

FCC Test Report

Product Name : UHD551-L
Trade Name : Vestel
Model No. : UHD551-L
FCC ID. : XU6-UHD551L

Applicant : VESTEL TRADE CO.

Address : Organize Sanayi Bölgesi (45030) Manisa/Türkiye

Date of Receipt : Mar. 28, 2017
Issued Date : Apr. 20, 2017
Report No. : 1740037R-RFUSP49V00
Report Version : V1.0



The test results relate only to the samples tested.

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Test Report Certification

Issued Date: Apr. 20, 2017

Report No. : 1740037R-RFUSP49V00

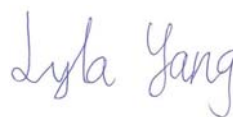


Product Name : UHD551-L
Applicant : VESTEL TRADE CO.
Address : Organize Sanayi Bölgesi (45030) Manisa/Türkiye
Manufacturer : VESTEL TRADE CO.
Model No. : UHD551-L
FCC ID. : XU6-UHD551L
EUT Voltage : AC 100-240V, 50-60Hz
Testing Voltage : AC 120V/60Hz
Trade Name : Vestel
Applicable Standard : FCC CFR Title 47 Part 15 Subpart E Section 15.407: 2015
ANSI C63.10: 2013
Test Lab : Hsin Chu Laboratory
Test Result : Complied

The test results relate only to the samples tested.

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Documented By :



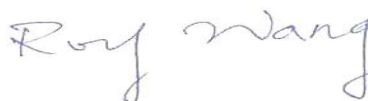
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(Carter Hsu / Senior Engineer)

Approved By :



(Roy Wang / Director)

Revision History

Report No.	Version	Description	Issued Date
1740037R-RFUSP49V00	V1.0	Initial issue of report	Apr. 20, 2017

Laboratory Information

We, **DEKRA Testing and Certification Co., Ltd.**, are an independent RF consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted (audited or listed) by the following related bodies in compliance with ISO 17025 specified testing scopes:

Taiwan R.O.C.	:	TAF, Accreditation Number: 3024
USA	:	FCC, Registration Number: 834100
Canada	:	IC, Submission No: 181665 / IC Registration Number: 22397-1 / 22397-2 / 22397-3

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:

<http://www.dekra.com.tw/english/about/certificates.aspx?bval=5>

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site : http://www.dekra.com.tw/index_en.aspx

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1. General Information

1.1. EUT Description

Product Name	UHD551-L	
Trade Name	Vestel	
Model No.	UHD551-L	
Frequency Range/ Channel Number	IEEE 802.11a/	5180~5240MHz / 4 Channels
	IEEE 802.11n (20MHz)	5260~5320MHz / 4 Channels
		5500~5700MHz / 11 Channels
	IEEE 802.11n (40MHz)	5190~5230MHz / 2 Channels
		5270~5310MHz / 2 Channels
		5510~5630MHz / 5 Channels
Type of Modulation	IEEE 802.11a/n	Orthogonal Frequency Division Multiplexing (OFDM)
Data Speed	IEEE 802.11a	6, 9,12,18, 24, 36, 48, 54Mbps
	IEEE 802.11n	Support a subset of the combination of GI, MCS 0~MCS 15 and bandwidth defined in 802.11n

Antenna Information	
Antenna Type	PIFA Antenna
Antenna Gain	5G low band-Antenna 0: 6.75 dBi
	5G low band-Antenna 1: 6.50 dBi
	5G medium band-Antenna 0: 7.00 dBi
	5G medium band-Antenna 1: 7.50 dBi

IEEE 802.11n

MCS Index	Modulation	R	N _{BPSCS}	N _{CBPS}		N _{DBPS}		Data Rate(Mb/s)			
				20MHz	40MHz	20MHz	40MHz	800ns GI		400ns GI	
								20MHz	40MHz	20MHz	40MHz
0	BPSK	1/2	1	52	108	26	54	6.5	13.5	7.2	15.0
1	QPSK	1/2	2	104	216	52	108	13.0	27.0	14.4	30.0
2	QPSK	3/4	2	104	216	78	162	19.5	40.5	21.7	45.0
3	16-QAM	1/2	4	208	432	104	216	26.0	54.0	28.9	60.0
4	16-QAM	3/4	4	208	432	156	324	39.0	81.0	43.3	90.0
5	64-QAM	2/3	6	312	648	208	432	52.0	108.0	57.8	120.0
6	64-QAM	3/4	6	312	648	234	486	58.5	121.5	65.0	135.0
7	64-QAM	5/6	6	312	648	260	540	65.0	135.0	72.2	150.0

Note 1: Support of 400ns GI is optional on transmit and receive.

Table 1 – MCS parameters for TX Antenna number = 1

MCS Index	Modulation	R	N _{BPSCS}	N _{CBPS}		N _{DBPS}		Data Rate(Mb/s)			
				20MHz	40MHz	20MHz	40MHz	800ns GI		400ns GI	
								20MHz	40MHz	20MHz	40MHz
8	BPSK	1/2	1	104	216	52	108	13.0	27.0	14.4	30.0
9	QPSK	1/2	2	208	432	104	216	26.0	54.0	28.9	60.0
10	QPSK	3/4	2	208	432	156	324	39.0	81.0	43.3	90.0
11	16-QAM	1/2	4	416	864	208	432	52.0	108.0	57.8	120.0
12	16-QAM	3/4	4	416	864	312	648	78.0	162.0	86.7	180.0
13	64-QAM	2/3	6	624	1296	416	864	104.0	216.0	115.6	240.0
14	64-QAM	3/4	6	624	1296	468	972	117.0	243.0	130.0	270.0
15	64-QAM	5/6	6	624	1296	520	1080	130.0	270.0	144.4	300.0

Note 1: Support of 400ns GI is optional on transmit and receive.

Table 2 – MCS parameters for TX Antenna number = 2

Symbol	Explanation
R	Code rate
N _{BPSCS}	Number of coded bits per single carrier
N _{CBPS}	Number of coded bits per symbol
N _{DBPS}	Number of data bits per symbol
GI	guard interval

IEEE 802.11a & IEEE 802.11n (20MHz)

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz	48	5240 MHz
52	5260 MHz	56	5280 MHz	60	5300 MHz	64	5320 MHz
100	5500 MHz	104	5520 MHz	108	5540 MHz	112	5560 MHz
116	5580 MHz	120	5600 MHz	124	5620 MHz	128	5640 MHz
132	5660 MHz	136	5680 MHz	140	5700 MHz		

IEEE 802.11n (40MHz)

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	54	5270 MHz	62	5310 MHz
102	5510 MHz	110	5550 MHz	118	5590 MHz	126	5630 MHz
134	5670 MHz						

Note:

1. This device is a UHD551-L including 2.4GHz b/g/n (2x2), BT2.0, BT4.0 and 5GHz a/n (2x2) transmitting and receiving function.
2. Regards to the frequency band operation; the lowest , middle and highest frequency of channel were selected to perform the test, and then shown on this report.
3. This device is a composite device in accordance with Part 15 regulations. The receiving function was tested and its number is 1740037R-RFUSP01V00.

1.2. Test Mode

DEKRA has verified the construction and function in typical operation. The preliminary tests were performed in different data rate, and to find the worst condition, which was shown in this test report. The following table is the final test mode.

TX	Mode 1: Tx_SISO Mode Mode 2: Tx_MIMO Mode
----	--

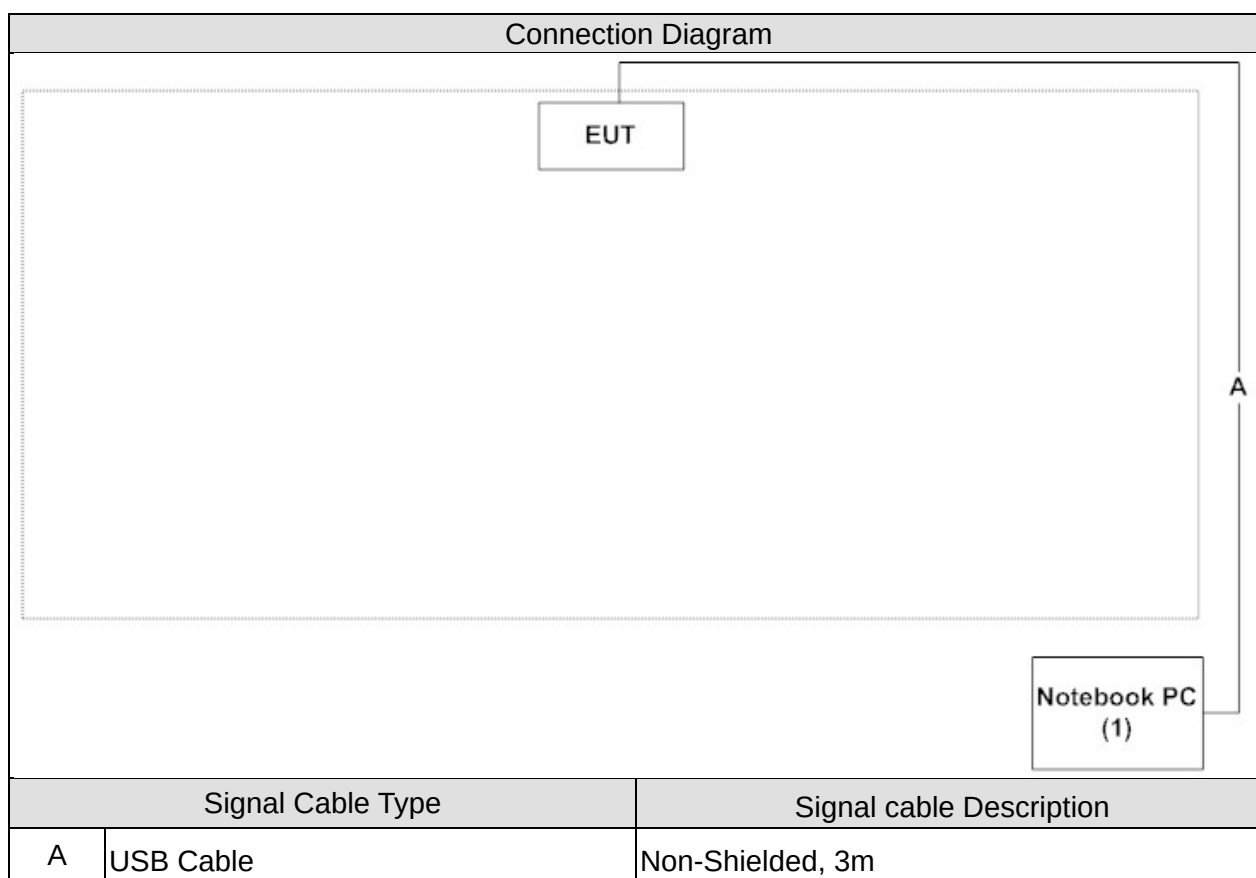
Test Items	Modulation	Channel	Antenna	Result
Conducted Emission	11n (40MHz)	38/54/110	0+1	Complies
99% & 20dB Bandwidth	a	36/44/48	0/1	Complies
	11n (20MHz)	52/60/64	0/1	Complies
	11n (40MHz)	100/116/140	0/1	Complies
Peak Transmit Output	a	36/44/48	0/1	Complies
	11n (20MHz)	52/60/64	0+1	Complies
	11n (40MHz)	100/116/140	0+1	Complies
Peak Power Spectrum Density	a	36/44/48	0/1	Complies
	11n (20MHz)	52/60/64	0+1	Complies
	11n (40MHz)	100/116/140	0+1	Complies
Radiated Emission	a	36/44/48	0+1	Complies
	11n (20MHz)	52/60/64	0+1	Complies
	11n (40MHz)	100/116/140	0+1	Complies
Band Edge	a	36/44/48	0+1	Complies
	11n (20MHz)	52/60/64	0+1	Complies
	11n (40MHz)	100/116/140	0+1	Complies
Frequency Stability	a	36/44/48	0/1	Complies
	11n (20MHz)	52/60/64	0/1	Complies
	11n (40MHz)	100/116/140	0/1	Complies

1.3. System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1 Notebook PC	ASUS	X522EP	E5N0CV043264 197	DoC	Non-Shielded, 1.8m, one ferrite core bonded

1.4. Configuration of tested System



1.5. EUT Exercise Software

1	Setup the EUT as shown in Section 1.4.
2	Execute the test program "MTool_2.0.2.1.exe".
3	Configure the test mode, the test channel, and the data rate.
4	Press "Start TX" to start the continuous transmitting.
5	Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC PART 15 E 15.407 Conducted Emission	15 - 35	20°C
Humidity (%RH)		25 - 75	50%RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 E 15.407 99% & DTS Bandwidth	15 - 35	25°C
Humidity (%RH)		25 - 75	45%RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 E 15.407 Peak Transmit Power	15 - 35	25°C
Humidity (%RH)		25 - 75	65%RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 E 15.407 Peak Power Spectrum	15 - 35	25°C
Humidity (%RH)		25 - 75	45%RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 E 15.407 Radiated Emission	15 - 35	25°C
Humidity (%RH)		25 - 75	45%RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 E 15.407 Band Edge	15 - 35	25°C
Humidity (%RH)		25 - 75	45%RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 E 15.407 Frequency Stability	15 - 35	25°C
Humidity (%RH)		25 - 75	45%RH
Barometric pressure (mbar)		860 - 1060	950-1000

2. Conducted Emission

2.1. Test Equipment

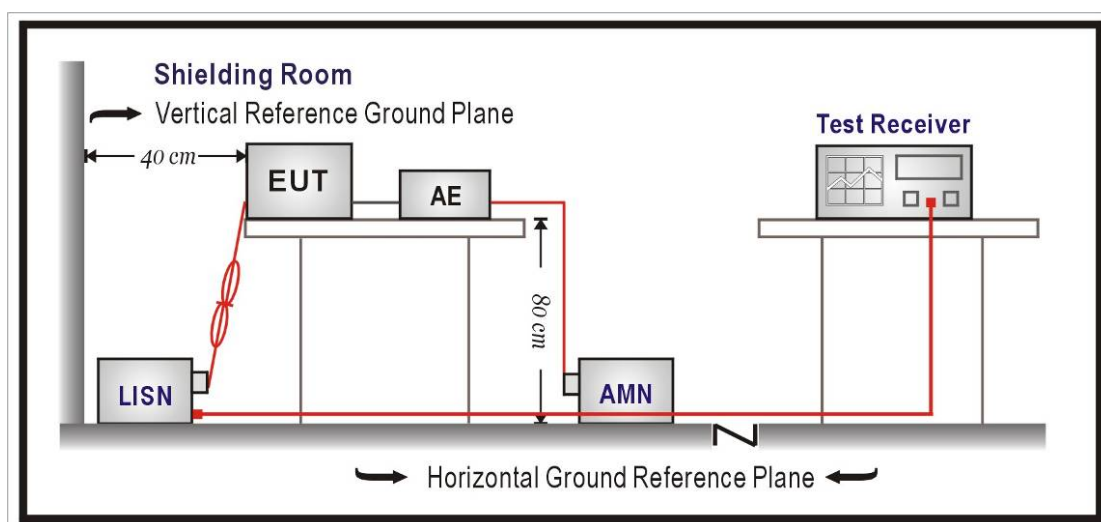
The following test equipments are used during the test:

Conducted Emission / SR2-H

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Artificial Mains Network	R&S	ENV4200	848411/010	2018/02/05
LISN	R&S	ENV216	100092	2017/08/16
Test Receiver	R&S	ESCS 30	836858/022	2018/01/14

Note: All equipments that need to calibrate are with calibration period of 1 year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
Frequency MHz	QP	AV
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Remark: In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT was setup according to ANSI C63.10:2013. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs.)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

2.5. Test Specification

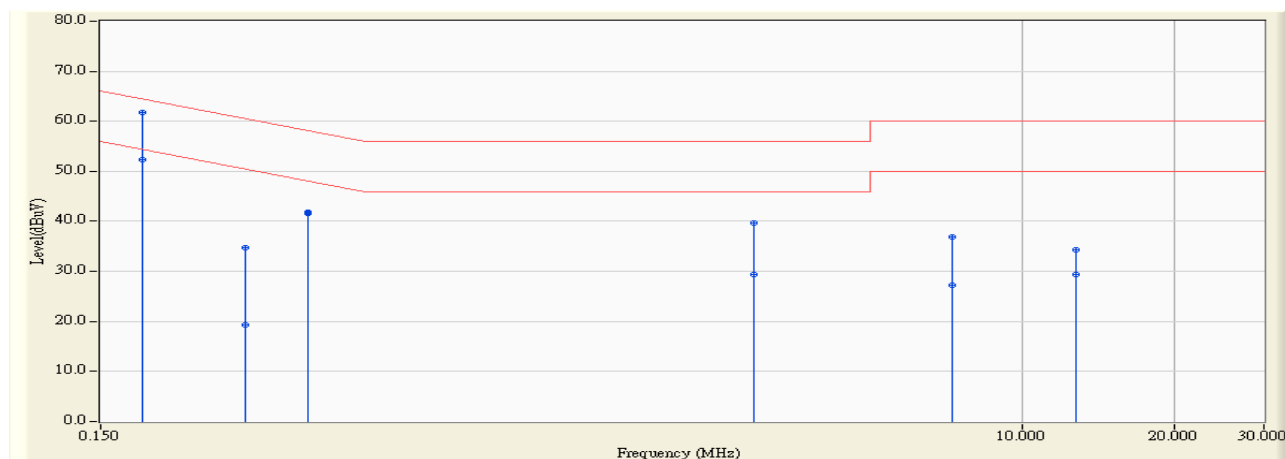
According to FCC Part 15 Subpart C Paragraph 15.207: 2015

2.6. Uncertainty

The measurement uncertainty is defined as ± 2.26 dB.

2.7. Test Result

Site : SR2-H	Time : 2017/04/13
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR2-H_LISN(16A)-6_0712 - Line1	Power : AC 120V/60Hz
EUT : UHD551-L	Note : Mode 2: Tx_MIMO Mode_802.11n(40M)_5190MHz

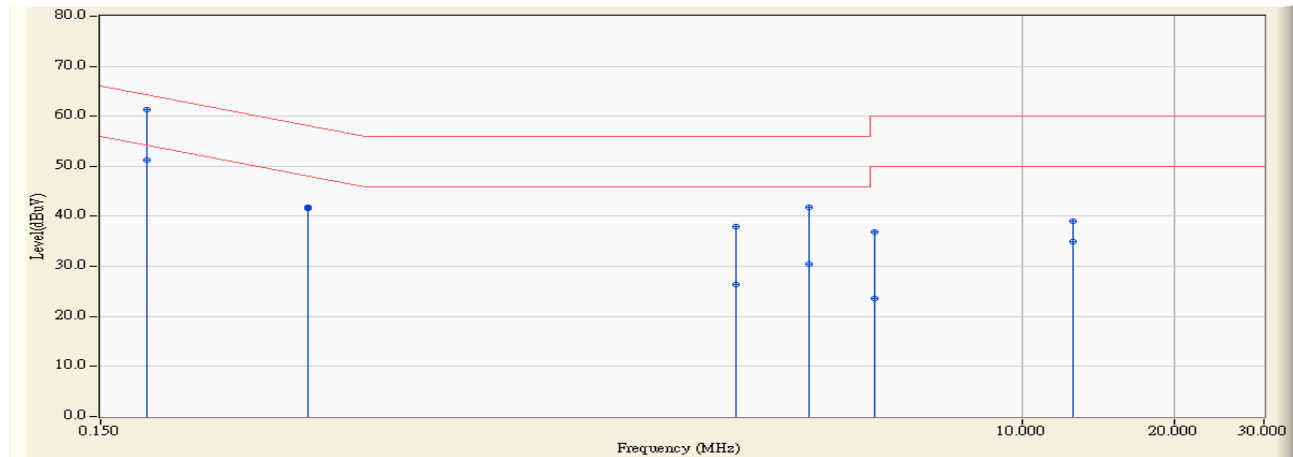


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.181	9.752	52.010	61.762	-2.666	64.428	QUASPEAK
2	*	0.181	9.752	42.540	52.292	-2.136	54.428	AVERAGE
3		0.291	9.741	24.920	34.661	-25.846	60.507	QUASPEAK
4		0.291	9.741	9.500	19.241	-31.266	50.507	AVERAGE
5		0.384	9.732	32.100	41.832	-16.353	58.184	QUASPEAK
6		0.384	9.732	31.840	41.572	-6.613	48.184	AVERAGE
7		2.931	9.888	29.840	39.728	-16.272	56.000	QUASPEAK
8		2.931	9.888	19.520	29.408	-16.592	46.000	AVERAGE
9		7.255	10.015	26.960	36.976	-23.024	60.000	QUASPEAK
10		7.255	10.015	17.220	27.236	-22.764	50.000	AVERAGE
11		12.763	10.179	24.120	34.300	-25.700	60.000	QUASPEAK
12		12.763	10.179	19.310	29.490	-20.510	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR2-H	Time : 2017/04/13
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR2-H_LISN(16A)-6_0712 - Line2	Power : AC 120V/60Hz
EUT : UHD551-L	Note : Mode 2: Tx_MIMO Mode_802.11n(40M)_5190MHz

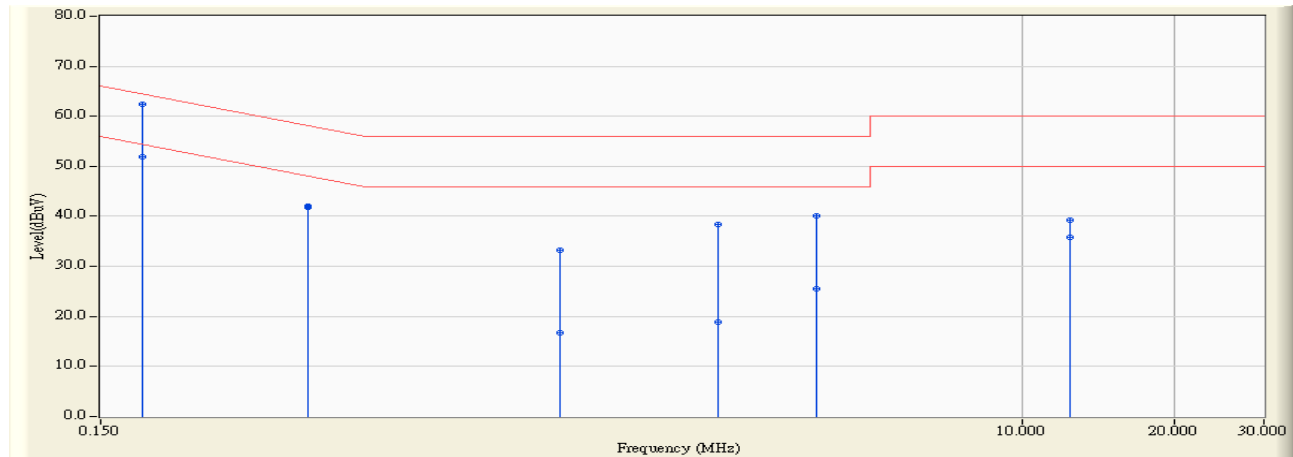


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.185	9.751	51.620	61.371	-2.880	64.251	QUASIPeAK
2		0.185	9.751	41.590	51.341	-2.910	54.251	AVERAGE
3		0.384	9.750	32.120	41.870	-16.314	58.184	QUASIPeAK
4		0.384	9.750	31.840	41.590	-6.594	48.184	AVERAGE
5		2.705	9.847	28.090	37.937	-18.063	56.000	QUASIPeAK
6		2.705	9.847	16.540	26.387	-19.613	46.000	AVERAGE
7		3.791	9.841	31.880	41.721	-14.279	56.000	QUASIPeAK
8		3.791	9.841	20.510	30.351	-15.649	46.000	AVERAGE
9		5.091	9.864	26.980	36.844	-23.156	60.000	QUASIPeAK
10		5.091	9.864	13.690	23.554	-26.446	50.000	AVERAGE
11		12.545	10.232	28.880	39.111	-20.889	60.000	QUASIPeAK
12		12.545	10.232	24.830	35.061	-14.939	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR2-H	Time : 2017/04/13
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR2-H_LISN(16A)-6_0712 - Line1	Power : AC 120V/60Hz
EUT : UHD551-L	Note : Mode 2: Tx_MIMO Mode_802.11n(40M)_5270MHz

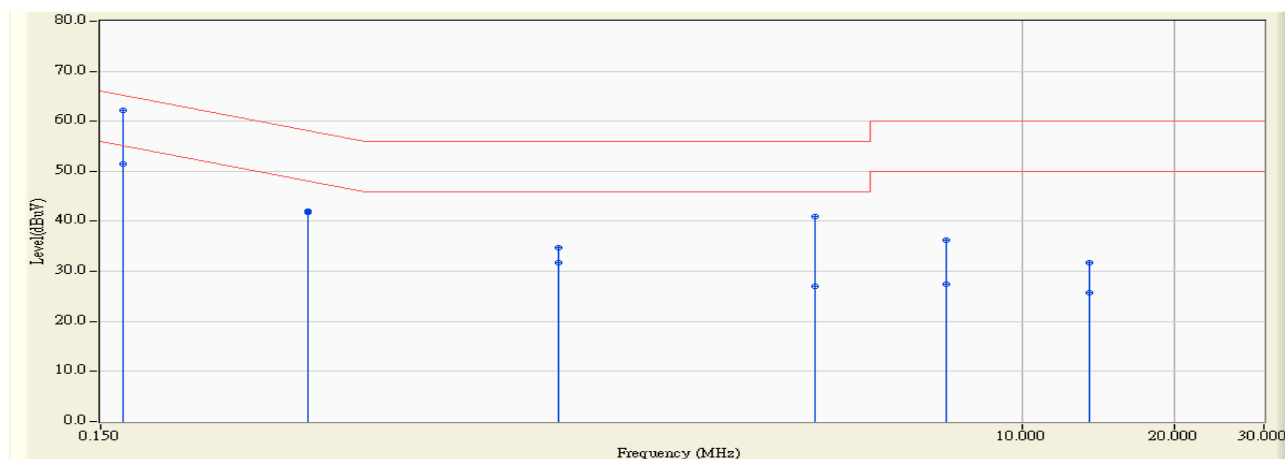


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.181	9.752	52.570	62.322	-2.106	64.428	QUASIPeAK
2		0.181	9.752	42.220	51.972	-2.456	54.428	AVERAGE
3		0.384	9.732	32.250	41.982	-16.203	58.184	QUASIPeAK
4		0.384	9.732	32.000	41.732	-6.453	48.184	AVERAGE
5		1.212	9.829	23.510	33.339	-22.661	56.000	QUASIPeAK
6		1.212	9.829	6.910	16.739	-29.261	46.000	AVERAGE
7		2.490	9.875	28.510	38.385	-17.615	56.000	QUASIPeAK
8		2.490	9.875	9.030	18.905	-27.095	46.000	AVERAGE
9		3.904	9.917	30.270	40.187	-15.813	56.000	QUASIPeAK
10		3.904	9.917	15.710	25.627	-20.373	46.000	AVERAGE
11		12.400	10.173	29.180	39.353	-20.647	60.000	QUASIPeAK
12		12.400	10.173	25.640	35.813	-14.187	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR2-H	Time : 2017/04/13
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR2-H_LISN(16A)-6_0712 - Line2	Power : AC 120V/60Hz
EUT : UHD551-L	Note : Mode 2: Tx_MIMO Mode_802.11n(40M)_5270MHz

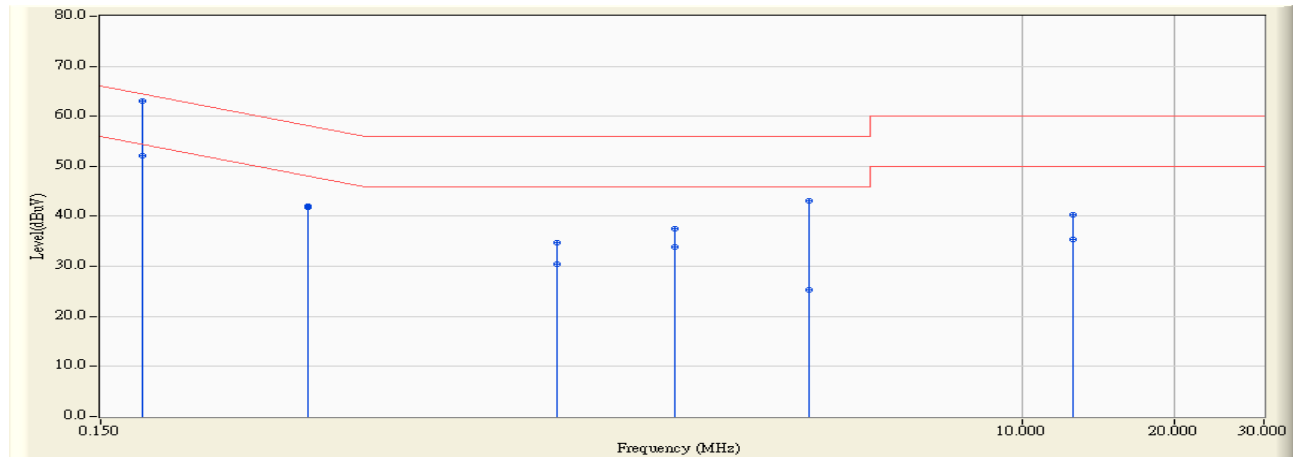


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.166	9.753	52.510	62.263	-2.914	65.177	QUASIPeAK
2		0.166	9.753	41.790	51.543	-3.634	55.177	AVERAGE
3		0.384	9.750	32.320	42.070	-16.114	58.184	QUASIPeAK
4		0.384	9.750	31.970	41.720	-6.464	48.184	AVERAGE
5		1.205	9.826	24.950	34.776	-21.224	56.000	QUASIPeAK
6		1.205	9.826	21.990	31.816	-14.184	46.000	AVERAGE
7		3.892	9.841	31.170	41.011	-14.989	56.000	QUASIPeAK
8		3.892	9.841	17.110	26.951	-19.049	46.000	AVERAGE
9		7.080	9.979	26.370	36.350	-23.650	60.000	QUASIPeAK
10		7.080	9.979	17.480	27.460	-22.540	50.000	AVERAGE
11		13.525	10.262	21.460	31.723	-28.277	60.000	QUASIPeAK
12		13.525	10.262	15.370	25.633	-24.367	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR2-H	Time : 2017/04/13
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR2-H_LISN(16A)-6_0712 - Line1	Power : AC 120V/60Hz
EUT : UHD551-L	Note : Mode 2: Tx_MIMO Mode_802.11n(40M)_550MHz

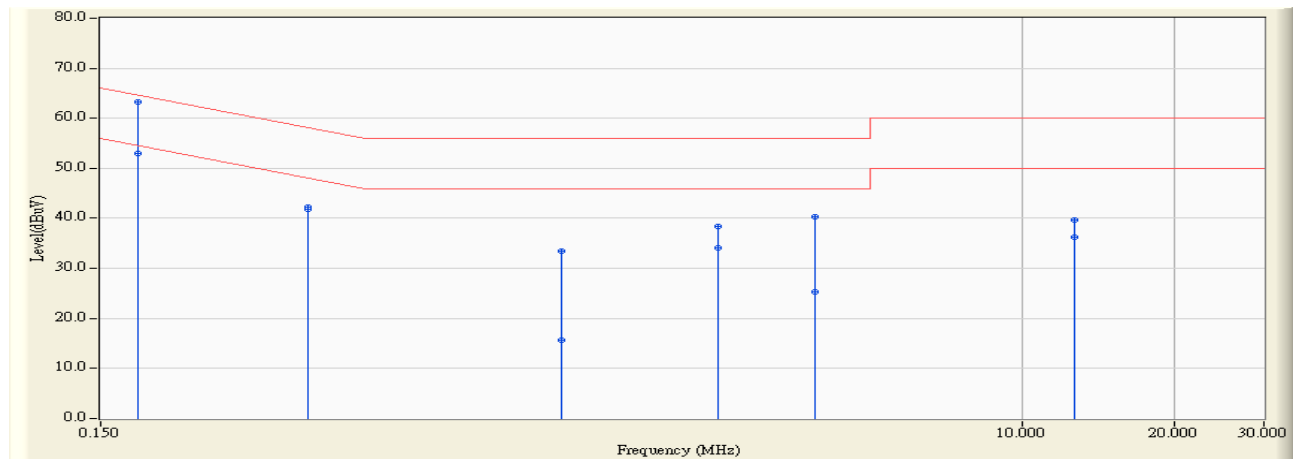


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.181	9.752	53.350	63.102	-1.326	64.428	QUASIPeAK
2		0.181	9.752	42.420	52.172	-2.256	54.428	AVERAGE
3		0.384	9.732	32.290	42.022	-16.163	58.184	QUASIPeAK
4		0.384	9.732	32.000	41.732	-6.453	48.184	AVERAGE
5		1.197	9.828	24.830	34.658	-21.342	56.000	QUASIPeAK
6		1.197	9.828	20.720	30.548	-15.452	46.000	AVERAGE
7		2.056	9.862	27.570	37.432	-18.568	56.000	QUASIPeAK
8		2.056	9.862	23.980	33.842	-12.158	46.000	AVERAGE
9		3.787	9.914	33.140	43.054	-12.946	56.000	QUASIPeAK
10		3.787	9.914	15.380	25.294	-20.706	46.000	AVERAGE
11		12.603	10.177	30.230	40.407	-19.593	60.000	QUASIPeAK
12		12.603	10.177	25.200	35.377	-14.623	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR2-H	Time : 2017/04/13
Limit : CISPR_B_00M_QP	Margin : 10
Probe : SR2-H_LISN(16A)-6_0712 - Line2	Power : AC 120V/60Hz
EUT : UHD551-L	Note : Mode 2: Tx_MIMO Mode_802.11n(40M)_5500MHz



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.177	9.752	53.610	63.362	-1.247	64.609	QUASIPeAK
2		0.177	9.752	43.240	52.992	-1.617	54.609	AVERAGE
3		0.384	9.750	32.460	42.210	-15.974	58.184	QUASIPeAK
4		0.384	9.750	32.090	41.840	-6.344	48.184	AVERAGE
5		1.220	9.827	23.570	33.397	-22.603	56.000	QUASIPeAK
6		1.220	9.827	5.850	15.677	-30.323	46.000	AVERAGE
7		2.502	9.847	28.600	38.447	-17.553	56.000	QUASIPeAK
8		2.502	9.847	24.220	34.067	-11.933	46.000	AVERAGE
9		3.896	9.841	30.390	40.231	-15.769	56.000	QUASIPeAK
10		3.896	9.841	15.400	25.241	-20.759	46.000	AVERAGE
11		12.670	10.235	29.520	39.755	-20.245	60.000	QUASIPeAK
12		12.670	10.235	26.010	36.245	-13.755	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

3. 99% & 26dB & DTS Bandwidth

3.1. Test Equipment

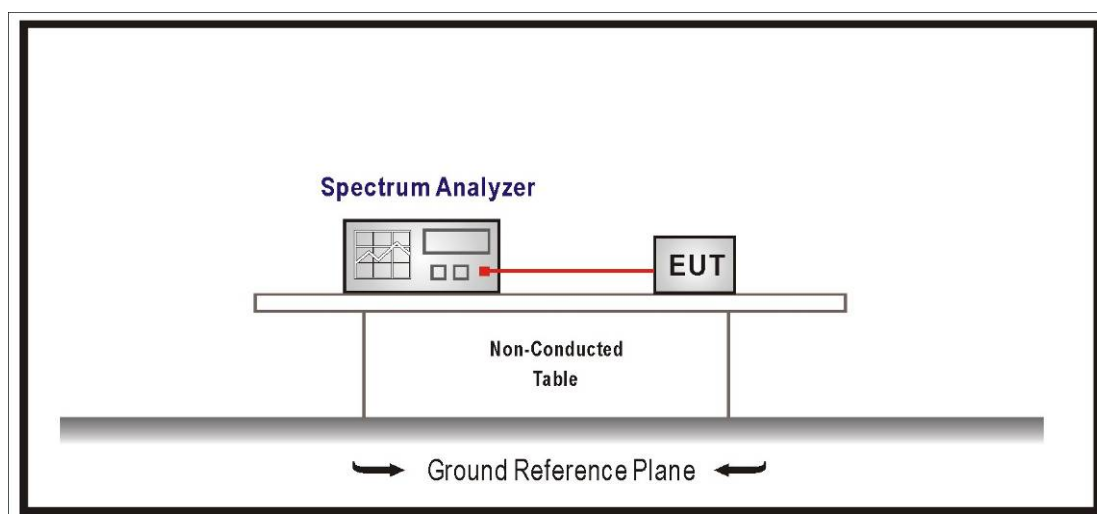
The following test equipments are used during the radiated emission tests:

99% & 26dB & DTS Bandwidth / SR10-H

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A	US47140172	2017/08/08

Note: All equipments that need to calibrate are with calibration period of 1 year.

