



FCC PART 15 TEST REPORT

No. I18Z60261-IOT17

for

TCL Communication Ltd.

GSM Quad-band/HSPA-UMTS Six-band/LTE 17-bands mobile phone

BBE100-1

with

FCC ID: 2ACCJN028

Hardware Version: 04

Software Version: V6R13-6

Issued Date: 2018-07-13



Note:

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REPORT HISTORY

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1. TEST LATORATORY

1.1. TestingLocation

Conducted testing Location: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,
P. R. China100191

Radiated testing Location: CTTL(BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology
Development Area, Beijing, P. R. China 100176

1.2. TestingEnvironment

Normal Temperature: 15-35°C

Extreme Temperature: -20/+55°C

Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2018-05-04

Testing End Date: 2018-06-12

1.4. Signature

Jiang Xue

(Prepared this test report)

Zheng Wei

(Reviewed this test report)

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(Approved this test report)



2. CLIENT INFORMATION

2.1. Applicant Information

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2.2. Manufacturer Information

Company Name: TCL Communication Ltd.
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Shenzhen, Guangdong
City: Shenzhen
Postal Code: 518052
Country: China
Telephone: 0086-755-36611722
Fax: 0086-75536612000-81722

3. EQUIPMENT UNDER TEST (EUT) AND
ANCILLARY EQUIPMENT(AE)

3.1. About EUT

Description	GSM Quad-band/HSPA-UMTS Six-band/LTE 17-bands mobile phone
Model name	BBE100-1
FCC ID	2ACCJN028
IC ID	/
WLAN Frequency Range	ISM Bands: -5150MHz~5350MHz -5470MHz~5725MHz -5725MHz~5850MHz
Type of modulation	OFDM
Antenna	Integral Antenna
Voltage	3.85V DC by Battery

Note: Photographs of EUT are shown in ANNEX C of this test report. Components list, please refer to documents of the manufacturer.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	/	04	V6R13-6
EUT2	/	04	V6R13-6

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN	Remarks
AE1	Battery	/	/
AE2	Charger	/	/
AE3	USB Cable	/	/
AE4	USB Cable	/	/
AE5	Charger	/	NO TEST
AE1			
	Model	TLp029C1	
	Manufacturer	BYD	
	Capacitance	2900mAh	
	Nominal voltage	3.85V	
AE2			
	Model	CBA0064AGBC1	
	Manufacturer	BYD	
	Length of cable	/	
AE3			
	Model	CDA0000119CF	



Manufacturer LUXSHARE
Length of cable /
AE4
Model CDA0000119C1
Manufacturer Juwei
Length of cable /
AE5
Model CBA0064AHBC1
Manufacturer BYD
Length of cable /

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

The Equipment under Test (EUT) is a model of GSM Quad-band/HSPA-UMTS Six-band/LTE 17-bands mobile phone with integrated antenna and inbuilt battery.

It has Bluetooth (EDR)function.

It consists of normal options: travel charger, USB cable.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

3.5. Interpretation of the Test Environment

For the test methods, the test environment uncertainty figures correspond to an expansion factor k=2.

Measurement Uncertainty

Parameter	Uncertainty
temperature	0.48°C
humidity	2 %
DC voltages	0.003V

4. REFERENCE DOCUMENTS

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

FCC Part15	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices	2016
ANSI C63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
UNII: KDB 789033 D02	General U-NII Test Procedures New Rules v02r01	2017-12

5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

6. SUMMARY OF TEST RESULTS

6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15E	Sub-clause of IC	Verdict
Maximum Output Power	15.407	/	BR
Power Spectral Density	15.407	/	BR
Occupied 26dB Bandwidth	15.403	/	BR
Band edge compliance	15.209	/	BR
Transmitter spurious emissions radiated	15.407	/	BR
Spurious emissions radiated < 30 MHz	15.407	/	BR
Spurious emissions conducted < 30 MHz	15.407	/	BR
Frequency Stability	15.407	/	BR
Transmit Power Control	15.407	/	NA

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NA	Not Applicable, The test was not applicable
BR	Re-use test data from basic model report.
F	Fail, The EUT does not comply with the essential requirements in the standard

6.2. Statements

CTTL has evaluated the test cases requested by the client/manufacturer as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.1.

This report only deals with the WLAN function among the features described in section 3.

