

TEST REPORT

Product : WIFI Module
Trade mark : GSD
Model/Type reference : WC3HM2511
Serial Number : N/A
Report Number : EED32K00324402
FCC ID : 2AC23-WC3HM2511
Date of Issue : May 21, 2019
Test Standards : 47 CFR Part 15 Subpart E
Test result : PASS

Prepared for:

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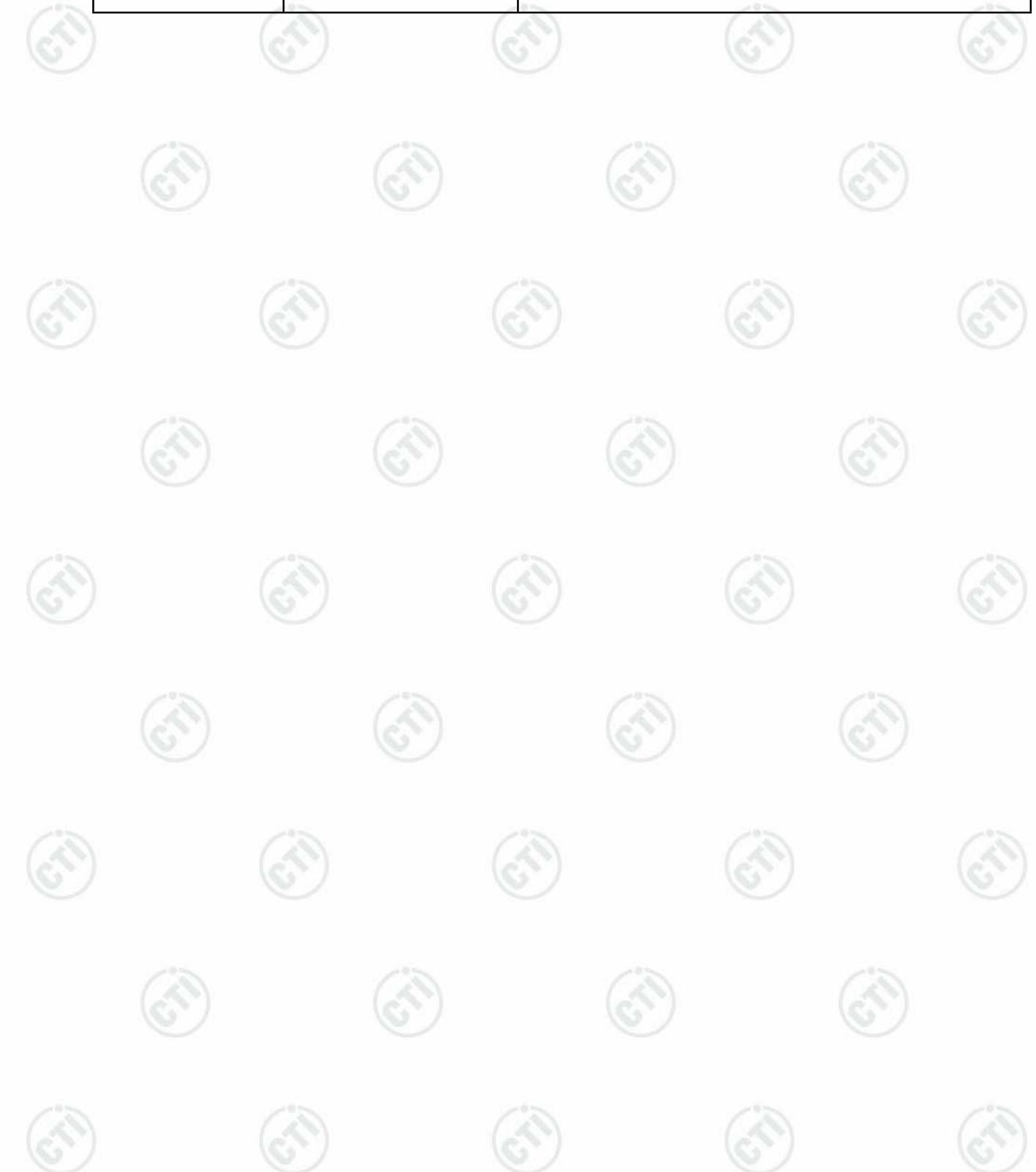
May 21, 2019

Check No.:3096391277



2 Version

Version No.	Date	Description
00	May 21, 2019	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 Occupied 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
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:

The tested sample(s) and the sample information are provided by the client.

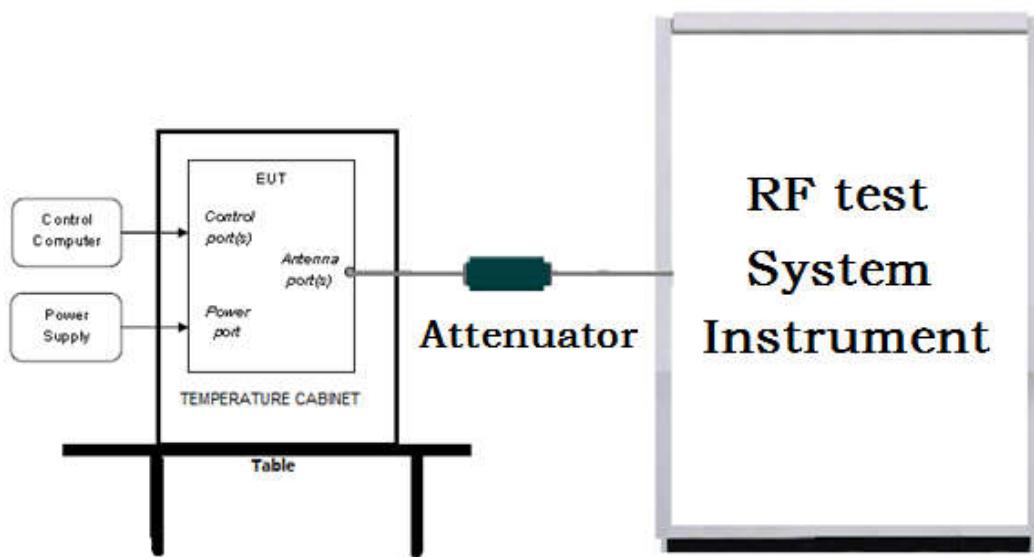
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5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

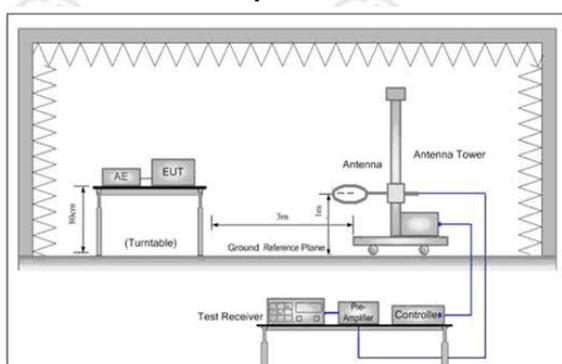


Figure 1. Below 30MHz

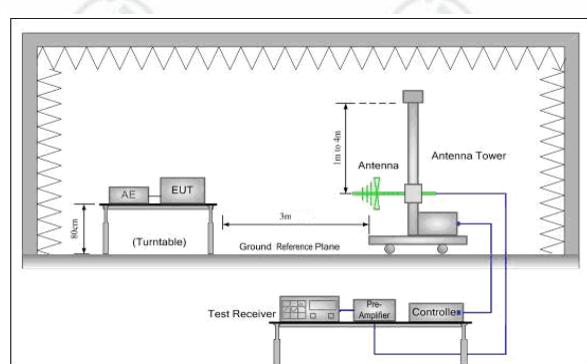


Figure 2. 30MHz to 1GHz

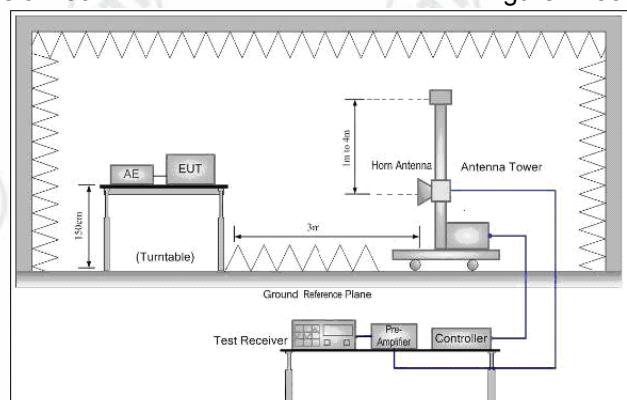
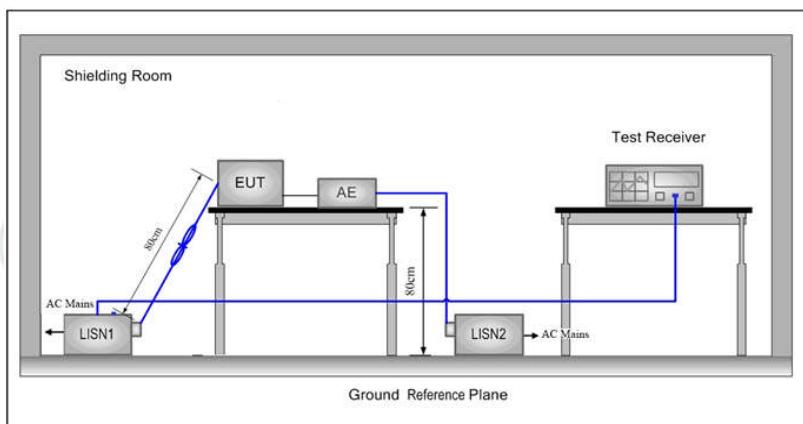


Figure 3. Above 1GHz

5.1.3 For Conducted Emissions test setup

Conducted Emissions setup



5.2 Test Environment

Operating Environment for RF test:

Temperature:	26°C
Humidity:	60% 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/ac(20M)	5150MHz ~5250 MHz	Channel 36	Channel 40	Channel 48
		5180MHz	5200MHz	5240MHz
802.11n/ac(40M)	5150MHz ~5250 MHz	Channel 38	N/A	Channel 46
		5190MHz	N/A	5230MHz
802.11ac(80M)	5150MHz ~5250 MHz	N/A	Channel 42	N/A
		N/A	5210MHz	N/A
802.11a/n/ac(20M)	5725MHz ~5850 MHz	Channel 149	Channel 157	Channel 165
		5745MHz	5785MHz	5825MHz
802.11n/ac(40M)	5725MHz ~5850 MHz	Channel 151	N/A	Channel 159
		5755MHz	N/A	5795MHz
802.11ac(80M)	5725MHz ~5850 MHz	N/A	Channel 155	N/A
		N/A	5775MHz	N/A

Test mode:

Pre-scan under all rate at lowest channel for Ant1

Mode	802.11a for 5150MHz ~5250 MHz							
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power(dBm)	13.94	13.92	13.92	13.90	13.91	13.90	13.87	13.85
Mode	802.11n (20M) for 5150MHz ~5250 MHz							
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power(dBm)	13.86	13.83	13.81	13.80	13.80	13.78	13.77	13.78
Mode	802.11ac (20M) for 5150MHz ~5250 MHz							
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power(dBm)	13.75	13.73	13.71	13.73	13.70	13.69	13.68	13.64
Mode	802.11n(40M) for 5150MHz ~5250 MHz							
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power(dBm)	14.35	14.31	14.31	14.30	14.28	14.27	14.28	14.26
Mode	802.11ac (40M) for 5150MHz ~5250 MHz							
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power(dBm)	14.61	14.60	14.58	14.57	14.57	14.53	14.53	14.52
Mode	802.11ac(80M)for 5150MHz ~5250 MHz							
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power(dBm)	9.24	9.21	9.21	9.20	9.18	9.18	9.20	9.17
Mode	802.11a for 5725MHz ~5850 MHz							
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power(dBm)	16.33	16.32	16.31	16.25	16.24	16.24	16.22	16.20
Mode	802.11n (20M) for 5725MHz ~5850 MHz							
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power(dBm)	15.07	15.03	15.03	15.01	15.01	14.98	14.92	14.90
Mode	802.11ac (20M) for 5725MHz ~5850 MHz							
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power(dBm)	15.62	15.61	15.60	15.57	15.57	15.56	15.56	15.50
Mode	802.11n (40M) for 5725MHz ~5850 MHz							
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power(dBm)	14.39	14.37	14.36	14.32	14.32	14.31	14.31	14.28
Mode	802.11ac (40M) for 5725MHz ~5850 MHz							
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power(dBm)	14.48	14.47	14.46	14.45	14.43	14.43	14.42	14.42
Mode	802.11ac(80M)for 5725MHz ~5850 MHz							
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Power(dBm)	9.59	9.57	9.56	9.56	9.55	9.53	9.53	9.51

Through Pre-scan, MCS0 is the worst case of 802.11a (20M) for 5150MHz ~5250 MHz;MCS0 is the worst case of 802.11n (20M) for 5150MHz ~5250 MHz;MCS0 is the worst case of 802.11ac (20M) for 5150MHz ~5250 MHz;MCS0 is the worst case of 802.11n(40M) for 5150MHz ~5250 MHz;MCS0 is the worst case of 802.11ac(40M) for 5150MHz ~5250 MHz;MCS0 is the worst case of 802.11ac(80M)for 5150MHz ~5250 MHz;MCS0 is the worst case of 802.11a (20M) for 5725MHz ~5850 MHz;MCS0 is the worst case of 802.11n (20M) for 5725MHz ~5850 MHz;MCS0 is the worst case of 802.11ac (20M) for 5725MHz ~5850 MHz;MCS0 is the worst case of 802.11n (40M) for 5725MHz ~5850 MHz;MCS0 is the worst case of 802.11ac(80M)for 5725MHz ~5850 MHz.