3.2. Test Setup



3.3. Limits

99% Bandwidth : No Required

6dB Bandwidth $\geq$ 500KHz, only for 5725MHz to 5850MHz

3.4. Test Procedure

99% & 26dB Bandwidth :

The EUT was tested according to U-NII test procedure of KDB 789033 V01r03.

Set RBW 1% of the emission bandwidth, VBW equal to 3 times the RBW.

DTS Bandwidth :

Set RBW = 100KHz, VBW $\geq$ 3xRBW, Sweep time=Auto, Set Peak detector.

3.5. Uncertainty

The measurement uncertainty is defined as $\pm 150\text{Hz}$

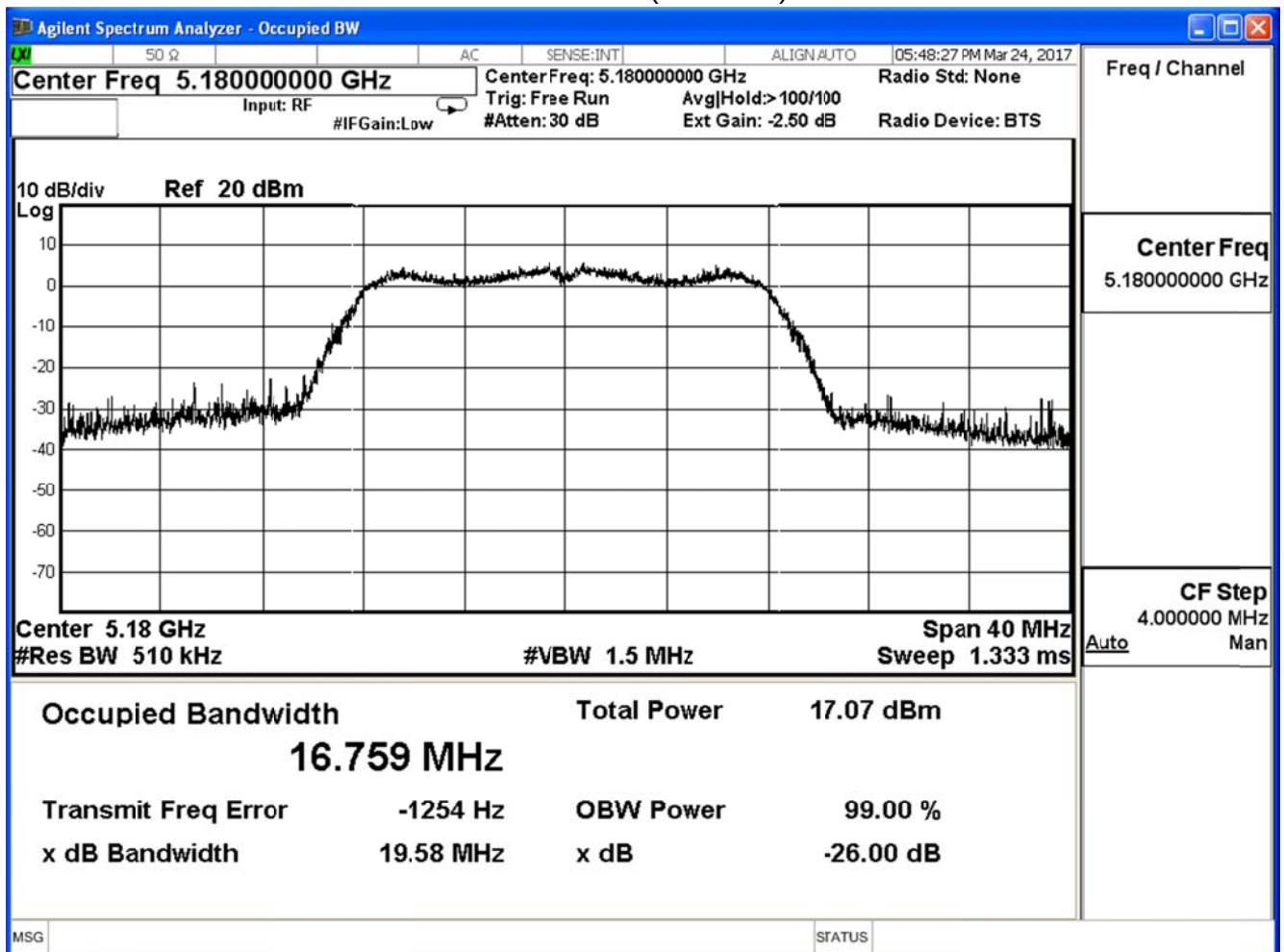
3.6. Test Result

Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Tx_SISO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

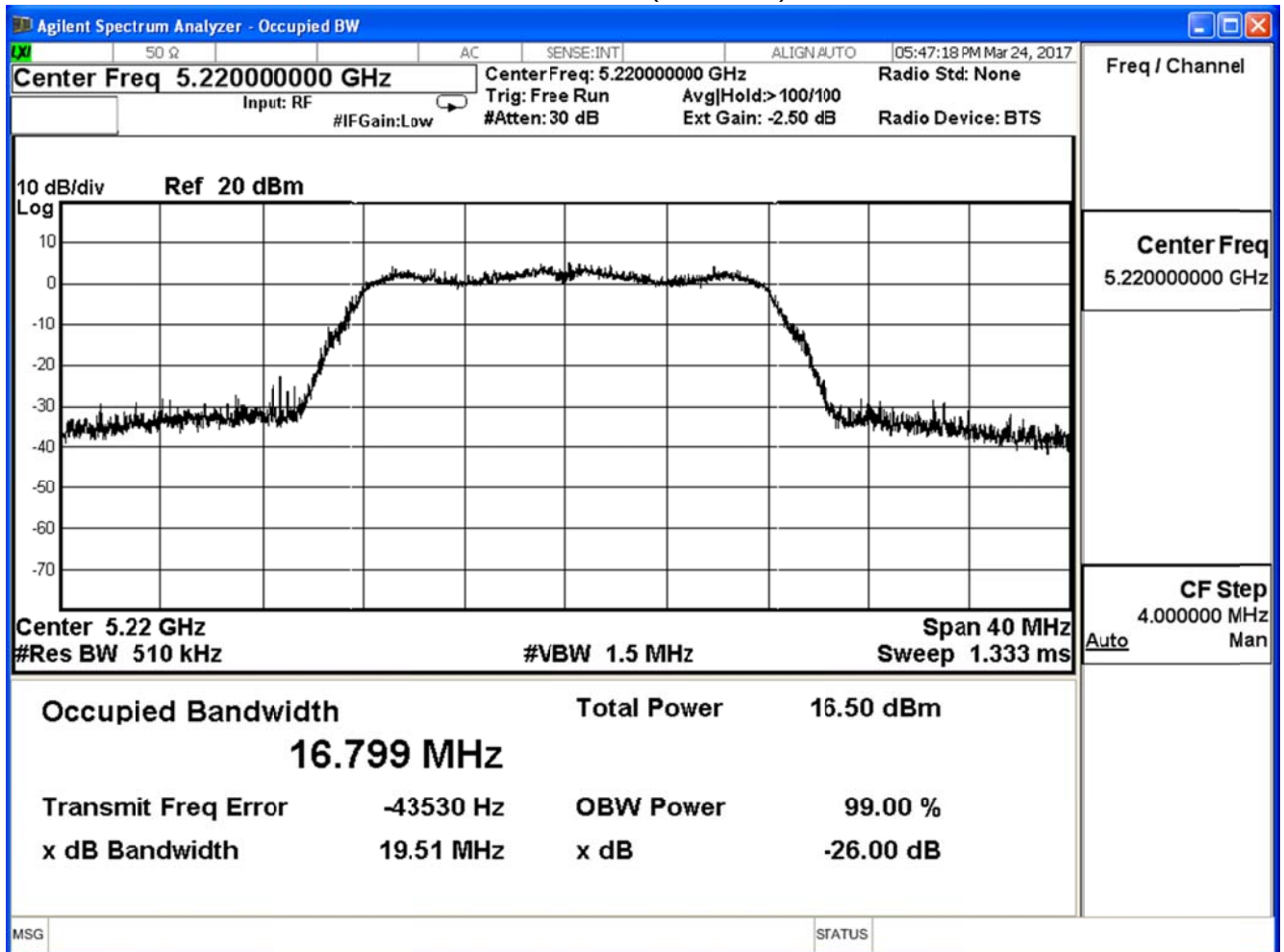
IEEE 802.11a (ANT 0)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
36	5180	16.759	19.580	--
44	5220	16.799	19.510	--
48	5240	16.878	19.540	--

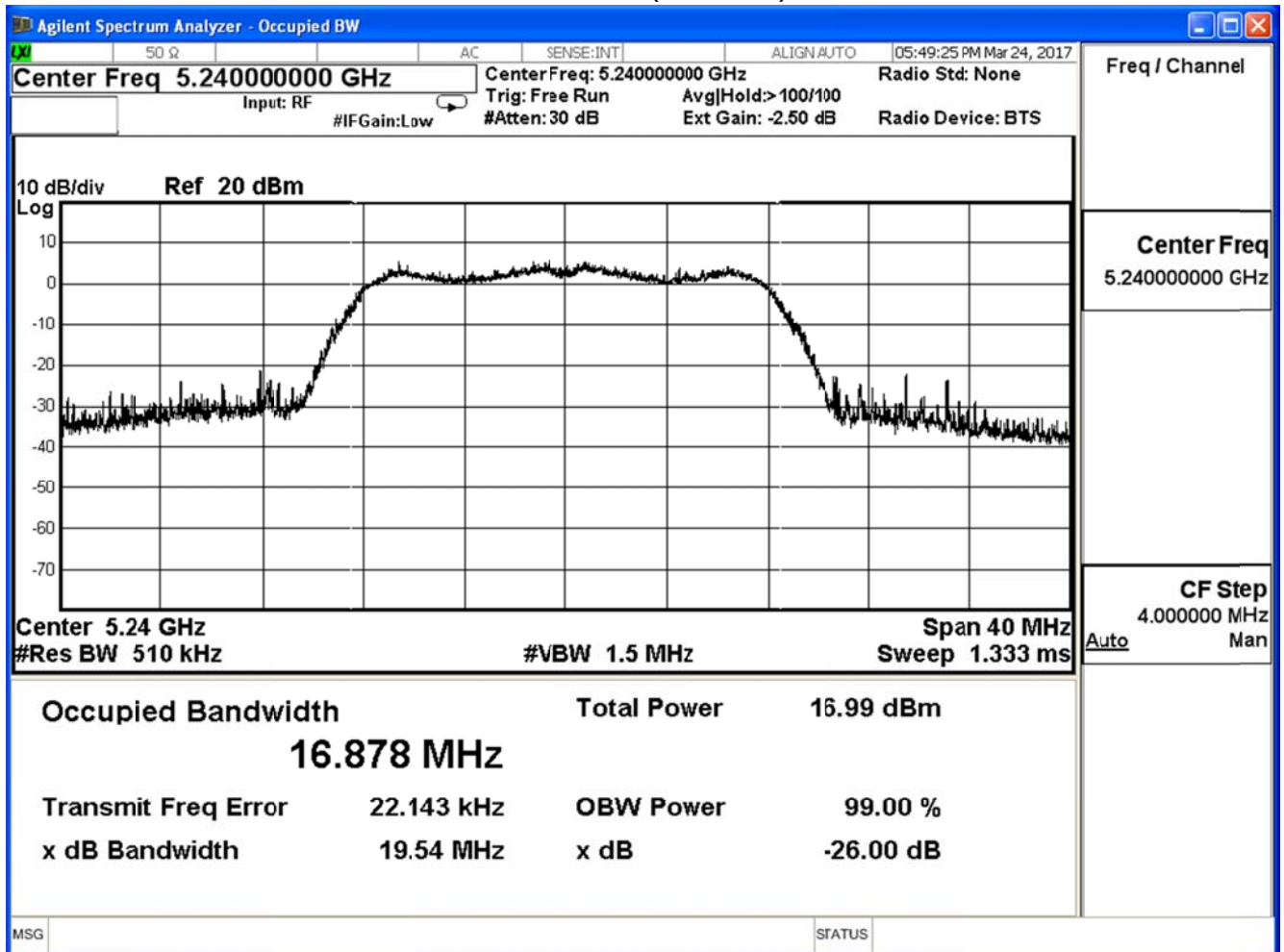
Channel 36 (5180MHz)



Channel 44 (5220MHz)



Channel 48 (5240MHz)

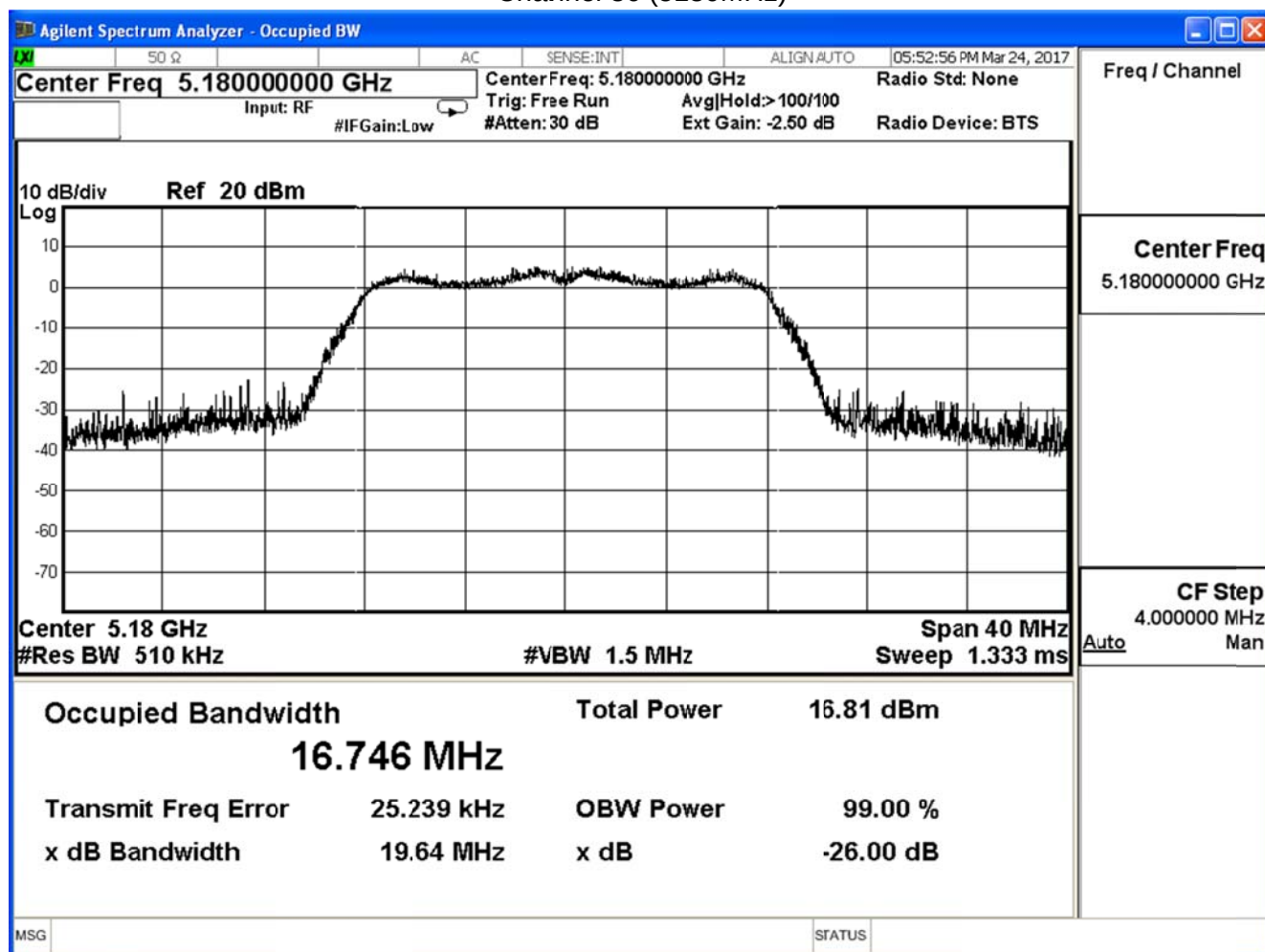


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Tx SISO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

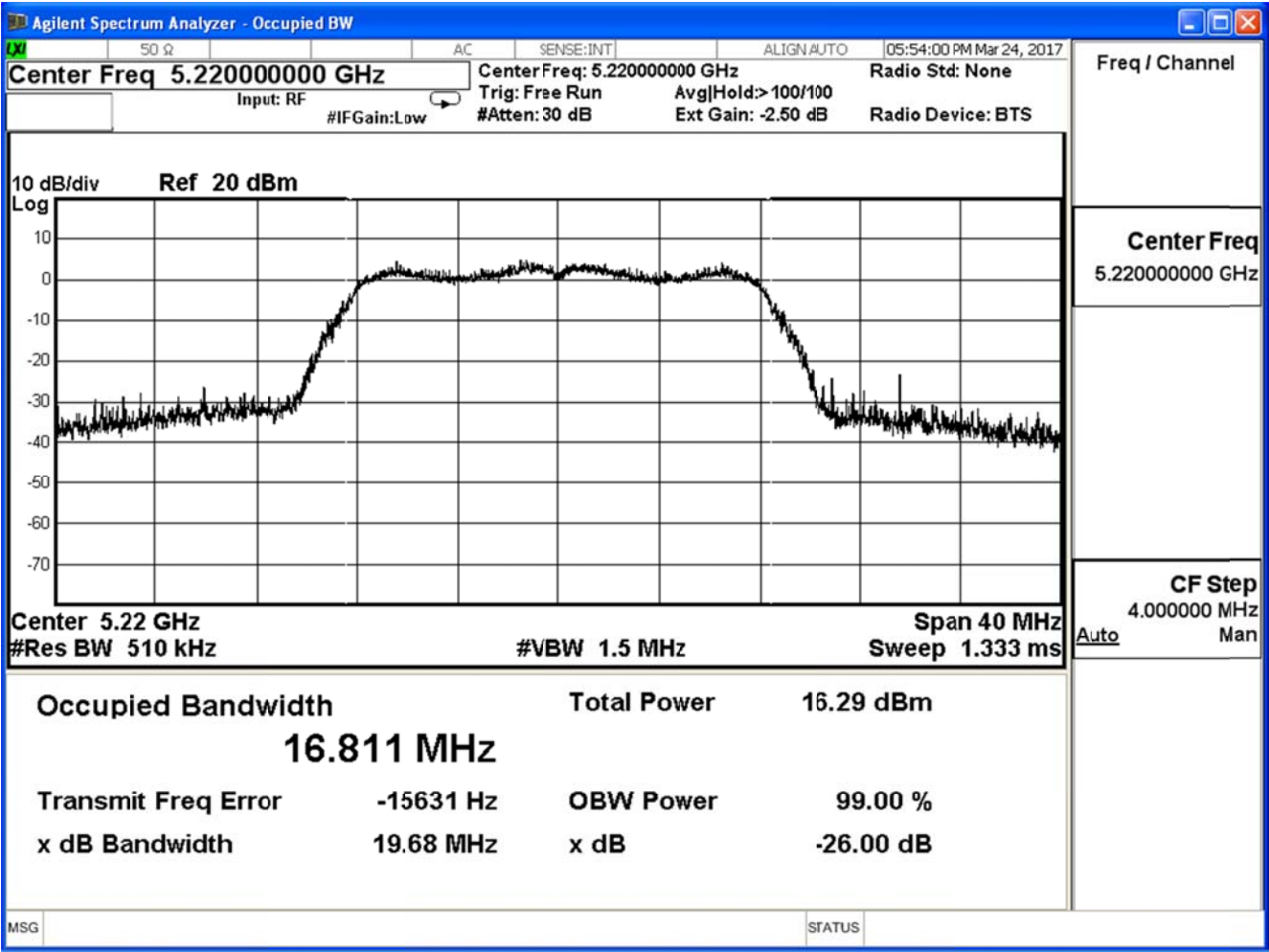
IEEE 802.11a (ANT 1)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
36	5180	16.746	19.640	--
44	5220	16.811	19.680	--
48	5240	16.784	19.750	--

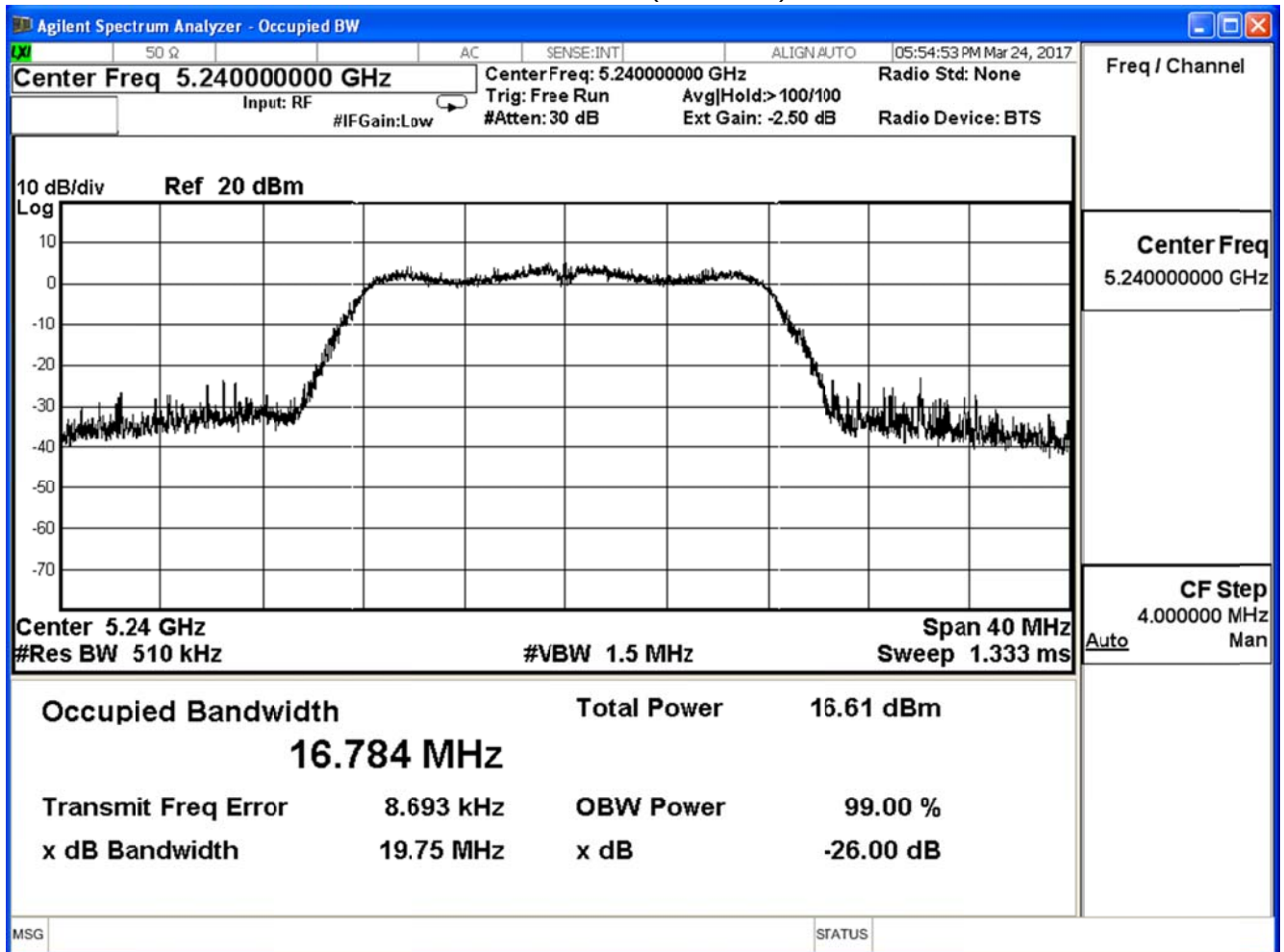
Channel 36 (5180MHz)



Channel 44 (5220MHz)



Channel 48 (5240MHz)

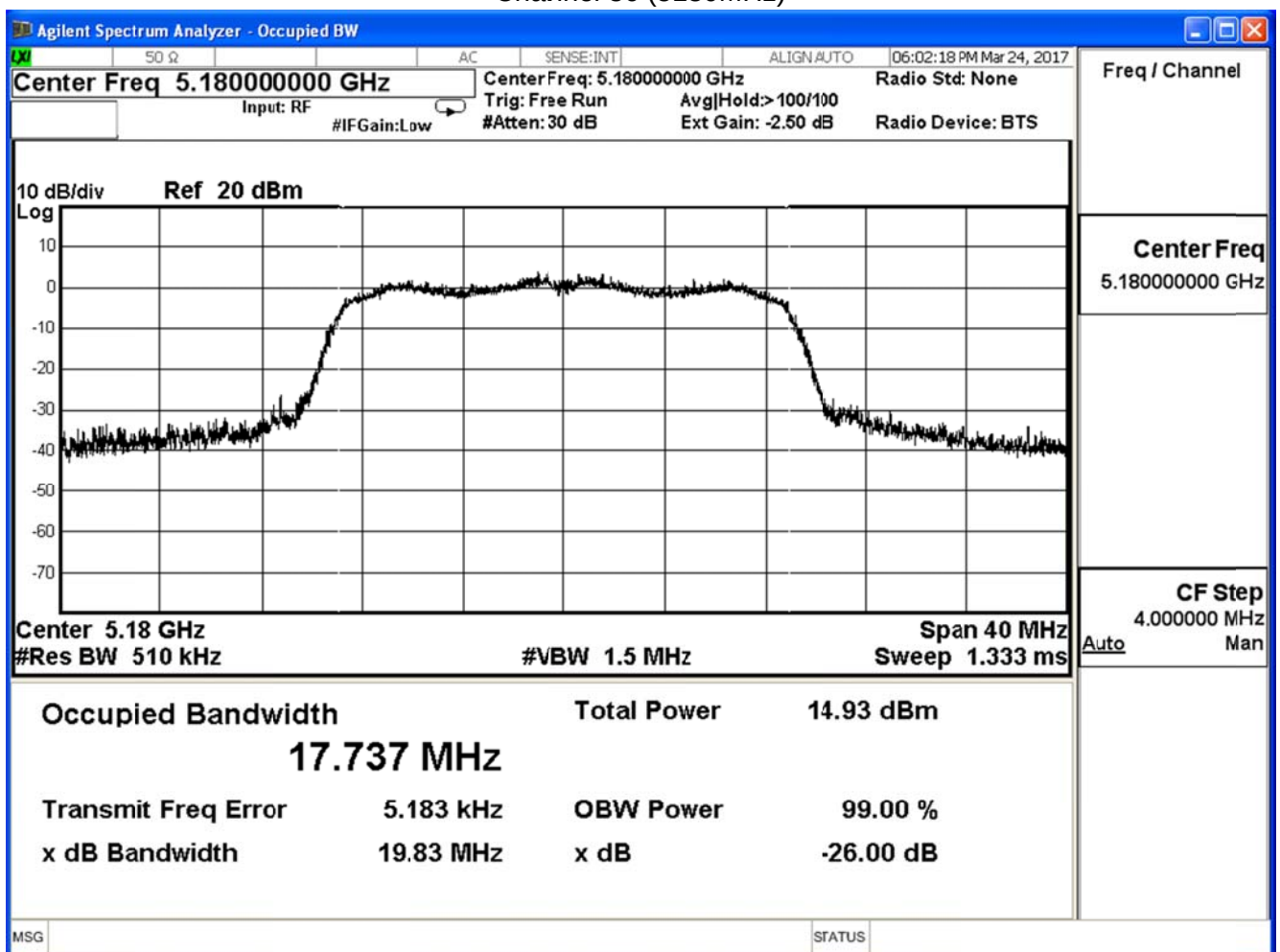


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 2: Tx MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

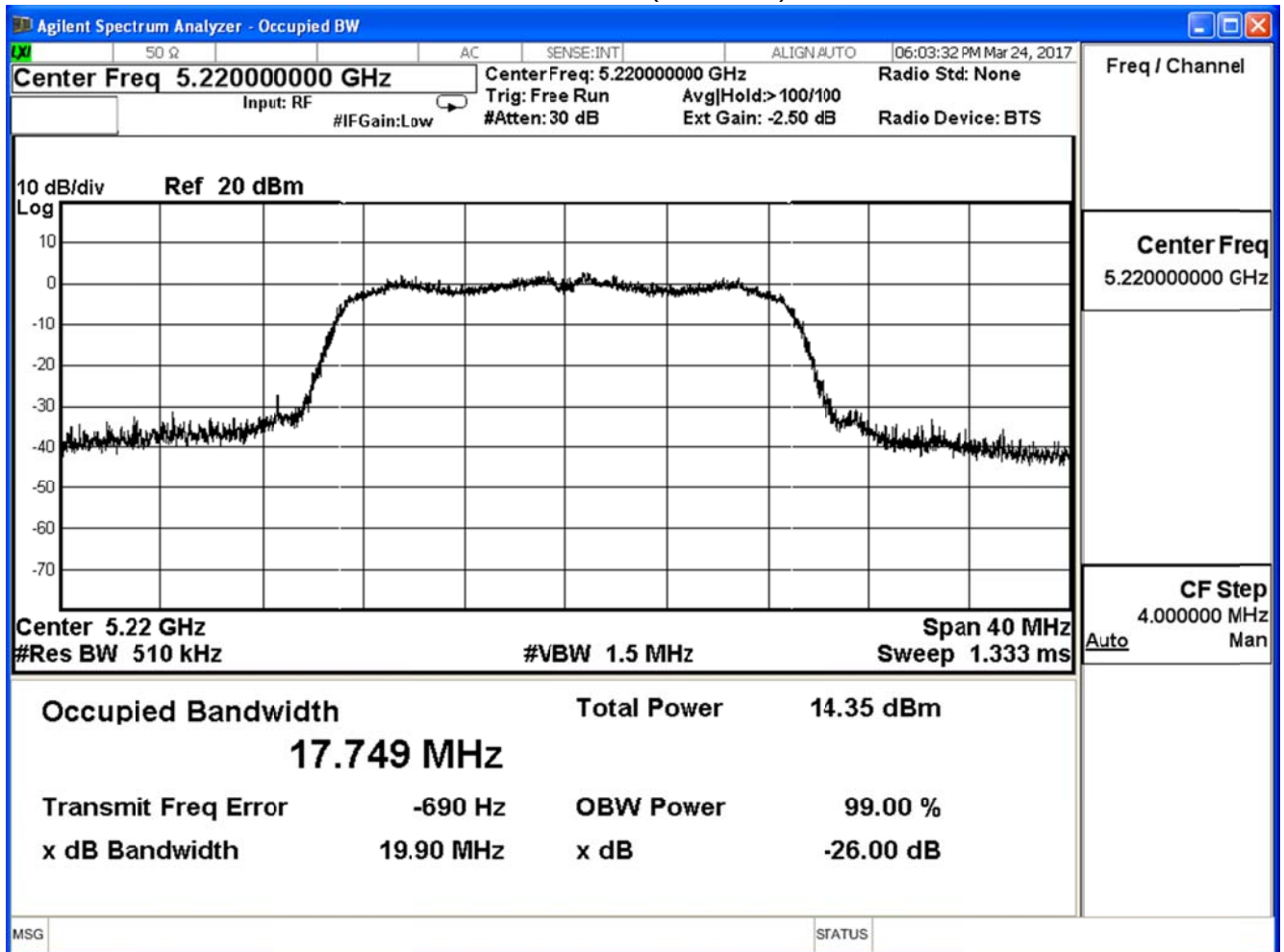
IEEE 802.11n20 (ANT 0)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
36	5180	17.737	19.830	--
44	5220	17.749	19.900	--
48	5240	17.757	19.930	--

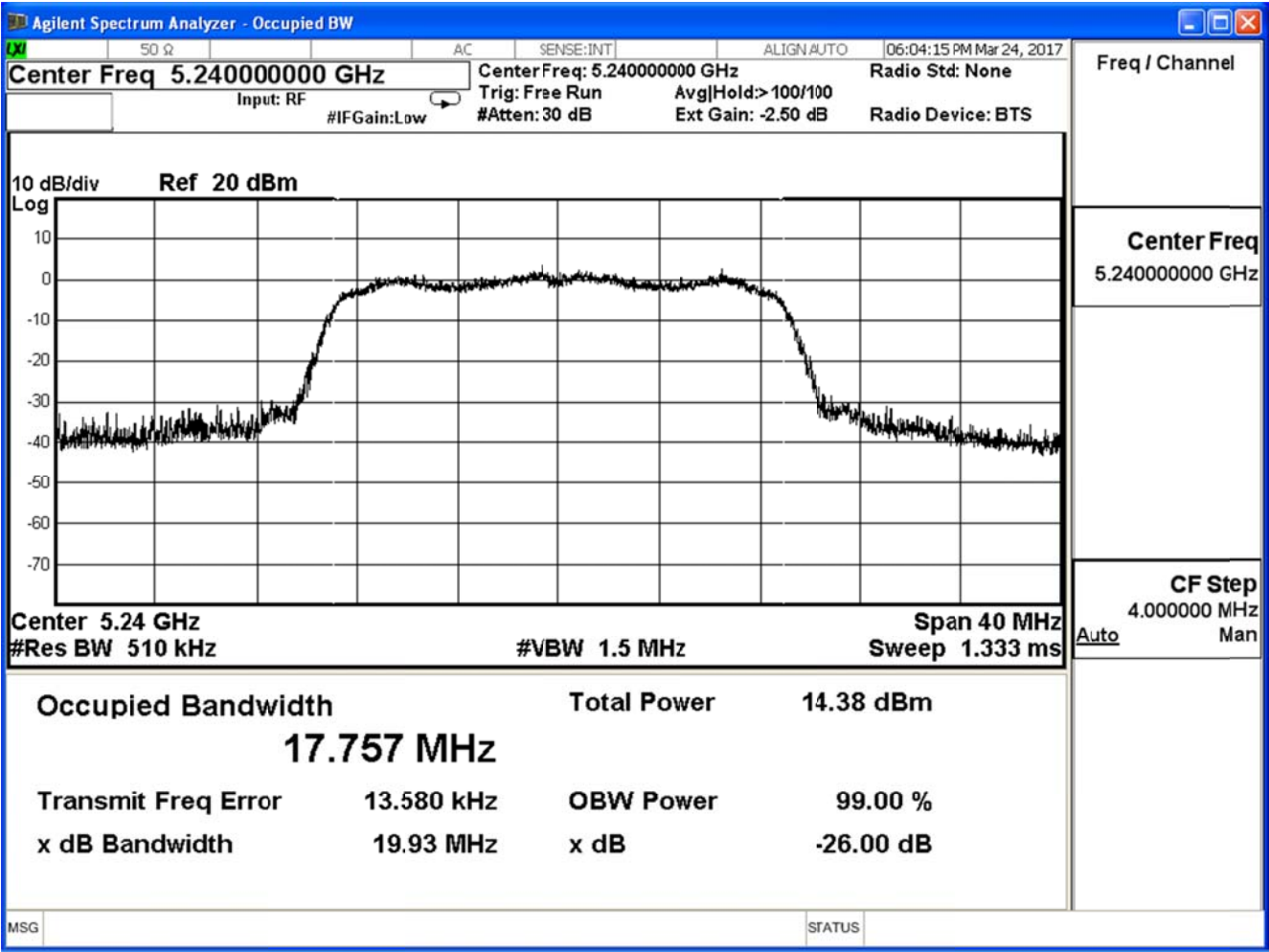
Channel 36 (5180MHz)