6.3. Test Conditions

The Equipment Under Test (EUT) model BBE100-1 (FCC ID: 2ACCJN028) is a variant product of BBE100-2 (FCC ID: 2ACCJN024), according to the declaration of changes provided by the applicant and FCC KDB publication 484596 D01, all the test results are derived from test report No. I18Z60272-IOT04. Please refer Annex A for detail data.

For detail differences between two models please refer the Declaration of Changes document.

For this report, all the test cases are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	26°C
Voltage	3.85V
Humidity	44%

7. TEST EQUIPMENTS UTILIZED

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	1 year	2019-05-17
2	Test Receiver	ESCI 3	100344	Rohde & Schwarz	1 year	2019-02-28
3	LISN	ENY216	101200	Rohde & Schwarz	1 year	2019-04-15
4	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100376	Rohde & Schwarz	1 year	2018-12-30
2	BiLog Antenna	VULB9163	514	Schwarzbeck	3 years	2021-01-03
3	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	3 years	2020-05-31
4	EMI Antenna	3117	00139065	ETS-Lindgren	3 Years	2020-11-15
5	Spectrum Analyzer	FSV40	101047	Rohde & Schwarz	1 year	2018-07-22

8. Measurement Uncertainty

8.1. Transmitter Output Power

Measurement Uncertainty: 0.387dB, k=1.96

8.2. Peak Power Spectral Density

Measurement Uncertainty: 0.705dBm/MHz, k=1.96

8.3. Occupied Channel Bandwidth

Measurement Uncertainty: 60.80Hz, k=1.96

8.4. Band Edges Compliance

Measurement Uncertainty : 0.62dBm, k=1.96

8.5. Spurious Emissions

Conducted (k=1.96)

Frequency Range	Uncertainty(dBm)
30MHz ≤ f ≤ 2GHz	1.22
2GHz ≤ f ≤ 3.6GHz	1.22
3.6GHz ≤ f ≤ 8GHz	1.22
8GHz ≤ f ≤ 12.75GHz	1.51
12.75GHz ≤ f ≤ 26GHz	1.51
26GHz ≤ f ≤ 40GHz	1.59

Radiated (k=2)

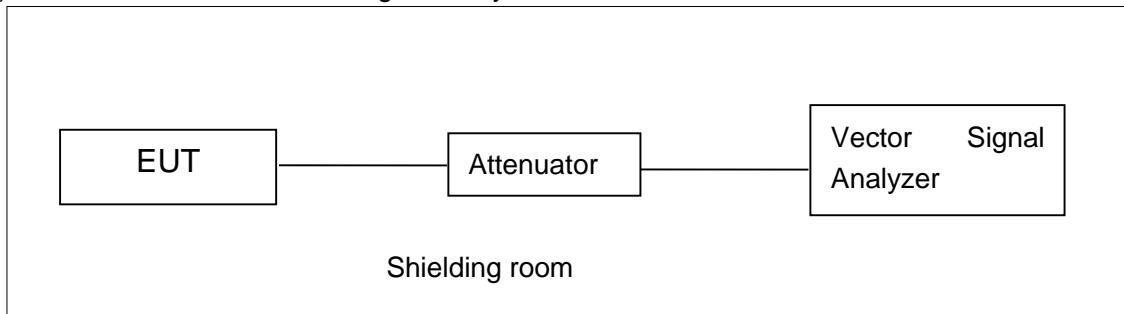
Frequency Range	Uncertainty(dBm)
9kHz-30MHz	
30MHz ≤ f ≤ 1GHz	4.86
1GHz ≤ f ≤ 18GHz	5.26
18GHz ≤ f ≤ 40GHz	5.28

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

A.1.1. Conducted Measurements

- 1). Connect the EUT to the test system correctly.
- 2). Set the EUT to the required work mode.
- 3). Set the EUT to the required channel.
- 4). Set the spectrum analyzer to start measurement.
- 5). Record the values. Vector Signal Analyzer

