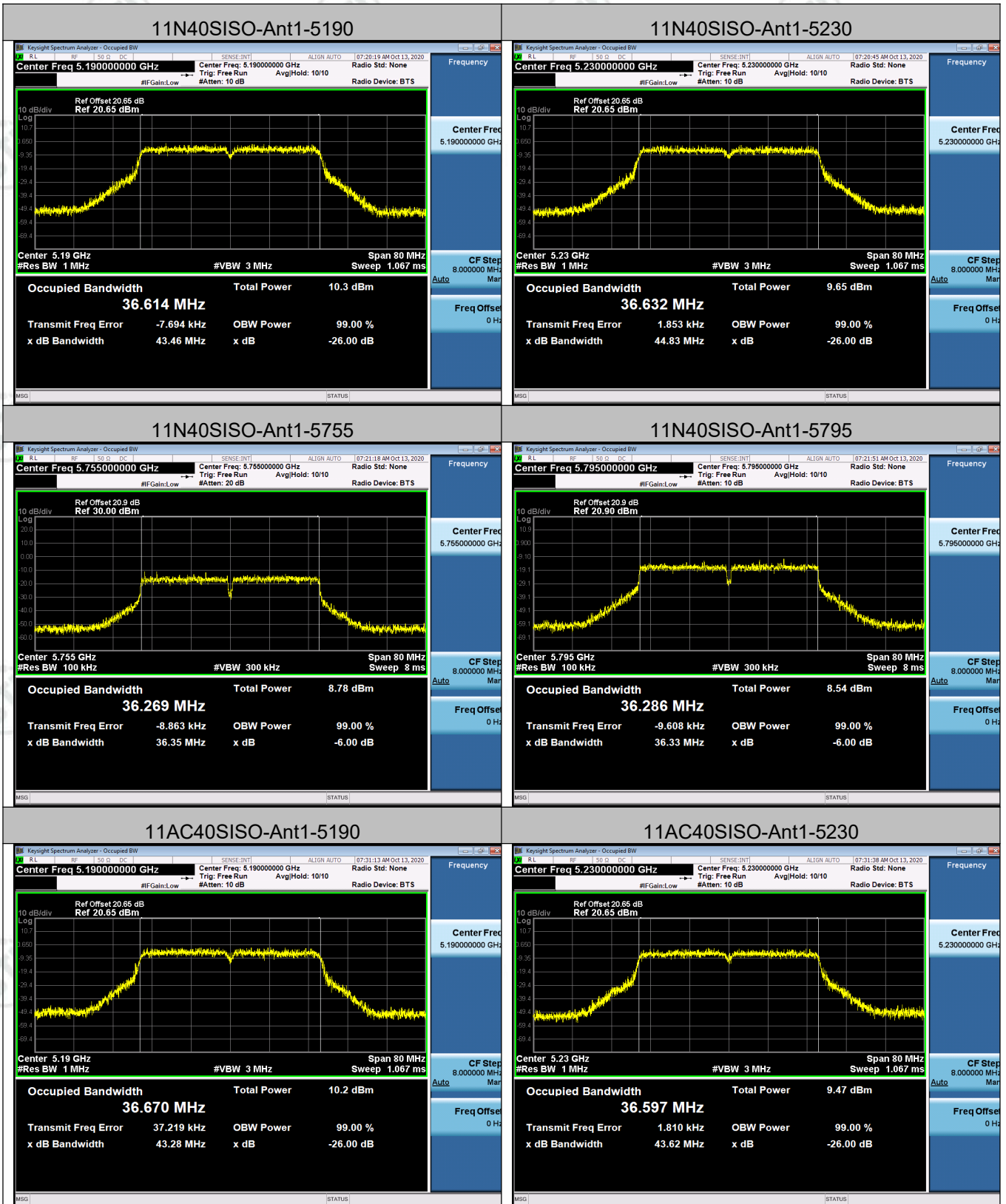


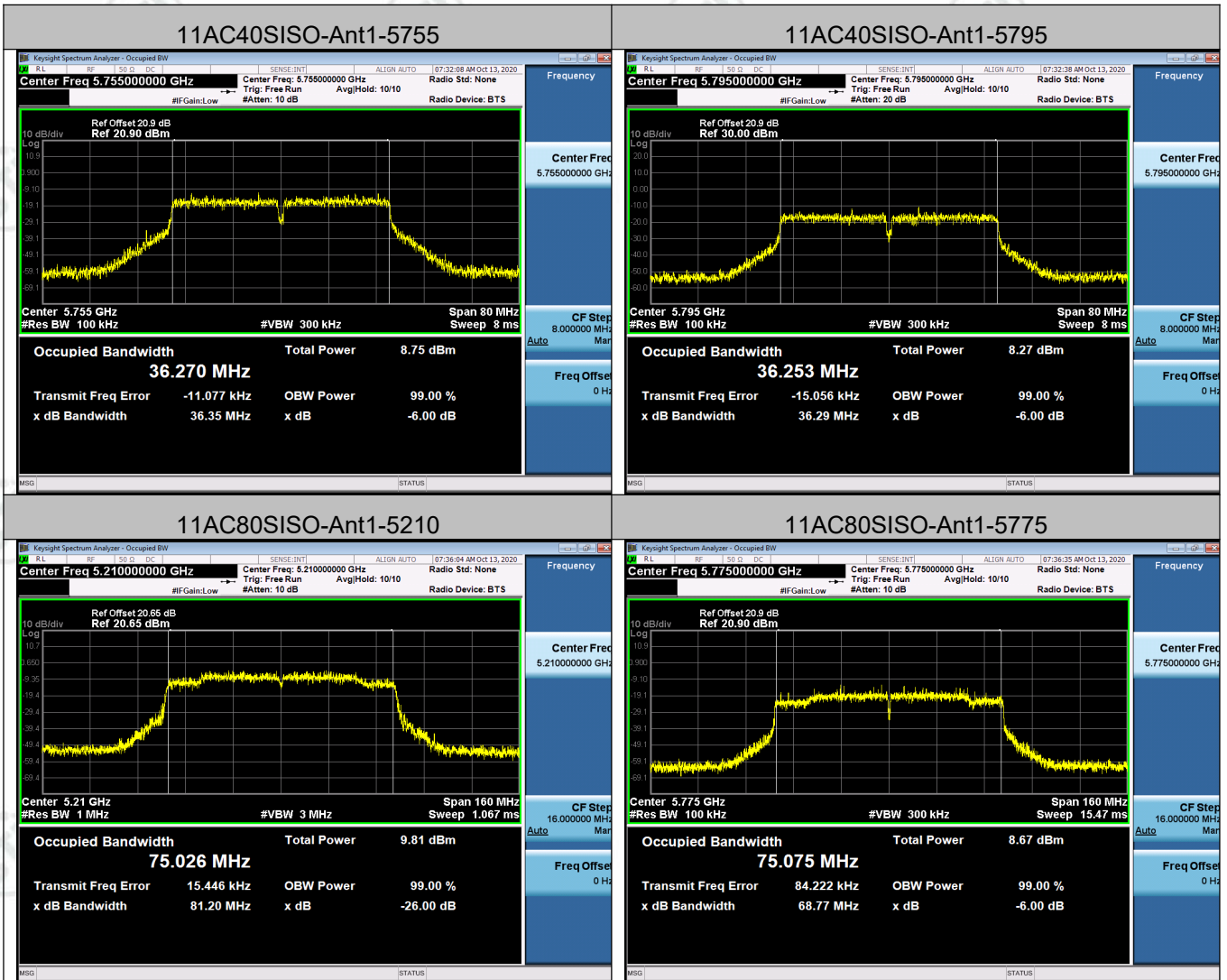
EBW











Appendix B): Maximum Conduct Output Power

Result Table

Test Mode	Antenna	Channel	Meas.Level [dBm]	Av.Power [dBm]	Verdict
11A	Ant1	5180	9.98	10.08	PASS
11A	Ant1	5200	10.41	10.51	PASS
11A	Ant1	5240	10.8	10.9	PASS
11A	Ant1	5745	10.11	10.22	PASS
11A	Ant1	5785	10.06	10.17	PASS
11A	Ant1	5825	10.14	10.25	PASS
11N20SISO	Ant1	5180	10.38	10.49	PASS
11N20SISO	Ant1	5200	10.38	10.49	PASS
11N20SISO	Ant1	5240	10.79	10.9	PASS
11N20SISO	Ant1	5745	10.26	10.37	PASS
11N20SISO	Ant1	5785	10.12	10.23	PASS
11N20SISO	Ant1	5825	10.24	10.35	PASS
11AC20SISO	Ant1	5180	10.54	10.65	PASS
11AC20SISO	Ant1	5200	10.56	10.67	PASS
11AC20SISO	Ant1	5240	10.83	10.94	PASS
11AC20SISO	Ant1	5745	9.21	9.32	PASS
11AC20SISO	Ant1	5785	10.14	10.25	PASS
11AC20SISO	Ant1	5825	10.14	10.25	PASS
11N40SISO	Ant1	5190	10.85	11.07	PASS
11N40SISO	Ant1	5230	10.26	10.49	PASS
11N40SISO	Ant1	5755	10.2	10.43	PASS
11N40SISO	Ant1	5795	9.95	10.18	PASS
11AC40SISO	Ant1	5190	10.77	11	PASS
11AC40SISO	Ant1	5230	10.24	10.46	PASS
11AC40SISO	Ant1	5755	10.23	10.45	PASS
11AC40SISO	Ant1	5795	10.09	10.31	PASS
11AC80SISO	Ant1	5210	9.01	9.47	PASS
11AC80SISO	Ant1	5775	7.86	8.32	PASS

Remark: Duty Factor(dB) = 10 * Log(1/Duty Cycle)

Av. Power(dBm) = Meas. Level(dBm) + Duty Factor(dB)

Test Graph