6 General Information

6.1 Client Information

Applicant:	Hui Zhou Gaoshengda Technology Co., LTD
Address of Applicant:	No. 75 Zhongkai Development Area Huizhou,Guangdong, China
Manufacturer:	Hui Zhou Gaoshengda Technology Co., LTD
Address of Manufacturer:	No. 75 Zhongkai Development Area Huizhou,Guangdong, China
Factory:	Hui Zhou Gaoshengda Technology Co., LTD
Address of Factory:	No. 75 Zhongkai Development Area Huizhou,Guangdong, China

6.2 General Description of EUT

Product Name:	WIFI Module
Model No.(EUT):	WC3HM2511
Trade Mark:	GSD
EUT Supports Radios application:	2.4G WiFi: IEEE802.11b/g/n(20MHz)/n(40MHz), 2412MHz-2462MHz 5G WiFi: IEEE802.11a/ac(HT20)/ac(HT40)/ac(HT80), 5150-5250MHz, 5725-5850MHz
Firmware version of the sample:	V1.0(manufacturer declare)
Hardware version of the sample:	V1.0(manufacturer declare)
Sample Received Date:	Dec. 05, 2018
Sample tested Date:	Dec. 25, 2018 to May 18, 2019

6.3 Product Specification subjective to this standard

Operation Frequency:	IEEE 802.11a/n/ac(20M): 5150MHz ~5250 MHz IEEE802.11n/ac(40M): 5150MHz ~5250 MHz IEEE802.11ac(80M): 5150MHz ~5250 MHz IEEE 802.11a/n/ac(20M): 5725MHz ~5850 MHz IEEE802.11n/ac(40M): 5725MHz ~5850 MHz IEEE802.11ac(80M): 5725MHz ~5850 MHz
Channel Numbers:	IEEE 802.11a/n/ac(20M): 5150MHz ~5250MHz/ 4 channel IEEE 802.11n/ac(40M): 5150MHz ~5250MHz/ 2 channel IEEE 802.11ac(80M): 5150MHz ~5250MHz/ 1 channel IEEE 802.11a/n/ac(20M): 5725MHz ~5850MHz/ 5 channel IEEE 802.11n/ac(40M): 5725MHz ~5850MHz/ 2 channel IEEE 802.11ac(80M): 5725MHz ~5850MHz/ 1 channel
Type of Modulation:	OFDM
Test Power Grade:	A:1D,1C,1E,1F; N20:1B,1C,1D,1E,1F; N40:1A,1C; AC20:1C,1D,1E; AC40:1A,1B; AC80:1B
Test Software of EUT:	MT7662 QA (manufacturer declare)
Antenna Type:	PIFA Antenna
Antenna gain:	3dBi
Test Voltage:	DC 5V

Operation Frequency each of channel

For 802.11a/n/ac(20M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	Channel	Frequency
36	5180MHz	44	5220MHz
40	5200MHz	48	5240MHz

For 802.11a/n/ac(20M) Operation in the 5725MHz ~5850 MHz band			
Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz	NA	NA

For 802.11n/ac(40M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz
For 802.11n/ac(40M) Operation in the 5725MHz ~5850 MHz band			
Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

For 802.11ac(80M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	NA	NA
42	5210MHz	NA	NA
For 802.11ac(80M) Operation in the 5725MHz ~5850 MHz band			
Channel	Frequency	NA	NA
155	5775MHz	NA	NA

6.4 Description of Support Units

The EUT has been tested with associated equipment below.

Associated equipment name	Manufacture	model	serial number	Supplied by	Certification	
AE1	Laptop	HP	430 G3	CTI	CE	
AE2	Mouse	L.Selectron	OP-308	G1103000147VJKJ	CTI	CE
AE3	PC	Apple	MMGF2 ZP/A	ODN20170212	CTI	CE

6.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.
Building C, Hongwei Ind. Zone, Baoan 70 District, Shenzhen, 518101, China
Telephone: +86 (0) 755 3368 3668 Fax:+86 (0) 755 3368 3385

No tests were sub-contracted.

IC-Registration No.: 7408A

6.6 Deviation from Standards

None.

6.7 Abnormalities from Standard Conditions

None.

6.8 Other Information Requested by the Customer

None.

6.9 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)
Signal Generator	Keysight	E8257D	MY53401106	03-02-2018 03-01-2019	03-01-2019 02-29-2020
Spectrum Analyzer	Keysight	N9010A	MY54510339	03-02-2018 03-01-2019	03-01-2019 02-29-2020
Signal Generator	Keysight	N5182B	MY53051549	03-02-2018 03-01-2019	03-01-2019 02-29-2020
High-pass filter	Sinoscite	FL3CX03WG18N M12-0398-002	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
DC Power	Keysight	E3642A	MY54426035	03-02-2018 03-01-2019	03-01-2019 02-29-2020
PC-1	Lenovo	R4960d	---	03-02-2018 03-01-2019	03-01-2019 02-29-2020
BT&WI-FI Automatic control	R&S	OSP120	101374	03-02-2018 03-01-2019	03-01-2019 02-29-2020
RF control unit	JS Tonscend	JS0806-2	15860006	03-02-2018 03-01-2019	03-01-2019 02-29-2020
RF control unit	JS Tonscend	JS0806-1	15860004	03-02-2018 03-01-2019	03-01-2019 02-29-2020
RF control unit	JS Tonscend	JS0806-4	158060007	03-02-2018 03-01-2019	03-01-2019 02-29-2020
BT&WI-FI Automatic test software	JS Tonscend	JS1120-2	---	03-02-2018 03-01-2019	03-01-2019 02-29-2020
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	10-12-2018	10-11-2019

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	05-25-2018	05-24-2019
Temperature/ Humidity Indicator	Defu	TH128	/	07-02-2018	07-01-2019
Communication test set	Agilent	E5515C	GB47050534	03-02-2018 03-01-2019	03-01-2019 02-29-2020
Communication test set	R&S	CMW500	102898	01-19-2018 01-18-2019	01-18-2019 01-17-2020
LISN	R&S	ENV216	100098	05-10-2018 05-08-2019	05-10-2019 05-06-2020
Voltage Probe	R&S	ESH2-Z3 0299.7810.56	100042	06-13-2017	06-11-2020
Current Probe	R&S	EZ-17 816.2063.03	100106	05-30-2018	05-29-2019
ISN	TESEQ	ISN T800	30297	01-17-2018 01-16-2019	01-16-2019 01-15-2020

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	---	06-04-2016	06-03-2019
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-401	12-21-2018	12-20-2019
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-618	07-30-2018	07-29-2019
Microwave Preamplifier	Agilent	8449B	3008A02425	08-21-2018	08-20-2019
Microwave Preamplifier	Tonscend	EMC051845SE	980380	01-17-2018 01-16-2019 01-16-2019	01-16-2019 01-15-2020
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1869	04-25-2018	04-23-2021
Horn Antenna	ETS-LINDGREN	3117	00057410	06-05-2018	06-03-2021
Double ridge horn antenna	A.H.SYSTEMS	SAS-574	374	06-05-2018	06-04-2021
Pre-amplifier	A.H.SYSTEMS	PAP-1840-60	6041.6041	08-08-2018	08-07-2019
Preamplifier	EMCI	EMC001330	980563	06-20-2018	06-19-2019
Loop Antenna	ETS	6502	00071730	06-22-2017	06-21-2019
Spectrum Analyzer	R&S	FSP40	100416	05-11-2018 04-28-2019	05-10-2019 04-26-2020
Receiver	R&S	ESCI	100435	05-25-2018	05-24-2019
Receiver	R&S	ESCI7	100938-003	11-23-2018	11-22-2019
Multi device Controller	maturo	NCD/070/10711 112	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
LISN	schwarzbeck	NNBM8125	81251547	05-11-2018 05-08-2019	05-10-2019 05-06-2020
LISN	schwarzbeck	NNBM8125	81251548	05-11-2018 05-08-2019	05-10-2019 05-06-2020
Signal Generator	Agilent	E4438C	MY45095744	03-02-2018 03-01-2019	03-01-2019 02-29-2020
Signal Generator	Keysight	E8257D	MY53401106	03-02-2018 03-01-2019	03-01-2019 02-29-2020
Temperature/ Humidity Indicator	Shanghai qixiang	HM10	1804298	10-12-2018	10-11-2019
Communication test set	Agilent	E5515C	GB47050534	03-02-2018 03-01-2019	03-01-2019 02-29-2020
Cable line	Fulai(7M)	SF106	5219/6A	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Fulai(6M)	SF106	5220/6A	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Fulai(3M)	SF106	5216/6A	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Fulai(3M)	SF106	5217/6A	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Communication test set	R&S	CMW500	104466	01-10-2018 01-09-2019	01-09-2019 01-08-2020
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
band rejection filter	Sinoscite	FL5CX01CA09C L12-0395-001	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
band rejection filter	Sinoscite	FL5CX01CA08C L12-0393-001	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
band rejection filter	Sinoscite	FL5CX02CA04C L12-0396-002	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020
band rejection filter	Sinoscite	FL5CX02CA03C L12-0394-001	---	01-10-2018 01-09-2019	01-09-2019 01-08-2020

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	06-20-2018	06-19-2019
Receiver	Keysight	N9038A	MY57290136	03-28-2018 03-27-2019	03-27-2019 03-25-2020
Spectrum Analyzer	Keysight	N9020B	MY57111112	03-28-2018 03-27-2019	03-27-2019 03-25-2020
Spectrum Analyzer	Keysight	N9030B	MY57140871	03-28-2018 03-27-2019	03-27-2019 03-25-2020
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-075	04-25-2018	04-23-2021
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04-25-2018	04-23-2021
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-25-2018	04-23-2021
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-25-2018	04-23-2021
Horn Antenna	Schwarzbeck	BBHA 9170	9170-829	04-25-2018	04-23-2021
Communication Antenna	Schwarzbeck	CLSA 0110L	1014	02-15-2018 02-14-2019	02-14-2019 02-13-2020
Biconical antenna	Schwarzbeck	VUBA 9117	9117-381	04-25-2018	04-23-2021
Horn Antenna	ETS-LINDGREN	3117	00057407	07-10-2018	07-08-2021
Preamplifier	EMCI	EMC184055SE	980596	06-20-2018	06-19-2019
Communication test set	R&S	CMW500	102898	01-19-2018 01-18-2019	01-18-2019 01-17-2020
Preamplifier	Agilent	8449B	3008A02425	08-21-2018	08-20-2019
Temperature/ Humidity Indicator	biaozi	GM1360	EE1186631	05-02-2018 04-30-2019	05-01-2019 04-28-2020
Signal Generator	KEYSIGHT	E8257D	MY53401106	03-02-2018 03-01-2019	03-01-2019 02-29-2020
Fully Anechoic Chamber	TDK	FAC-3	---	01-17-2018	01-15-2021
Filter bank	JS Tonscend	JS0806-F	188060094	04-10-2018	04-08-2021
Cable line	Times	SFT205-NMSM-2.50M	394812-0001	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Times	SFT205-NMSM-2.50M	394812-0002	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Times	SFT205-NMSM-2.50M	394812-0003	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Times	SFT205-NMSM-2.50M	393495-0001	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Times	EMC104-NMNM-1000	SN160710	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Times	SFT205-NMSM-3.00M	394813-0001	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Times	SFT205-NMNM-1.50M	381964-0001	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Times	SFT205-NMSM-7.00M	394815-0001	01-10-2018 01-09-2019	01-09-2019 01-08-2020
Cable line	Times	HF160-KMKM-3.00M	393493-0001	01-10-2018 01-09-2019	01-09-2019 01-08-2020

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15E	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
4	KDB 662911 D01 Multiple Transmitter Output v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band

Test Results List:

Test Requirement	Test method	Test item	Verdict	Note
Part15E Section 15.407 (a)(1)(2)(4)(h)(1)	KDB789033 D02v01	Conducted Output Power and transmit power control mechanism	PASS	Appendix A)
Part15E Section 15.407 (a)(1)(2)	KDB789033 D02v01	26dB Occupied Bandwidth	PASS	Appendix B)
Part15E Section 15.407 (a)(1)(2)(5)	KDB789033 D02v01	Power Spectral Density	PASS	Appendix C)
Part15E Section 15.407 (b)(1)to(6)	KDB789033 D02v01	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	Appendix G)
Part15E Section 15.407 (b)(6)	ANSI C63.10	AC Power Line Conducted Emission	PASS	Appendix H)
Part15E Section 15.407 (b)(6)(7)(8)	KDB789033 D02v01	Restricted bands around fundamental frequency (Radiated Emission)	PASS	Appendix I)
Part15E Section 15.407 (b)(6)(7)(8)	KDB789033 D02v01	Unwanted Emissions in the Restricted Bands	PASS	Appendix J)
Part15E Section 15.407 (b)(1)(2)(3)(5)	KDB789033 D02v01	Unwanted Emissions that fall Outside of the Restricted Bands	PASS	Appendix K)