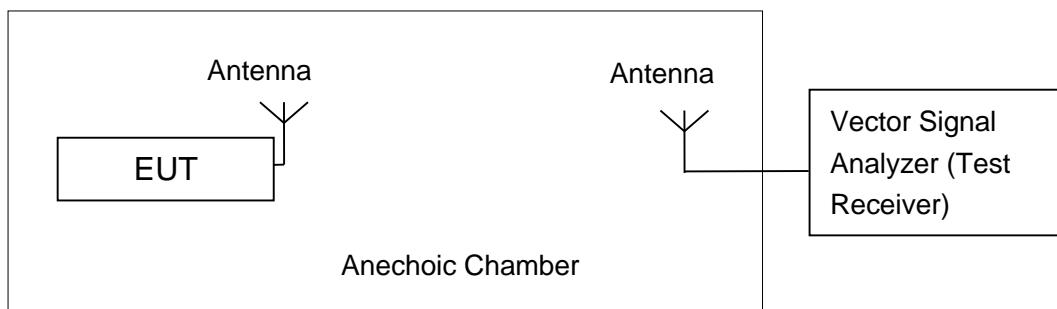


A.1.2. Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 10Hz;



The measurement is made according to KDB 789033

The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

A.2. Maximum output Power

Measurement Limit and Method:

Standard	Frequency (MHz)	Limit (dBm)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	24dBm
	5250MHz~5350MHz	24dBm or 11+10logB
	5470MHz~5725MHz	24dBm or 11+10logB

Limit use the less value, and B is the 26dB bandwidth.

The measurementmethod SA-1 is made according to KDB 789033

Measurement Results:

802.11a mode

Mode	Channel	Test Result (dBm)							
		Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
802.11a	5180MHz	/	/	/	14.96	/	/	/	/
	5200MHz	/	/	/	15.22	/	/	/	/
	5240MHz	15.78	15.68	15.57	16.03	15.67	15.12	14.87	14.71
	5260MHz	/	/	/	16.39	/	/	/	/
	5280MHz	/	/	/	16.46	/	/	/	/
	5320MHz	/	/	/	16.19	/	/	/	/
	5500MHz	/	/	/	15.92	/	/	/	/
	5580MHz	/	/	/	15.32	/	/	/	/
	5700MHz	/	/	/	16.49	/	/	/	/

The data rate 18Mbps Mbps is selected as worse condition, and the following cases are performed with this condition.

802.11n-HT20 mode

Mode	Channel	Test Result (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (HT20)	5180MHz	12.94	12.63	13.36	13.17	12.82	12.55	12.48	12.35
	5200MHz	/	/	13.62	/	/	/	/	/
	5240MHz	/	/	13.77	/	/	/	/	/
	5260MHz	/	/	13.88	/	/	/	/	/
	5280MHz	/	/	13.75	/	/	/	/	/
	5320MHz	/	/	13.73	/	/	/	/	/
	5500MHz	/	/	13.83	/	/	/	/	/
	5580MHz	/	/	14.11	/	/	/	/	/
	5700MHz	/	/	14.02	/	/	/	/	/

The data rate MCS2 is selected as worse condition, and the following cases are performed with this condition.

802.11ac-HT20 mode

Mode	Channel	Test Result (dBm)								
		Data Rate								
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
802.11ac (HT20)	5180MHz	9.98	9.67	10.43	10.22	9.78	9.58	9.50	9.35	9.15
	5200MHz	/	/	10.65	/	/	/	/	/	/
	5240MHz	/	/	10.99	/	/	/	/	/	/
	5260MHz	/	/	10.78	/	/	/	/	/	/
	5280MHz	/	/	10.86	/	/	/	/	/	/
	5320MHz	/	/	10.66	/	/	/	/	/	/
	5500MHz	/	/	10.96	/	/	/	/	/	/
	5580MHz	/	/	11.20	/	/	/	/	/	/
	5700MHz	/	/	11.01	/	/	/	/	/	/

The data rate MCS2 is selected as worse condition, and the following cases are performed with this condition.

802.11n-HT40 mode

Mode	Channel	Test Result (dBm)								
		Data Rate								
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	
802.11n (HT40)	5190MHz	13.33	13.05	12.80	12.61	12.79	12.38	12.29	12.12	
	5230MHz	13.56	/	/	/	/	/	/	/	
	5270MHz	13.55	/	/	/	/	/	/	/	
	5310MHz	13.42	/	/	/	/	/	/	/	
	5510MHz	13.48	/	/	/	/	/	/	/	
	5550MHz	13.49	/	/	/	/	/	/	/	
	5670MHz	14.31	/	/	/	/	/	/	/	