Channel 44 (5220MHz)



Channel 48 (5240MHz)

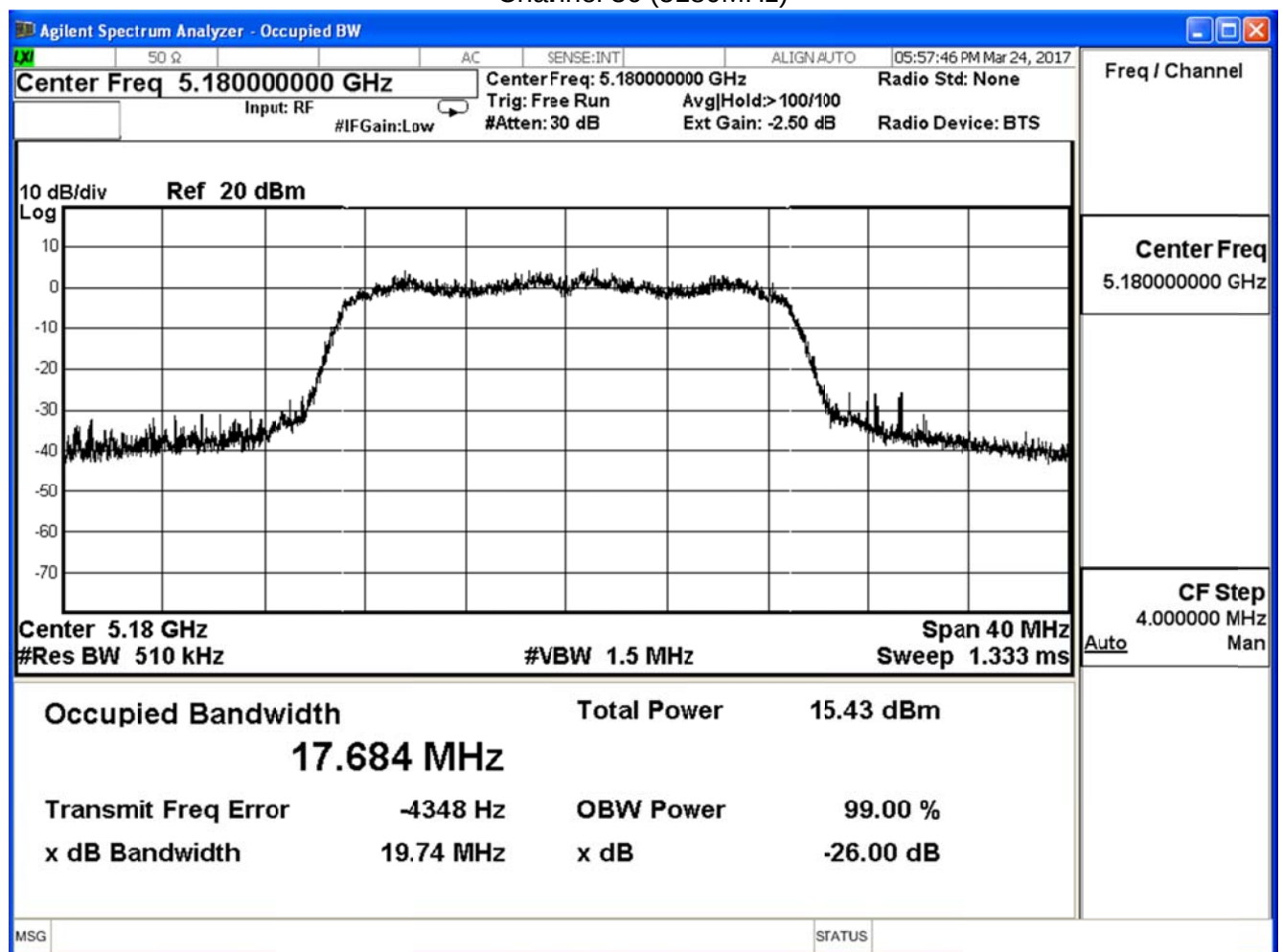


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

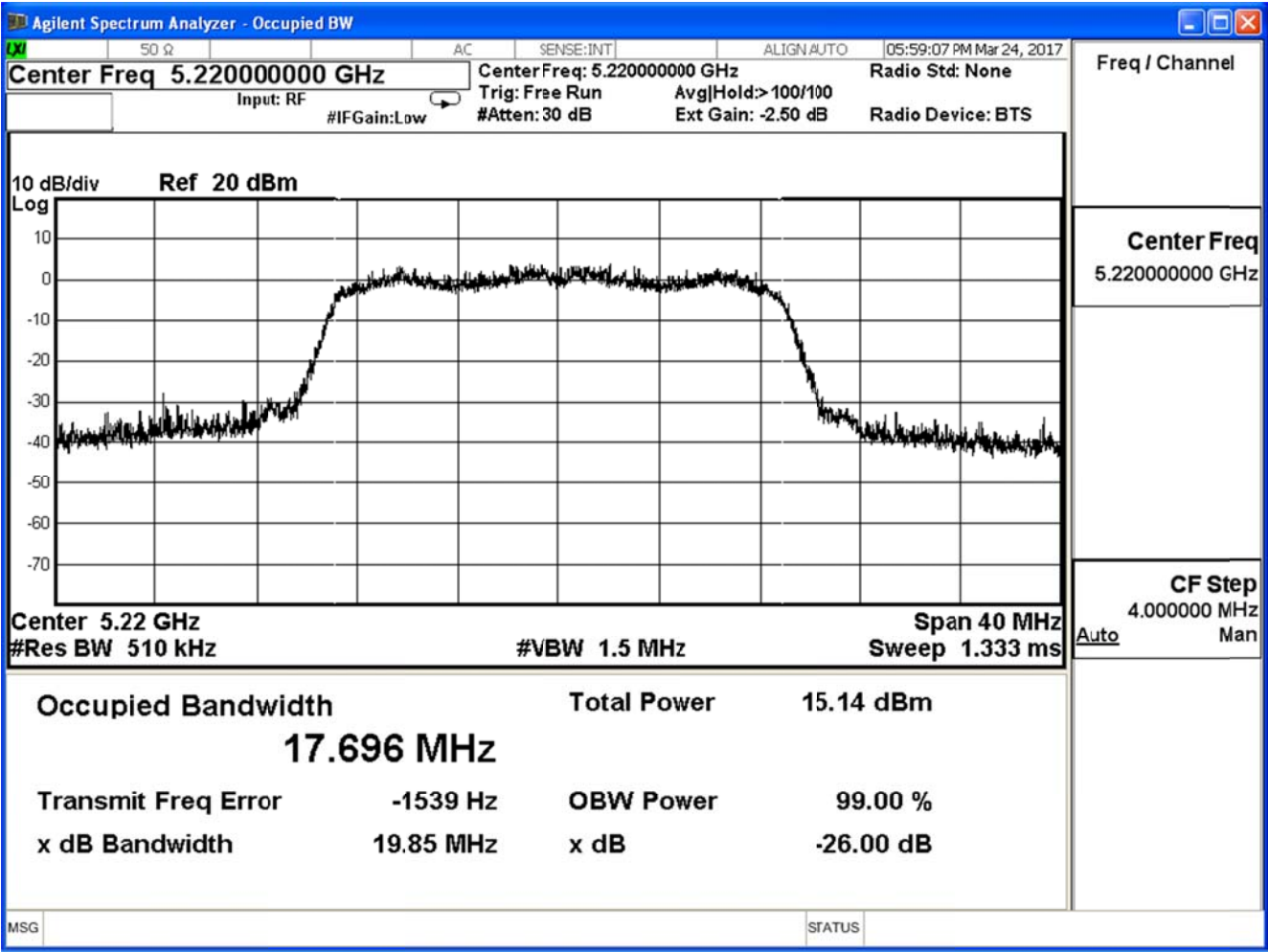
IEEE 802.11n20 (ANT 1)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
36	5180	17.684	19.740	--
44	5220	17.696	19.850	--
48	5240	17.719	19.810	--

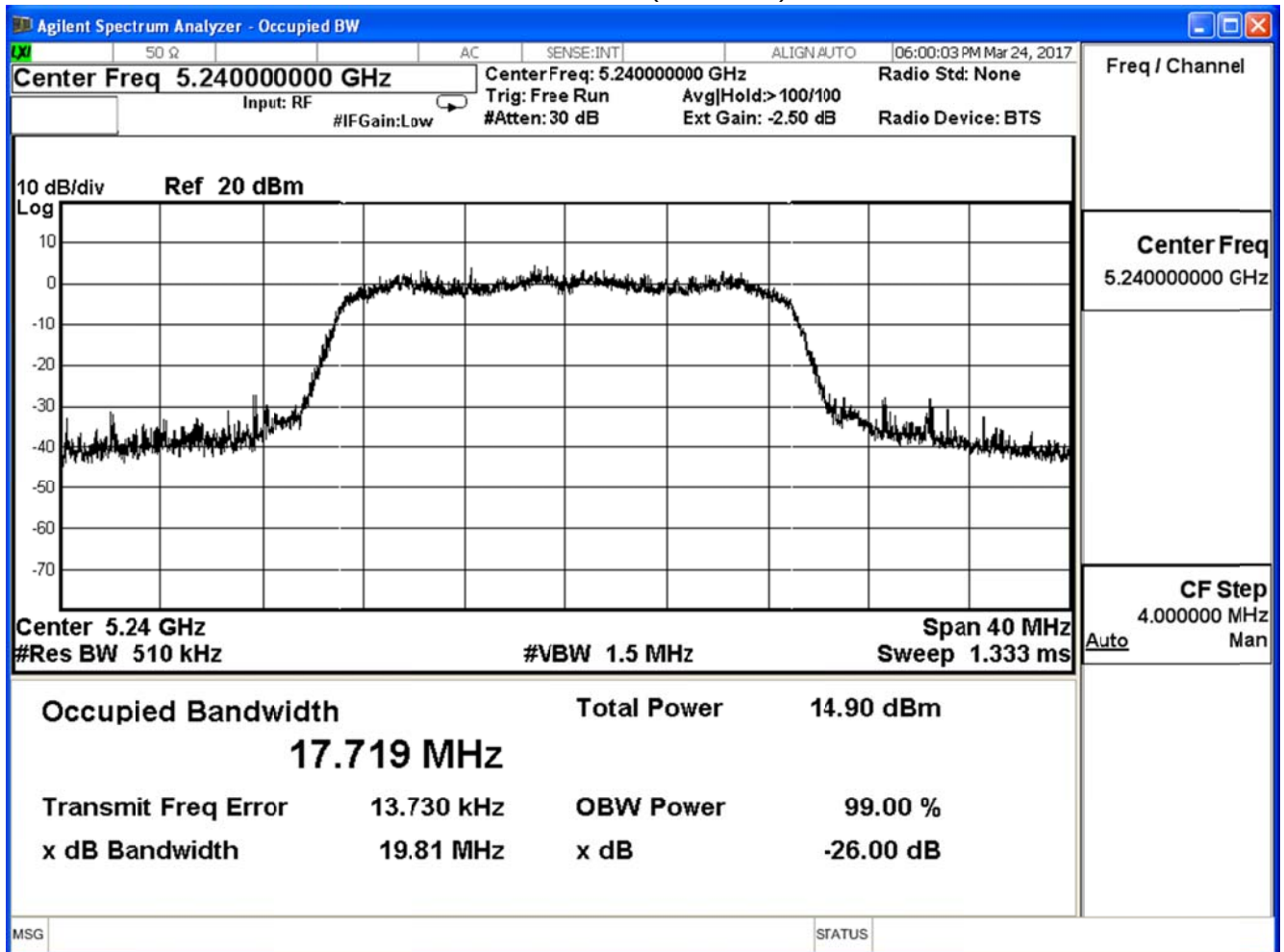
Channel 36 (5180MHz)



Channel 44 (5220MHz)



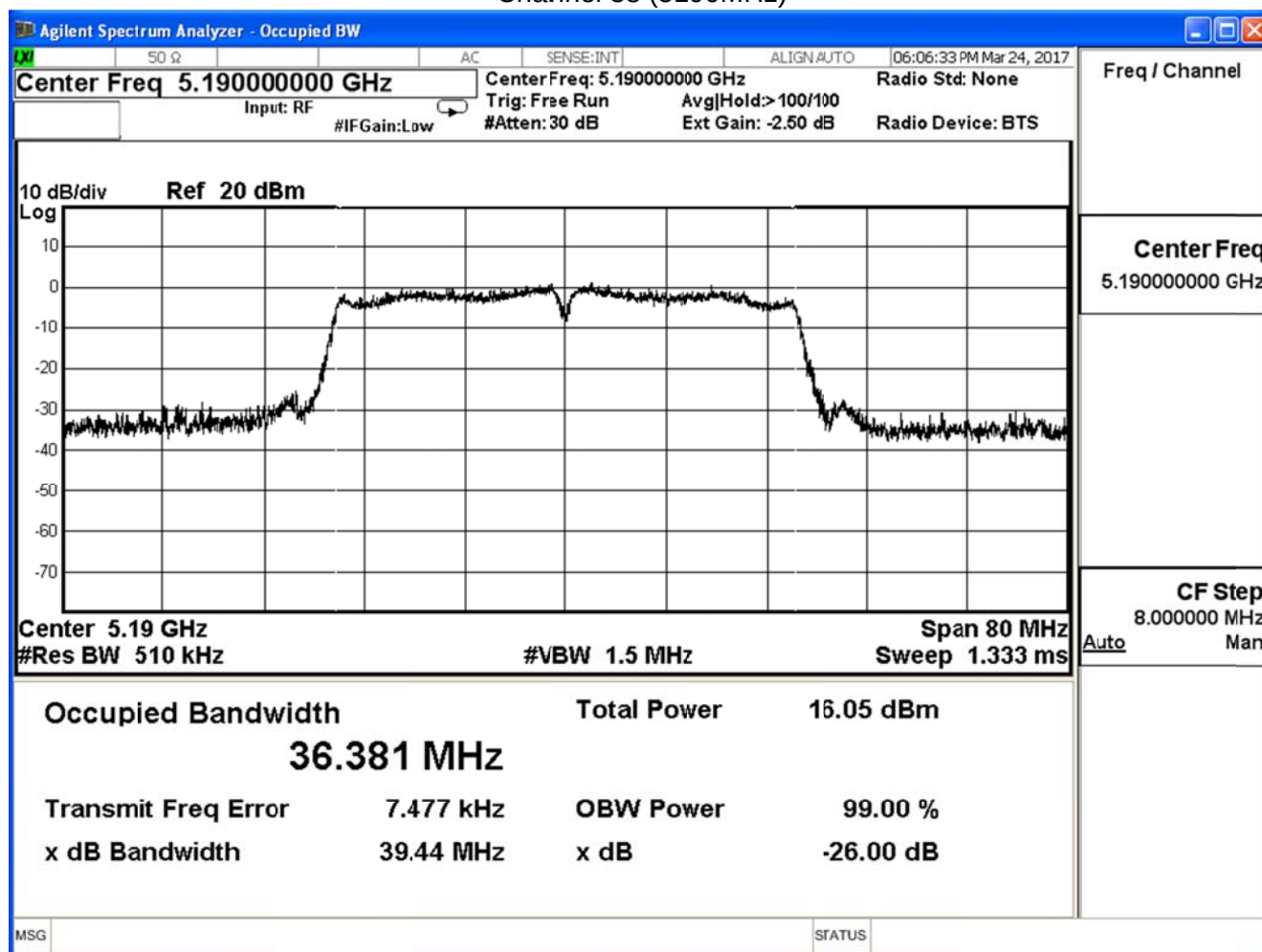
Channel 48 (5240MHz)



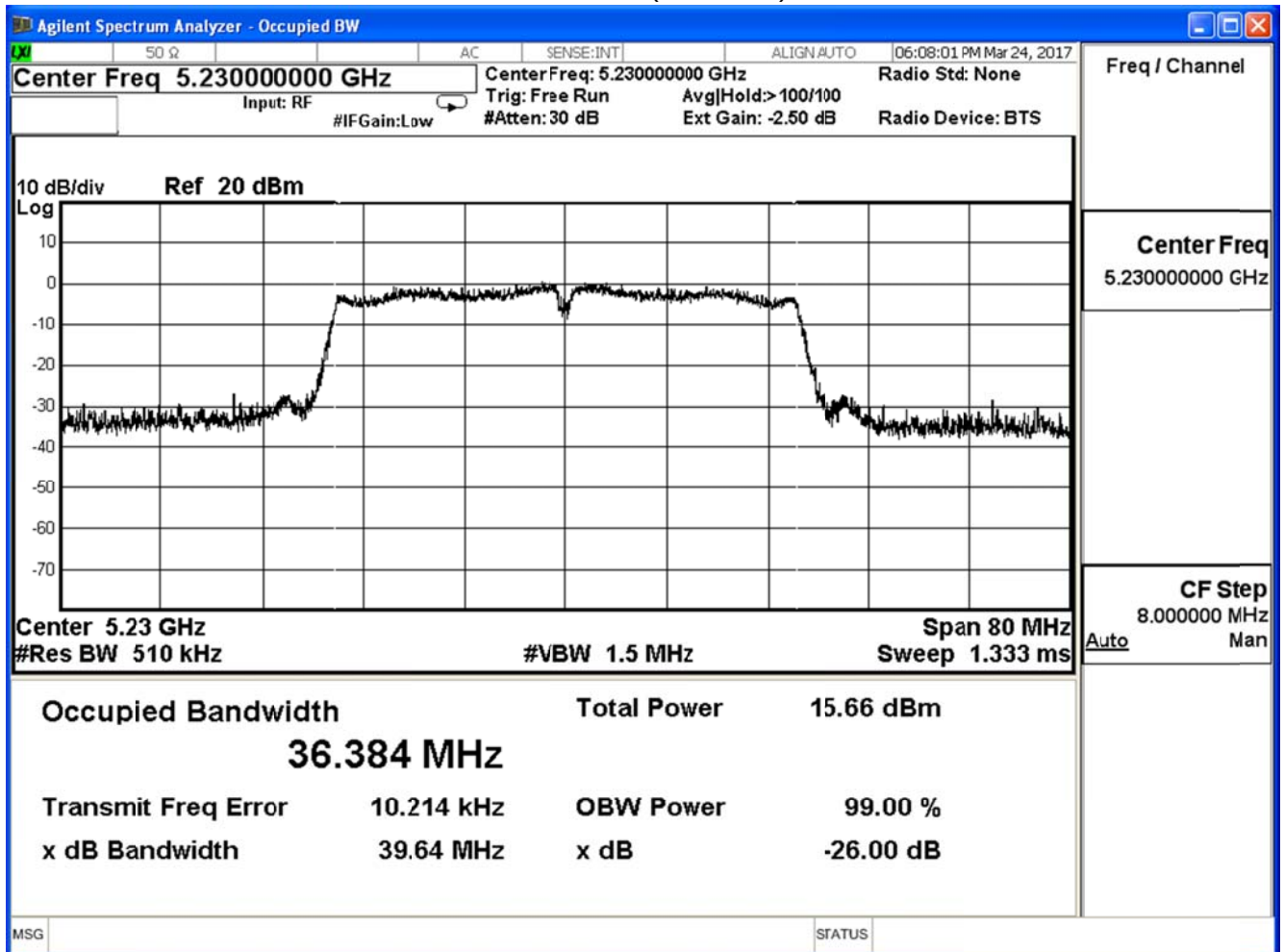
Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n40 (ANT 0)				
Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
38	5190	36.381	39.440	--
46	5230	36.384	39.640	--

Channel 38 (5190MHz)



Channel 46 (5230MHz)

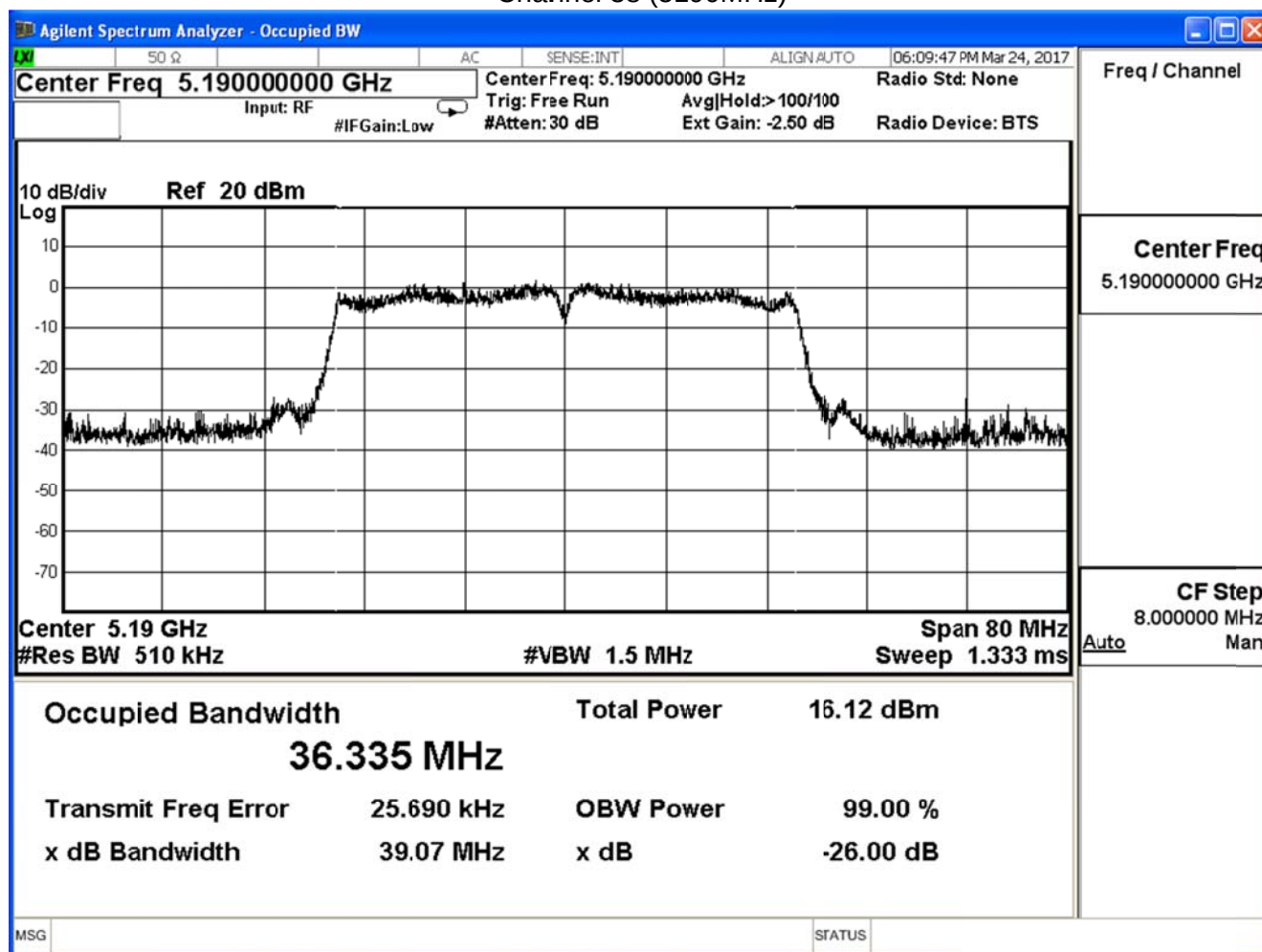


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

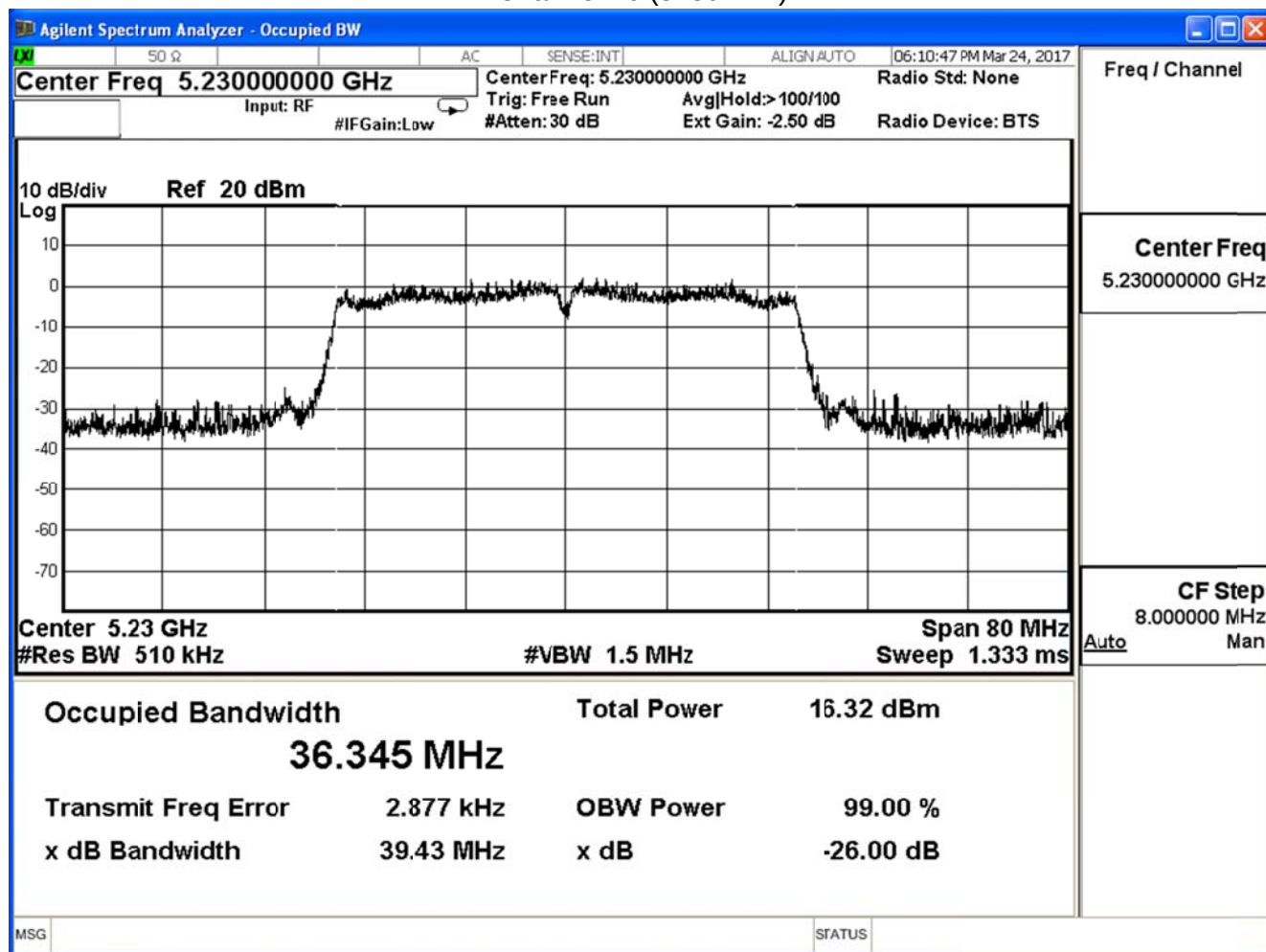
IEEE 802.11n40 (ANT 1)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
38	5190	36.335	39.070	--
46	5230	36.345	39.430	--

Channel 38 (5190MHz)



Channel 46 (5230MHz)

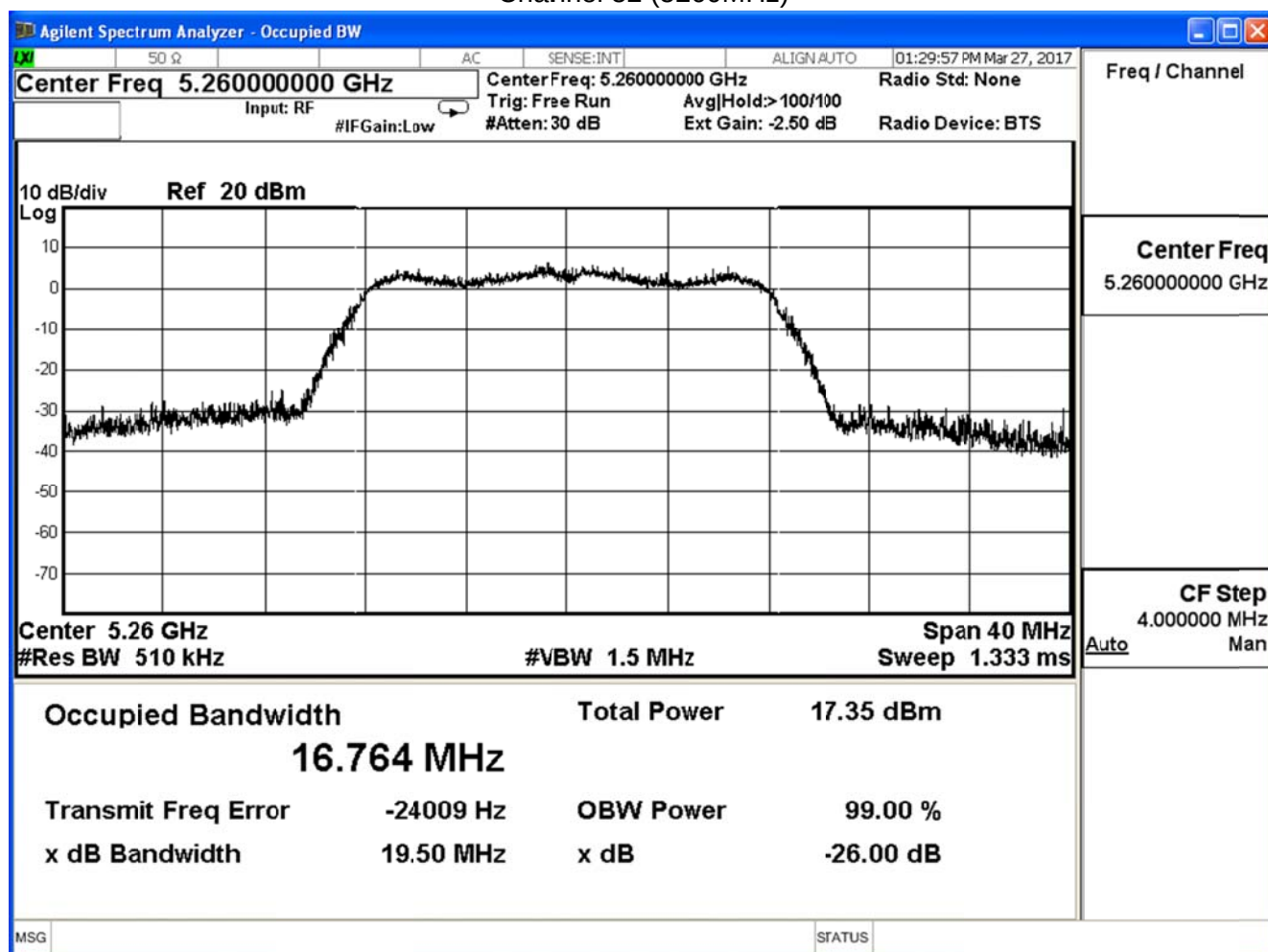


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Tx_SISO Mode		
Date of Test	2017/03/27	Test Site	SR10-H

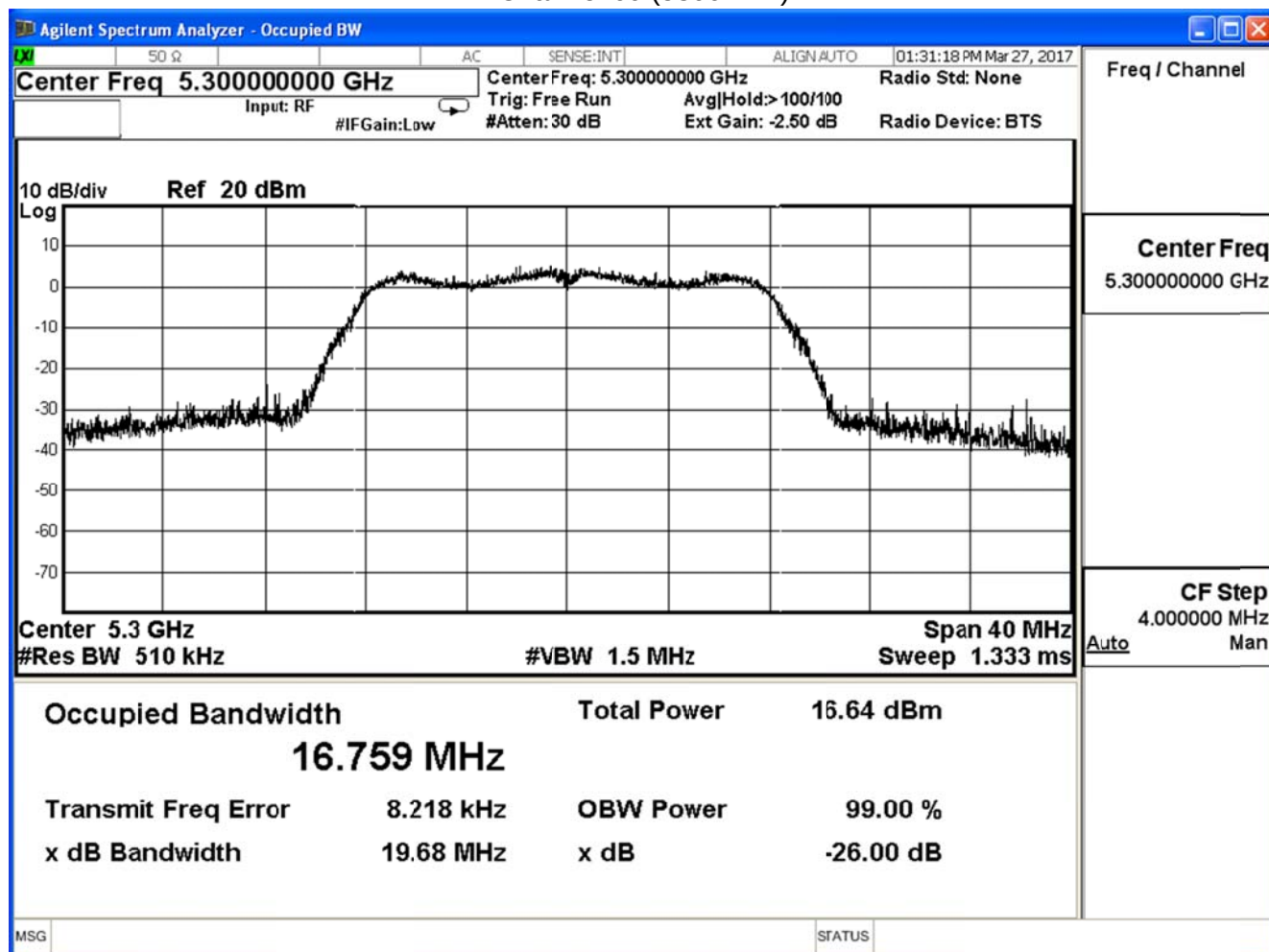
IEEE 802.11a (ANT 0)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
52	5260	16.764	19.500	--
60	5300	16.759	19.680	--
64	5320	16.805	19.680	--