Appendix A): Emission Bandwidth

Result Table

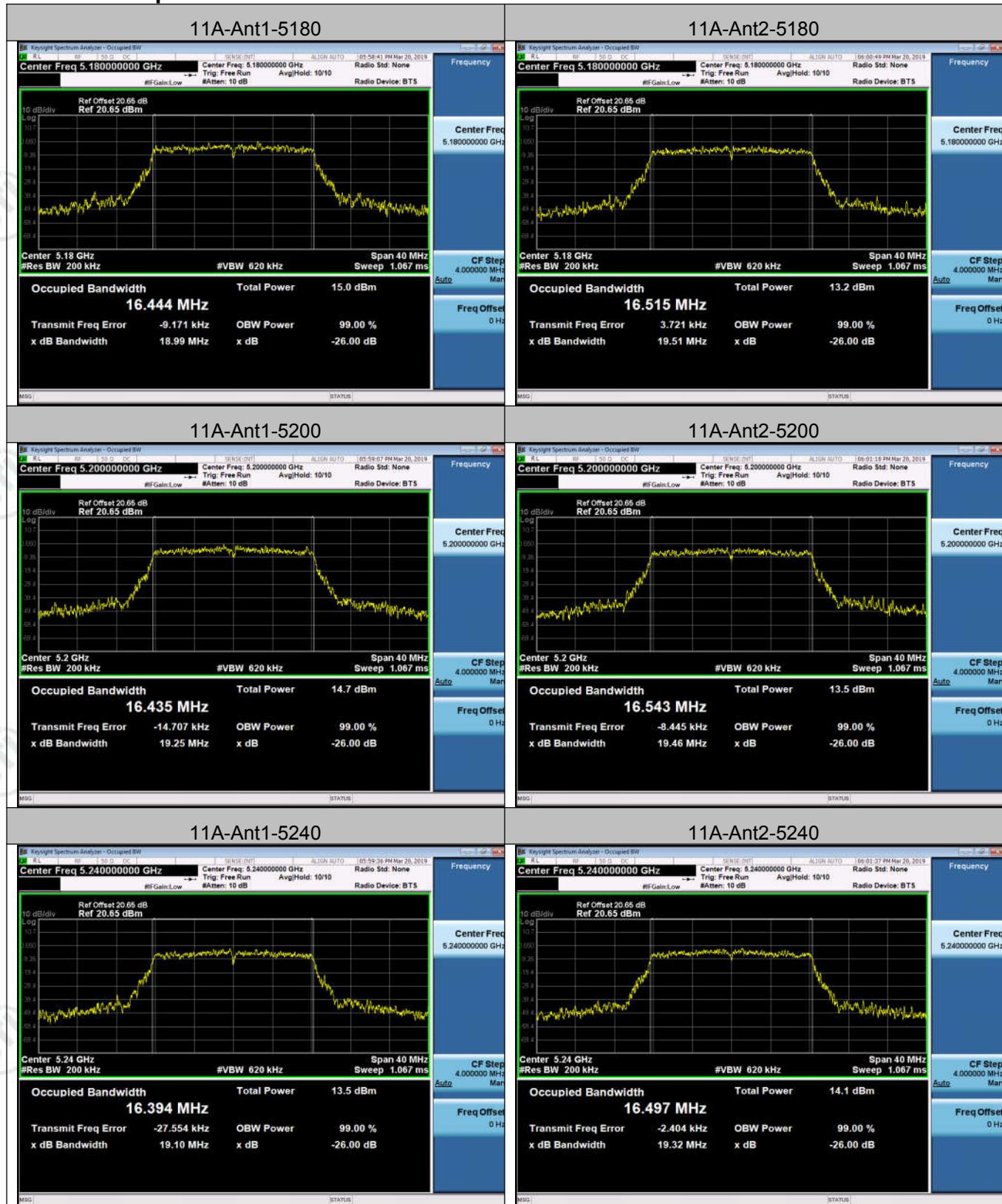
Test Mode	Antenna	Channel	EBW[MHz]	OBW[MHz]	Verdict
11A	Ant1	5180	18.99	16.444	PASS
11A	Ant2	5180	19.51	16.515	PASS
11A	Ant1	5200	19.25	16.435	PASS
11A	Ant2	5200	19.46	16.543	PASS
11A	Ant1	5240	19.10	16.394	PASS
11A	Ant2	5240	19.32	16.497	PASS
11A	Ant1	5745	16.40	16.479	PASS
11A	Ant2	5745	15.84	16.417	PASS
11A	Ant1	5785	16.45	16.476	PASS
11A	Ant2	5785	16.36	16.424	PASS
11A	Ant1	5825	16.31	16.895	PASS
11A	Ant2	5825	16.32	16.465	PASS
Test Mode	Antenna	Channel	EBW[MHz]	OBW[MHz]	Verdict
11N20SISO	Ant1	5180	20.01	17.604	PASS
11N20SISO	Ant2	5180	19.72	17.560	PASS
11N20SISO	Ant1	5200	19.78	17.587	PASS
11N20SISO	Ant2	5200	19.70	17.595	PASS
11N20SISO	Ant1	5240	19.63	17.595	PASS
11N20SISO	Ant2	5240	19.72	17.630	PASS
11N20SISO	Ant1	5745	17.60	17.599	PASS
11N20SISO	Ant2	5745	17.62	17.572	PASS
11N20SISO	Ant1	5785	17.58	17.627	PASS
11N20SISO	Ant2	5785	17.62	17.590	PASS
11N20SISO	Ant1	5825	17.18	18.352	PASS
11N20SISO	Ant2	5825	17.59	17.581	PASS
11N40SISO	Ant1	5190	39.36	36.047	PASS
11N40SISO	Ant2	5190	39.01	35.989	PASS
11N40SISO	Ant1	5230	39.57	36.020	PASS
11N40SISO	Ant2	5230	40.07	35.977	PASS
11N40SISO	Ant1	5755	35.43	36.049	PASS
11N40SISO	Ant2	5755	35.30	35.916	PASS
11N40SISO	Ant1	5795	35.96	35.947	PASS
11N40SISO	Ant2	5795	33.73	35.881	PASS

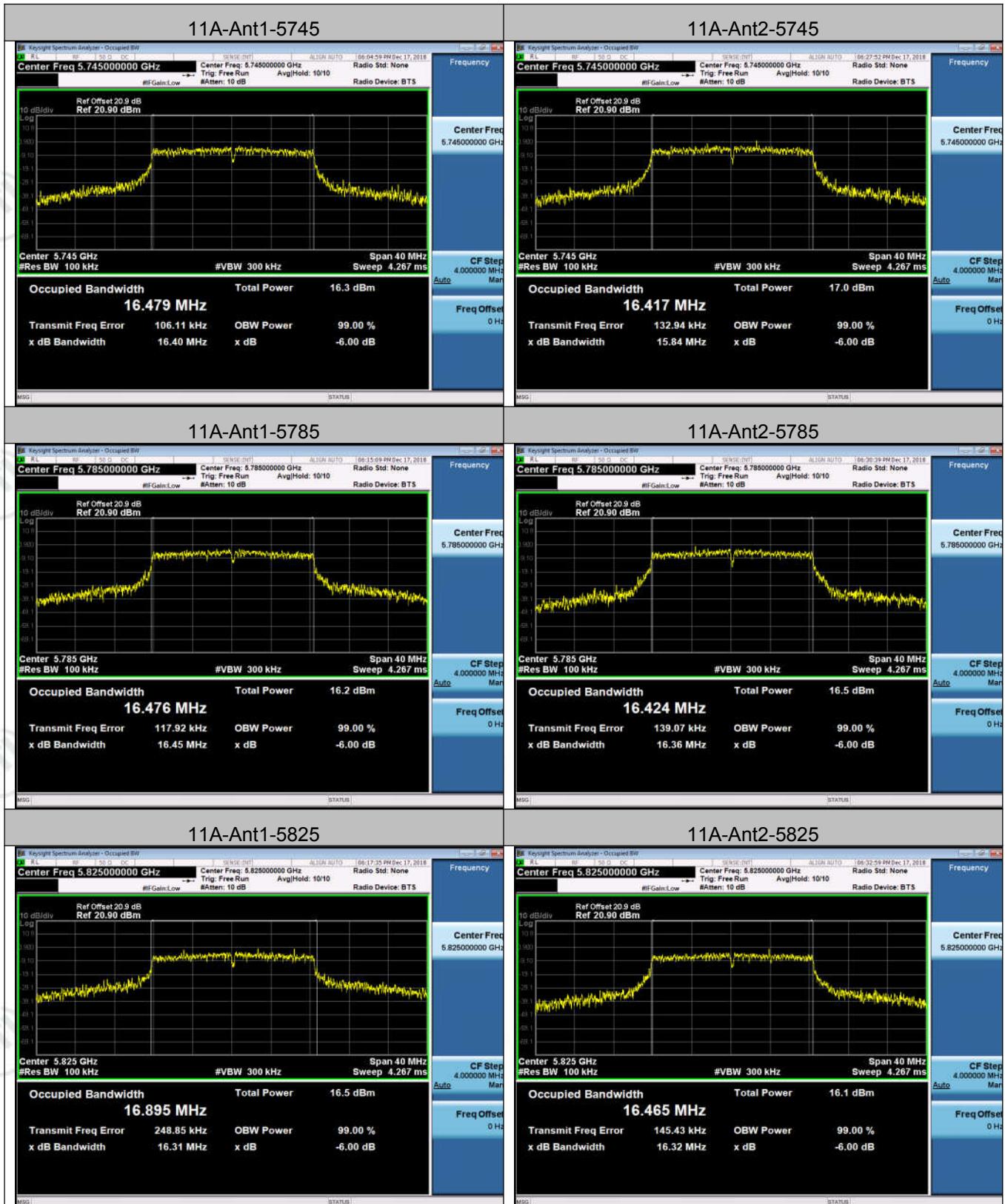
Test Mode	Antenna	Channel	EBW[MHz]	OBW[MHz]	Verdict
11AC20SISO	Ant1	5180	19.33	17.584	PASS
11AC20SISO	Ant2	5180	20.10	17.531	PASS
11AC20SISO	Ant1	5200	19.79	17.561	PASS
11AC20SISO	Ant2	5200	20.00	17.596	PASS
11AC20SISO	Ant1	5240	19.77	17.587	PASS
11AC20SISO	Ant2	5240	19.47	17.605	PASS
11AC20SISO	Ant1	5745	17.28	17.563	PASS
11AC20SISO	Ant2	5745	17.58	17.580	PASS
11AC20SISO	Ant1	5785	17.59	17.607	PASS
11AC20SISO	Ant2	5785	17.55	17.589	PASS
11AC20SISO	Ant1	5825	17.35	17.702	PASS
11AC20SISO	Ant2	5825	17.30	17.589	PASS
11AC40SISO	Ant1	5190	39.92	36.014	PASS
11AC40SISO	Ant2	5190	39.32	36.025	PASS
11AC40SISO	Ant1	5230	40.18	36.103	PASS
11AC40SISO	Ant2	5230	39.35	35.934	PASS
11AC40SISO	Ant1	5755	34.45	36.061	PASS
11AC40SISO	Ant2	5755	34.20	35.908	PASS
11AC40SISO	Ant1	5795	34.14	36.044	PASS
11AC40SISO	Ant2	5795	35.36	35.902	PASS
11AC80SISO	Ant1	5210	110.6	75.199	PASS
11AC80SISO	Ant2	5210	79.30	74.789	PASS
11AC80SISO	Ant1	5775	72.94	75.072	PASS
11AC80SISO	Ant2	5775	70.97	74.914	PASS