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

802.11ac-HT40 mode

Mode	Channel	Test Result (dBm)									
		Data Rate									
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
802.11ac (HT40)	5190MHz	10.12	9.83	9.57	9.32	9.57	9.33	9.22	9.04	8.89	8.67
	5230MHz	10.42	/	/	/	/	/	/	/	/	/
	5270MHz	10.40	/	/	/	/	/	/	/	/	/
	5310MHz	10.30	/	/	/	/	/	/	/	/	/
	5510MHz	10.26	/	/	/	/	/	/	/	/	/
	5550MHz	10.52	/	/	/	/	/	/	/	/	/
	5670MHz	11.08	/	/	/	/	/	/	/	/	/

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

802.11ac-HT80 mode

Mode	Channel	Test Result (dBm)									
		Data Rate									
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
802.11ac (HT80)	5210MHz	10.54	10.15	9.97	9.50	9.41	9.10	8.98	8.89	8.65	8.57
	5290MHz	10.59	/	/	/	/	/	/	/	/	/
	5530MHz	10.21	/	/	/	/	/	/	/	/	/
	5610MHz	11.23	/	/	/	/	/	/	/	/	/

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

A.3. Peak Power Spectral Density (conducted)

Measurement Limit:

Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC CRF Part 15.407(a)	5150MHz~5250MHz	11
	5250MHz~5350MHz	11
	5470MHz~5725MHz	11

The output power measurement method SA-1 is made according to KDB 789033

Measurement Results:

Mode	Channel	Power Spectral Density (dBm/MHz)	Conclusion
802.11a	5180 MHz	6.14	P
	5200 MHz	6.89	P
	5240 MHz	6.39	P
	5260 MHz	6.59	P
	5280 MHz	6.31	P
	5320 MHz	6.29	P
	5500 MHz	6.52	P
	5580 MHz	6.09	P
	5700 MHz	6.34	P
802.11n HT20	5180 MHz	5.54	P
	5200 MHz	5.32	P
	5240 MHz	5.47	P
	5260 MHz	5.38	P
	5280 MHz	5.36	P
	5320 MHz	5.29	P
	5500 MHz	5.25	P
	5580 MHz	5.43	P
	5700 MHz	5.65	P
802.11ac HT20	5180 MHz	2.37	P
	5200 MHz	2.37	P
	5240 MHz	2.79	P
	5260 MHz	2.36	P
	5280 MHz	2.34	P
	5320 MHz	2.20	P
	5500 MHz	2.40	P
	5580 MHz	2.60	P
	5700 MHz	2.33	P
802.11n HT40	5190 MHz	1.98	P
	5230 MHz	2.00	P
	5270 MHz	1.92	P
	5310 MHz	1.84	P

	5510 MHz	1.70	P
	5550 MHz	1.74	P
	5670 MHz	2.57	P
802.11ac HT40	5190 MHz	-1.35	P
	5230 MHz	-1.24	P
	5270 MHz	-1.39	P
	5310 MHz	-1.38	P
	5510 MHz	-1.49	P
	5550 MHz	-1.36	P
	5670 MHz	-0.51	P
	5210MHz	-3.16	P
802.11ac HT80	5290MHz	-3.51	P
	5530MHz	-3.71	P
	5610MHz	-2.74	P

Conclusion: PASS

A.4. Occupied 26dB Bandwidth(conducted)

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.403 (i)	/

The measurement is made according to KDB 789033

Measurement Uncertainty:

Measurement Uncertainty	60.80Hz
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Measurement Result:

Mode	Channel	Occupied 26dB Bandwidth (MHz)	conclusion
802.11a	5180 MHz	Fig.1	22.10
	5200 MHz	Fig.2	22.20
	5240 MHz	Fig.3	22.65
	5260 MHz	Fig.4	22.60
	5280 MHz	Fig.5	23.20
	5320 MHz	Fig.6	22.70
	5500 MHz	Fig.7	22.00
	5580 MHz	Fig.8	22.00
	5700 MHz	Fig.9	22.65
802.11n HT20	5180 MHz	Fig.10	23.15
	5200 MHz	Fig.11	23.35
	5240 MHz	Fig.12	23.95
	5260 MHz	Fig.13	23.75
	5280 MHz	Fig.14	23.25
	5320 MHz	Fig.15	25.80
	5500 MHz	Fig.16	23.15
	5580 MHz	Fig.17	25.50
	5700 MHz	Fig.18	23.10