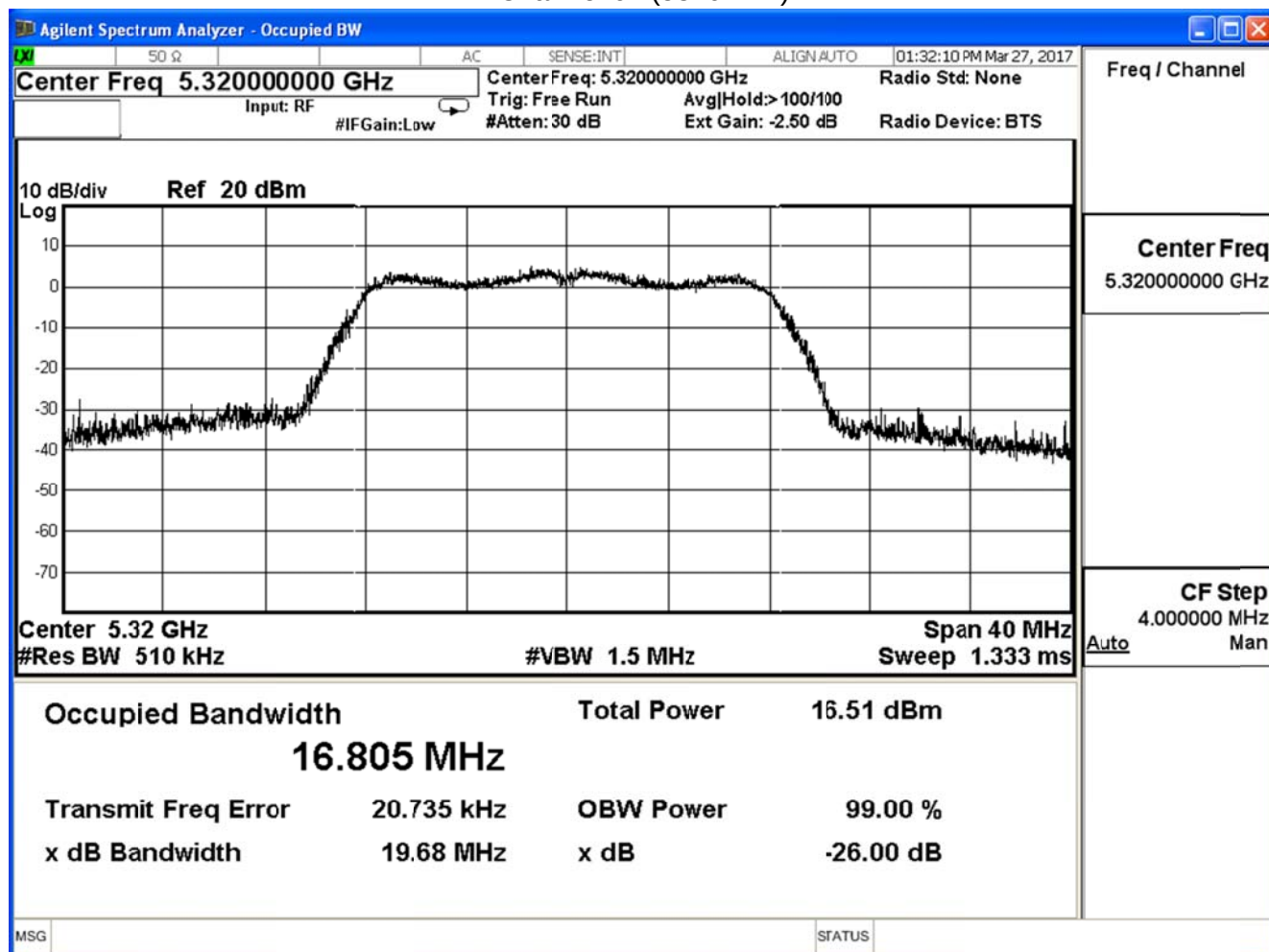
Channel 52 (5260MHz)



Channel 60 (5300MHz)



Channel 64 (5320MHz)

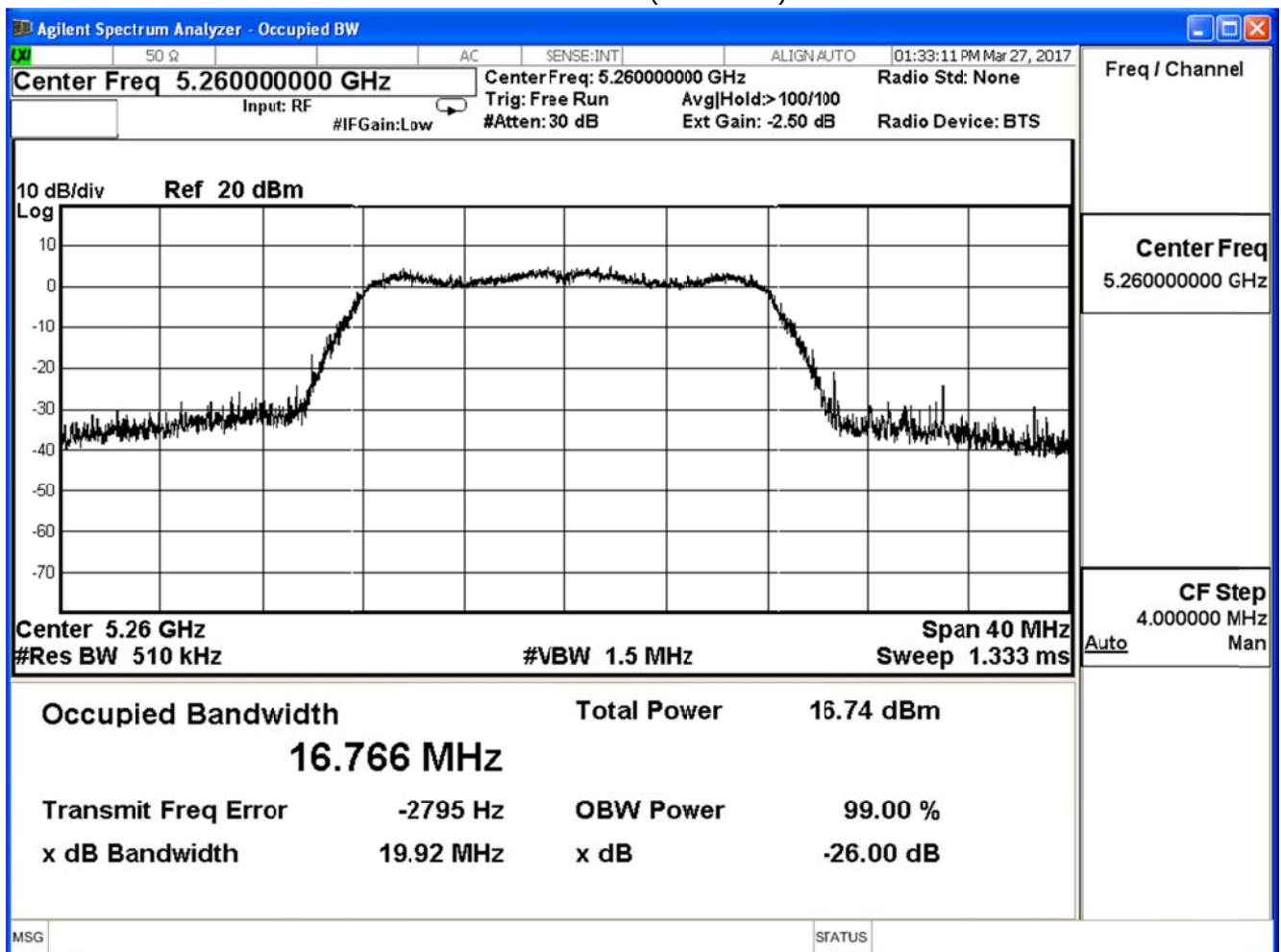


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Tx_SISO Mode		
Date of Test	2017/03/27	Test Site	SR10-H

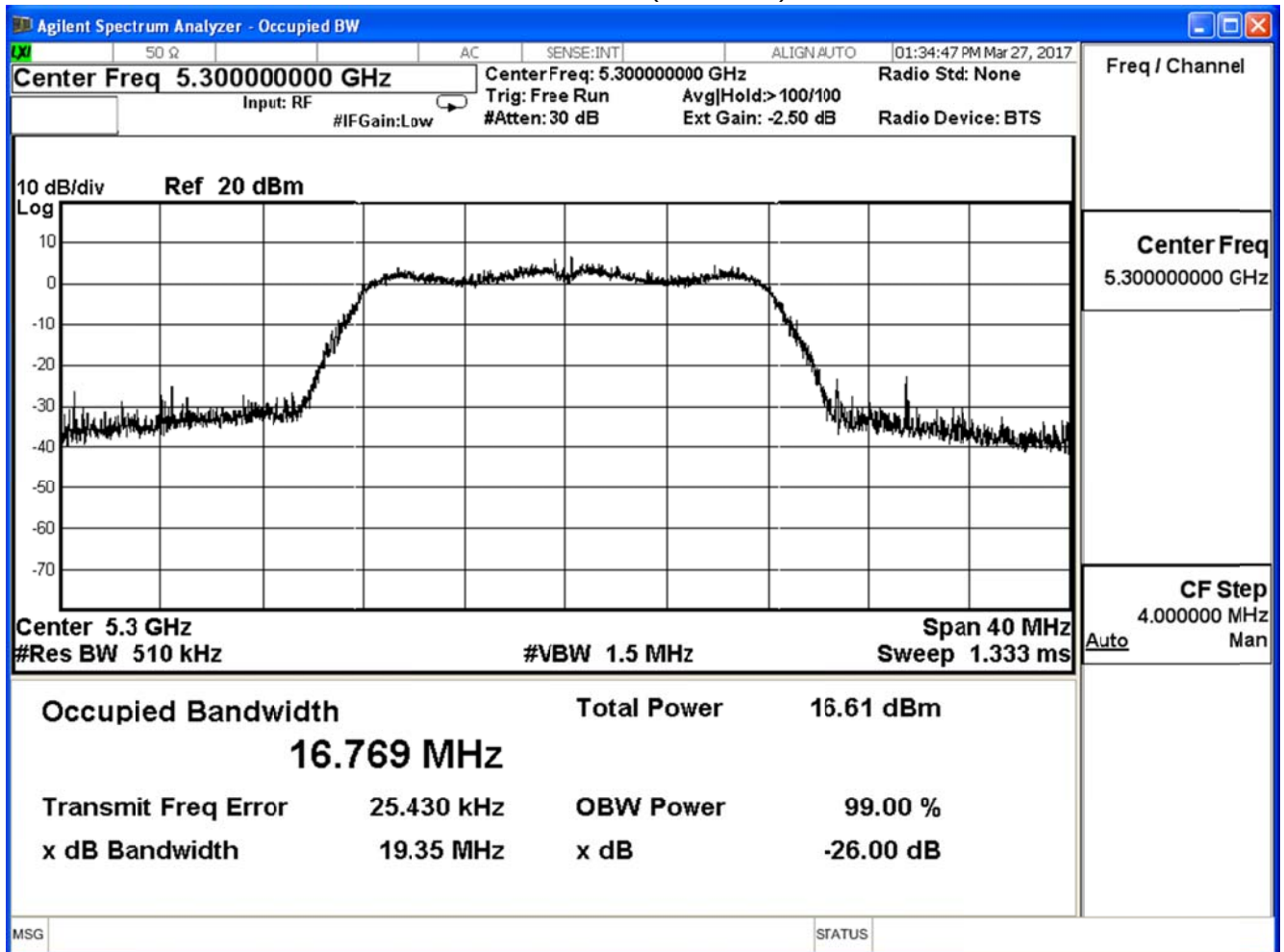
IEEE 802.11a (ANT 1)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
52	5260	16.766	19.920	--
60	5300	16.769	19.350	--
64	5320	16.758	19.700	--

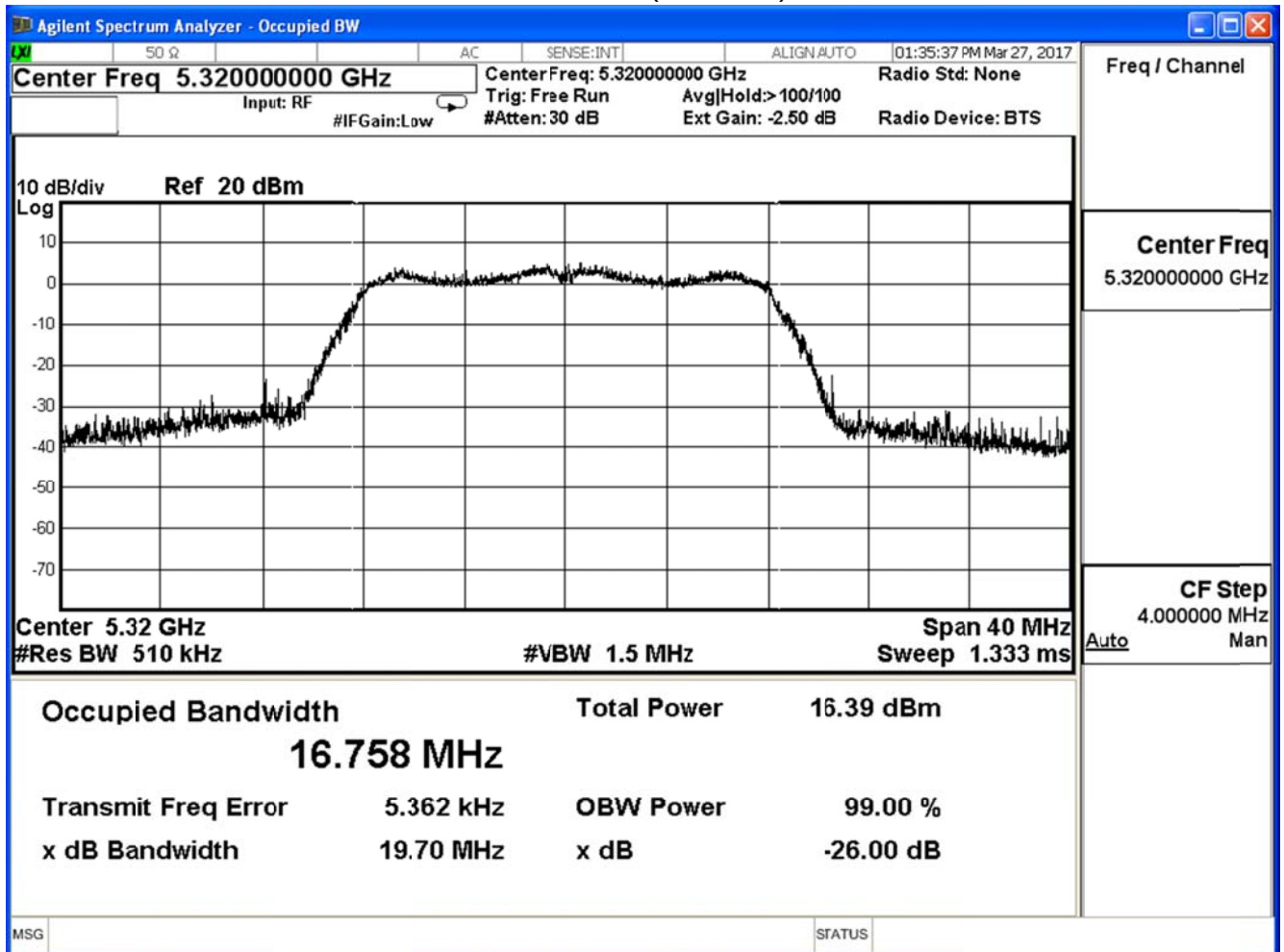
Channel 52 (5260MHz)



Channel 60 (5300MHz)



Channel 64 (5320MHz)

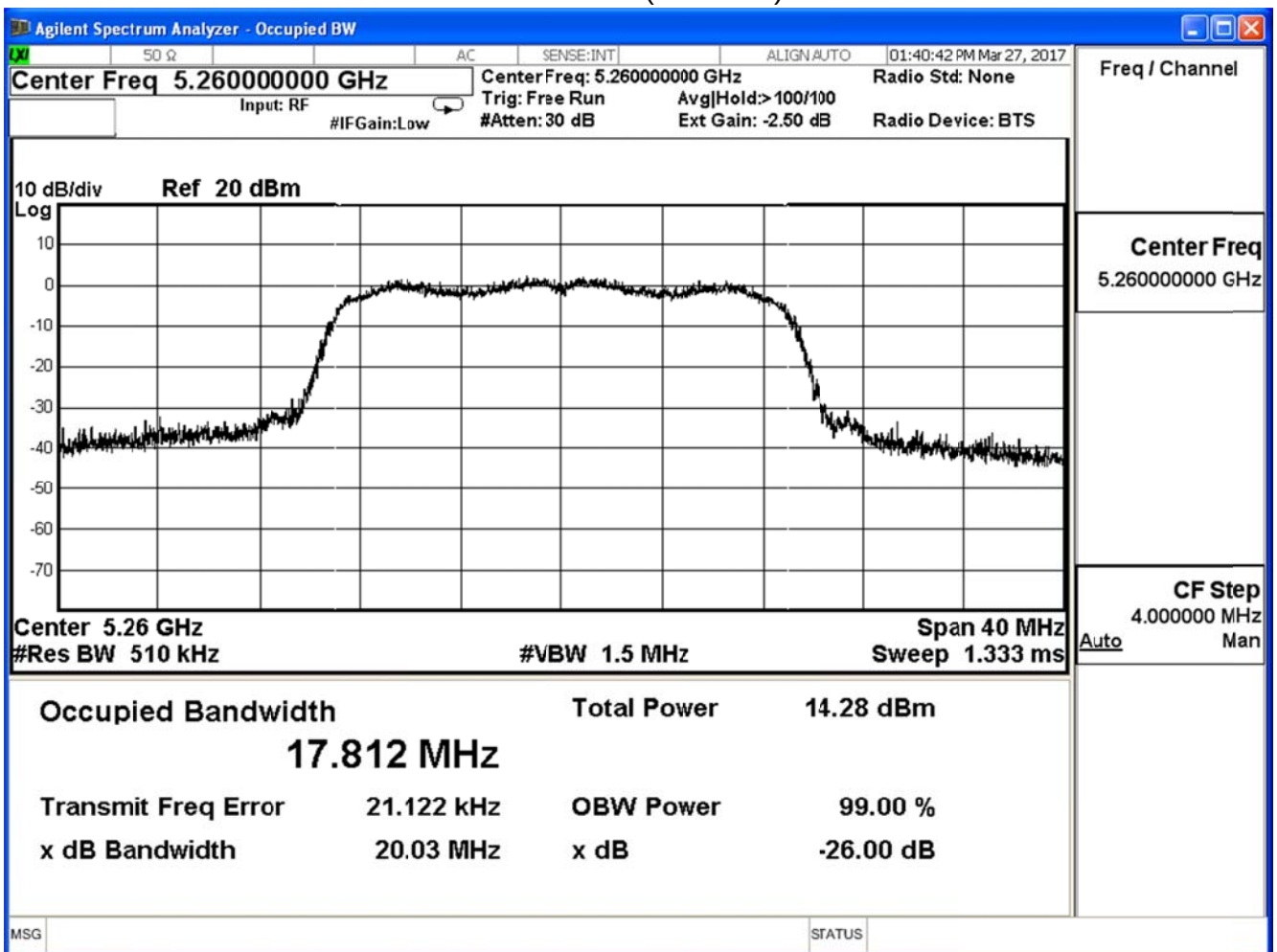


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 2: Tx MIMO Mode		
Date of Test	2017/03/27	Test Site	SR10-H

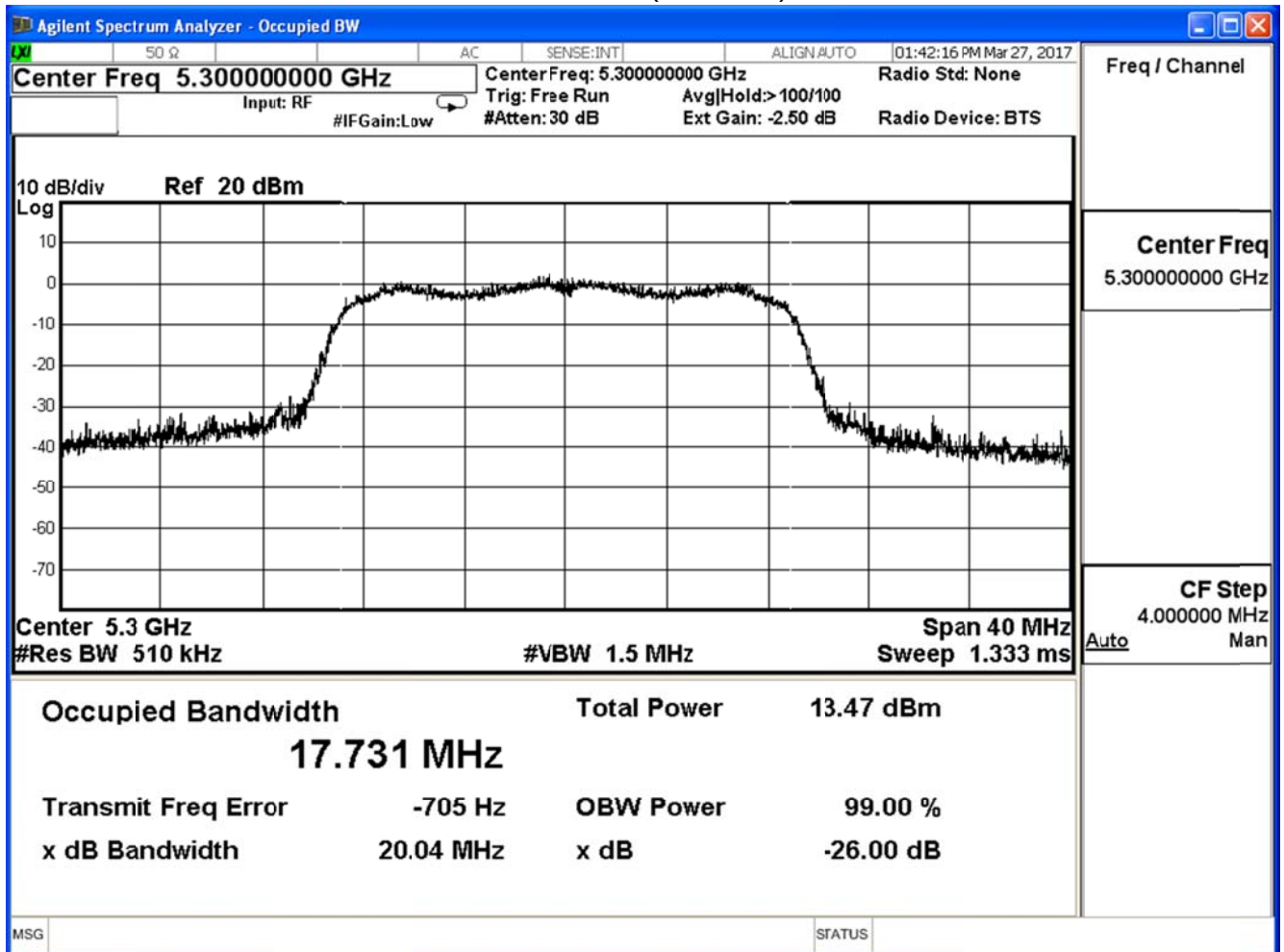
IEEE 802.11n20 (ANT 0)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
52	5260	17.812	20.030	--
60	5300	17.731	20.040	--
64	5320	17.769	19.910	--

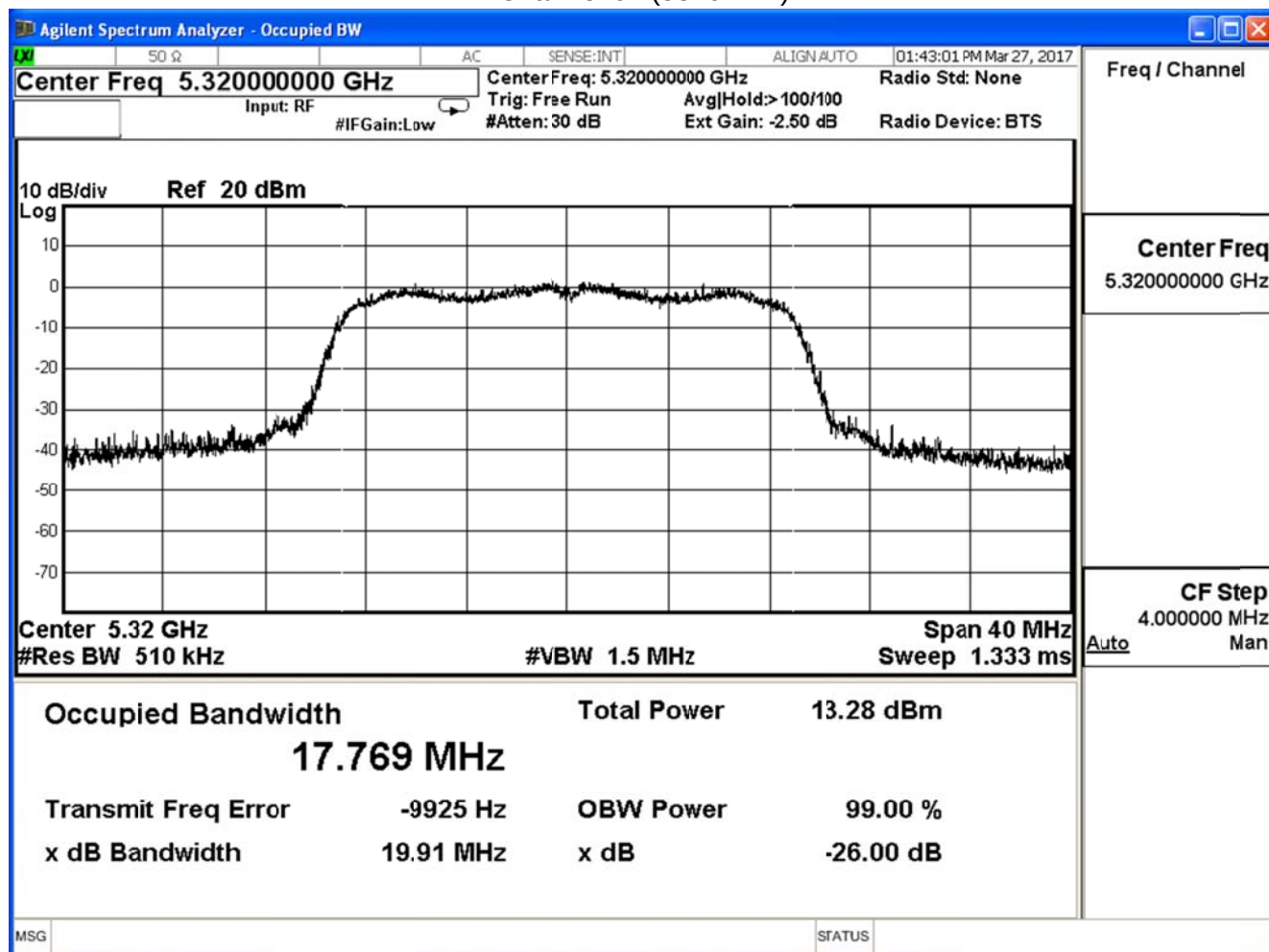
Channel 52 (5260MHz)



Channel 60 (5300MHz)



Channel 64 (5320MHz)

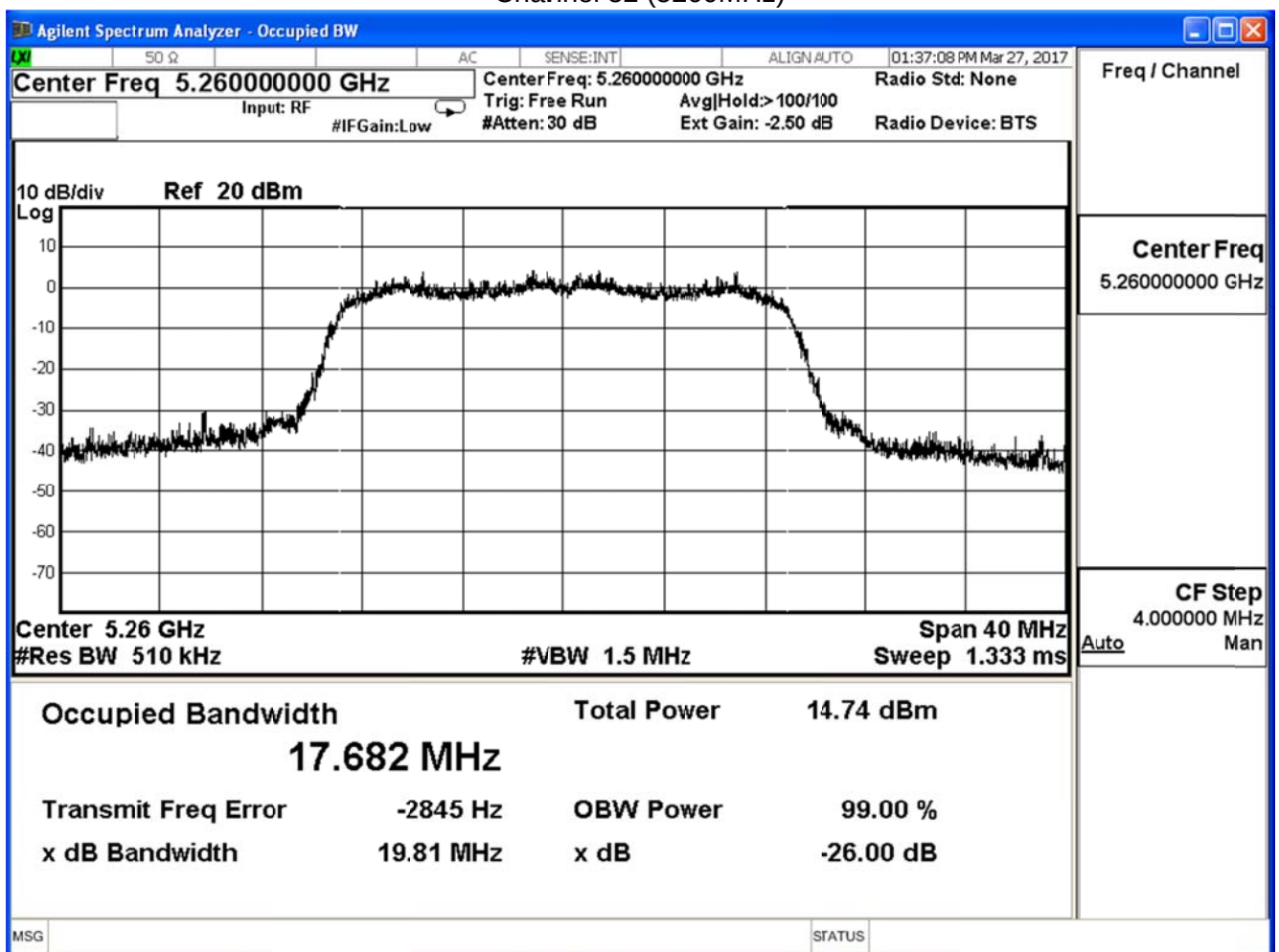


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 2: Tx MIMO Mode		
Date of Test	2017/03/27	Test Site	SR10-H

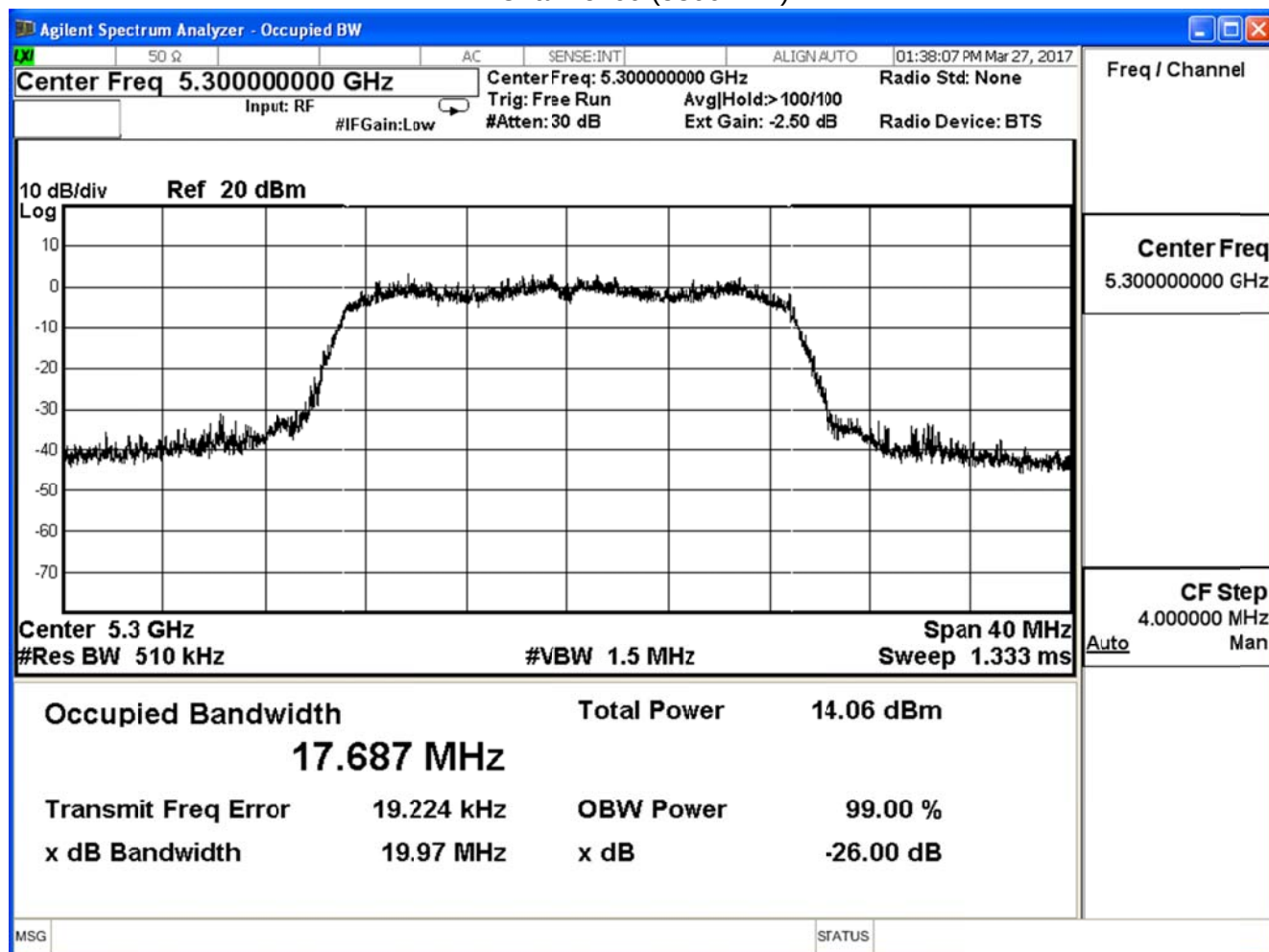
IEEE 802.11n20 (ANT 1)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
52	5260	17.682	19.810	--
60	5300	17.687	19.970	--
64	5320	17.688	19.740	--