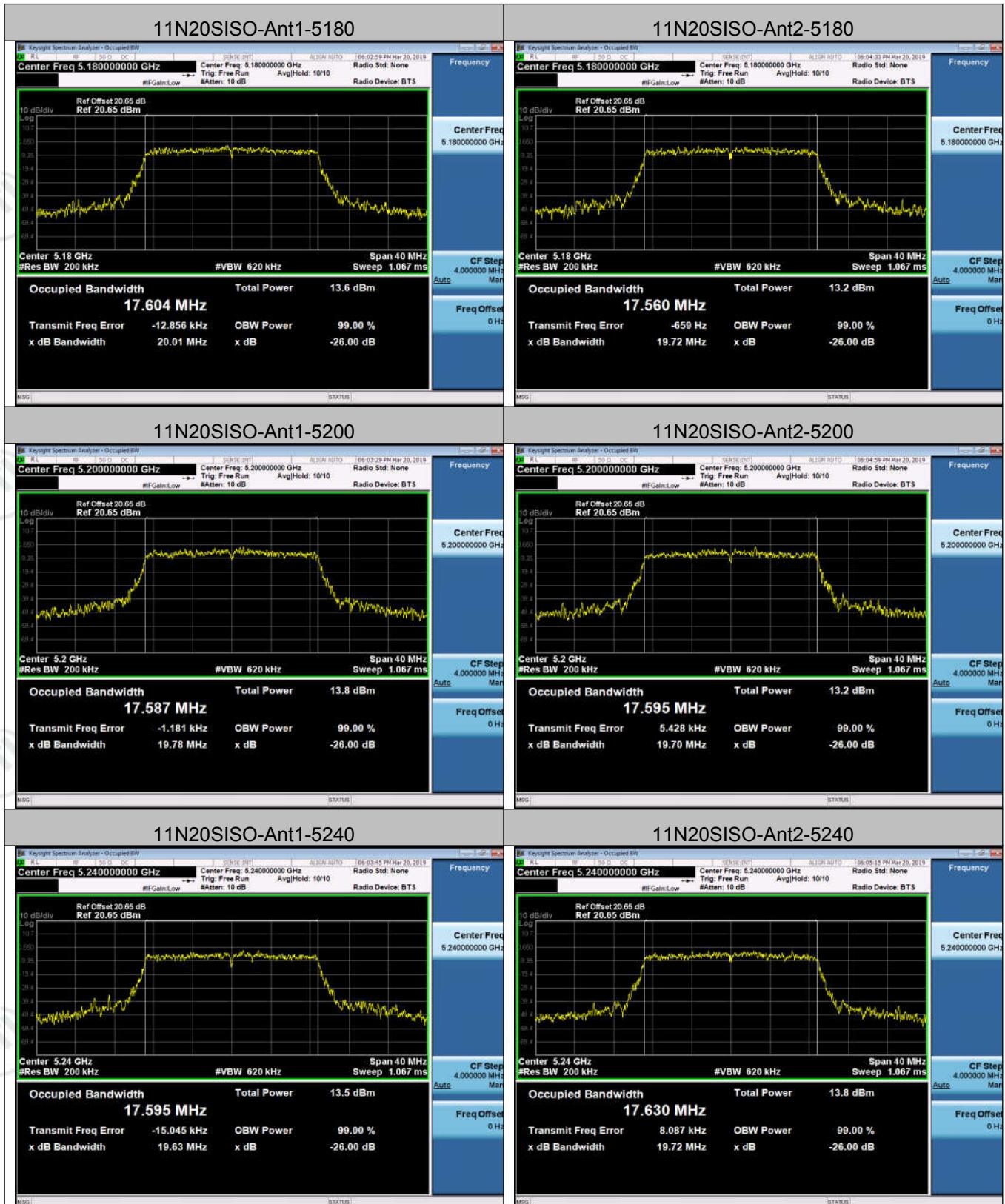
Test Mode	Antenna	Channel	EBW[MHz]	OBW[MHz]	Verdict
11N20MIMO	Ant1	5180	19.79	17.556	PASS
11N20MIMO	Ant2	5180	19.71	17.585	PASS
11N20MIMO	Ant1	5200	19.78	17.603	PASS
11N20MIMO	Ant2	5200	19.73	17.574	PASS
11N20MIMO	Ant1	5240	19.83	17.649	PASS
11N20MIMO	Ant2	5240	19.25	17.536	PASS
11N20MIMO	Ant1	5745	17.58	17.563	PASS
11N20MIMO	Ant2	5745	16.03	17.572	PASS
11N20MIMO	Ant1	5785	17.58	17.566	PASS
11N20MIMO	Ant2	5785	16.90	17.573	PASS
11N20MIMO	Ant1	5825	16.70	17.668	PASS
11N20MIMO	Ant2	5825	17.55	17.579	PASS
11N40MIMO	Ant1	5190	39.57	35.981	PASS
11N40MIMO	Ant2	5190	39.23	35.908	PASS
11N40MIMO	Ant1	5230	39.27	35.999	PASS
11N40MIMO	Ant2	5230	39.74	36.005	PASS
11N40MIMO	Ant1	5755	36.08	36.021	PASS
11N40MIMO	Ant2	5755	36.08	35.890	PASS
11N40MIMO	Ant1	5795	34.05	35.957	PASS
11N40MIMO	Ant2	5795	35.95	35.978	PASS

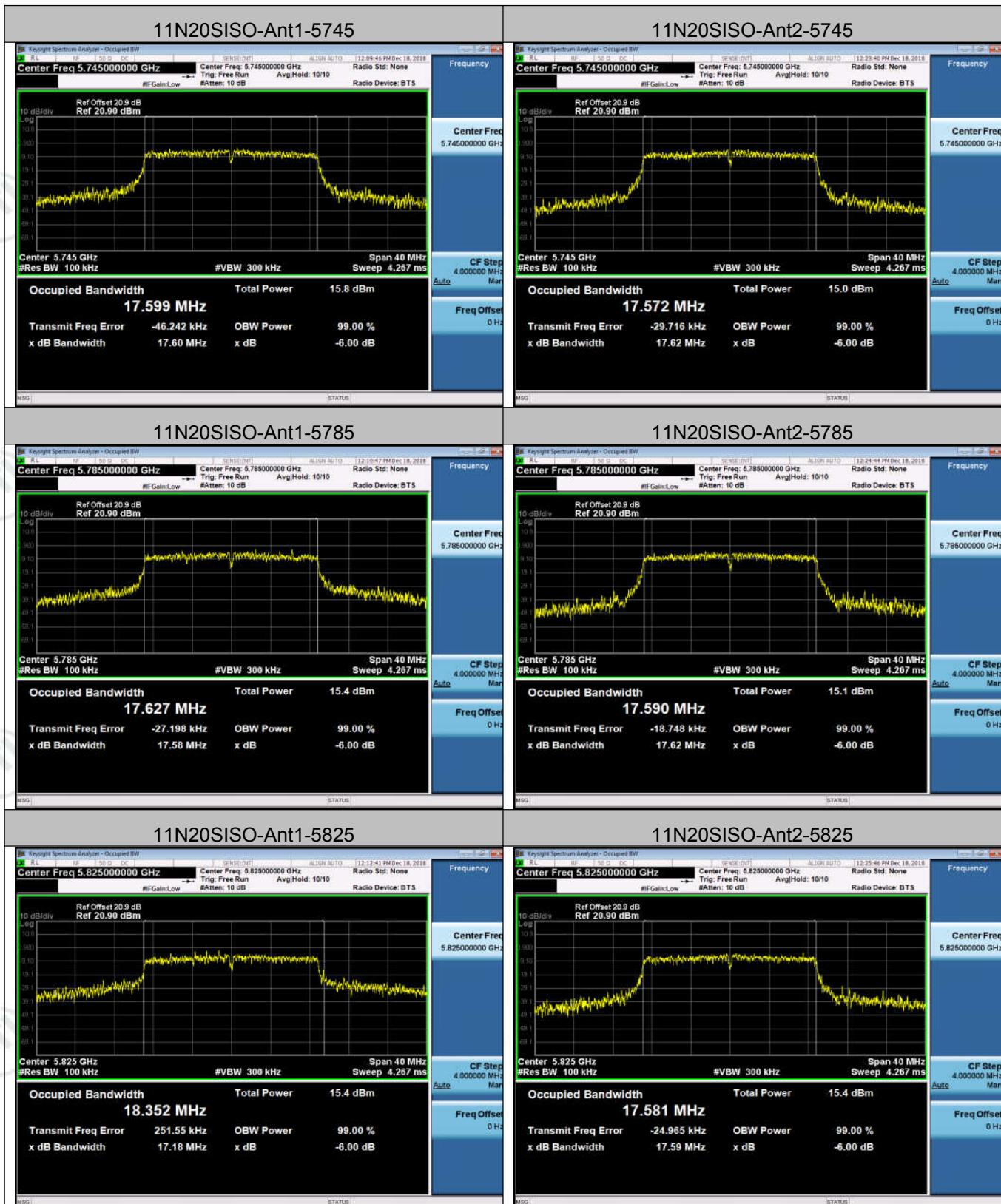
Test Mode	Antenna	Channel	EBW[MHz]	OBW[MHz]	Verdict
11AC20MIMO	Ant1	5180	19.88	17.603	PASS
11AC20MIMO	Ant2	5180	19.60	17.650	PASS
11AC20MIMO	Ant1	5200	19.74	17.548	PASS
11AC20MIMO	Ant2	5200	19.92	17.611	PASS
11AC20MIMO	Ant1	5240	19.77	17.577	PASS
11AC20MIMO	Ant2	5240	19.74	17.641	PASS
11AC20MIMO	Ant1	5745	17.30	17.557	PASS
11AC20MIMO	Ant2	5745	17.52	17.552	PASS
11AC20MIMO	Ant1	5785	17.54	17.550	PASS
11AC20MIMO	Ant2	5785	17.61	17.571	PASS
11AC20MIMO	Ant1	5825	16.65	17.589	PASS
11AC20MIMO	Ant2	5825	16.42	17.566	PASS
11AC40MIMO	Ant1	5190	39.53	35.904	PASS
11AC40MIMO	Ant2	5190	39.34	35.886	PASS
11AC40MIMO	Ant1	5230	39.37	35.917	PASS
11AC40MIMO	Ant2	5230	39.23	35.973	PASS
11AC40MIMO	Ant1	5755	34.79	36.025	PASS
11AC40MIMO	Ant2	5755	34.14	35.946	PASS
11AC40MIMO	Ant1	5795	35.16	35.965	PASS
11AC40MIMO	Ant2	5795	34.66	35.952	PASS
11AC80MIMO	Ant1	5210	79.98	74.785	PASS
11AC80MIMO	Ant2	5210	80.45	74.692	PASS
11AC80MIMO	Ant1	5775	73.71	74.975	PASS
11AC80MIMO	Ant2	5775	73.89	75.007	PASS