802.11ac HT20	5180 MHz	Fig.19	22.80	P
	5200 MHz	Fig.20	22.90	P
	5240 MHz	Fig.21	23.25	P
	5260 MHz	Fig.22	23.55	P
	5280 MHz	Fig.23	22.75	P
	5320 MHz	Fig.24	22.75	P
	5500 MHz	Fig.25	22.85	P
	5580 MHz	Fig.26	23.00	P
	5700 MHz	Fig.27	24.75	P

802.11n HT40	5190 MHz	Fig.28	41.76	P
	5230 MHz	Fig.29	41.84	P
	5270 MHz	Fig.30	41.84	P
	5310 MHz	Fig.31	41.84	P
	5510 MHz	Fig.32	41.60	P
	5550 MHz	Fig.33	41.60	P
	5670 MHz	Fig.34	41.92	P

802.11ac HT40	5190 MHz	Fig.35	41.68	P
	5230 MHz	Fig.36	41.76	P
	5270 MHz	Fig.37	41.68	P
	5310 MHz	Fig.38	41.60	P
	5510 MHz	Fig.39	41.60	P
	5550 MHz	Fig.40	41.84	P
	5670 MHz	Fig.41	41.76	P

802.11ac HT80	5210MHz	Fig.42	84.16	P
	5290MHz	Fig.43	84.48	P
	5530MHz	Fig.44	84.32	P
	5610MHz	Fig.45	84.32	P

Conclusion: PASS

Test graphs as below:



Fig. 1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

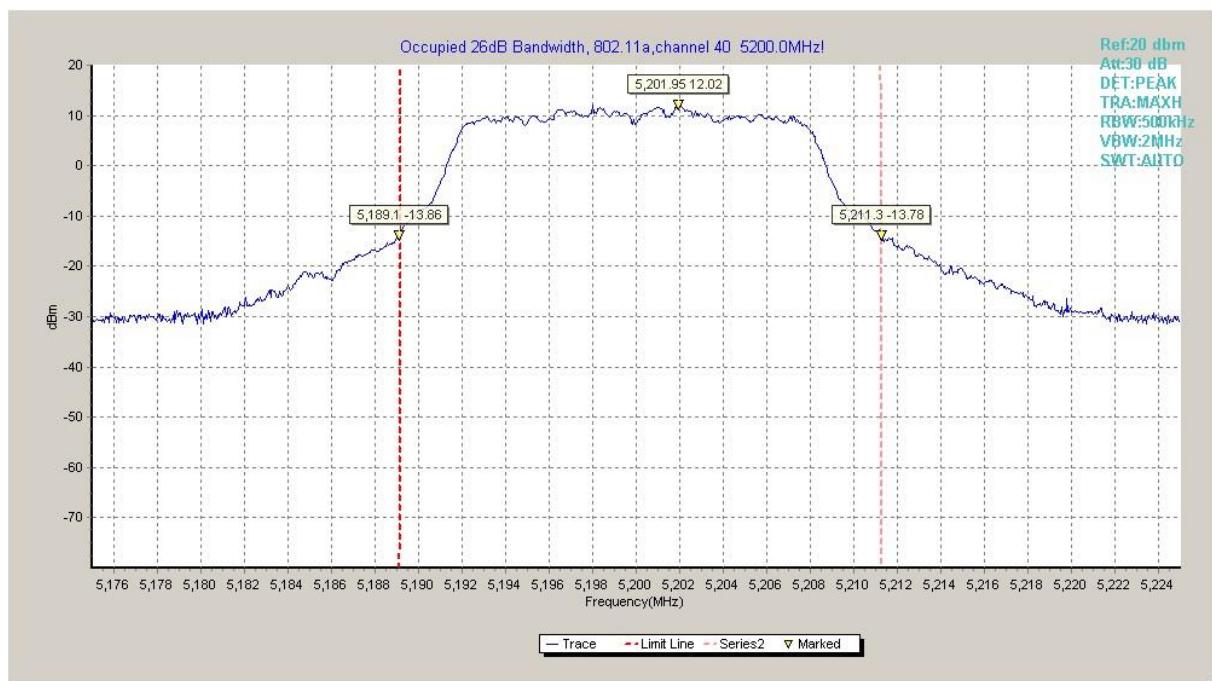

Fig. 2 Occupied 26dB Bandwidth (802.11a, 5200MHz)

Fig. 3
Occupied 26dB Bandwidth (802.11a, 5240MHz)



Fig. 4

Occupied 26dB Bandwidth (802.11a, 5260MHz)