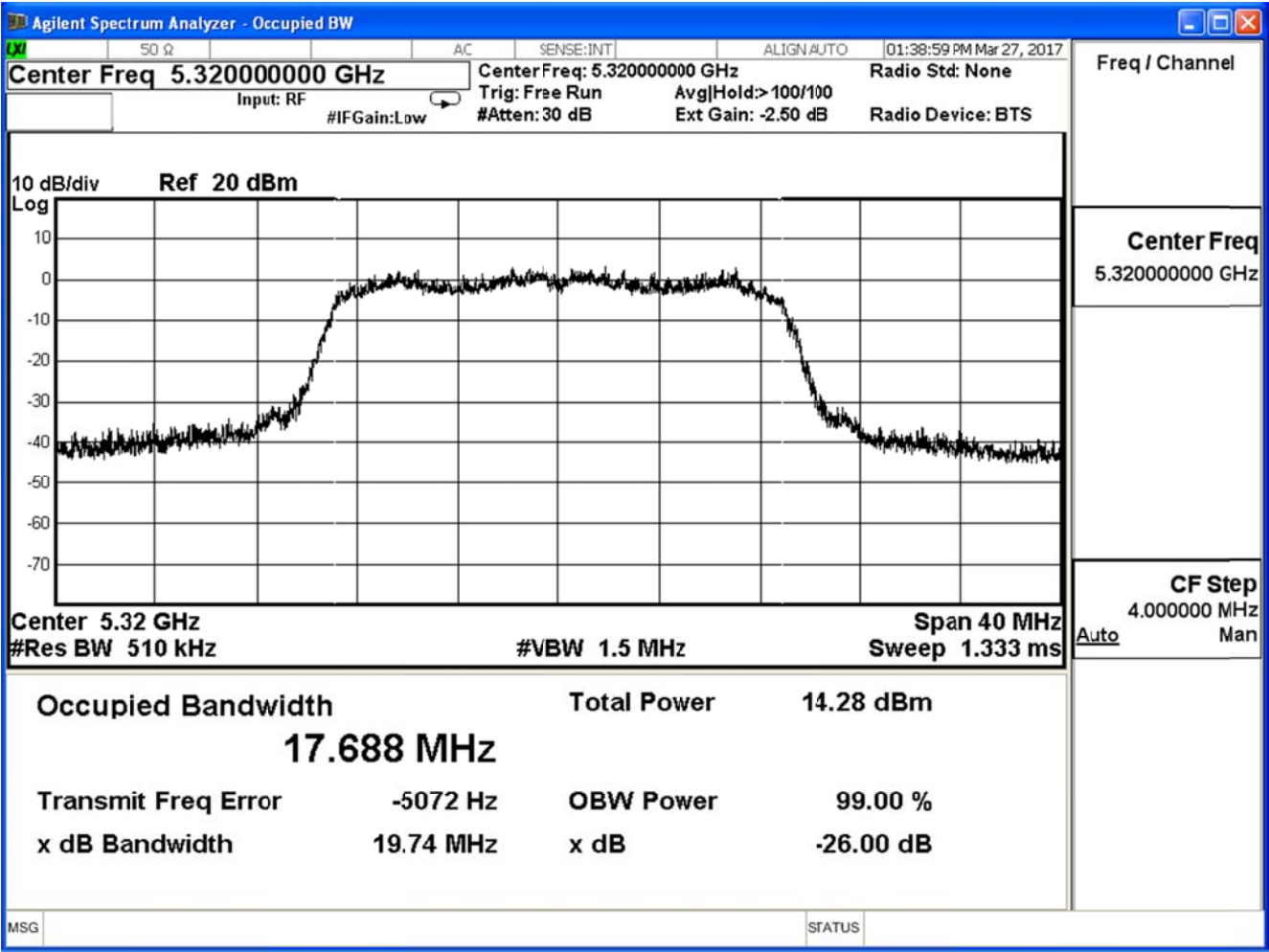
Channel 52 (5260MHz)



Channel 60 (5300MHz)



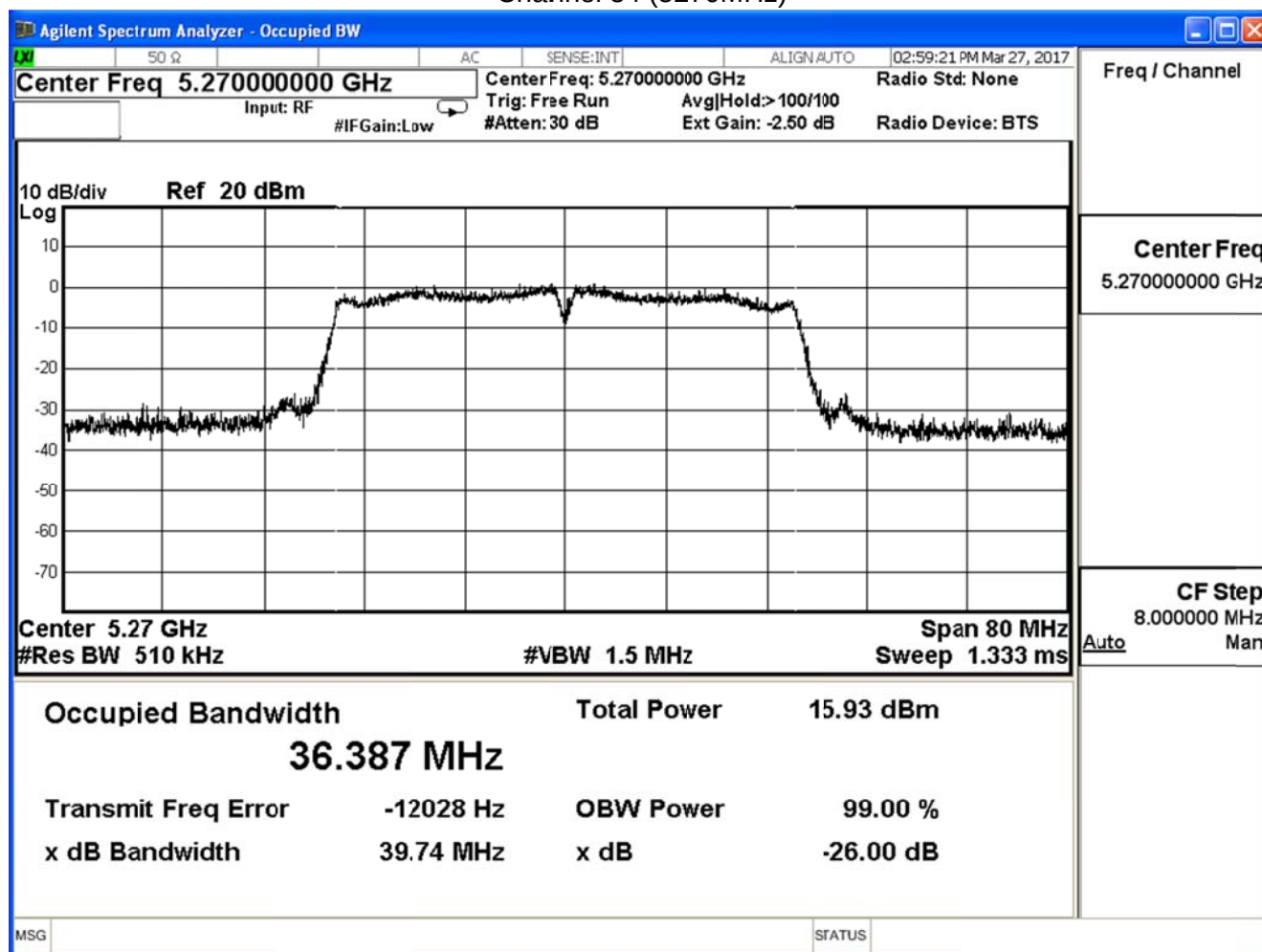
Channel 64 (5320MHz)



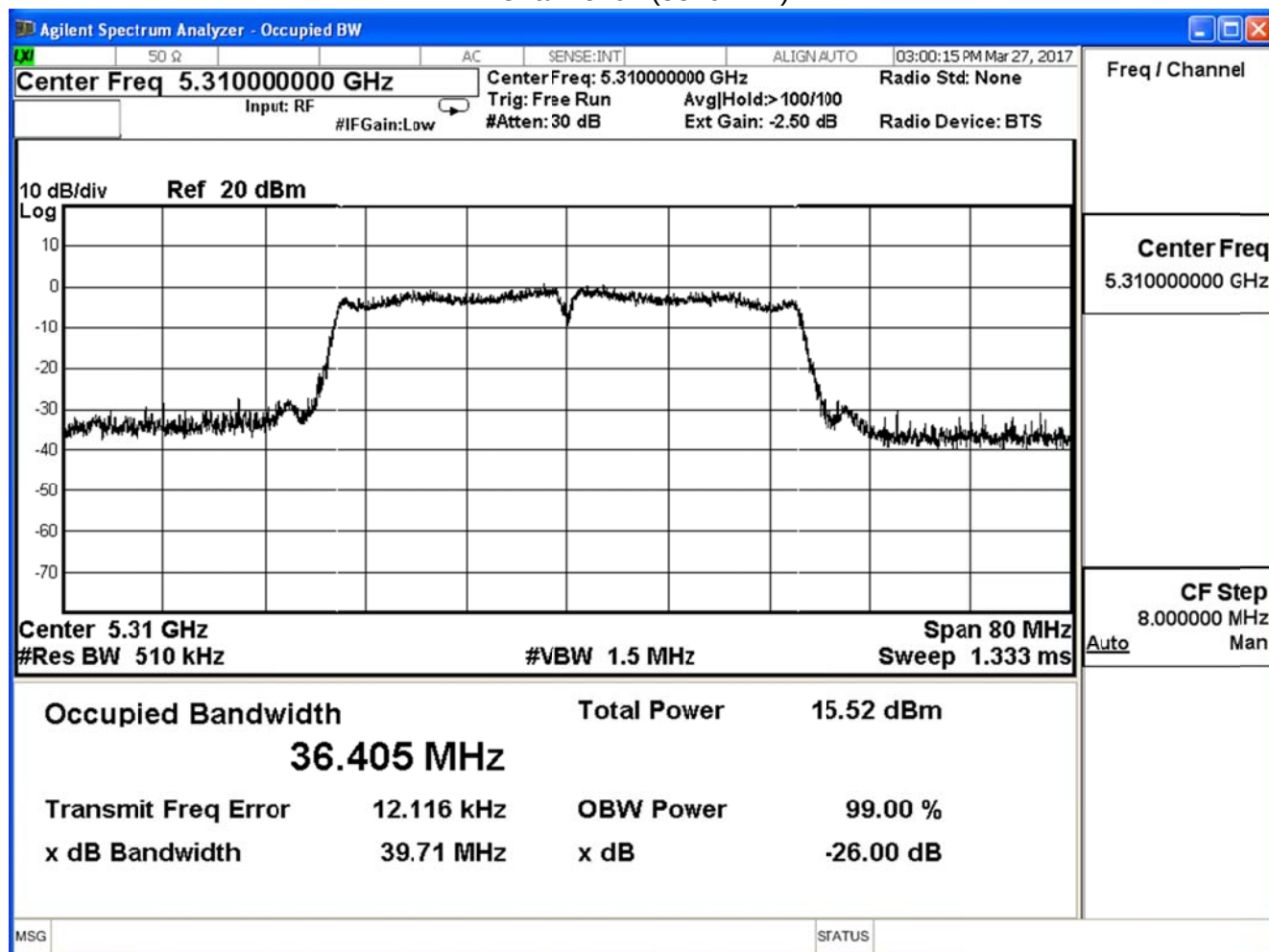
Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/27	Test Site	SR10-H

IEEE 802.11n40 (ANT 0)				
Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
54	5270	36.387	39.740	--
62	5310	36.405	39.710	--

Channel 54 (5270MHz)



Channel 62 (5310MHz)

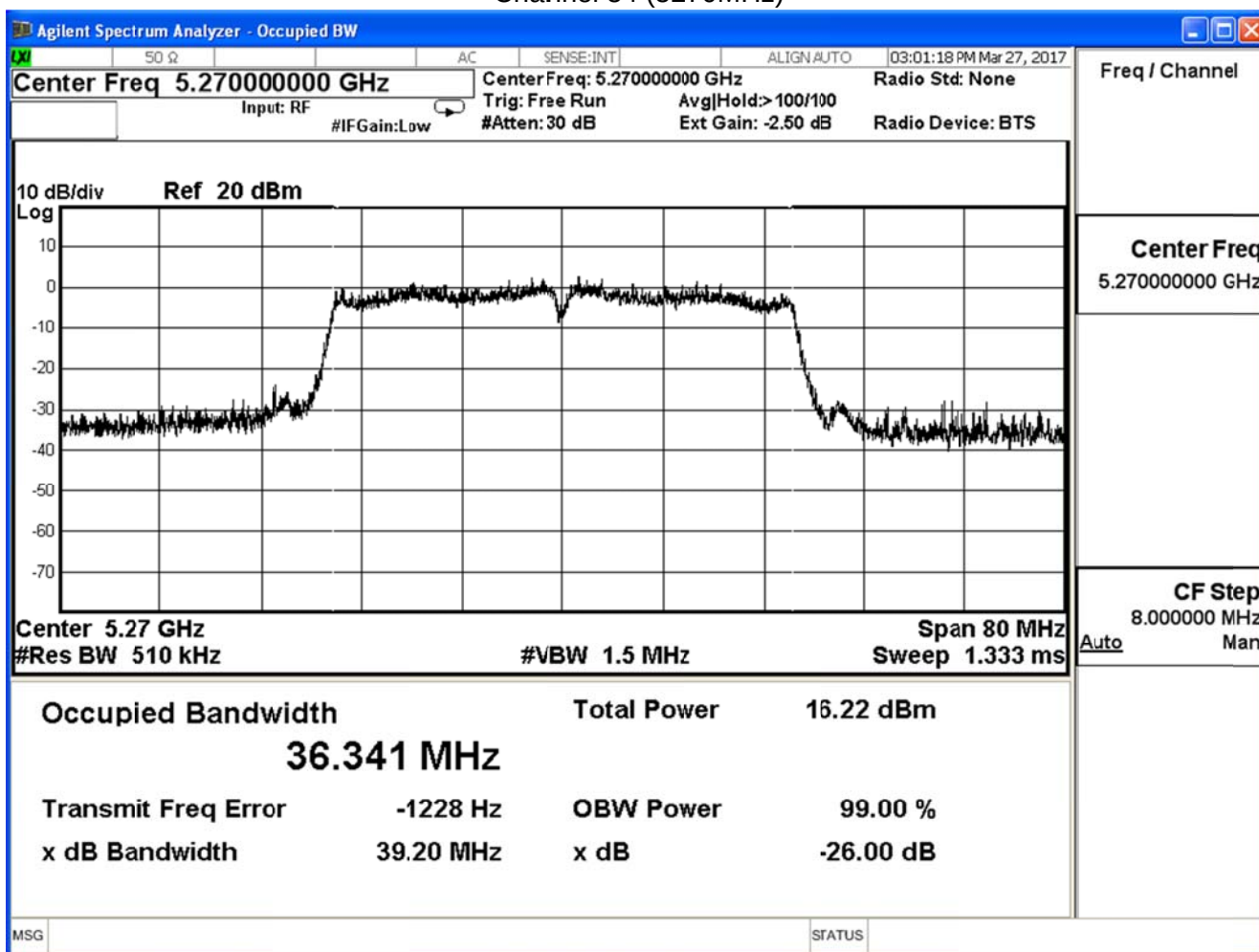


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/27	Test Site	SR10-H

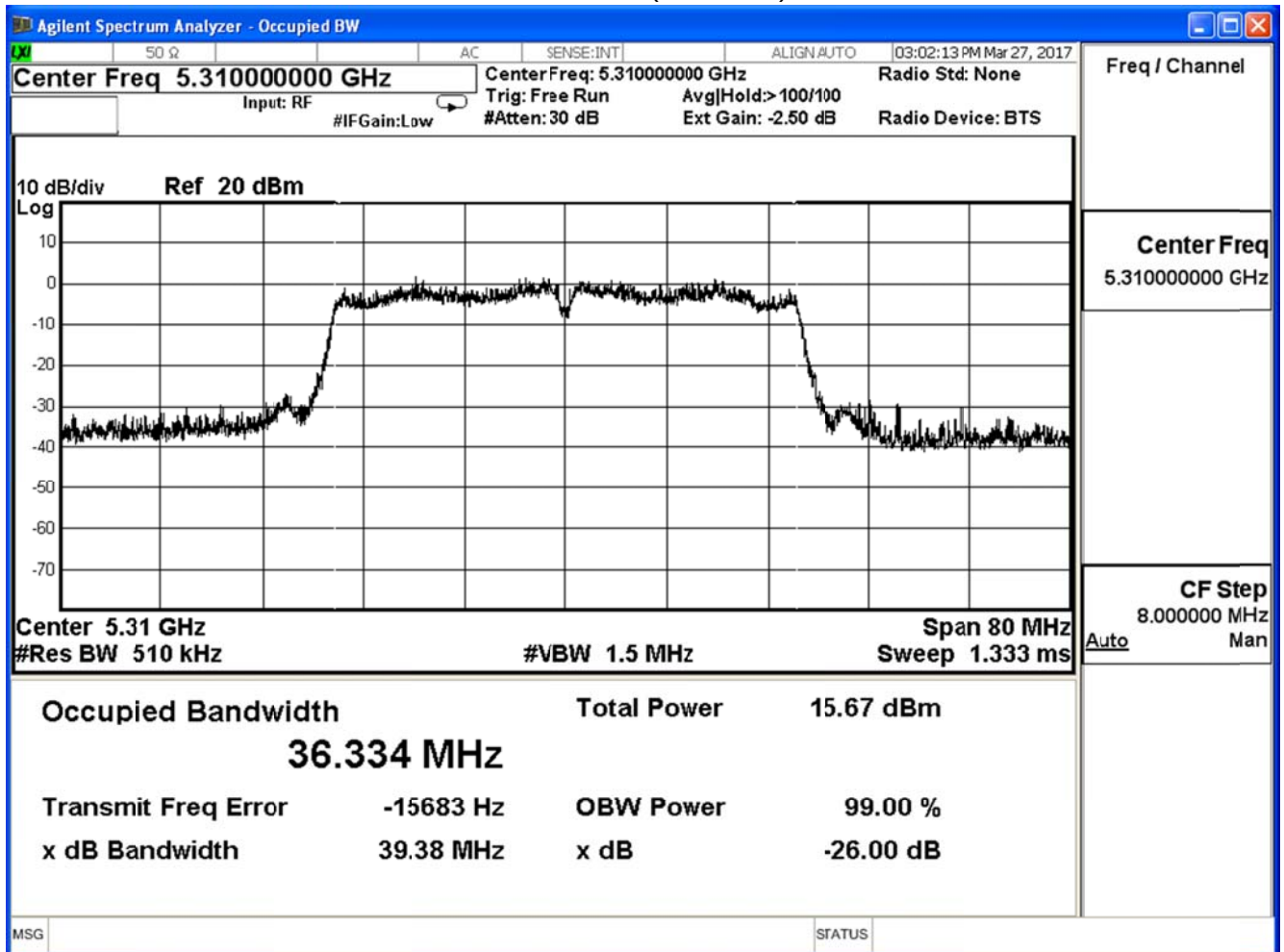
IEEE 802.11n40 (ANT 1)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
54	5270	36.341	39.200	--
62	5310	36.334	39.380	--

Channel 54 (5270MHz)



Channel 62 (5310MHz)

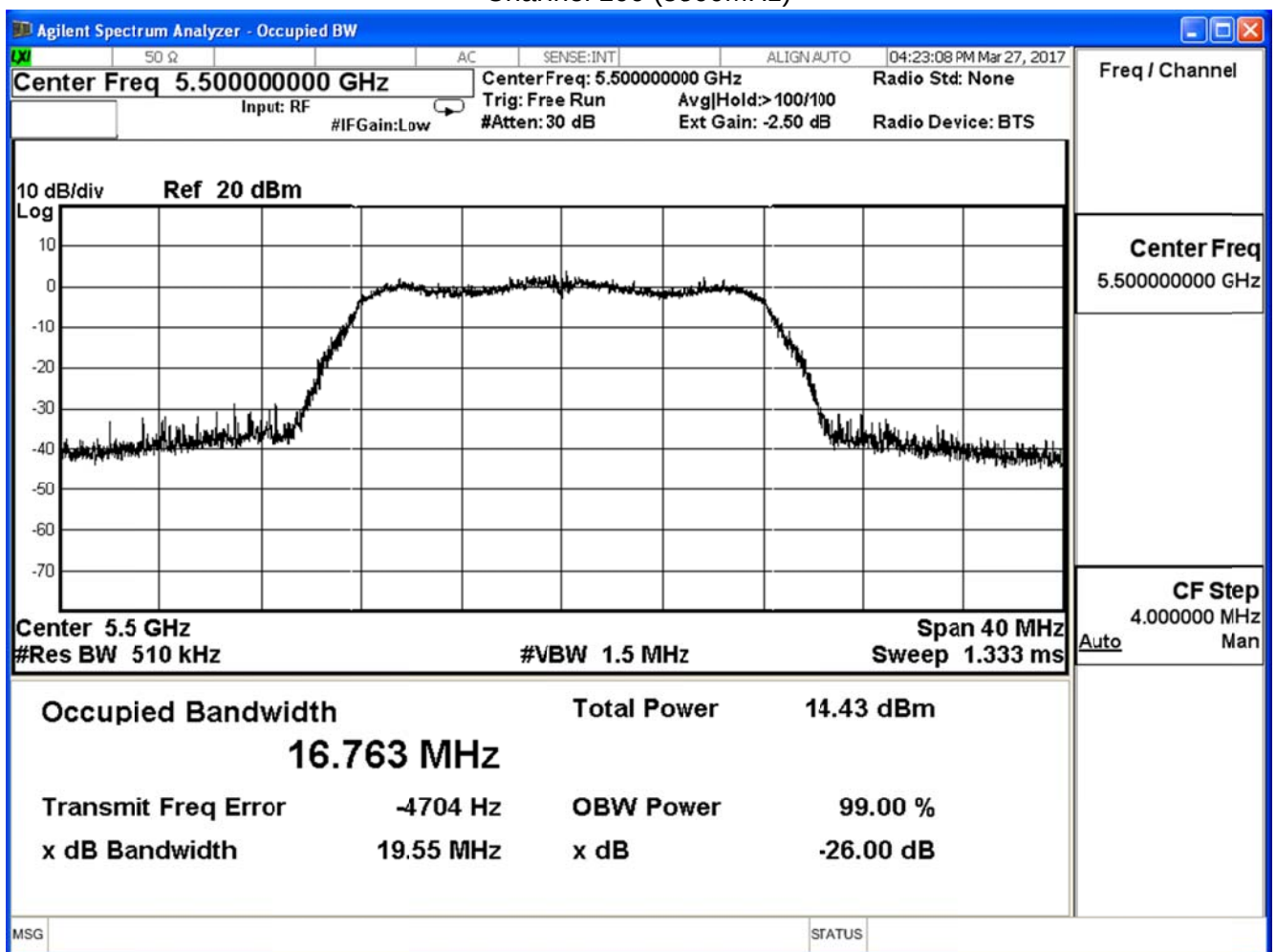


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Tx_SISO Mode		
Date of Test	2017/03/27	Test Site	SR10-H

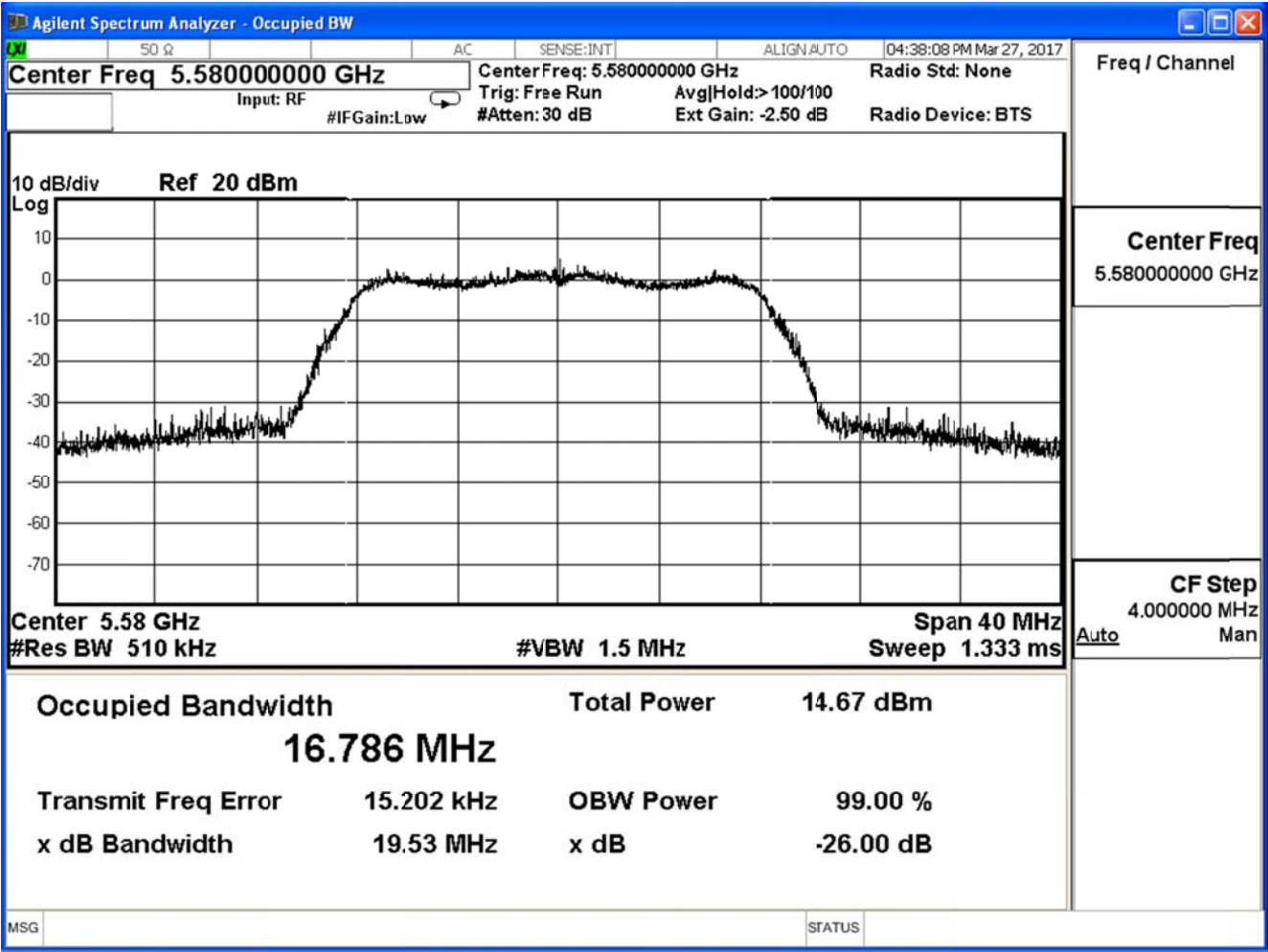
IEEE 802.11a (ANT 0)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
100	5500	16.763	19.550	--
116	5580	16.786	19.530	--
140	5700	16.782	19.800	--

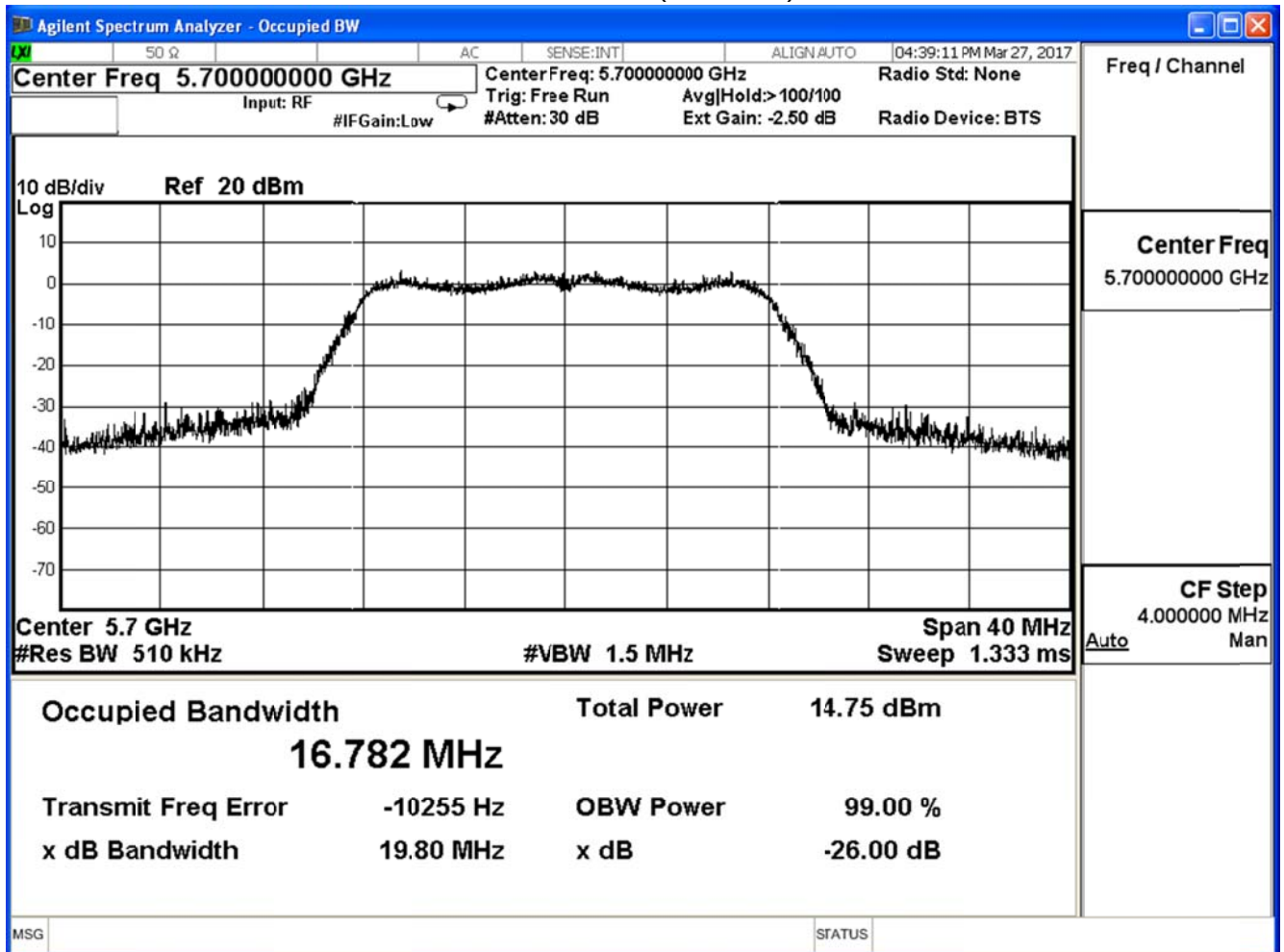
Channel 100 (5500MHz)



Channel 116 (5580MHz)



Channel 140 (5700MHz)

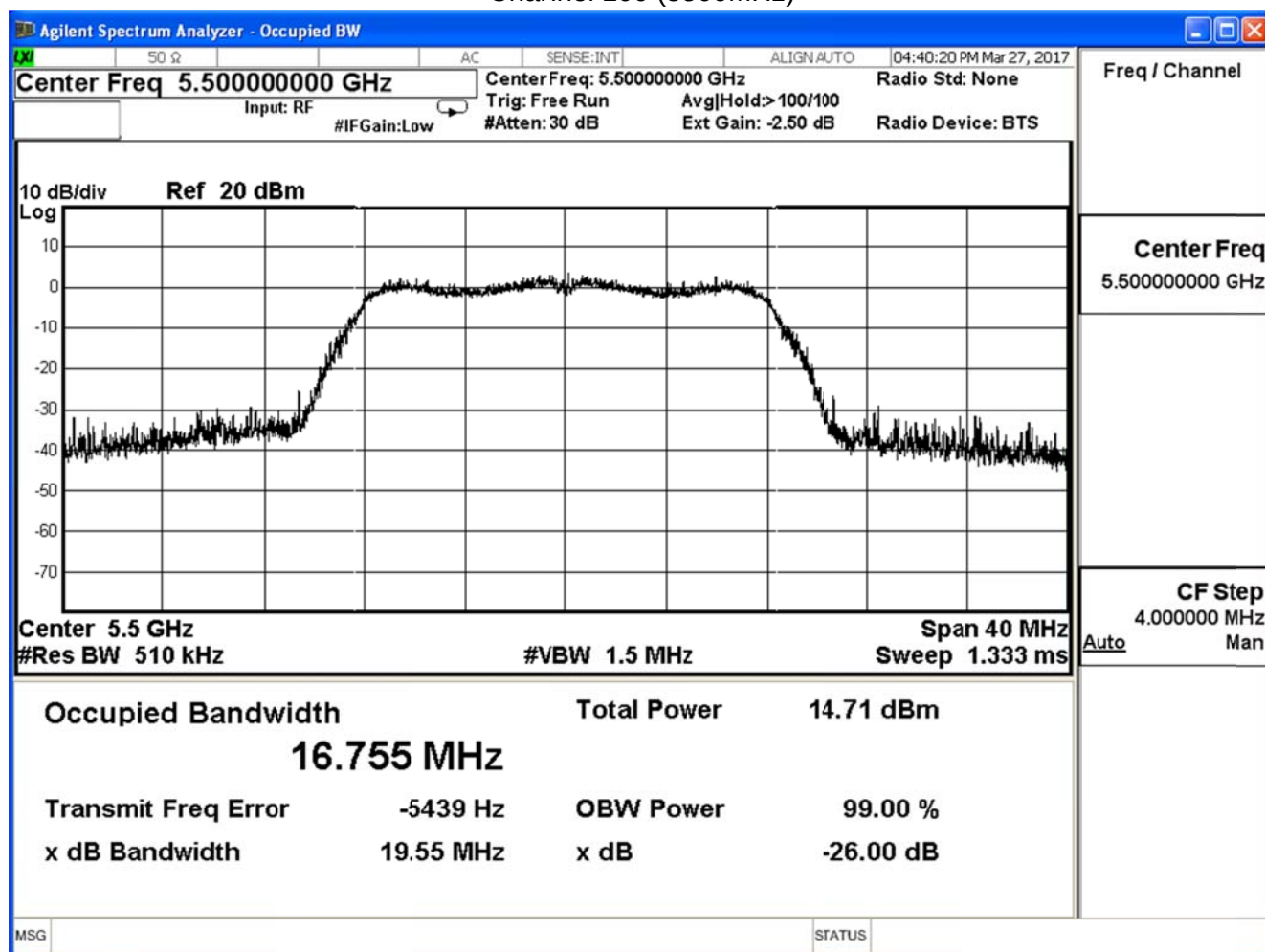


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 1: Tx_SISO Mode		
Date of Test	2017/03/27	Test Site	SR10-H