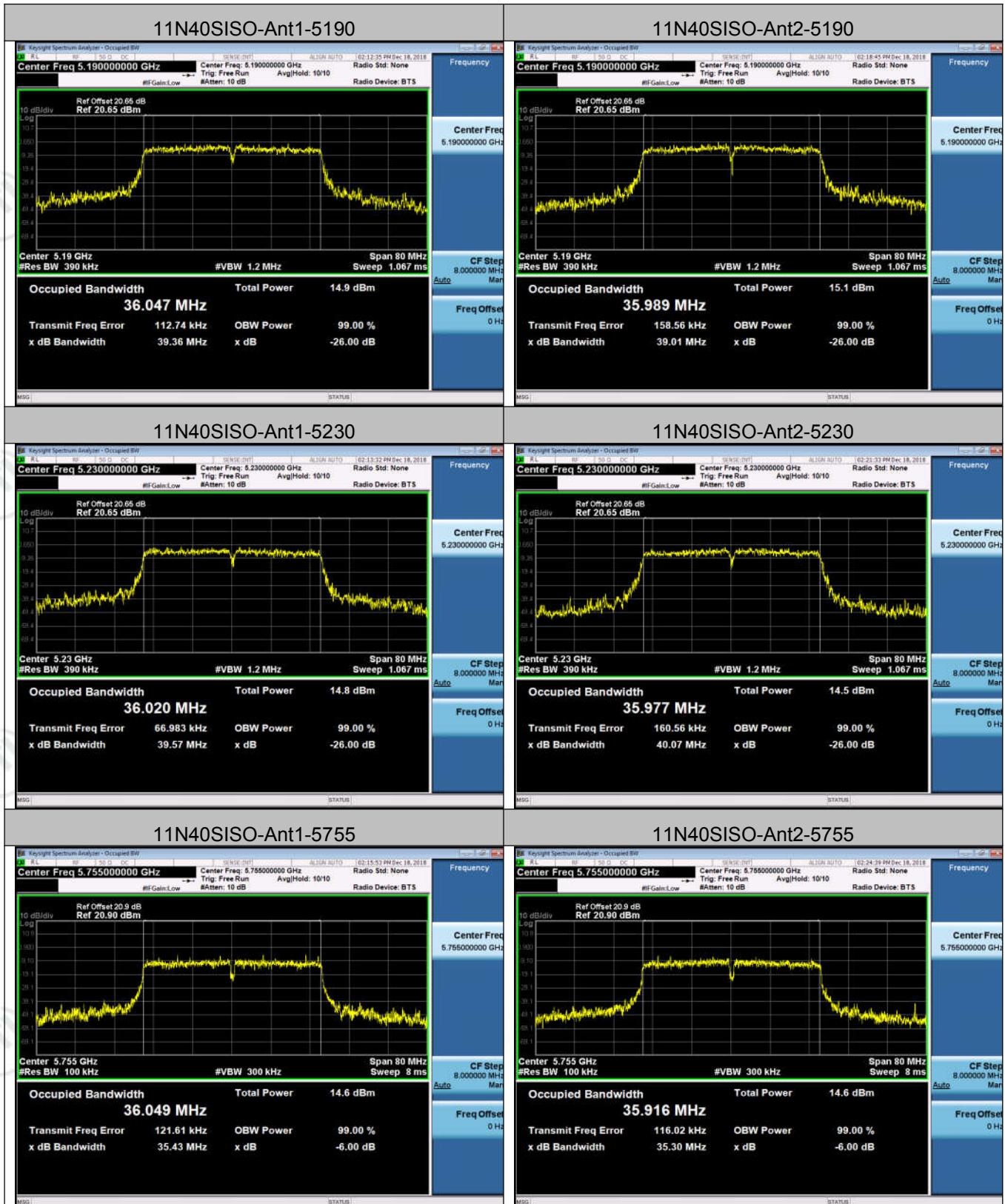
Test Graph

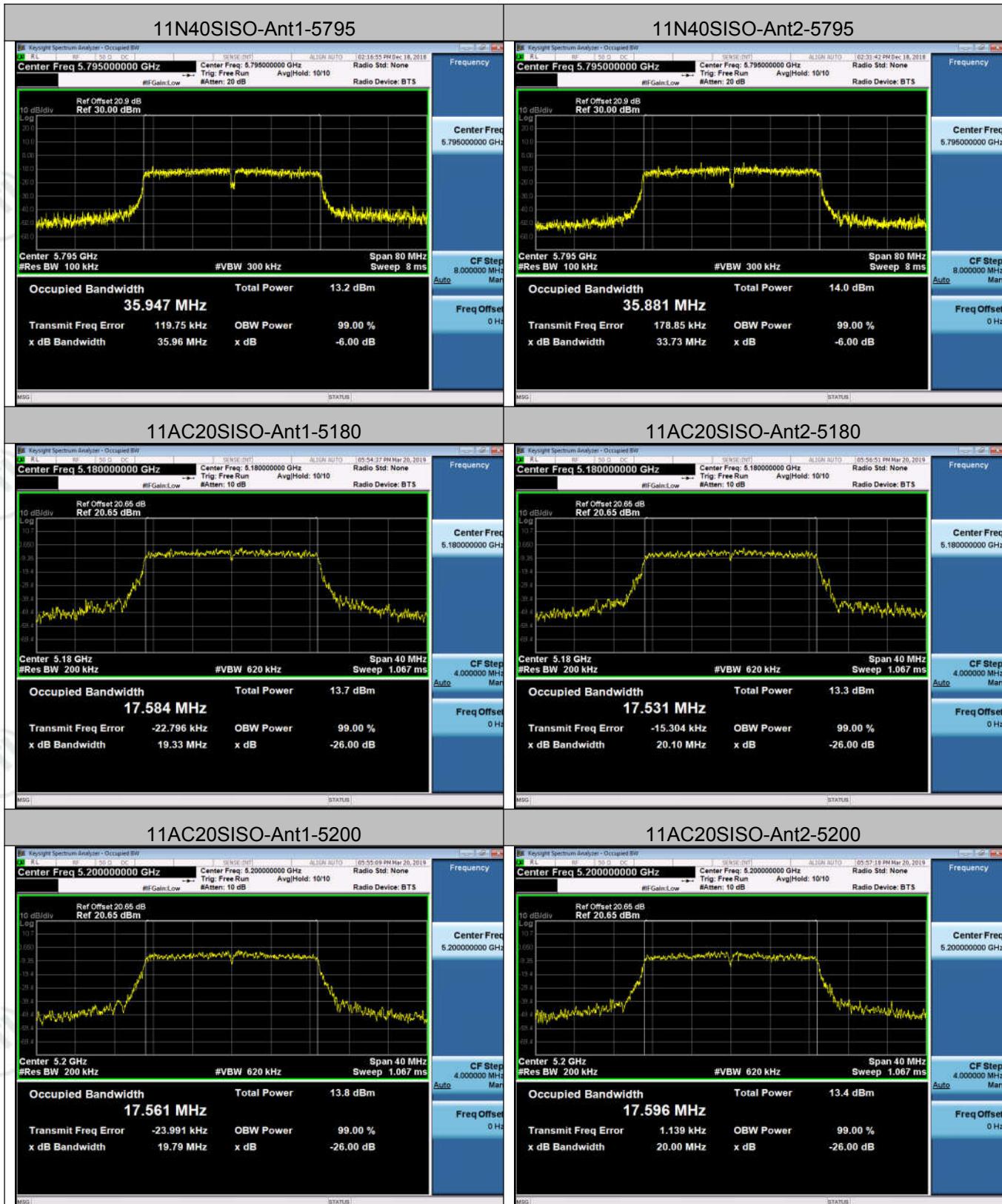


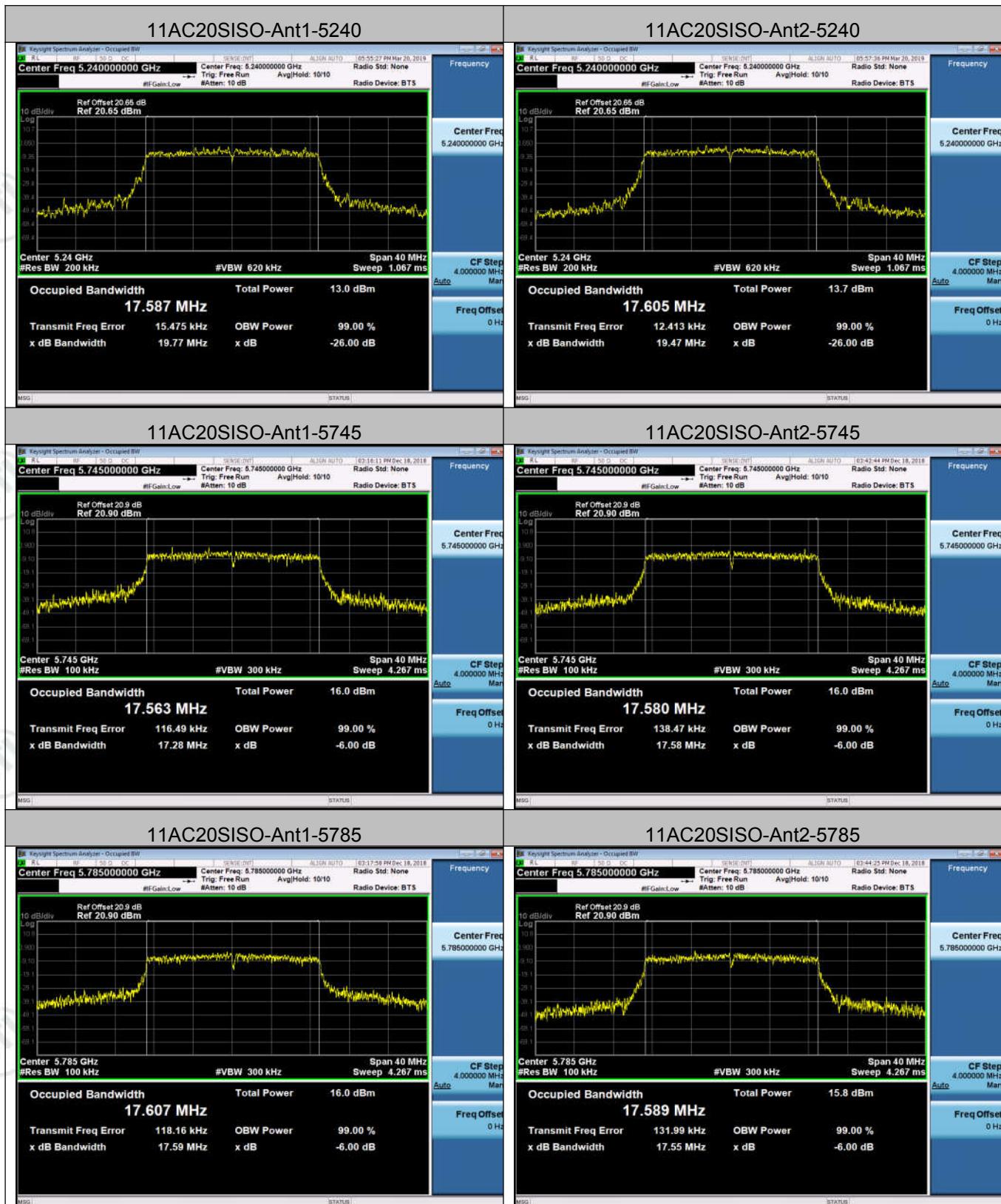


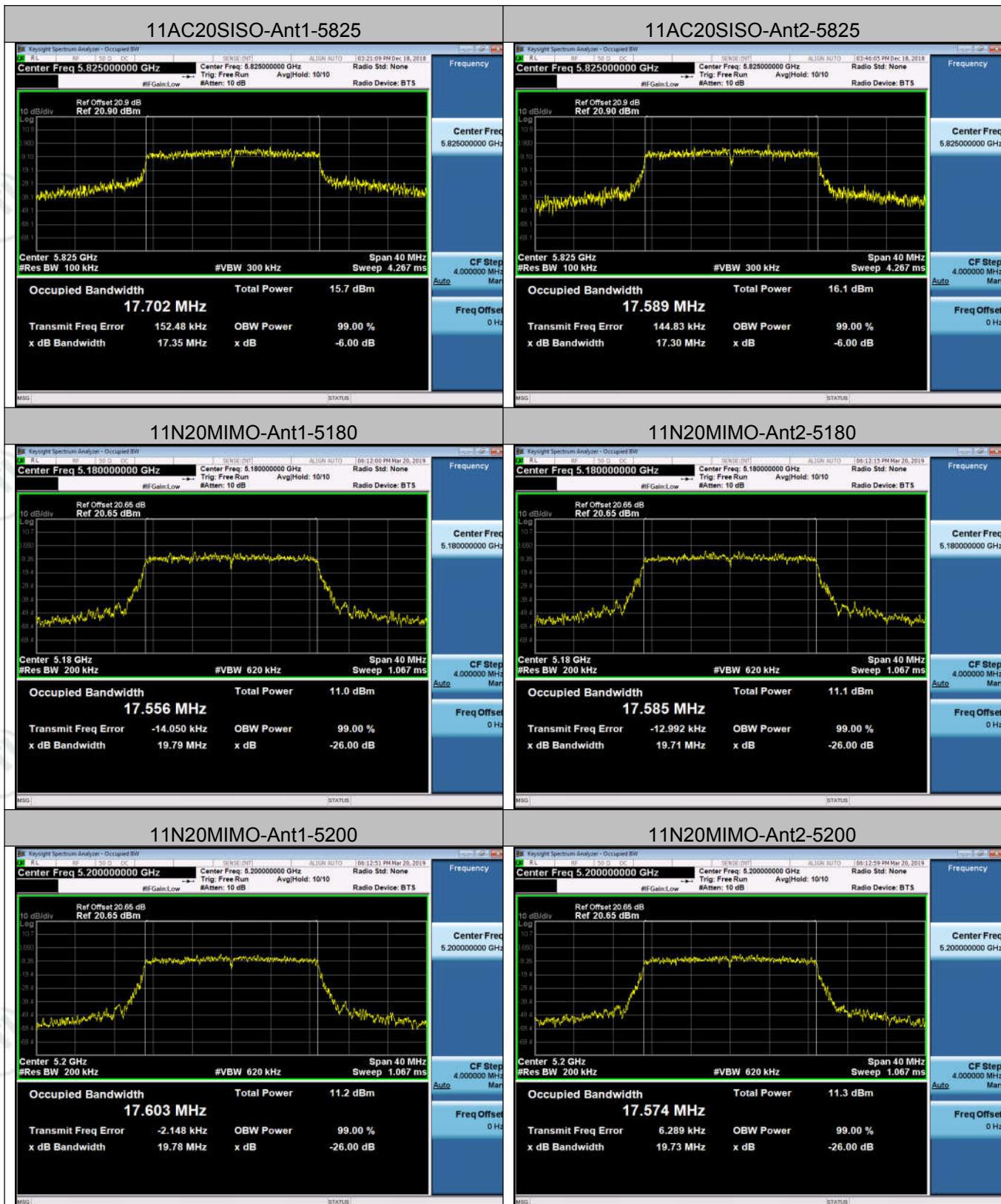


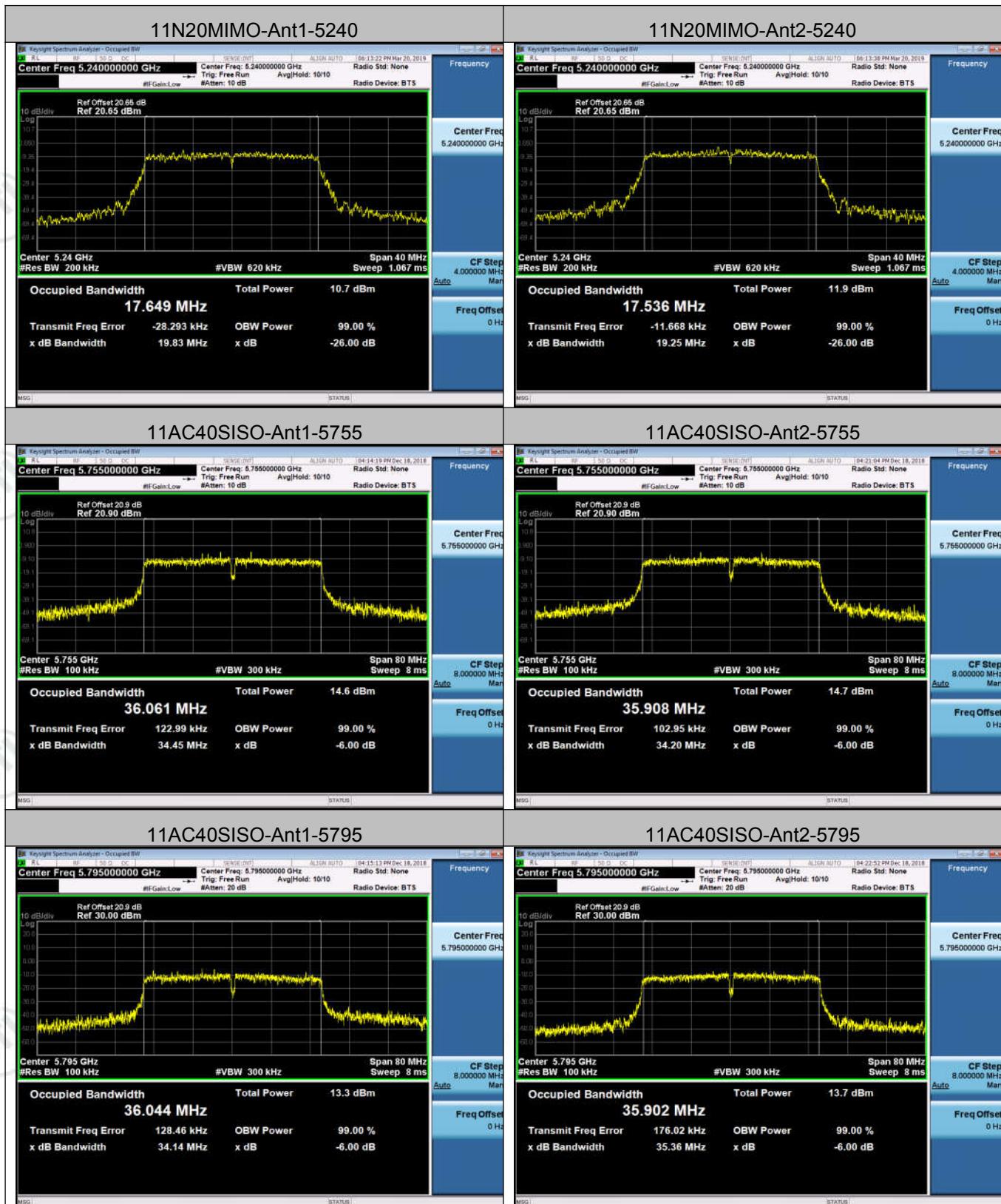