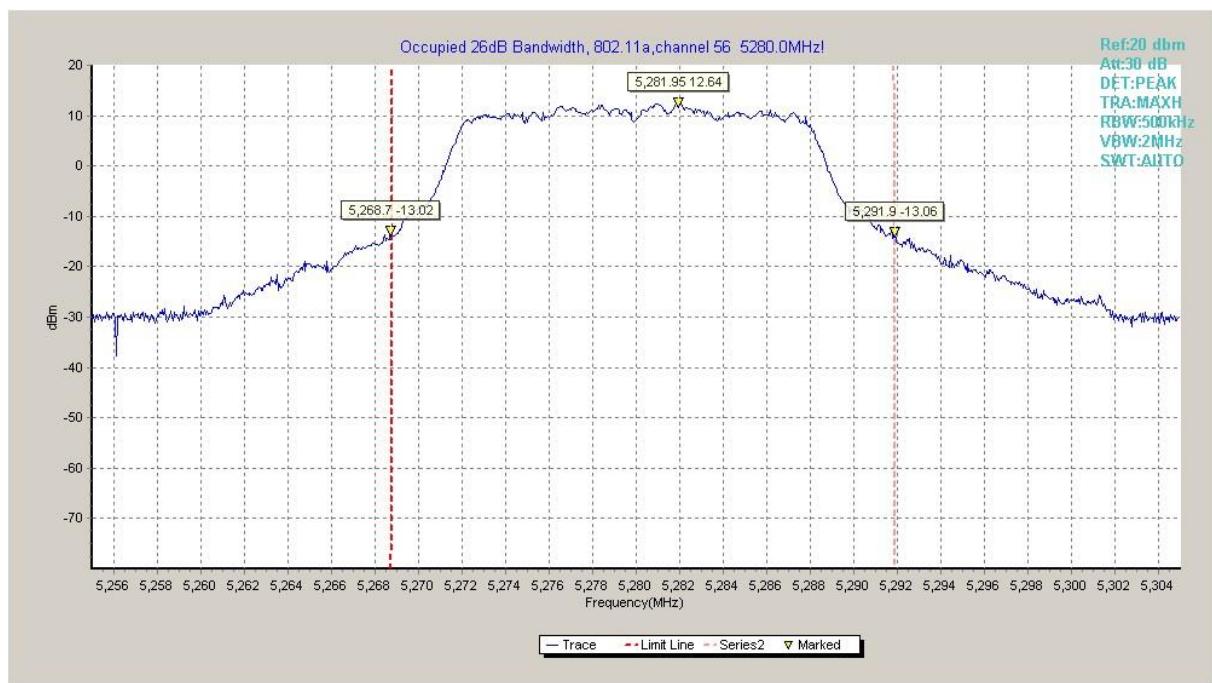


Fig. 5

Occupied 26dB Bandwidth (802.11a, 5280MHz)



Fig. 6

Occupied 26dB Bandwidth (802.11a, 5320MHz)