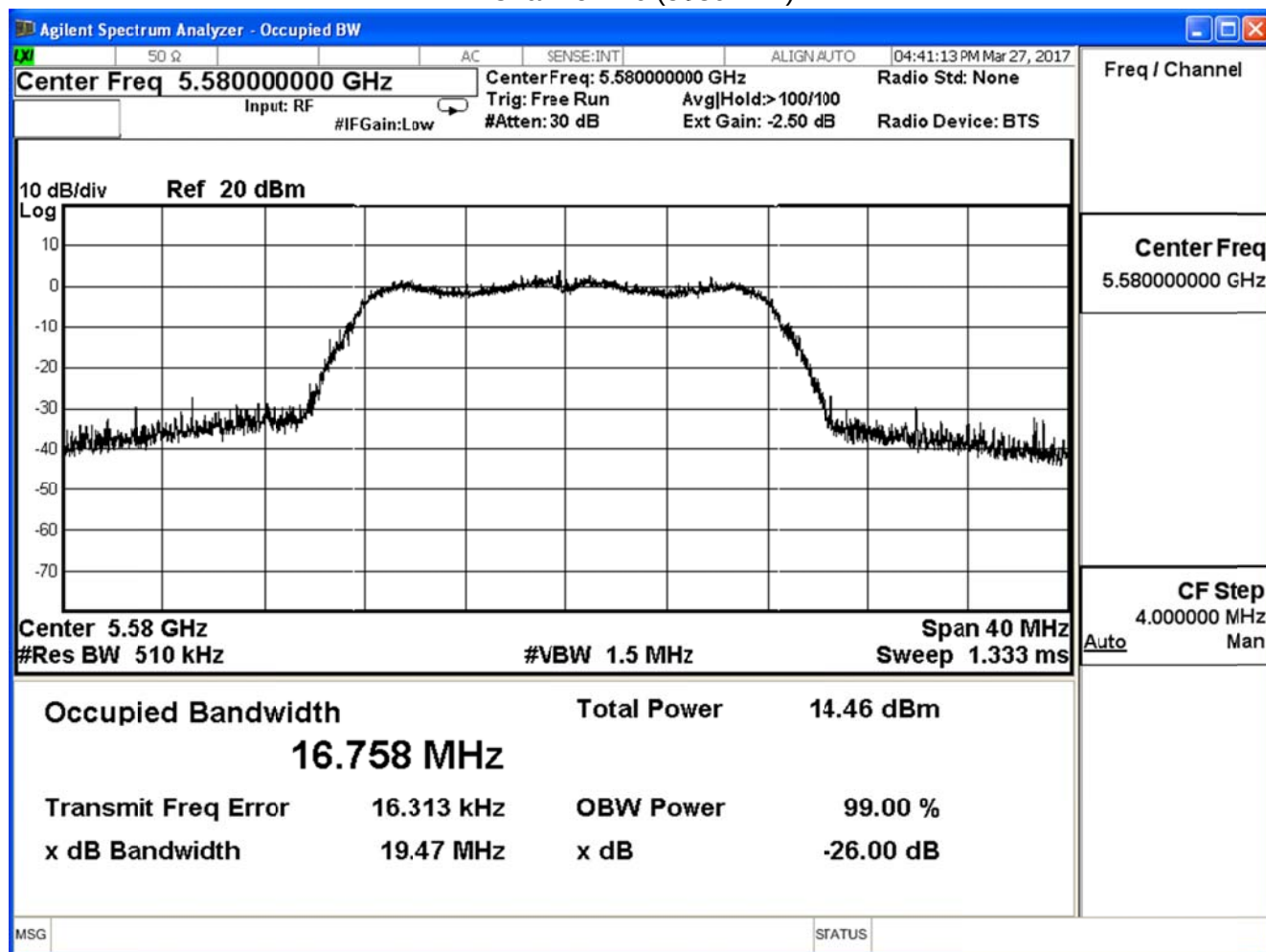
IEEE 802.11a (ANT 1)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
100	5500	16.755	19.550	--
116	5580	16.758	19.470	--
140	5700	16.858	19.700	--

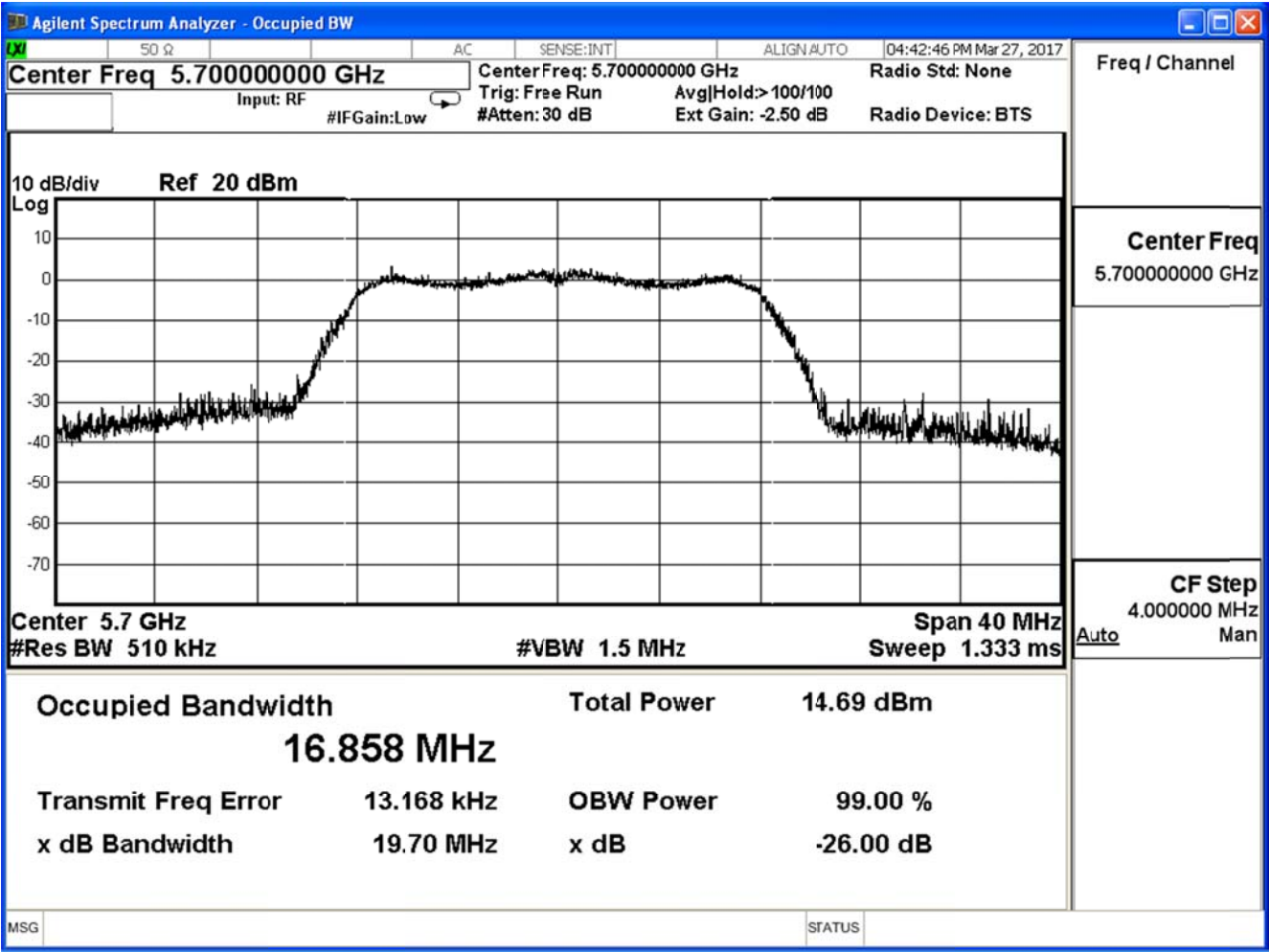
Channel 100 (5500MHz)



Channel 116 (5580MHz)



Channel 140 (5700MHz)

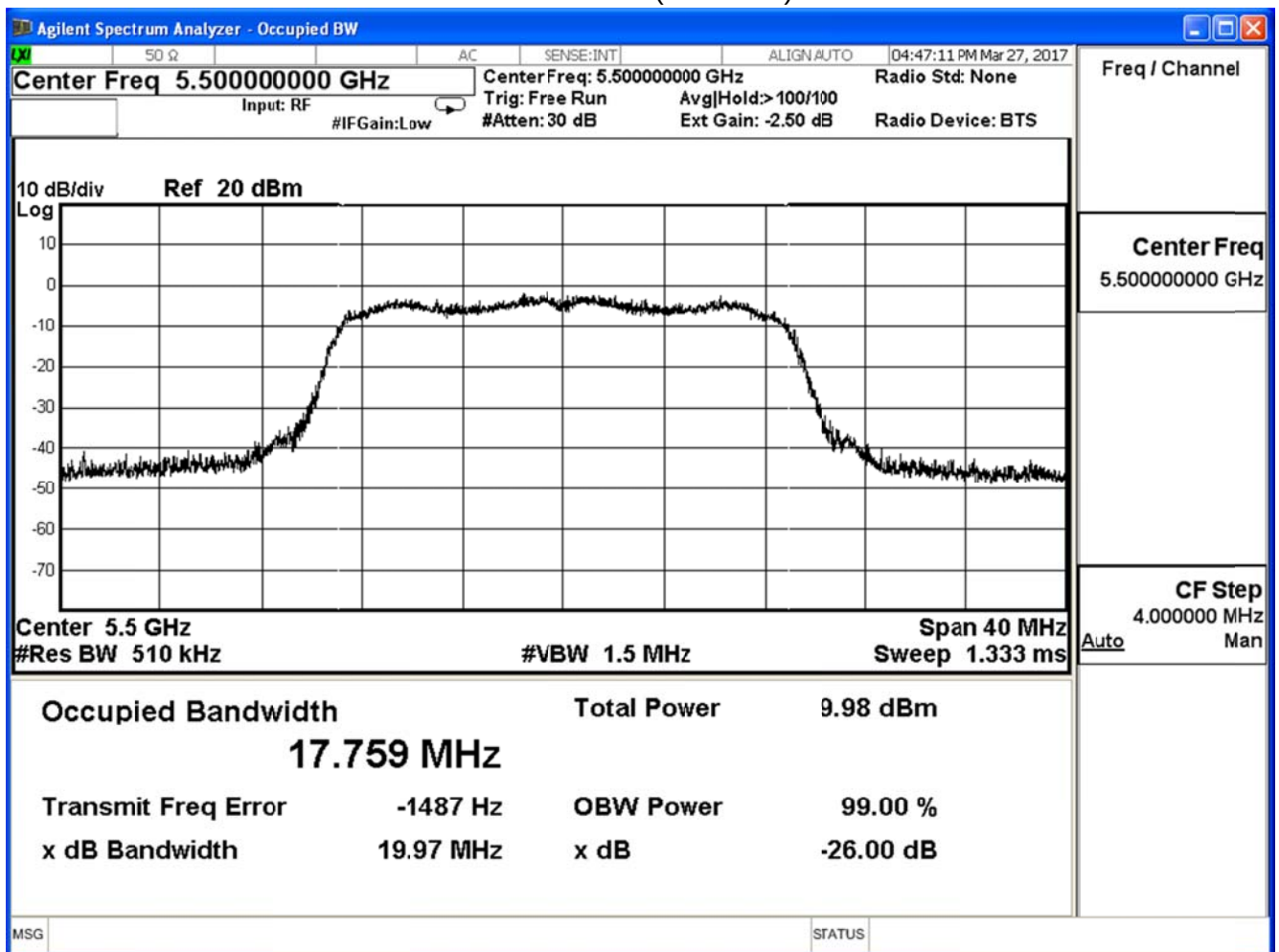


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 2: Tx MIMO Mode		
Date of Test	2017/03/27	Test Site	SR10-H

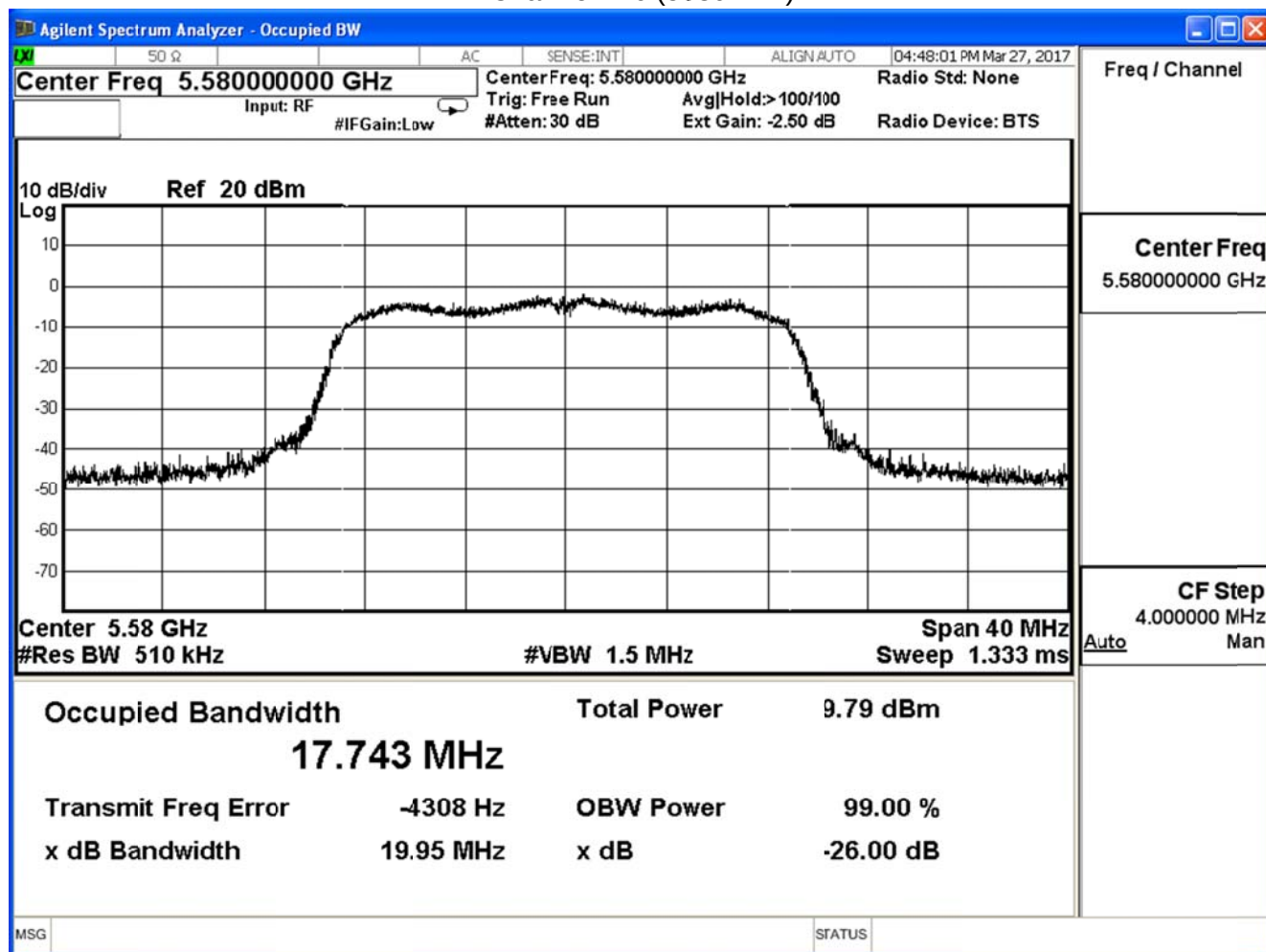
IEEE 802.11n20 (ANT 0)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
100	5500	17.759	19.970	--
116	5580	17.743	19.950	--
140	5700	17.723	19.950	--

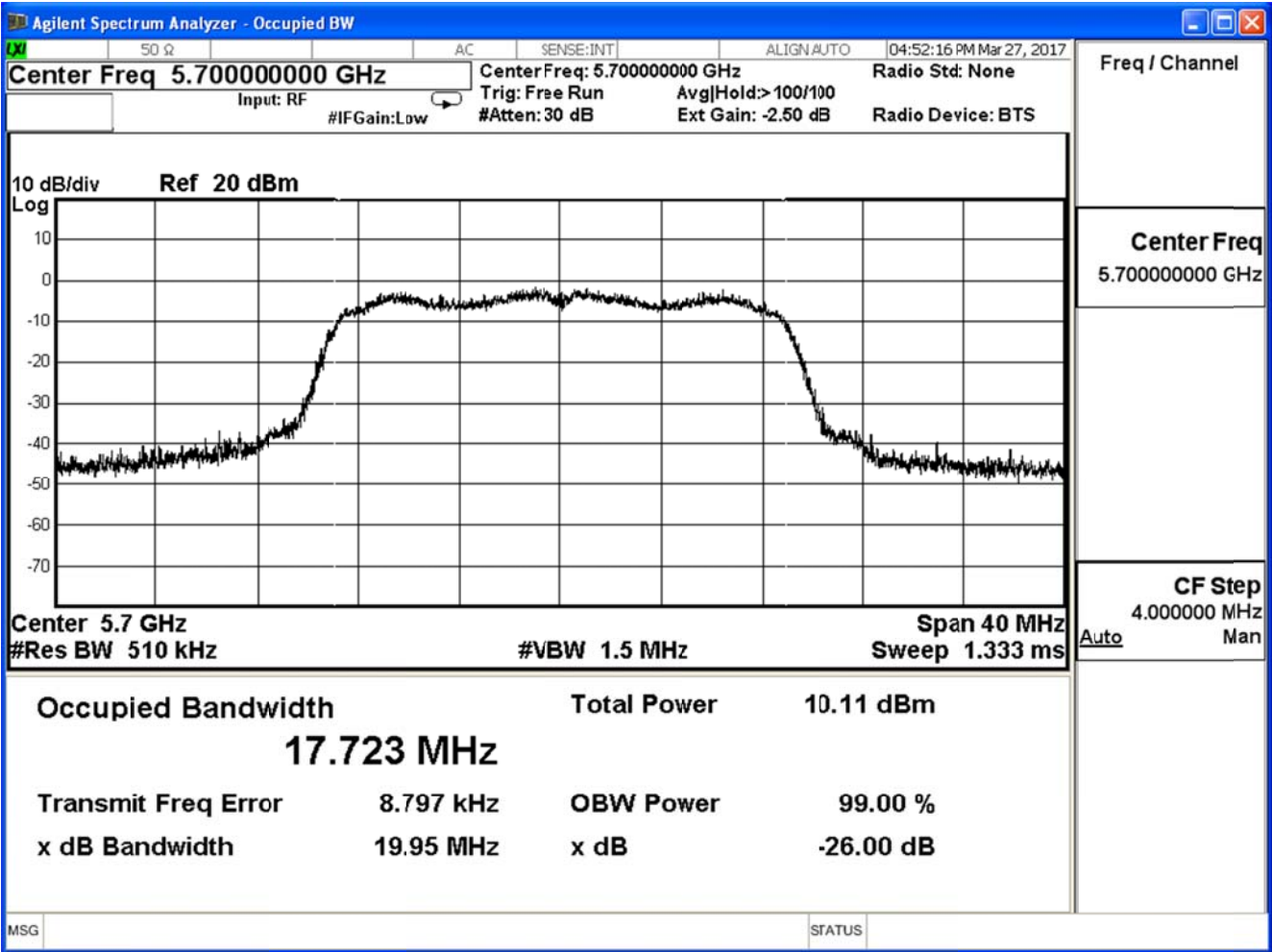
Channel 100 (5500MHz)



Channel 116 (5580MHz)



Channel 140 (5700MHz)

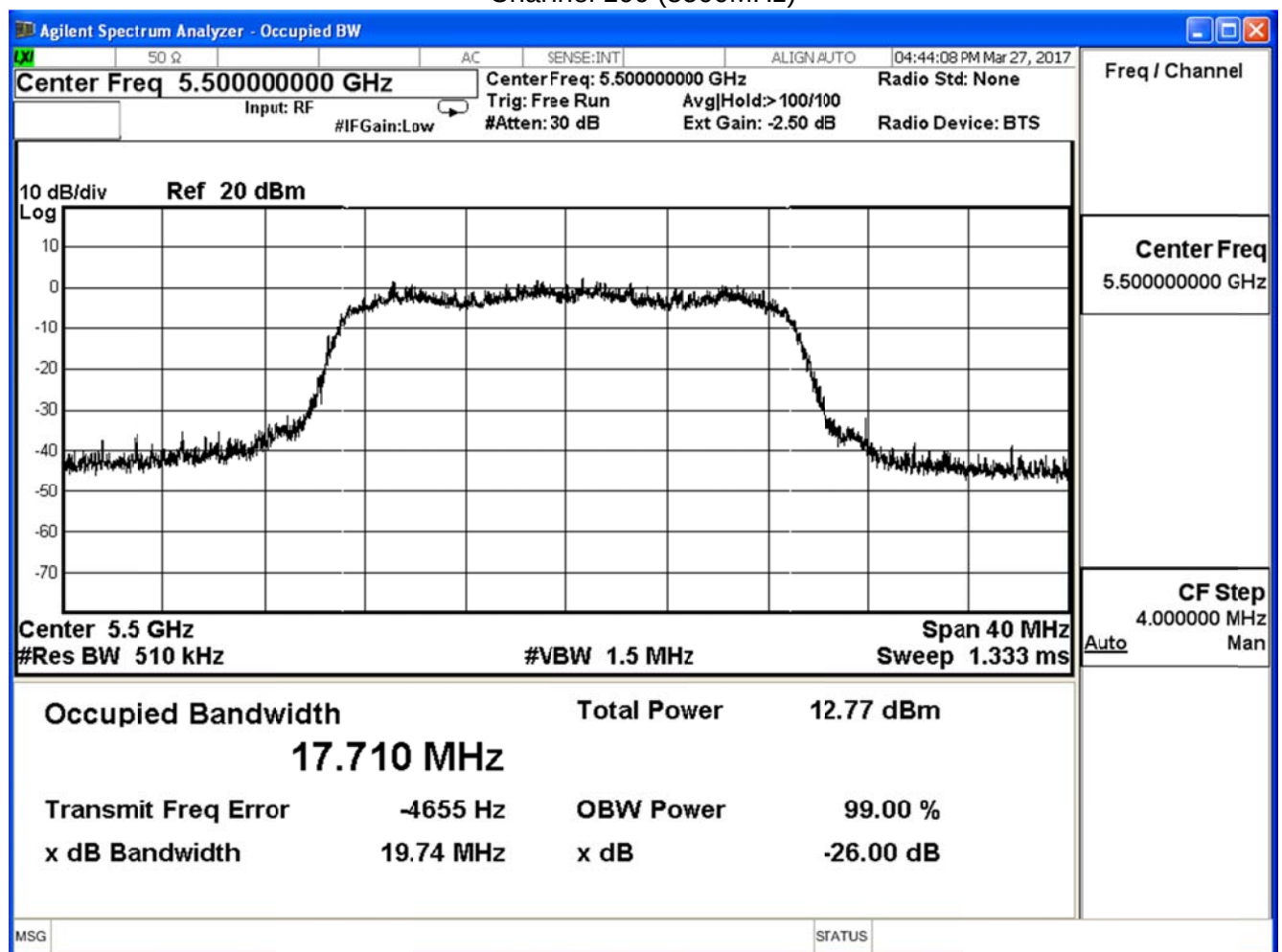


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/27	Test Site	SR10-H

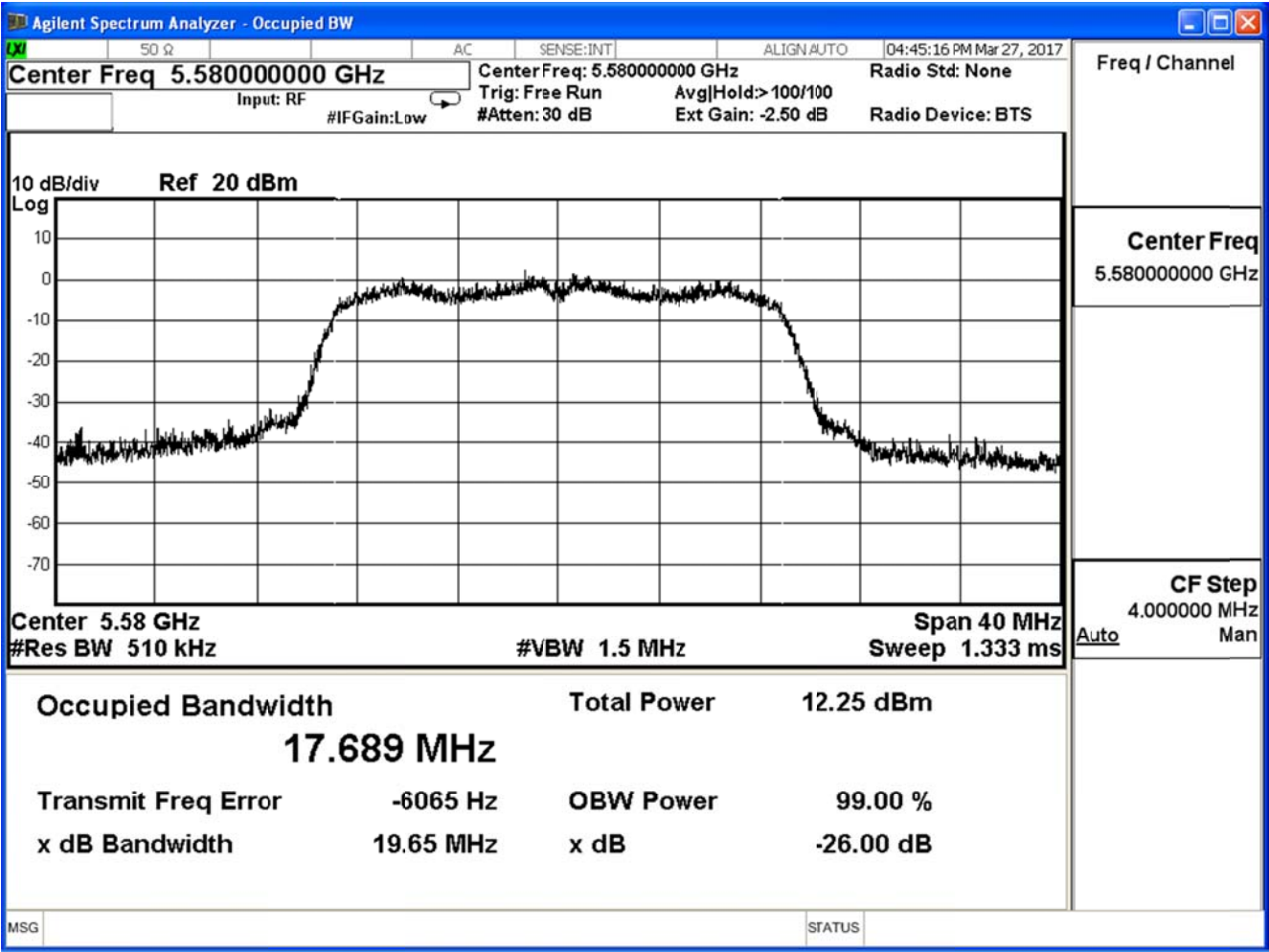
IEEE 802.11n20 (ANT 1)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
100	5500	17.710	19.740	--
116	5580	17.689	19.650	--
140	5700	17.713	19.750	--

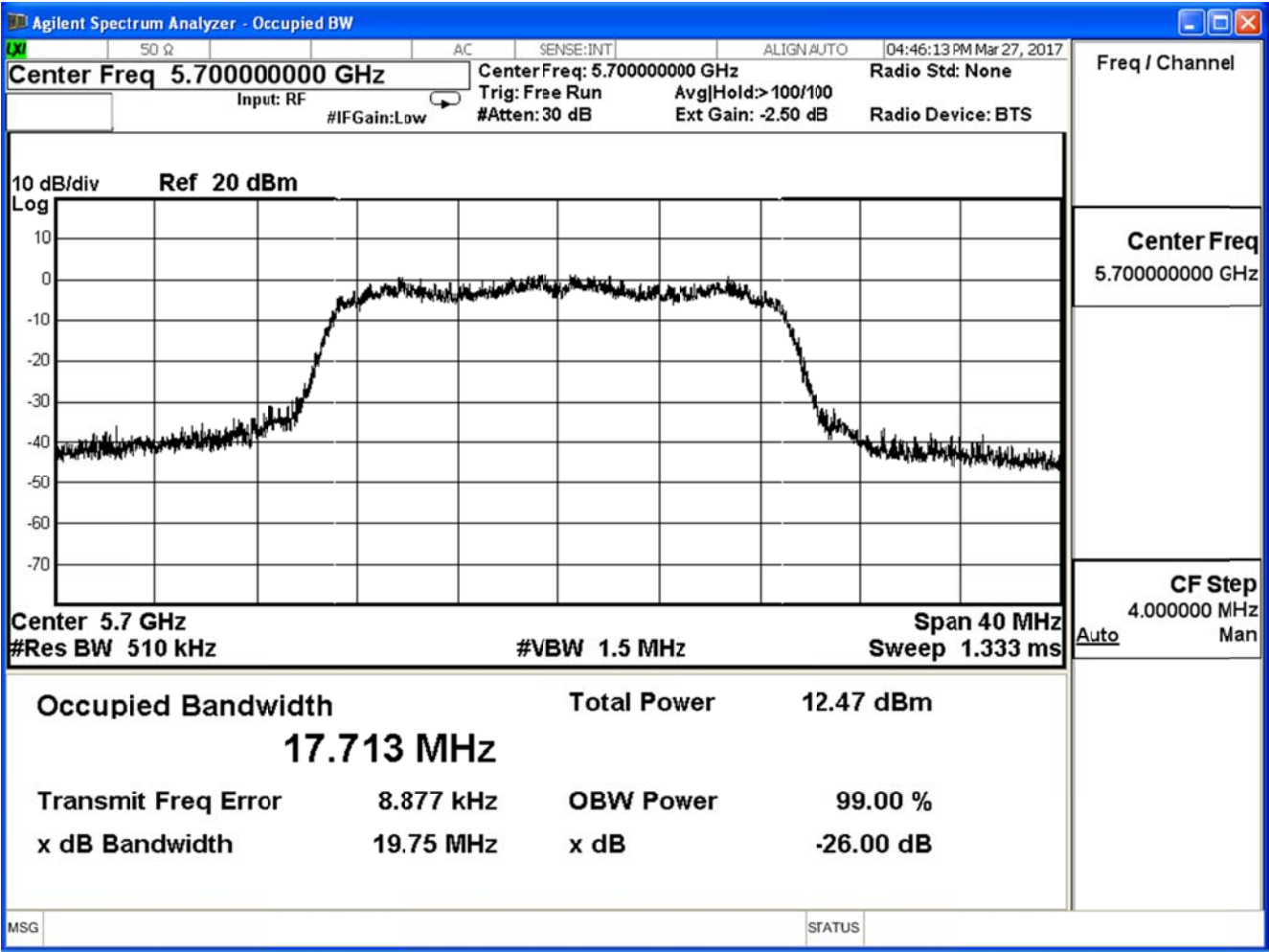
Channel 100 (5500MHz)



Channel 116 (5580MHz)



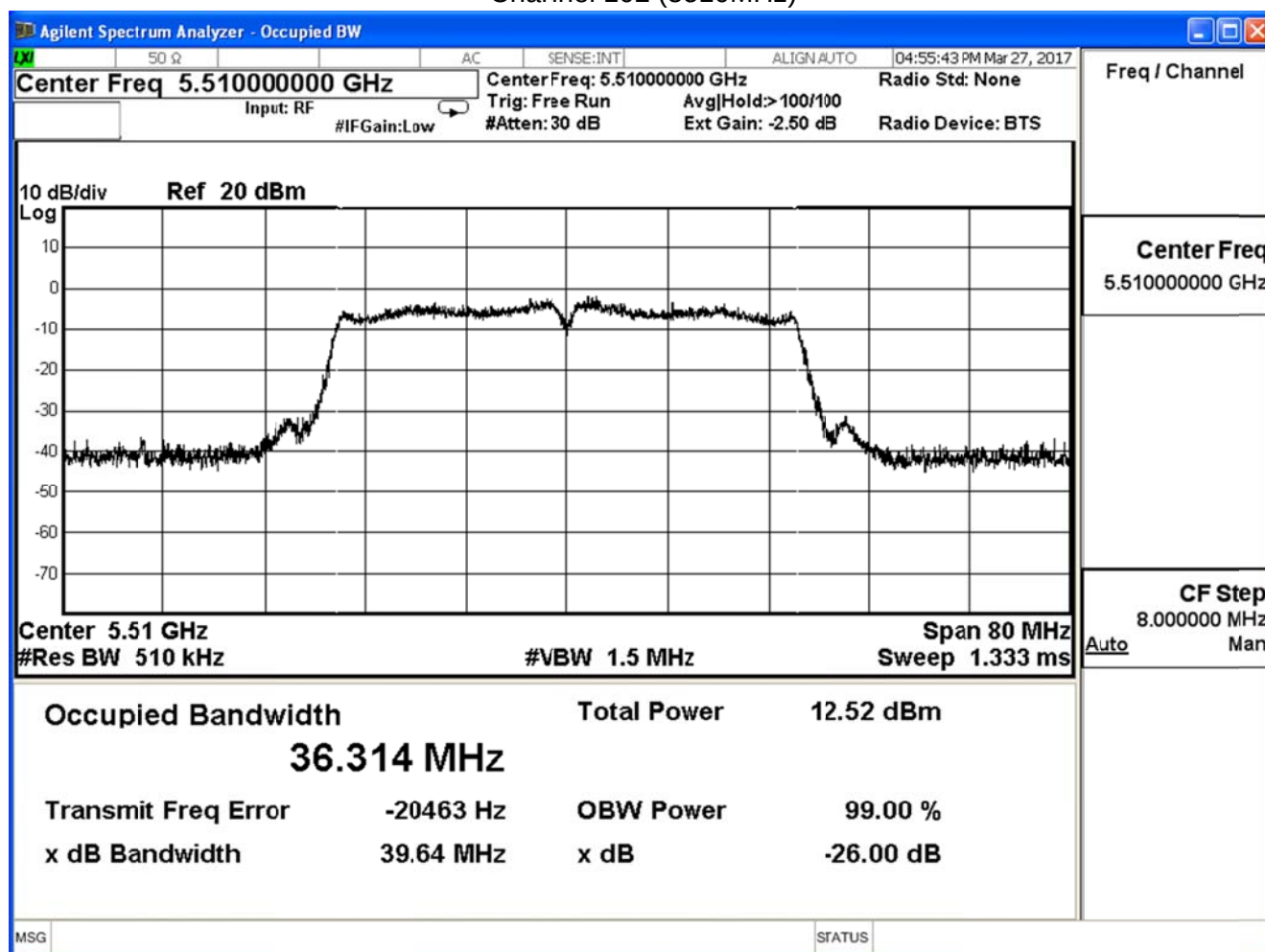
Channel 140 (5700MHz)



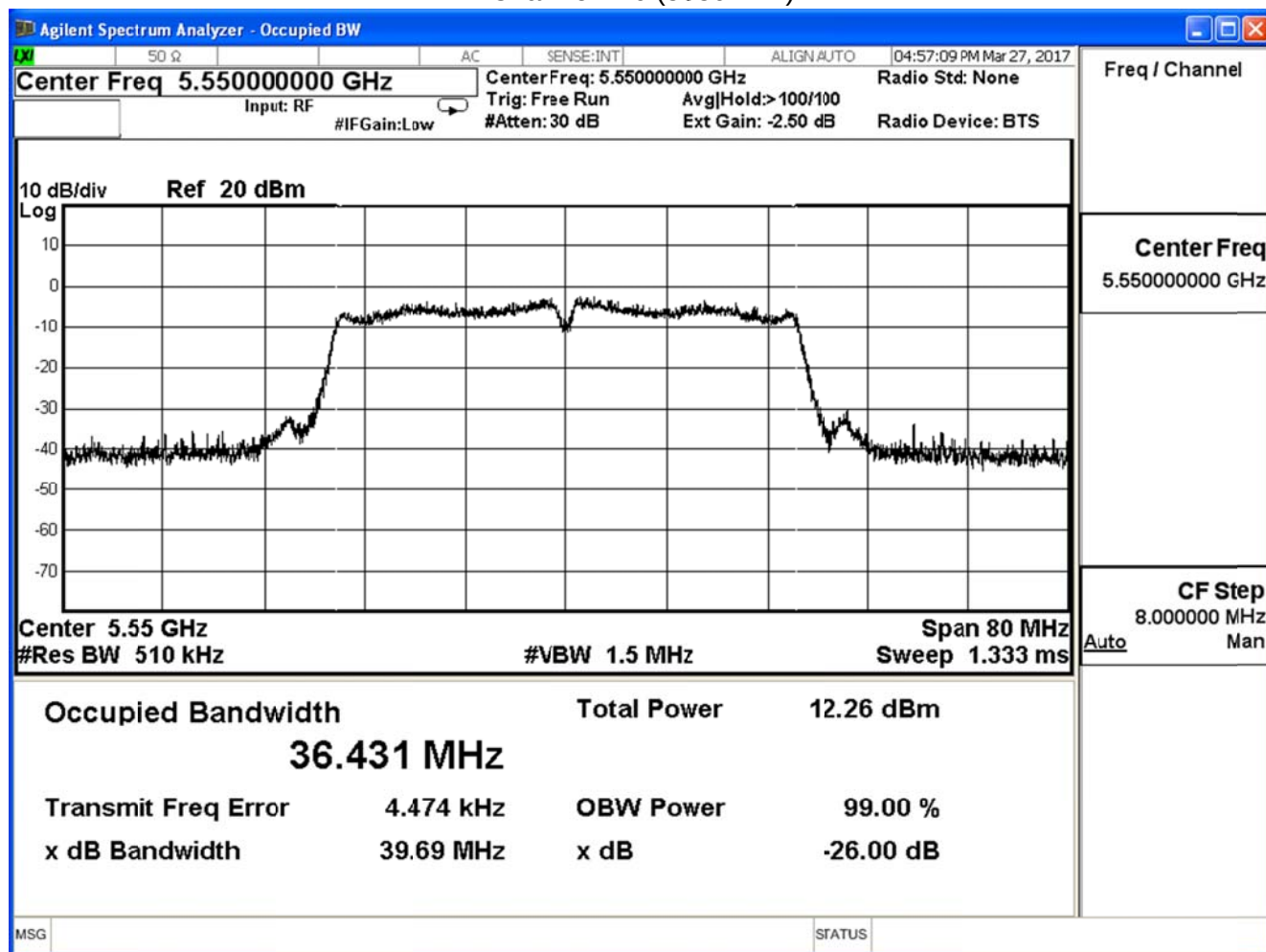
Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/27	Test Site	SR10-H