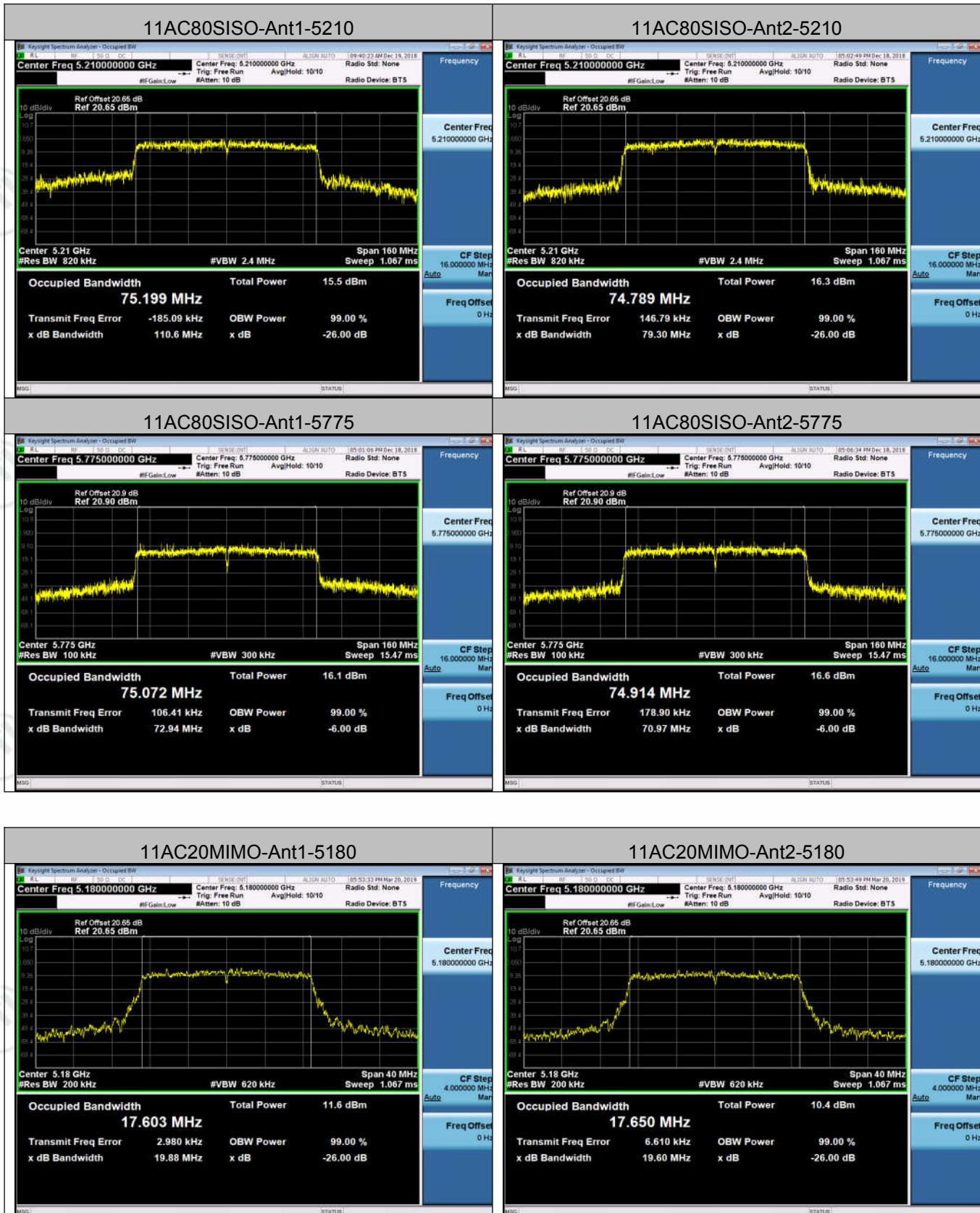


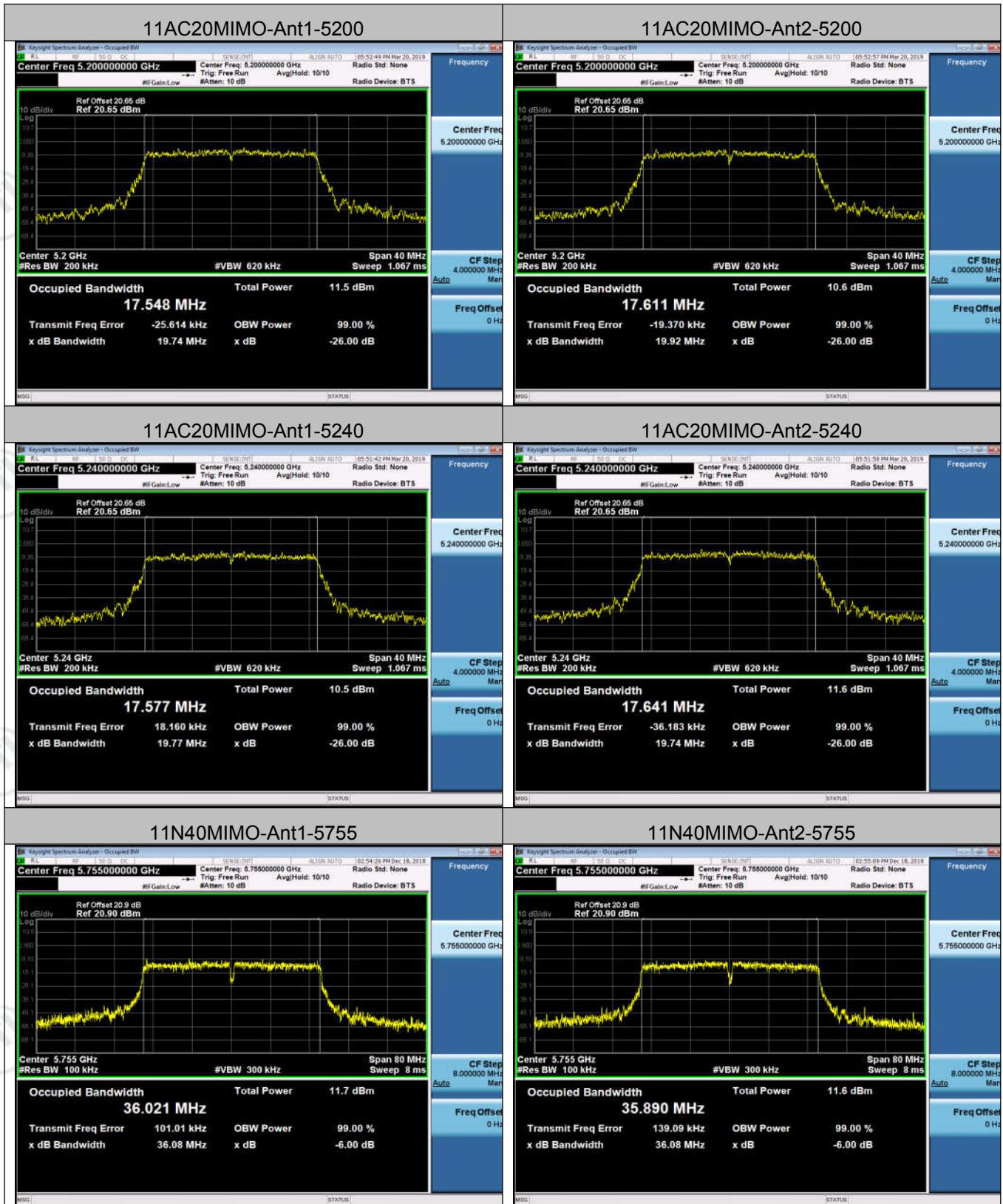


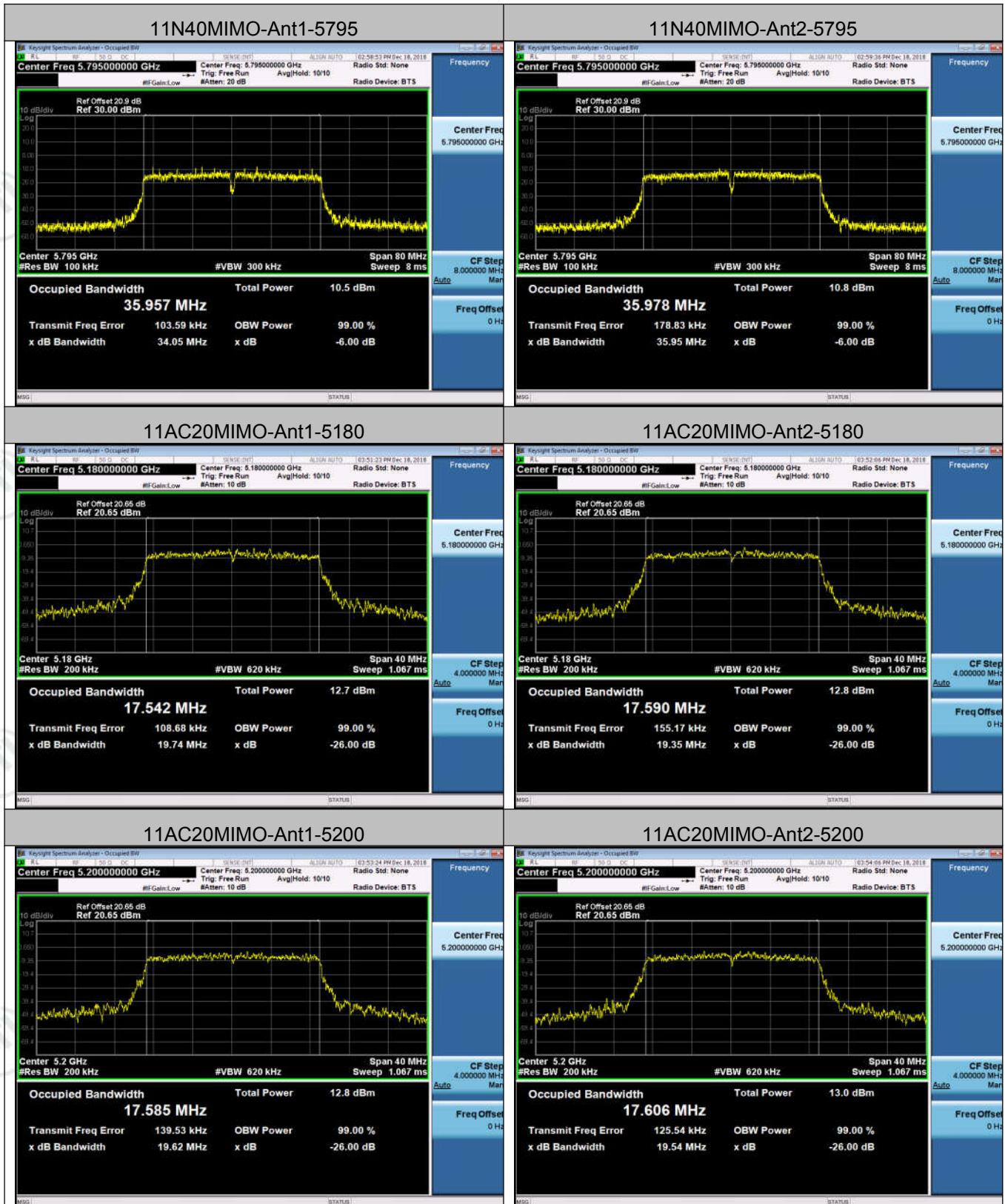


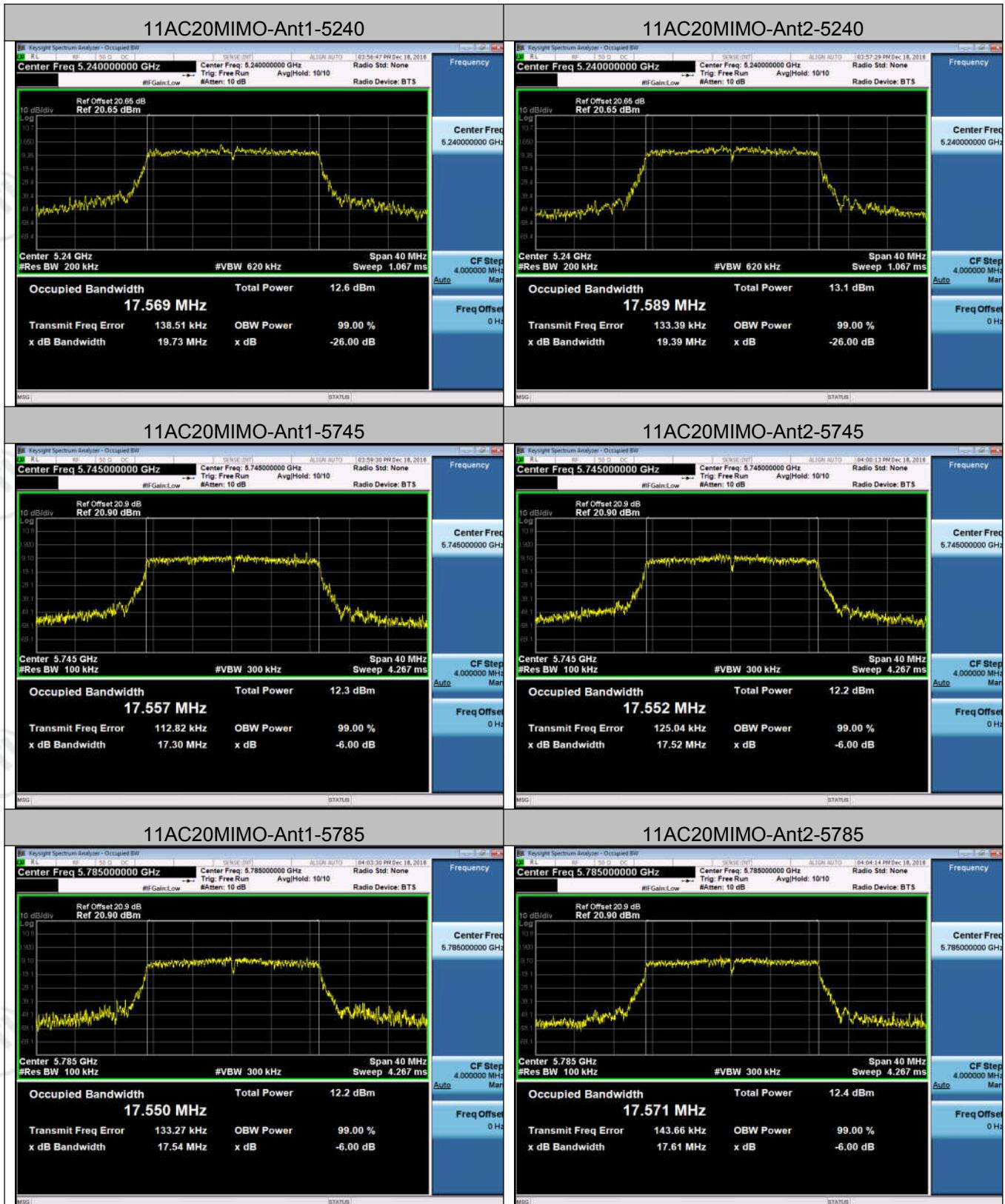


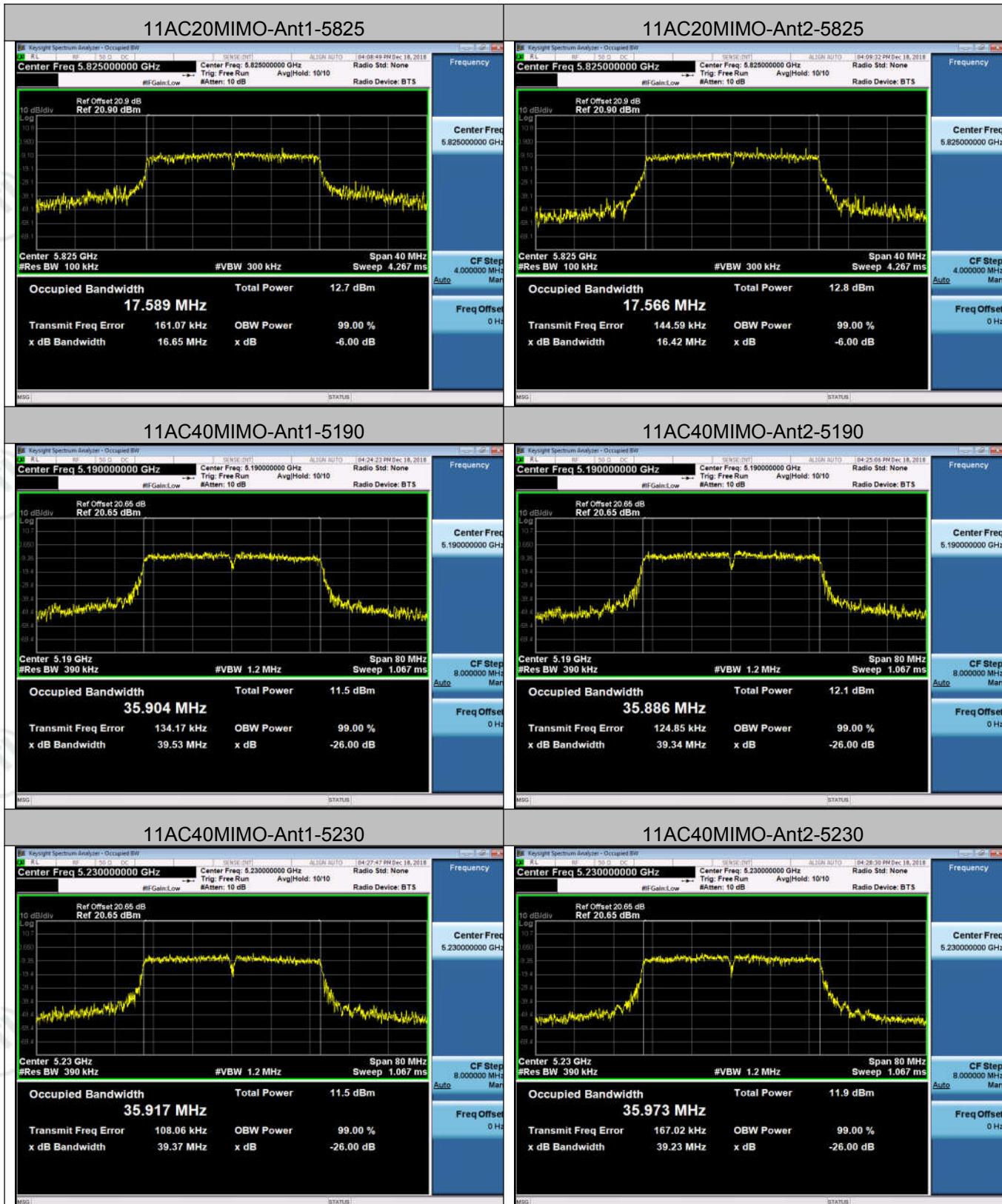