IEEE 802.11n40 (ANT 0)				
Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
102	5510	36.314	39.640	--
110	5550	36.431	39.690	--
134	5670	36.327	40.070	--

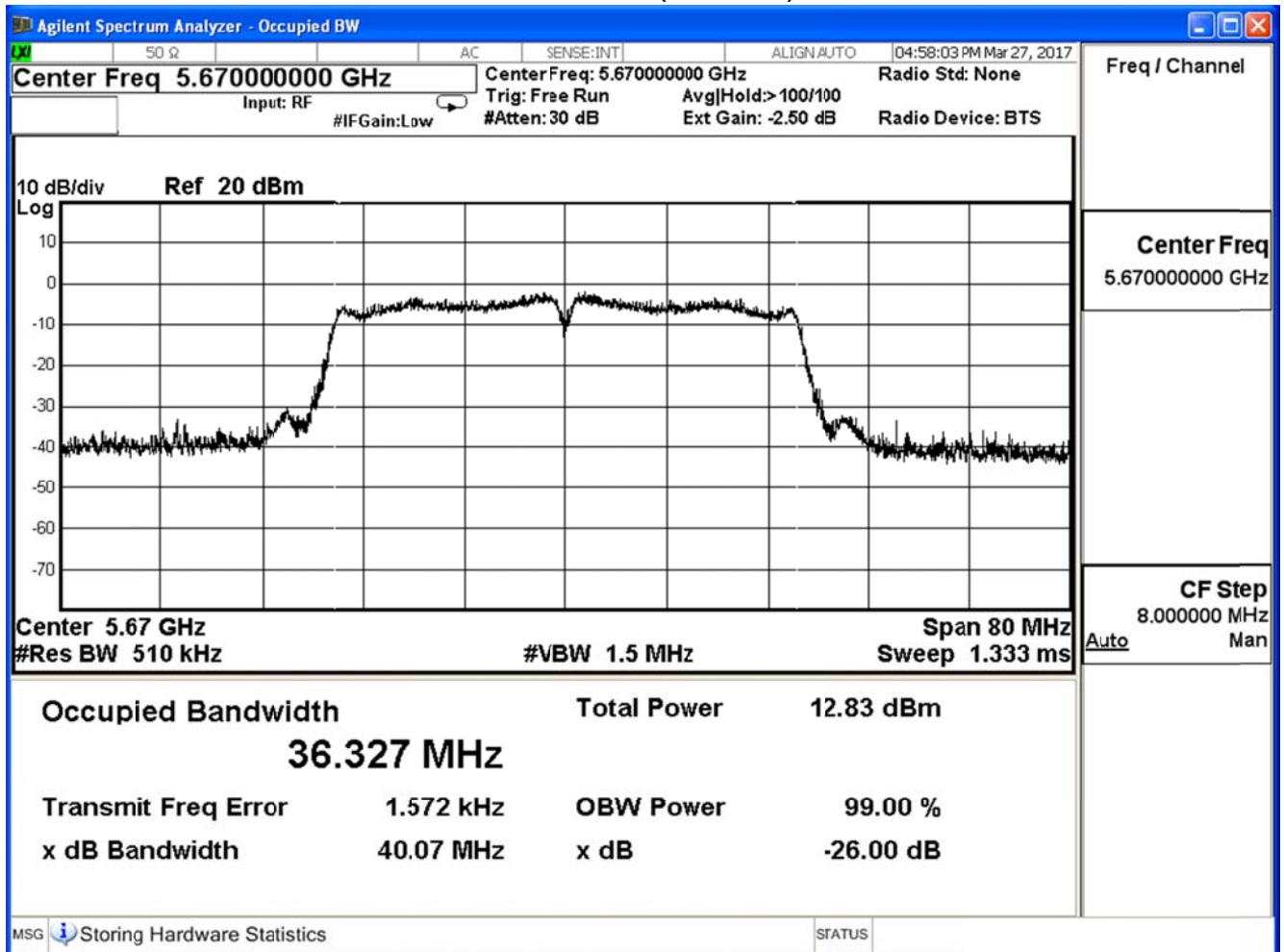
Channel 102 (5510MHz)



Channel 110 (5550MHz)



Channel 134 (5670MHz)

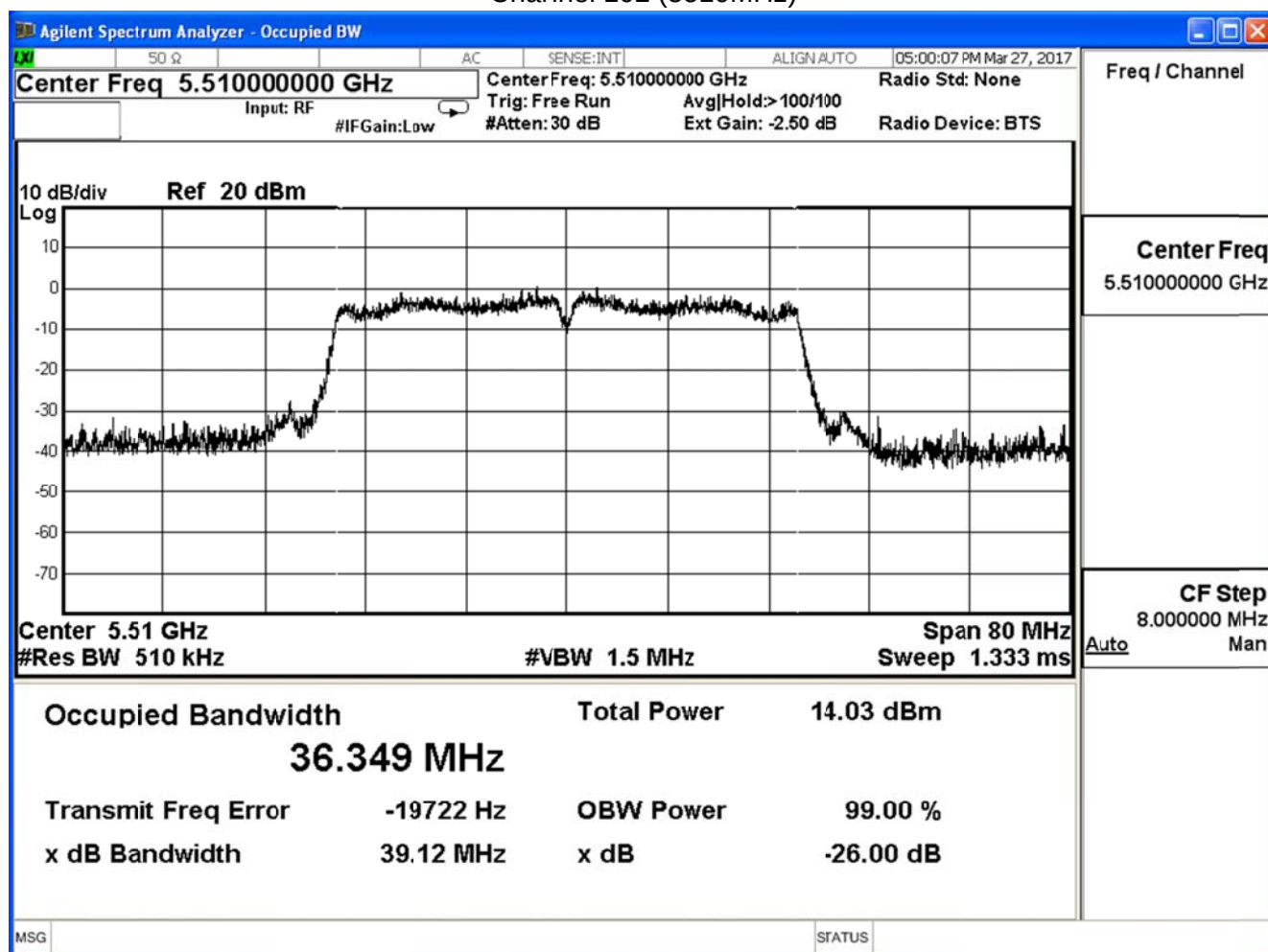


Product	UHD551-L		
Test Item	99% & 26dB Bandwidth		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/27	Test Site	SR10-H

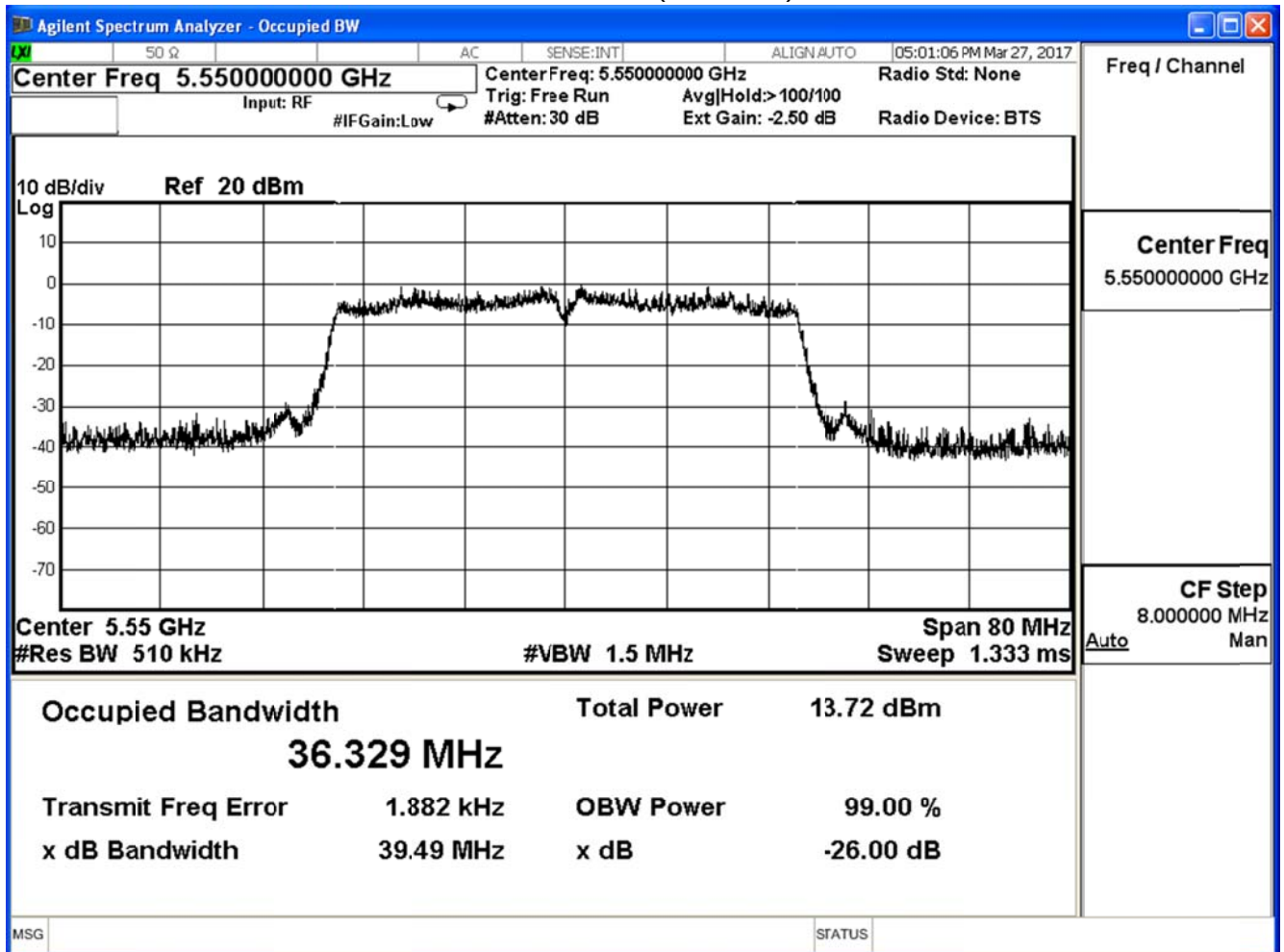
IEEE 802.11n40 (ANT 1)

Channel No.	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)
102	5510	36.349	39.120	--
110	5550	36.329	39.490	--
134	5670	36.336	39.590	--

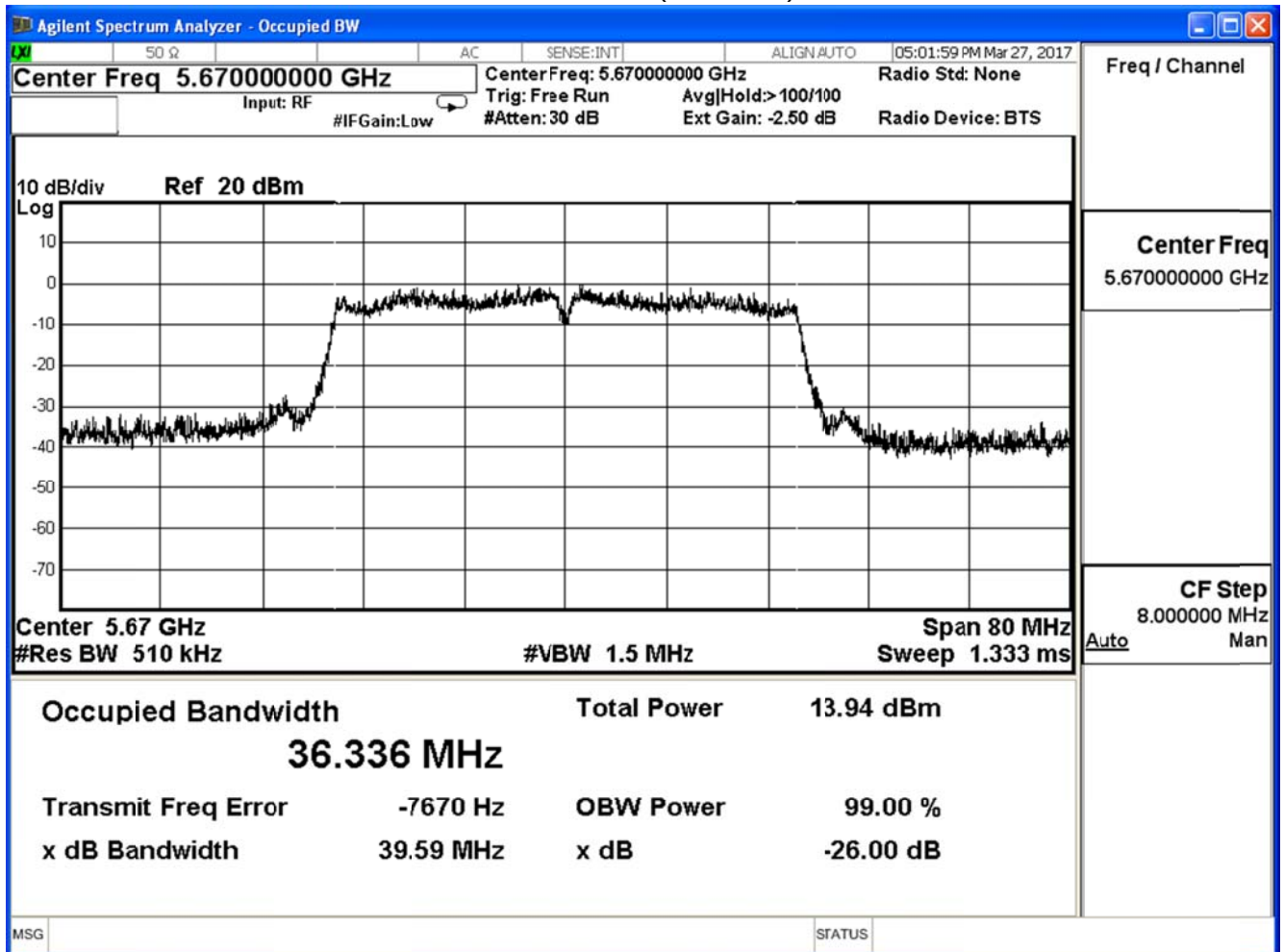
Channel 102 (5510MHz)



Channel 110 (5550MHz)



Channel 134 (5670MHz)



4. Peak Transmit power

4.1. Test Equipment

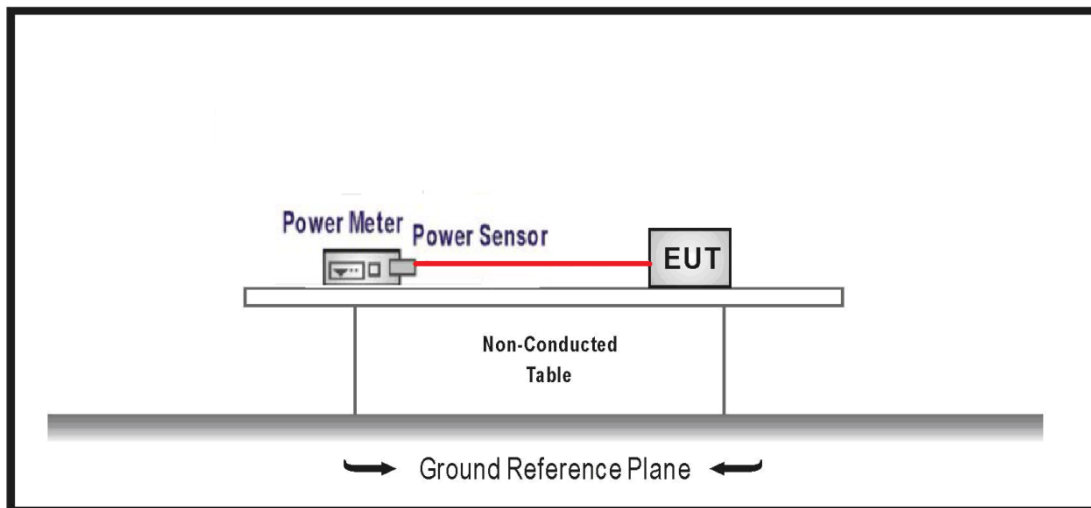
The following test equipments are used during the radiated emission tests:

Peak Transmit Output / SR10-H

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	2018/01/19
Pulse Power Sensor	Anritsu	MA2411B	1531043	2018/01/19
Pulse Power Sensor	Anritsu	MA2411B	1531044	2018/01/19

Note: All equipments that need to calibrate are with calibration period of 1 year.

4.2. Test Setup



4.3. Limits

1. 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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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).
2. 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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.
3. 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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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 or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density 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.
4. For 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. 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.

5. For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
6. For the band 5.725-5.850 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 1W. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.

4.4. Test Procedure

The EUT was setup to ANSI C63.10: 2013; tested to U-NII test procedure of 789033 D02 V01r03 and 662911 D01 v02r01 for compliance to FCC 47CFR Subpart E requirements.

The Method SA-1 of the Maximum conducted output power was used.

Set RBW=1MHz, VBW=3MHz with RMS detector and trace average 100 traces in power averaging mode. Set span to encompass the entire emission bandwidth (EBW) of the signal.

4.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

4.6. Test Result

Product	UHD551-L		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Tx_SISO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11a (ANT 0)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
36	5180	11.800	≤ 23.98
44	5220	11.810	≤ 23.98
48	5240	11.520	≤ 23.98

The worst emission of data rate is 6 Mbps.

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate							Required Limit
		6	12	18	24	36	48	54	
36	5180	11.800	--	--	--	--	--	--	≤ 23.98
44	5220	11.810	11.720	11.680	11.640	11.600	11.570	11.500	≤ 23.98
48	5240	11.520	--	--	--	--	--	--	≤ 23.98

Product	UHD551-L		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Tx_SISO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11a (ANT 1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
36	5180	11.870	≤ 23.98
44	5220	11.860	≤ 23.98
48	5240	11.920	≤ 23.98

The worst emission of data rate is 6 Mbps.

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate							Required Limit
		6	12	18	24	36	48	54	
36	5180	11.870	--	--	--	--	--	--	≤ 23.98
44	5220	11.860	11.840	11.820	11.770	11.710	11.680	11.600	≤ 23.98
48	5240	11.920	--	--	--	--	--	--	≤ 23.98

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n20 (ANT 0)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
36	5180	9.860	≤ 20.22
44	5220	9.510	≤ 20.22
48	5240	9.500	≤ 20.22

The worst emission of data rate is 6.5 Mbps

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		0	1	2	3	4	5	6	7	
36	5180	9.860	--	--	--	--	--	--	--	≤ 20.22
44	5220	9.510	9.450	9.400	9.340	9.280	9.210	9.100	9.010	≤ 20.22
48	5240	9.500	--	--	--	--	--	--	--	≤ 20.22

Direction antenna $= 6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBi

Limit $= 23.98$ dBm $-(9.76-6) = 20.22$ dBm

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n20 (ANT 1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
36	5180	9.81	≤ 20.22
44	5220	9.34	≤ 20.22
48	5240	9.53	≤ 20.22

The worst emission of data rate is 6.5 Mbps

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		0	1	2	3	4	5	6	7	
36	5180	9.810	--	--	--	--	--	--	--	≤ 20.22
44	5220	9.340	9.210	9.140	9.010	8.910	8.770	8.450	8.300	≤ 20.22
48	5240	9.530	--	--	--	--	--	--	--	≤ 20.22

Direction antenna $= 6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBi

Limit $= 23.98 \text{ dBm} - (9.76 - 6) = 20.22 \text{ dBm}$

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n20 (ANT 0+1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
36	5180	12.845	≤ 20.22
44	5220	12.436	≤ 20.22
48	5240	12.525	≤ 20.22

Direction antenna = $6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBi

Limit = $23.98 \text{ dBm} - (9.76 - 6) = 20.22 \text{ dBm}$

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n40 (ANT 0)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
38	5190	10.890	≤ 20.22
46	5230	10.540	≤ 20.22

The worst emission of data rate is 13.5Mbps.

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		0	1	2	3	4	5	6	7	
38	5190	10.890	--	--	--	--	--	--	--	≤ 20.22
46	5230	10.540	10.470	10.320	10.180	10.020	9.880	9.460	9.320	≤ 20.22

Direction antenna = $6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBi

Limit = $23.98 \text{ dBm} - (9.76 - 6) = 20.22 \text{ dBm}$

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n40 (ANT 1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
38	5190	10.740	≤ 20.22
46	5230	10.840	≤ 20.22

The worst emission of data rate is 13.5Mbps.

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		0	1	2	3	4	5	6	7	
38	5190	10.740	--	--	--	--	--	--	--	≤ 20.22
46	5230	10.840	10.720	10.660	10.480	10.310	10.170	10.020	9.750	≤ 20.22

Direction antenna = $6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBi

Limit = $23.98 \text{ dBm} - (9.76 - 6) = 20.22 \text{ dBm}$

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n40 (ANT 0+1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
38	5190	13.826	≤ 20.22
46	5230	13.703	≤ 20.22

Direction antenna = $6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBi

Limit = $23.98 \text{ dBm} - (9.76 - 6) = 20.22 \text{ dBm}$

Product	UHD551-L		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Tx_SISO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11a (ANT 0)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
52	5260	11.990	≤ 23.98
60	5300	11.890	≤ 23.98
64	5320	11.560	≤ 23.98

The worst emission of data rate is 6 Mbps.

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate							Required Limit
		6	12	18	24	36	48	54	
52	5260	11.990	--	--	--	--	--	--	≤ 23.98
60	5300	11.890	11.840	11.800	11.750	11.700	11.660	11.600	≤ 23.98
64	5320	11.560	--	--	--	--	--	--	≤ 23.98

Product	UHD551-L		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Tx_SISO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11a (ANT 1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
52	5260	12.050	≤ 23.98
60	5300	11.820	≤ 23.98
64	5320	11.810	≤ 23.98

The worst emission of data rate is 6 Mbps.

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate							Required Limit
		6	12	18	24	36	48	54	
52	5260	12.050	--	--	--	--	--	--	≤ 23.98
60	5300	11.820	11.740	11.700	11.660	11.620	11.570	11.540	≤ 23.98
64	5320	11.810	--	--	--	--	--	--	≤ 23.98

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n20 (ANT 0)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
52	5260	8.890	≤ 20.22
60	5300	8.680	≤ 20.22
64	5320	8.440	≤ 20.22

The worst emission of data rate is 6.5 Mbps

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		0	1	2	3	4	5	6	7	
52	5260	8.890	--	--	--	--	--	--	--	≤ 20.22
60	5300	8.680	8.600	8.510	8.450	8.420	8.370	8.310	8.270	≤ 20.22
64	5320	8.440	--	--	--	--	--	--	--	≤ 20.22

Direction antenna = $6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBi

Limit = $23.98 \text{ dBm} - (9.76 - 6) = 20.22 \text{ dBm}$

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n20 (ANT 1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
52	5260	8.98	≤ 20.22
60	5300	8.77	≤ 20.22
64	5320	8.34	≤ 20.22

The worst emission of data rate is 6.5 Mbps

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		0	1	2	3	4	5	6	7	
52	5260	8.980	--	--	--	--	--	--	--	≤ 20.22
60	5300	8.770	8.700	8.640	8.570	8.500	8.410	8.340	8.200	≤ 20.22
64	5320	8.340	--	--	--	--	--	--	--	≤ 20.22

Direction antenna $= 6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBi

Limit $= 23.98$ dBm $-(9.76-6) = 20.22$ dBm

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n20 (ANT 0+1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
52	5260	11.946	≤ 20.22
60	5300	11.736	≤ 20.22
64	5320	11.401	≤ 20.22

Direction antenna = $6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBi

Limit = $23.98 \text{ dBm} - (9.76 - 6) = 20.22 \text{ dBm}$

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n40 (ANT 0)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
54	5270	10.290	≤ 20.22
62	5310	10.190	≤ 20.22

The worst emission of data rate is 13.5Mbps.

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		0	1	2	3	4	5	6	7	
54	5270	10.290	--	--	--	--	--	--	--	≤ 20.22
62	5310	10.190	10.020	9.880	9.750	9.620	9.410	9.210	9.010	≤ 20.22

Direction antenna = $6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBi

Limit = $23.98 \text{ dBm} - (9.76 - 6) = 20.22 \text{ dBm}$

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n40 (ANT 1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
54	5270	10.690	≤ 20.22
62	5310	10.600	≤ 20.22

The worst emission of data rate is 13.5Mbps.

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		0	1	2	3	4	5	6	7	
54	5270	10.690	--	--	--	--	--	--	--	≤ 20.22
62	5310	10.600	10.550	10.320	10.140	10.020	9.870	9.640	9.420	≤ 20.22

Direction antenna = $6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBi

Limit = $23.98 \text{ dBm} - (9.76 - 6) = 20.22 \text{ dBm}$

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n40 (ANT 0+1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
54	5270	13.505	≤ 20.22
62	5310	13.410	≤ 20.22

Direction antenna = $6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBi

Limit = $23.98 \text{ dBm} - (9.76 - 6) = 20.22 \text{ dBm}$

Product	UHD551-L		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Tx_SISO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11a (ANT 0)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
100	5500	11.990	≤ 23.98
116	5580	11.890	≤ 23.98
140	5700	11.560	≤ 23.98

The worst emission of data rate is 6 Mbps.

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate							Required Limit
		6	12	18	24	36	48	54	
100	5500	11.990	--	--	--	--	--	--	≤ 23.98
116	5580	11.890	11.840	11.800	11.750	11.700	11.660	11.600	≤ 23.98
140	5700	11.560	--	--	--	--	--	--	≤ 23.98

Product	UHD551-L		
Test Item	Peak Transmit Output		
Test Mode	Mode 1: Tx_SISO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11a (ANT 1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
100	5500	12.050	≤ 23.98
116	5580	11.820	≤ 23.98
140	5700	11.810	≤ 23.98

The worst emission of data rate is 6 Mbps.

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate							Required Limit
		6	12	18	24	36	48	54	
100	5500	12.050	--	--	--	--	--	--	≤ 23.98
116	5580	11.820	11.740	11.700	11.660	11.620	11.570	11.540	≤ 23.98
140	5700	11.810	--	--	--	--	--	--	≤ 23.98

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n20 (ANT 0)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
100	5500	8.890	≤ 19.47
116	5580	8.680	≤ 19.47
140	5700	8.440	≤ 19.47

The worst emission of data rate is 6.5 Mbps

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		0	1	2	3	4	5	6	7	
100	5500	8.890	--	--	--	--	--	--	--	≤ 19.47
116	5580	8.680	8.600	8.510	8.450	8.420	8.370	8.310	8.270	≤ 19.47
140	5700	8.440	--	--	--	--	--	--	--	≤ 19.47

Direction antenna = $7.5 + 10\log(2) = 7.5 + 3.01 = 10.51$

Limit = $23.98\text{dBm} - (10.51\text{dBi} - 6\text{dBi}) = 19.47\text{dBm}$

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n20 (ANT 1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
100	5500	8.98	≤ 19.47
116	5580	8.77	≤ 19.47
140	5700	8.34	≤ 19.47

The worst emission of data rate is 6.5 Mbps

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		0	1	2	3	4	5	6	7	
100	5500	8.980	--	--	--	--	--	--	--	≤ 19.47
116	5580	8.770	8.700	8.640	8.570	8.500	8.410	8.340	8.200	≤ 19.47
140	5700	8.340	--	--	--	--	--	--	--	≤ 19.47

Direction antenna = $7.5 + 10\log(2) = 7.5 + 3.01 = 10.51$

Limit = $23.98\text{dBm} - (10.51\text{dBi} - 6\text{dBi}) = 19.47\text{dBm}$

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n20 (ANT 0+1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
100	5500	11.946	≤ 19.47
116	5580	11.736	≤ 19.47
140	5700	11.401	≤ 19.47

Direction antenna = $7.5 + 10\log(2) = 7.5 + 3.01 = 10.51$

Limit = $23.98\text{dBm} - (10.51\text{dBi} - 6\text{dBi}) = 19.47\text{dBm}$

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n40 (ANT 0)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
102	5510	10.290	≤ 19.47
110	5550	10.190	≤ 19.47

The worst emission of data rate is 13.5Mbps.

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		0	1	2	3	4	5	6	7	
102	5510	10.290	--	--	--	--	--	--	--	≤ 19.47
110	5550	10.190	10.020	9.880	9.750	9.620	9.410	9.210	9.010	≤ 19.47

Direction antenna = $7.5 + 10\log(2) = 7.5 + 3.01 = 10.51$

Limit = $23.98\text{dBm} - (10.51\text{dBi} - 6\text{dBi}) = 19.47\text{dBm}$

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n40 (ANT 1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
102	5510	10.690	≤ 19.47
110	5550	10.600	≤ 19.47

The worst emission of data rate is 13.5Mbps.

Peak Power Output (dBm)										
Channel No	Frequency (MHz)	Data Rate								Required Limit
		0	1	2	3	4	5	6	7	
102	5510	10.690	--	--	--	--	--	--	--	≤ 19.47
110	5550	10.600	10.550	10.320	10.140	10.020	9.870	9.640	9.420	≤ 19.47

Direction antenna = $7.5 + 10\log(2) = 7.5 + 3.01 = 10.51$

Limit = $23.98\text{dBm} - (10.51\text{dBi} - 6\text{dBi}) = 19.47\text{dBm}$

Product	UHD551-L		
Test Item	Peak Transmit power		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n40 (ANT 0+1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
102	5510	13.505	≤ 19.47
110	5550	13.410	≤ 19.47

Direction antenna = $7.5 + 10\log(2) = 7.5 + 3.01 = 10.51$

Limit = $23.98\text{dBm} - (10.51\text{dBi} - 6\text{dBi}) = 19.47\text{dBm}$

5. Peak Power Spectrum Density

5.1. Test Equipment

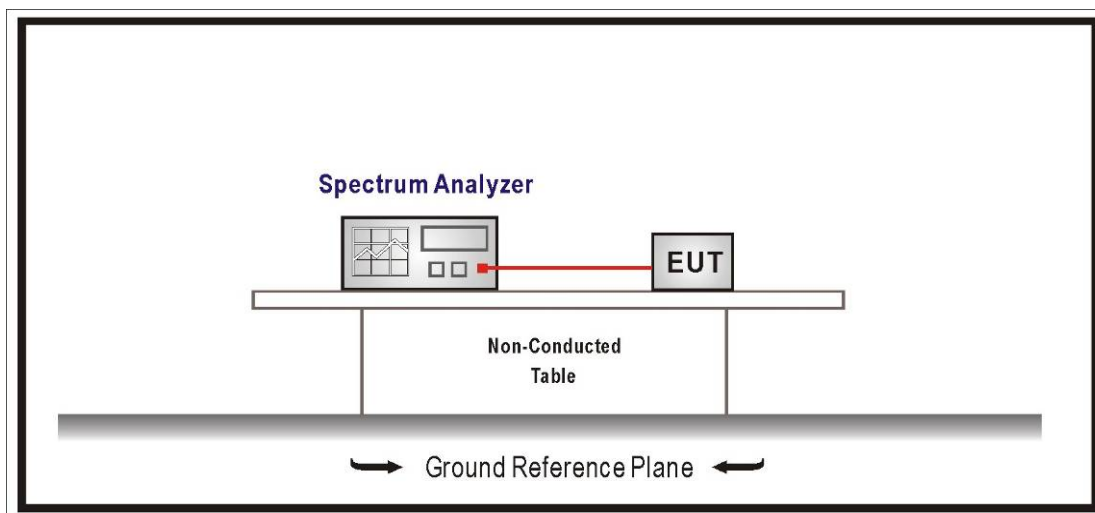
The following test equipments are used during the radiated emission tests:

Peak Power Spectrum Density / SR10-H

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A	US47140172	2017/08/08

Note: All equipments that need to calibrate are with calibration period of 1 year.

5.2. Test Setup



5.3. Limits

1. For an outdoor access point operating in the band 5.15-5.25 GHz In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used,
2. 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 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used,
3. For fixed point-to-point access points operating in the band 5.15-5.25 GHz,.In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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 or maximum power spectral density.
4. For client devices in the 5.15-5.25 GHz band, In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. 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.
5. For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
6. For the band 5.725-5.850 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 1W. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.

5.4. Test Procedure

The EUT was setup to ANSI C63.10: 2013; tested to U-NII test procedure of KDB 789033 V01r03 and and 662911 D01 v02r01 for compliance to FCC 47CFR Subpart E requirements. For Band1 : Set RBW=1MHz, VBW=3MHz with RMS detector. The PPSD is the highest level found across the emission in any 1-MHz band after 100 sweeps of averaging.

For Band4 : Set RBW=500KHz, VBW=1.5MHz with RMS detector. The PPSD is the highest level found across the emission in any 500KHz band after 100 sweeps of averaging.