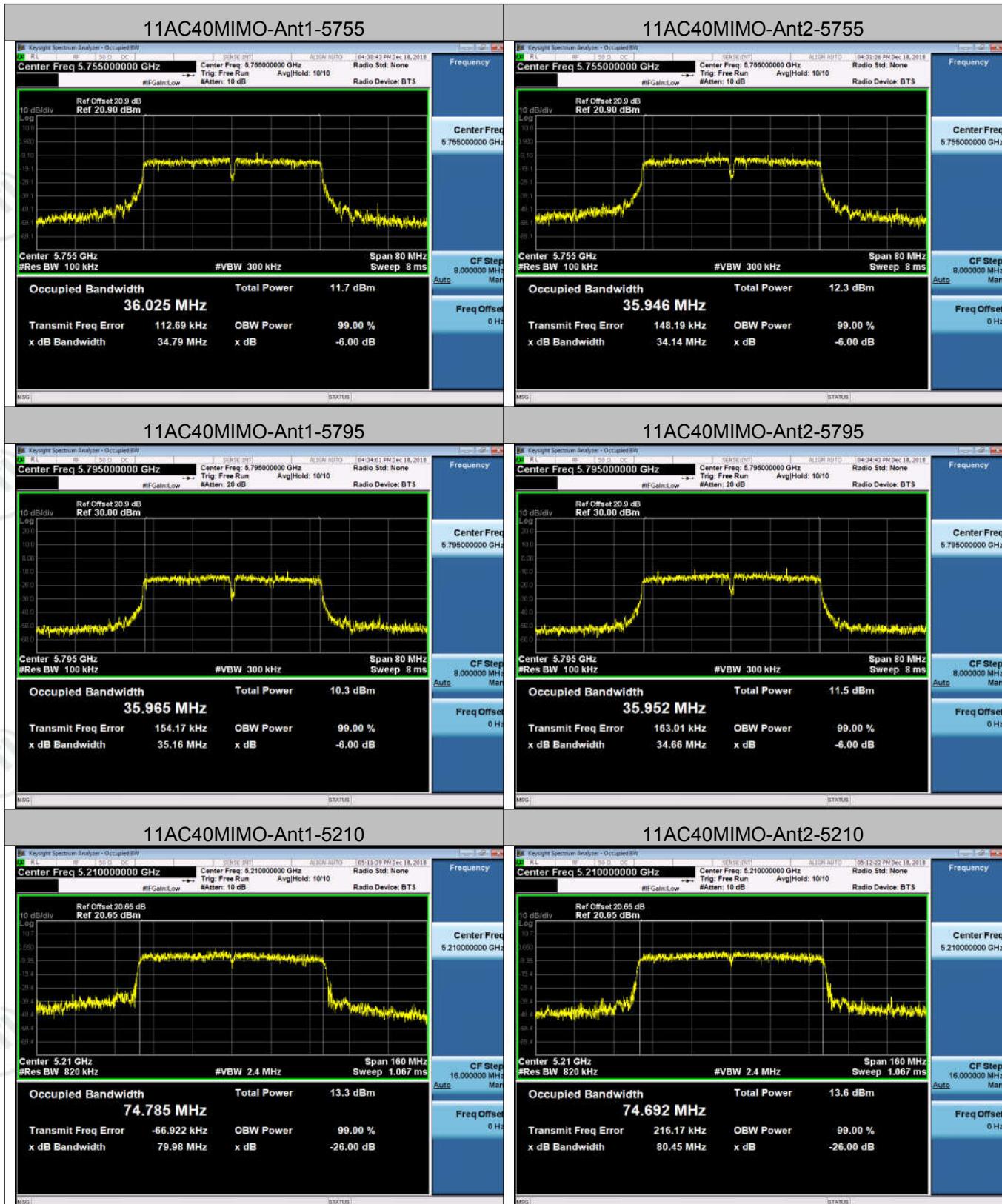


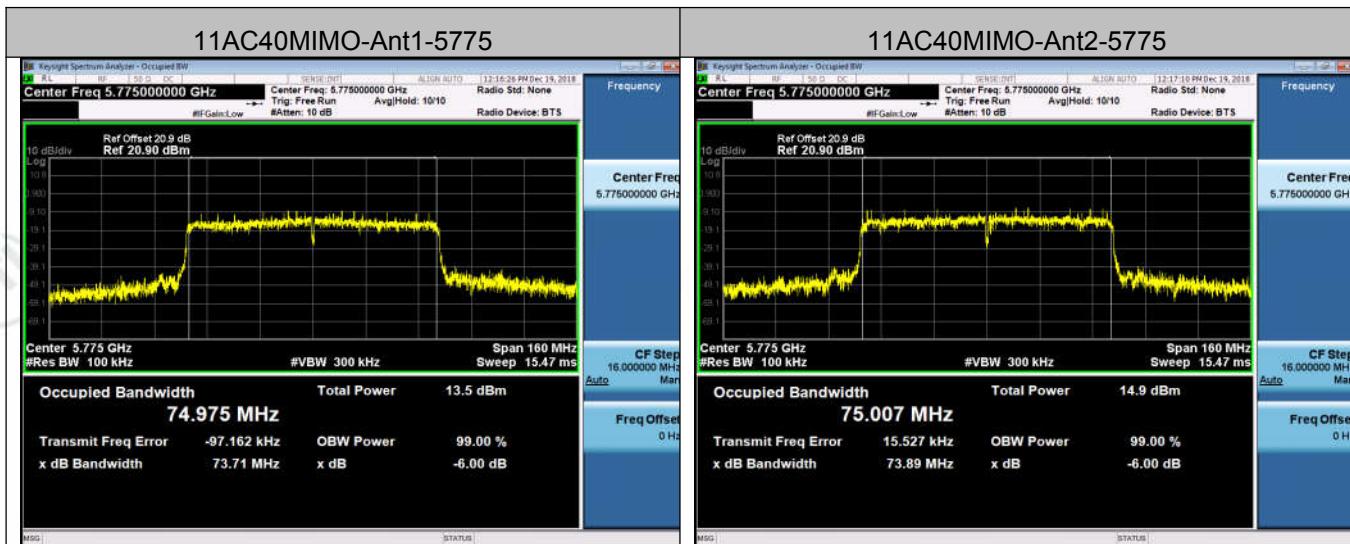












Appendix B): Maximum Conduct Output Power

Directional Antenna Gain

The TX chains are correlated, the antenna gain is equal among the chains.