5.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

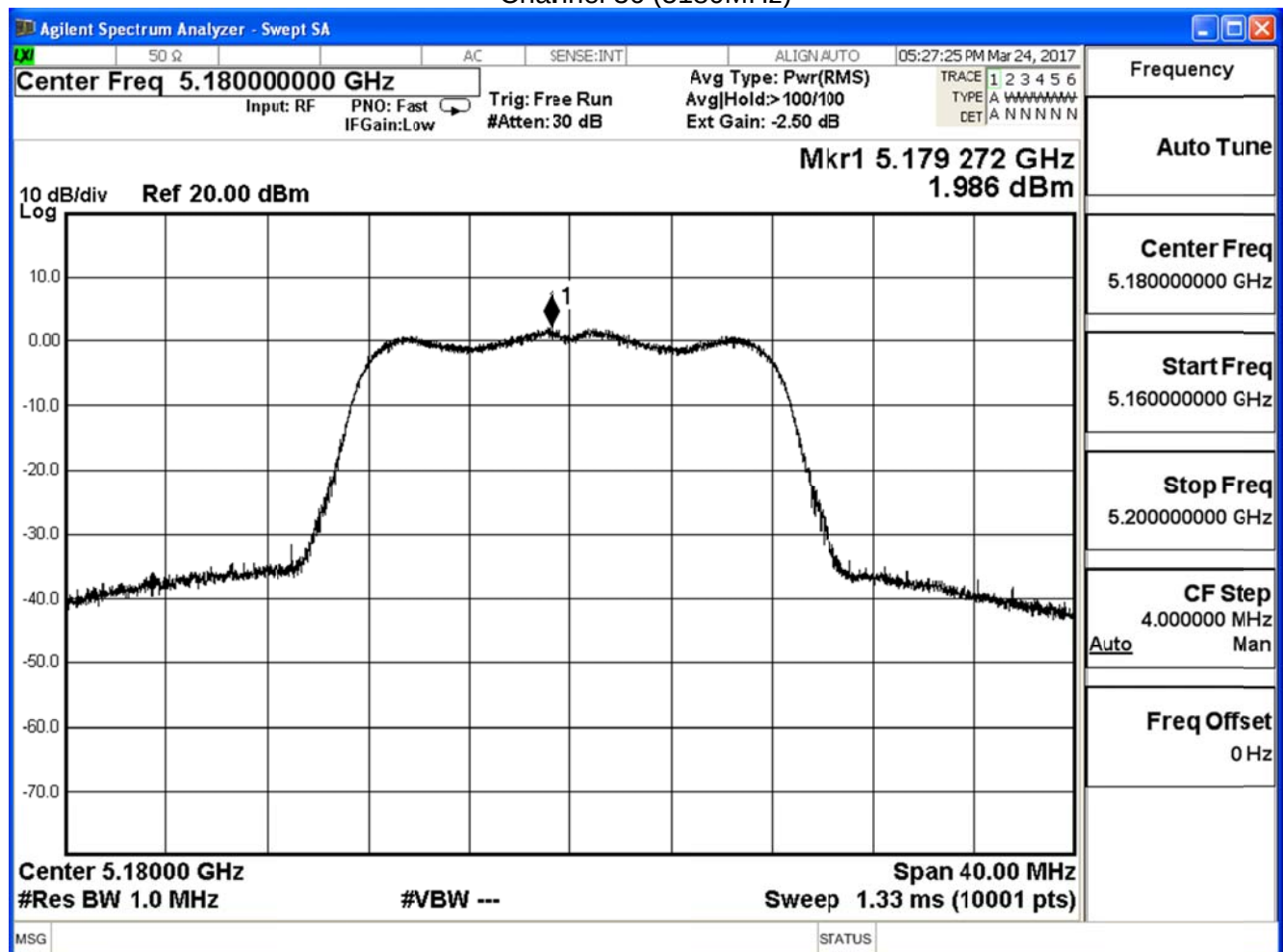
5.6. Test Result

Product	UHD551-L		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 1: Tx_SISO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

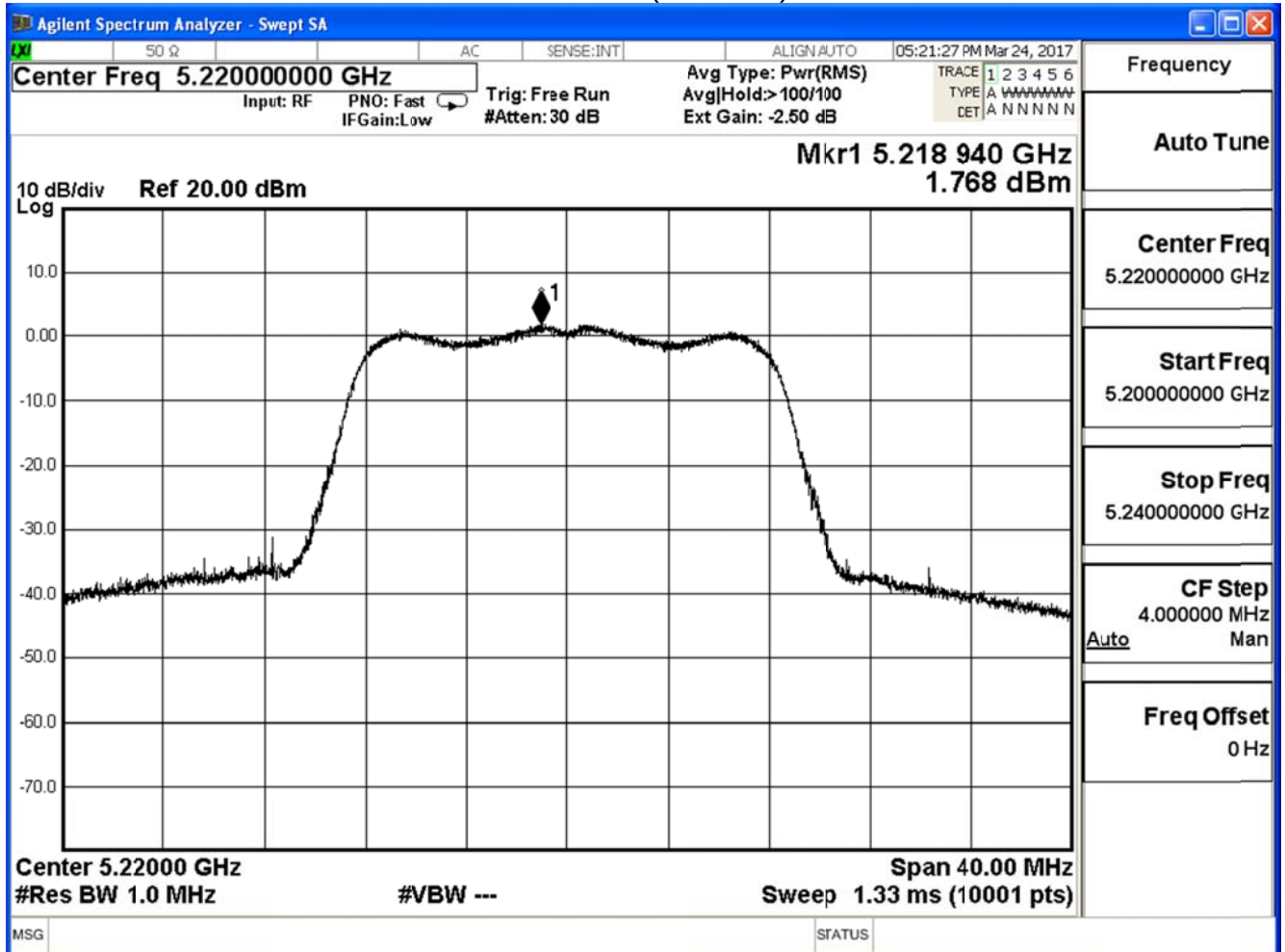
IEEE 802.11a (ANT 0)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
36	5180	1.986	≤ 11	Pass
44	5220	1.768	≤ 11	Pass
48	5240	1.555	≤ 11	Pass

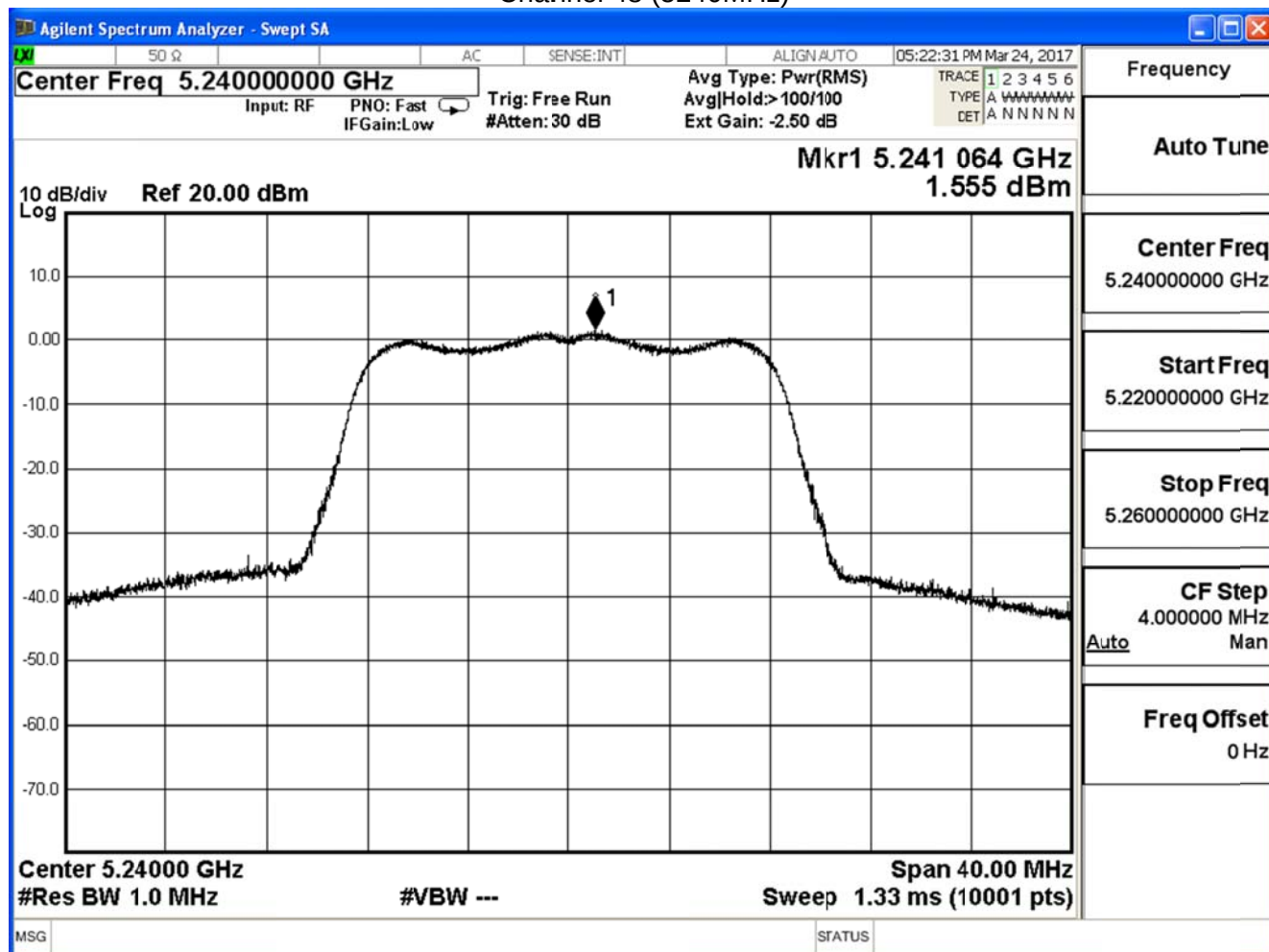
Channel 36 (5180MHz)



Channel 44 (5220MHz)



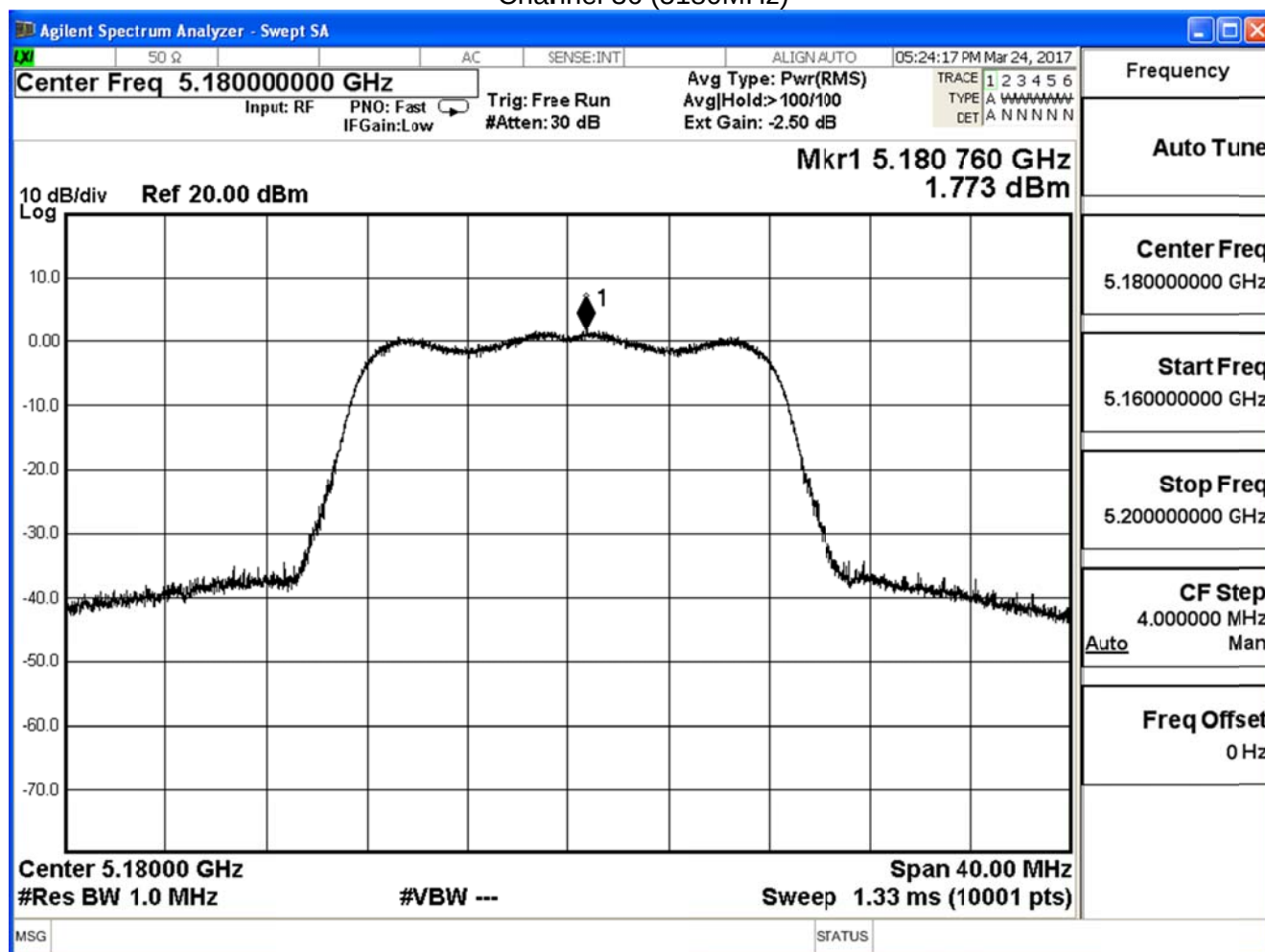
Channel 48 (5240MHz)



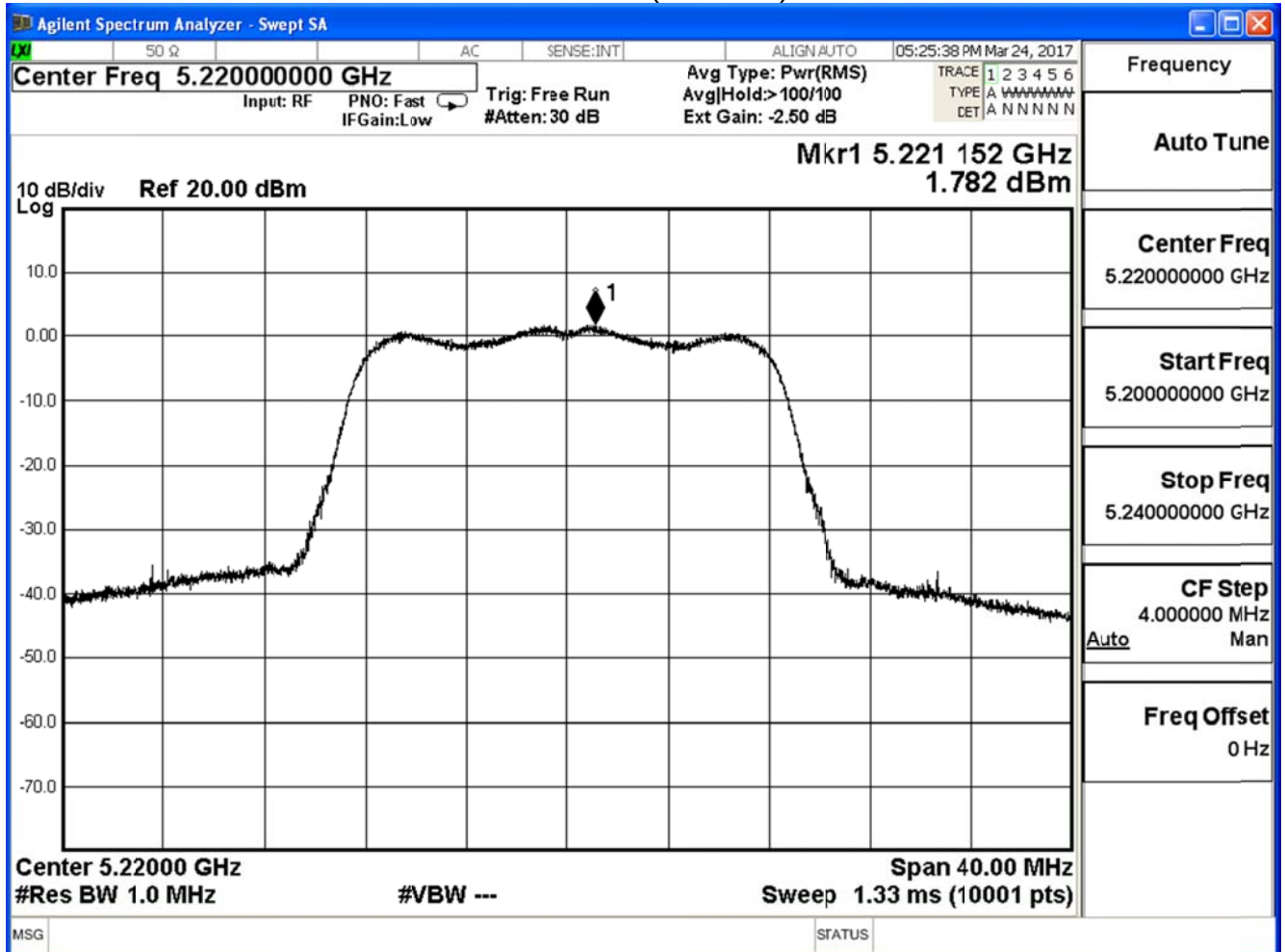
Product	UHD551-L		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 1: Tx_SISO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11a (ANT 1)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
36	5180	1.773	≤ 11	Pass
44	5220	1.782	≤ 11	Pass
48	5240	1.513	≤ 11	Pass

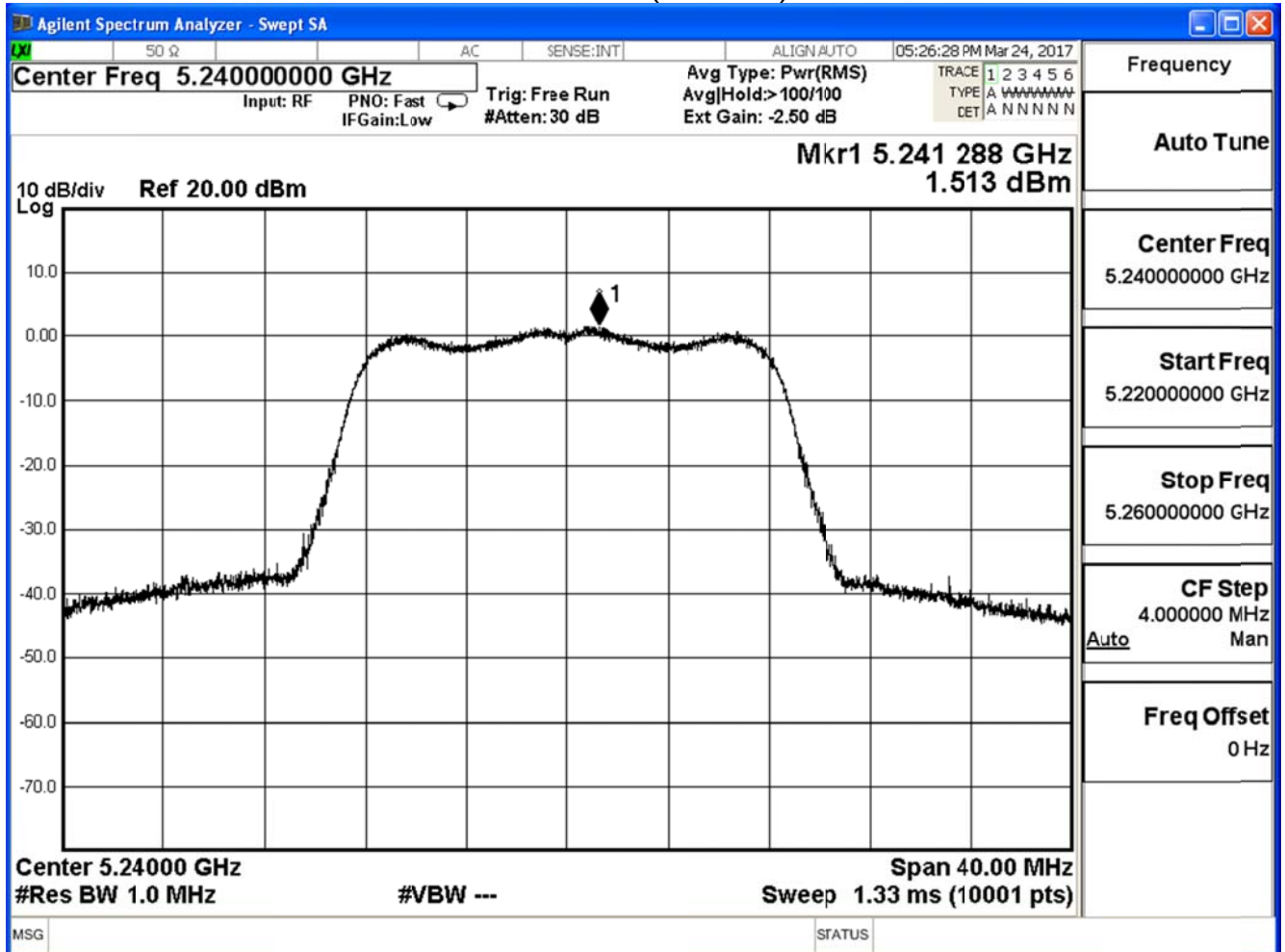
Channel 36 (5180MHz)



Channel 44 (5220MHz)



Channel 48 (5240MHz)



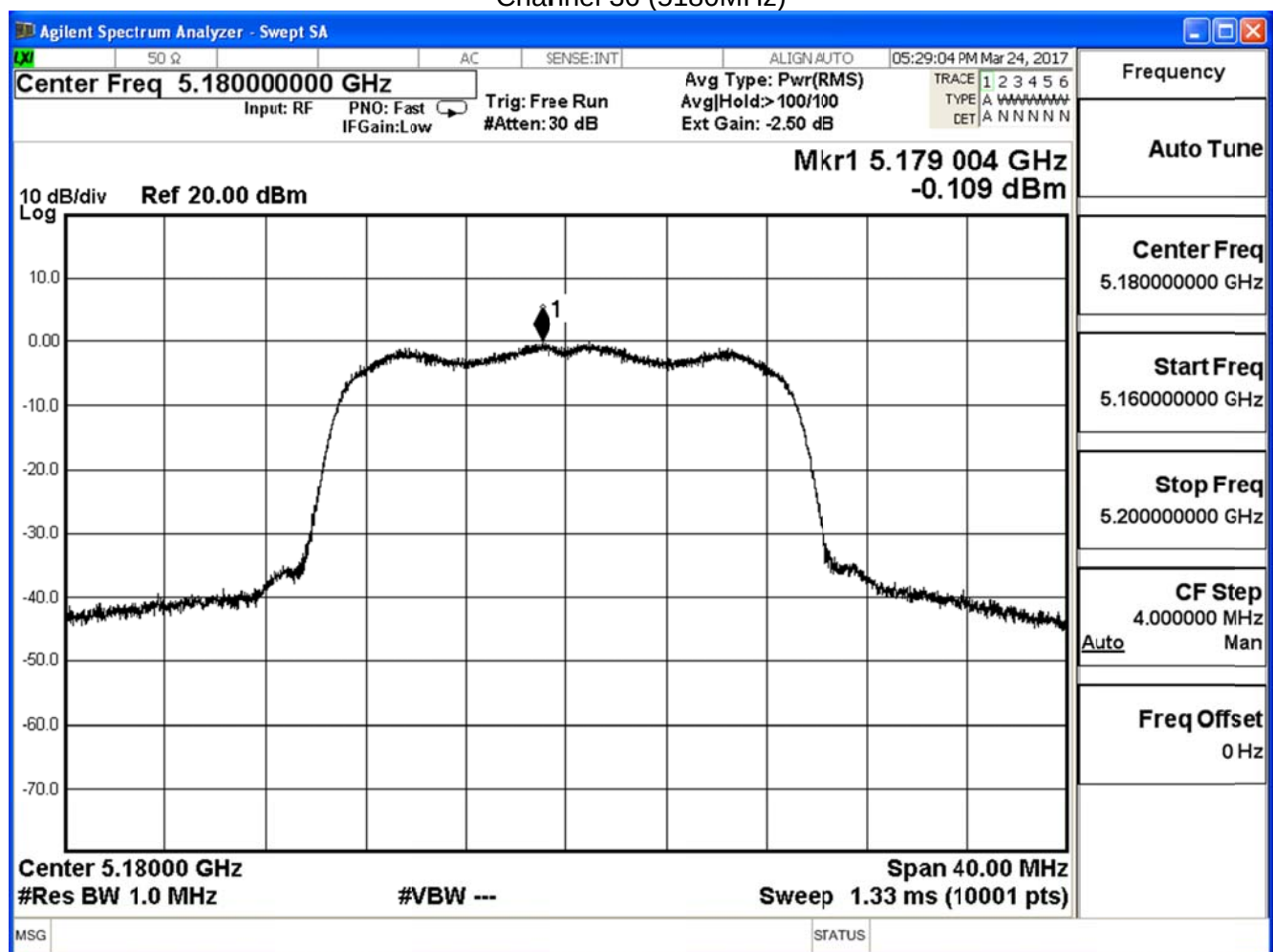
Product	UHD551-L		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n(20MHz)(ANT 0)

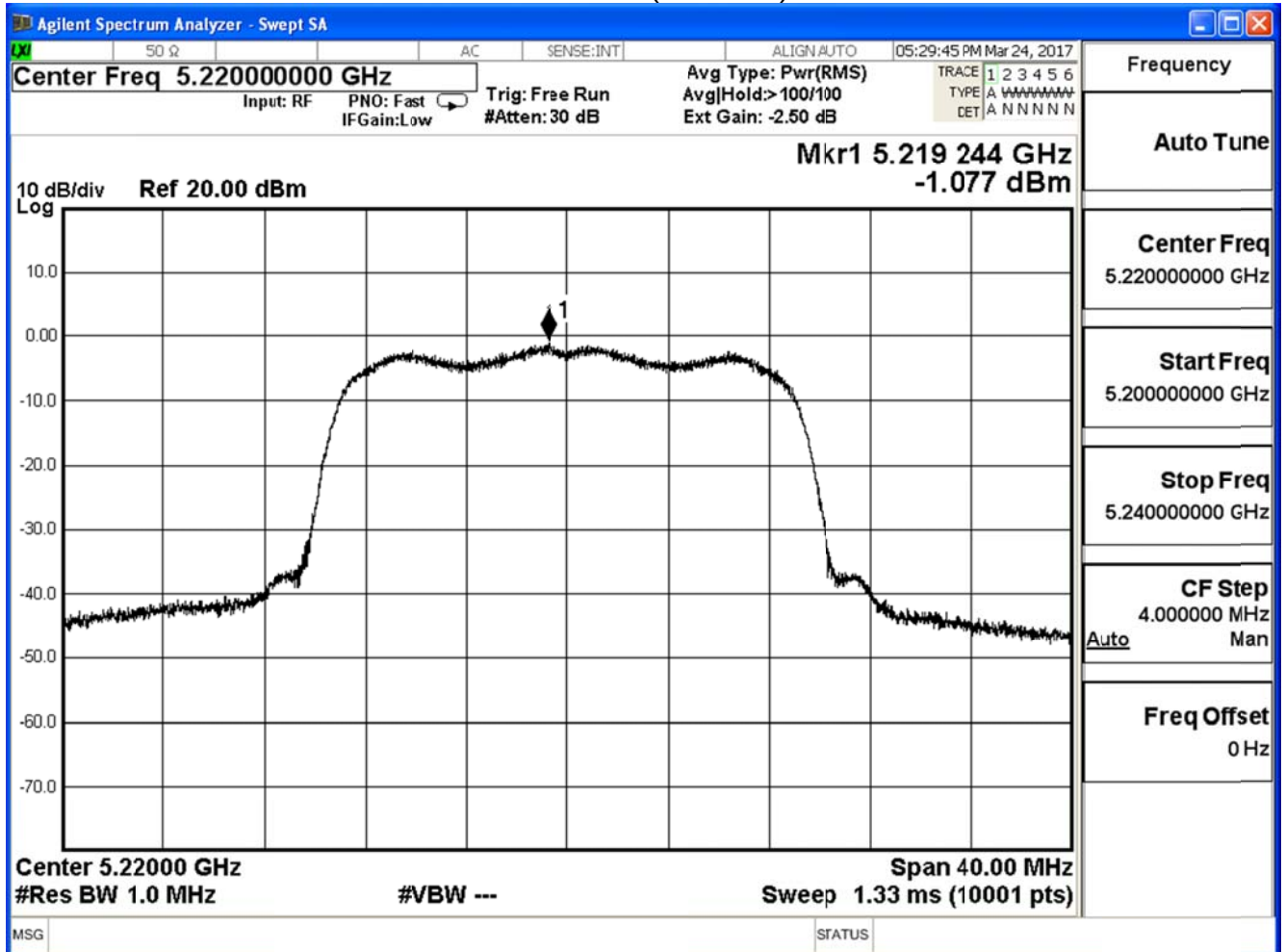
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
36	5180	-0.109	≤ 7.24	Pass
44	5220	-1.077	≤ 7.24	Pass
48	5240	-0.824	≤ 7.24	Pass

Direction antenna = $6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBiLimit = $11 \text{ dBm} - (9.76 - 6) = 7.24 \text{ dBm}$

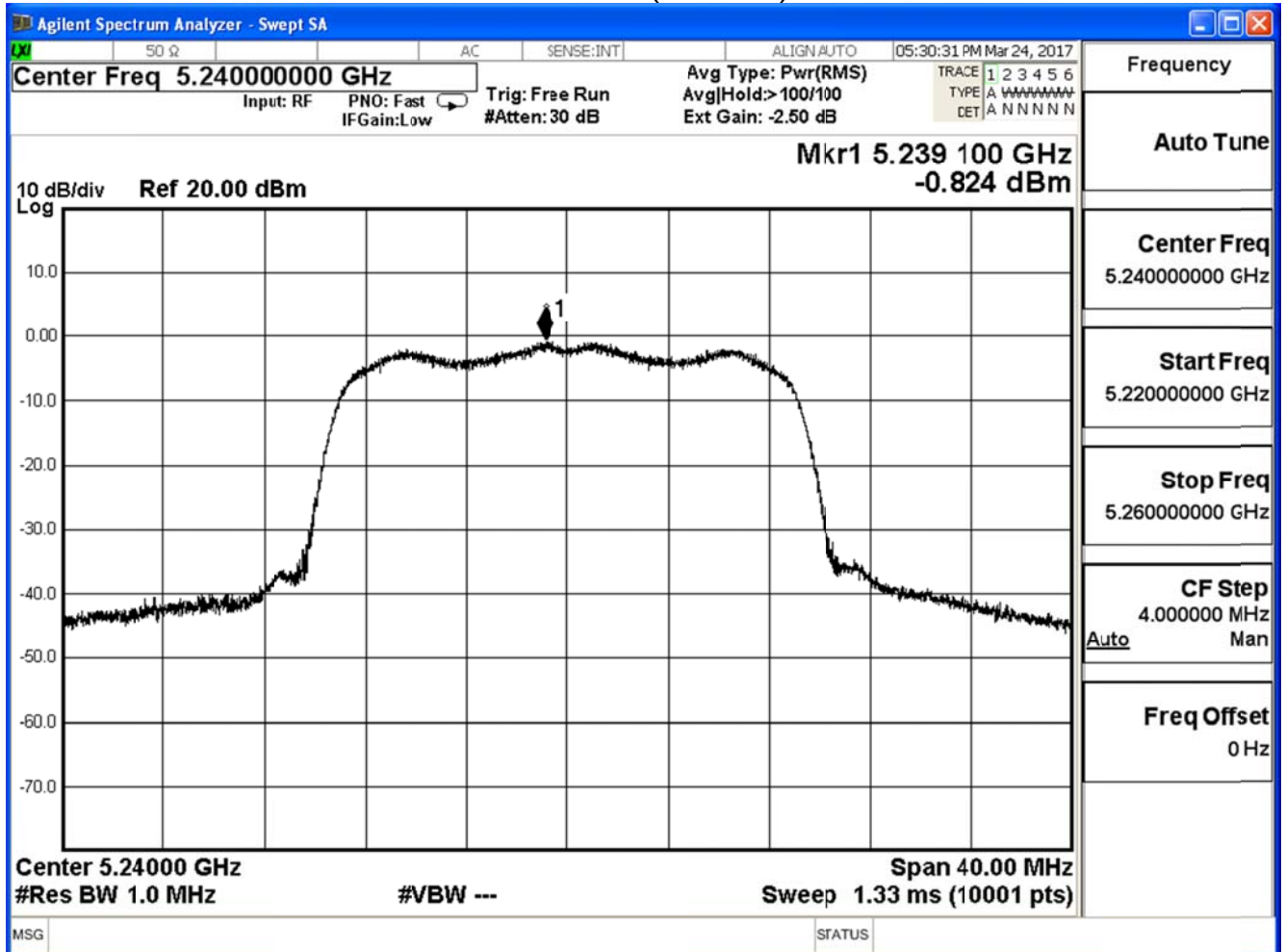
Channel 36 (5180MHz)



Channel 44 (5220MHz)



Channel 48 (5240MHz)



Product	UHD551-L		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 2: Tx_MIMO Mode		
Date of Test	2017/03/24	Test Site	SR10-H

IEEE 802.11n(20MHz) (ANT 1)

Channel No.	Frequency (MHz)	Measurement (dBm)	Limit (dBm)	Result
36	5180	-0.890	≤ 7.24	Pass
44	5220	-1.189	≤ 7.24	Pass
48	5240	-1.028	≤ 7.24	Pass

Direction antenna = $6.75 + 10\log(2) = 6.75 + 3.01 = 9.76$ dBi

Limit = $11 \text{ dBm} - (9.76 - 6) = 7.24 \text{ dBm}$

Channel 36 (5180MHz)