Employs an antenna that operates simultaneously on multiple directional beams using the same frequency channels. No carrier aggregation techniques.

The directional gain is:

Antenna 0 Gain(dBi)	Antenna 0 Gain(dBi)	Correlated Chains DirectionalGain(dBi)
3	3	6

Test Mode	Channel	Duty Cycle[%]	Verdict
11A	5180	100	PASS
11A	5200	100	PASS
11A	5240	100	PASS
11A	5745	100	PASS
11A	5785	100	PASS
11A	5825	100	PASS
11N20SISO	5180	100	PASS
11N20SISO	5200	100	PASS
11N20SISO	5240	100	PASS
11N20SISO	5745	100	PASS
11N20SISO	5785	100	PASS
11N20SISO	5825	100	PASS
11N40SISO	5190	100	PASS
11N40SISO	5230	100	PASS
11N40SISO	5755	100	PASS
11N40SISO	5795	100	PASS
11N20MIMO	5180	100	PASS
11N20MIMO	5200	100	PASS
11N20MIMO	5240	100	PASS
11N20MIMO	5745	100	PASS
11N20MIMO	5785	100	PASS
11N20MIMO	5825	100	PASS
11N40MIMO	5190	100	PASS
11N40MIMO	5230	100	PASS
11N40MIMO	5755	100	PASS
11N40MIMO	5795	100	PASS

11AC20SISO	5180	100	PASS
11AC20SISO	5200	100	PASS
11AC20SISO	5240	100	PASS
11AC20SISO	5745	100	PASS
11AC20SISO	5785	100	PASS
11AC20SISO	5825	100	PASS
11AC40SISO	5190	100	PASS
11AC40SISO	5230	100	PASS
11AC40SISO	5755	100	PASS
11AC40SISO	5795	100	PASS
11AC80SISO	5210	100	PASS
11AC80SISO	5775	100	PASS
11AC20MIMO	5180	100	PASS
11AC20MIMO	5200	100	PASS
11AC20MIMO	5240	100	PASS
11AC20MIMO	5745	100	PASS
11AC20MIMO	5785	100	PASS
11AC20MIMO	5825	100	PASS
11AC40MIMO	5190	100	PASS
11AC40MIMO	5230	100	PASS
11AC40MIMO	5755	100	PASS
11AC40MIMO	5795	100	PASS
11AC80MIMO	5210	100	PASS
11AC80MIMO	5775	100	PASS

Result Table

Test Mode	Antenna	Channel	Meas.Level [dBm]	Av.Power [dBm]	Verdict
11A	Ant1	5180	13.94	13.94	PASS
11A	Ant2	5180	12.81	12.81	PASS
11A	Ant1	5200	13.98	13.98	PASS
11A	Ant2	5200	13.91	13.91	PASS
11A	Ant1	5240	13.83	13.83	PASS
11A	Ant2	5240	14.21	14.21	PASS
11A	Ant1	5745	16.33	16.33	PASS
11A	Ant2	5745	16.8	16.8	PASS
11A	Ant1	5785	16.34	16.34	PASS
11A	Ant2	5785	16.46	16.46	PASS
11A	Ant1	5825	16.15	16.15	PASS
11A	Ant2	5825	16.04	16.04	PASS
Test Mode	Antenna	Channel	Meas.Level [dBm]	Av.Power [dBm]	Verdict
11N20SISO	Ant1	5180	13.86	13.86	PASS
11N20SISO	Ant2	5180	13.26	13.26	PASS
11N20SISO	Ant1	5200	13.47	13.47	PASS
11N20SISO	Ant2	5200	13.17	13.17	PASS
11N20SISO	Ant1	5240	13.62	13.62	PASS
11N20SISO	Ant2	5240	14.12	14.12	PASS
11N20SISO	Ant1	5745	15.07	15.07	PASS
11N20SISO	Ant2	5745	15.2	15.2	PASS
11N20SISO	Ant1	5785	15.37	15.37	PASS
11N20SISO	Ant2	5785	15.25	15.25	PASS
11N20SISO	Ant1	5825	15.17	15.17	PASS
11N20SISO	Ant2	5825	15.67	15.67	PASS
11N40SISO	Ant1	5190	14.35	14.35	PASS
11N40SISO	Ant2	5190	14.65	14.65	PASS
11N40SISO	Ant1	5230	14.71	14.71	PASS
11N40SISO	Ant2	5230	14.26	14.26	PASS
11N40SISO	Ant1	5755	14.39	14.39	PASS
11N40SISO	Ant2	5755	14.77	14.77	PASS
11N40SISO	Ant1	5795	14.2	14.2	PASS
11N40SISO	Ant2	5795	14.55	14.55	PASS

Test Mode	Antenna	Channel	Meas.Level [dBm]	Av.Power [dBm]	Verdict
11AC20SISO	Ant1	5180	13.75	13.75	PASS
11AC20SISO	Ant2	5180	13.6	13.6	PASS
11AC20SISO	Ant1	5200	14.1	14.1	PASS
11AC20SISO	Ant2	5200	13.43	13.43	PASS
11AC20SISO	Ant1	5240	13.42	13.42	PASS
11AC20SISO	Ant2	5240	13.65	13.65	PASS
11AC20SISO	Ant1	5745	15.62	15.62	PASS
11AC20SISO	Ant2	5745	15.48	15.48	PASS
11AC20SISO	Ant1	5785	15.14	15.14	PASS
11AC20SISO	Ant2	5785	15.89	15.89	PASS
11AC20SISO	Ant1	5825	14.92	14.92	PASS
11AC20SISO	Ant2	5825	15.58	15.58	PASS
11AC40SISO	Ant1	5190	14.61	14.61	PASS
11AC40SISO	Ant2	5190	14.87	14.87	PASS
11AC40SISO	Ant1	5230	14.97	14.97	PASS
11AC40SISO	Ant2	5230	14.82	14.82	PASS
11AC40SISO	Ant1	5755	14.48	14.48	PASS
11AC40SISO	Ant2	5755	14.68	14.68	PASS
11AC40SISO	Ant1	5795	14.03	14.03	PASS
11AC40SISO	Ant2	5795	14.53	14.53	PASS
11AC80SISO	Ant1	5210	9.24	9.24	PASS
11AC80SISO	Ant2	5210	9.45	9.45	PASS
11AC80SISO	Ant1	5775	9.59	9.59	PASS
11AC80SISO	Ant2	5775	9.44	9.44	PASS

Test Mode	Antenna	Channel	Meas.Level [dBm]	Av.Power [dBm]	Verdict
11N20MIMO	Ant1	5180	10.95	10.95	PASS
11N20MIMO	Ant2	5180	10.9	10.9	PASS
11N20MIMO	Ant 1+2	5180	13.94	13.94	PASS
11N20MIMO	Ant1	5200	10.84	10.84	PASS
11N20MIMO	Ant2	5200	11.19	11.19	PASS
11N20MIMO	Ant 1+2	5200	14.03	14.03	PASS
11N20MIMO	Ant1	5240	10.77	10.77	PASS
11N20MIMO	Ant2	5240	11.61	11.61	PASS
11N20MIMO	Ant 1+2	5240	14.22	14.22	PASS
11N20MIMO	Ant1	5745	12.65	12.65	PASS
11N20MIMO	Ant2	5745	12.04	12.04	PASS
11N20MIMO	Ant 1+2	5745	15.37	15.37	PASS
11N20MIMO	Ant1	5785	12.36	12.36	PASS
11N20MIMO	Ant2	5785	12.09	12.09	PASS
11N20MIMO	Ant 1+2	5785	15.24	15.24	PASS
11N20MIMO	Ant1	5825	12.41	12.41	PASS
11N20MIMO	Ant2	5825	12.46	12.46	PASS
11N20MIMO	Ant 1+2	5825	15.45	15.45	PASS
11N40MIMO	Ant1	5190	11.87	11.87	PASS
11N40MIMO	Ant2	5190	11.66	11.66	PASS
11N40MIMO	Ant 1+2	5190	14.78	14.78	PASS
11N40MIMO	Ant1	5230	11.1	11.1	PASS
11N40MIMO	Ant2	5230	11.24	11.24	PASS
11N40MIMO	Ant 1+2	5230	14.18	14.18	PASS
11N40MIMO	Ant1	5755	11.22	11.22	PASS
11N40MIMO	Ant2	5755	11.88	11.88	PASS
11N40MIMO	Ant 1+2	5755	14.57	14.57	PASS
11N40MIMO	Ant1	5795	11.55	11.55	PASS
11N40MIMO	Ant2	5795	11.56	11.56	PASS
11N40MIMO	Ant 1+2	5795	14.57	14.57	PASS

Test Mode	Antenna	Channel	Meas.Level [dBm]	Av.Power [dBm]	Verdict
11AC20MIMO	Ant1	5180	10.5	10.5	PASS
11AC20MIMO	Ant2	5180	10.39	10.39	PASS
11AC20MIMO	Ant 1+2	5180	13.46	13.46	PASS
11AC20MIMO	Ant1	5200	10.81	10.81	PASS
11AC20MIMO	Ant2	5200	10.85	10.85	PASS
11AC20MIMO	Ant 1+2	5200	13.84	13.84	PASS
11AC20MIMO	Ant1	5240	10.63	10.63	PASS
11AC20MIMO	Ant2	5240	11.73	11.73	PASS
11AC20MIMO	Ant 1+2	5240	14.23	14.23	PASS
11AC20MIMO	Ant1	5745	11.94	11.94	PASS
11AC20MIMO	Ant2	5745	12.39	12.39	PASS
11AC20MIMO	Ant 1+2	5745	15.18	15.18	PASS
11AC20MIMO	Ant1	5785	12.39	12.39	PASS
11AC20MIMO	Ant2	5785	12.25	12.25	PASS
11AC20MIMO	Ant 1+2	5785	15.33	15.33	PASS
11AC20MIMO	Ant1	5825	12.38	12.38	PASS
11AC20MIMO	Ant2	5825	12.52	12.52	PASS
11AC20MIMO	Ant 1+2	5825	15.46	15.46	PASS
11AC40MIMO	Ant1	5190	11.75	11.75	PASS
11AC40MIMO	Ant2	5190	11.8	11.8	PASS
11AC40MIMO	Ant 1+2	5190	14.79	14.79	PASS
11AC40MIMO	Ant1	5230	11.87	11.87	PASS
11AC40MIMO	Ant2	5230	11.53	11.53	PASS
11AC40MIMO	Ant 1+2	5230	14.71	14.71	PASS
11AC40MIMO	Ant1	5755	11.63	11.63	PASS
11AC40MIMO	Ant2	5755	11.98	11.98	PASS
11AC40MIMO	Ant 1+2	5755	14.82	14.82	PASS
11AC40MIMO	Ant1	5795	11.71	11.71	PASS
11AC40MIMO	Ant2	5795	12.08	12.08	PASS
11AC40MIMO	Ant 1+2	5795	14.91	14.91	PASS
11AC80MIMO	Ant1	5210	6.56	6.56	PASS
11AC80MIMO	Ant2	5210	6.56	6.56	PASS
11AC80MIMO	Ant 1+2	5210	9.57	9.57	PASS
11AC80MIMO	Ant1	5775	7.19	7.19	PASS
11AC80MIMO	Ant2	5775	7.83	7.83	PASS
11AC80MIMO	Ant 1+2	5775	10.53	10.53	PASS

Remark:

1.E.i.r.p=Av.Power+G, G = antenna gain in dBi.

2.For band 1, MCS0 mode, 802.11a channel 36, 5180MHz; E.i.r.p=13.94+3=16.94dBm.

Test Graph