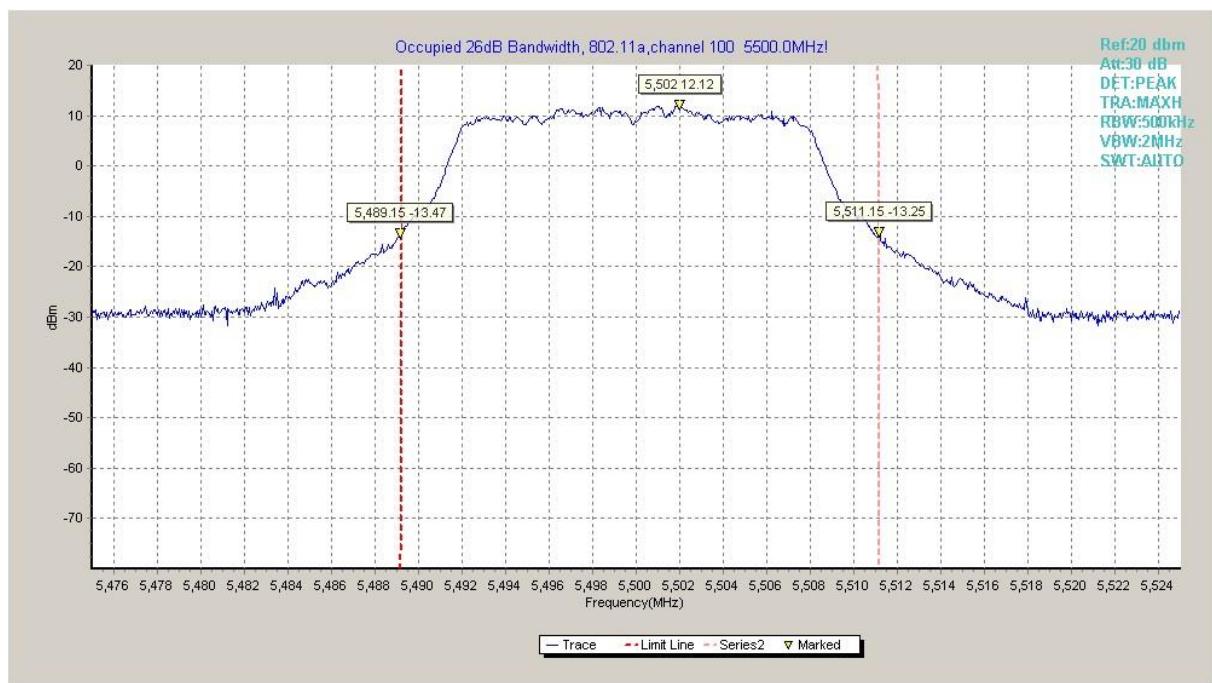


Fig. 7

Occupied 26dB Bandwidth (802.11a, 5500MHz)

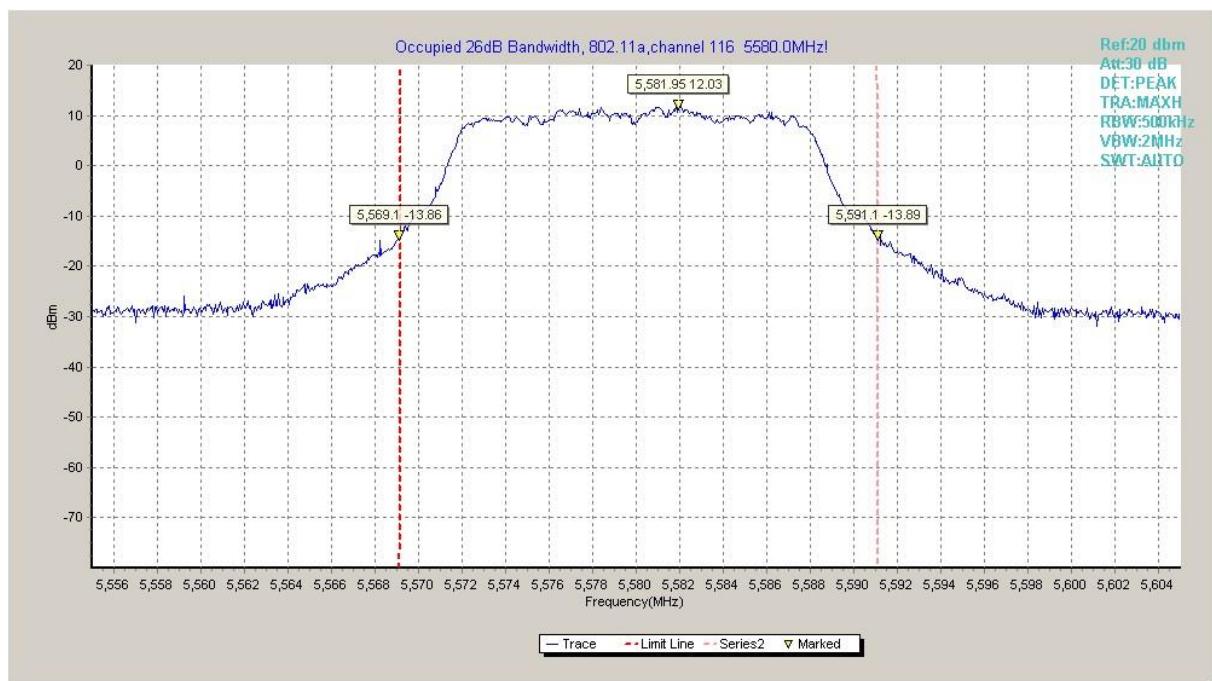


Fig. 8

Occupied 26dB Bandwidth (802.11a, 5580MHz)



Fig. 9

Occupied 26dB Bandwidth (802.11a, 5700MHz)

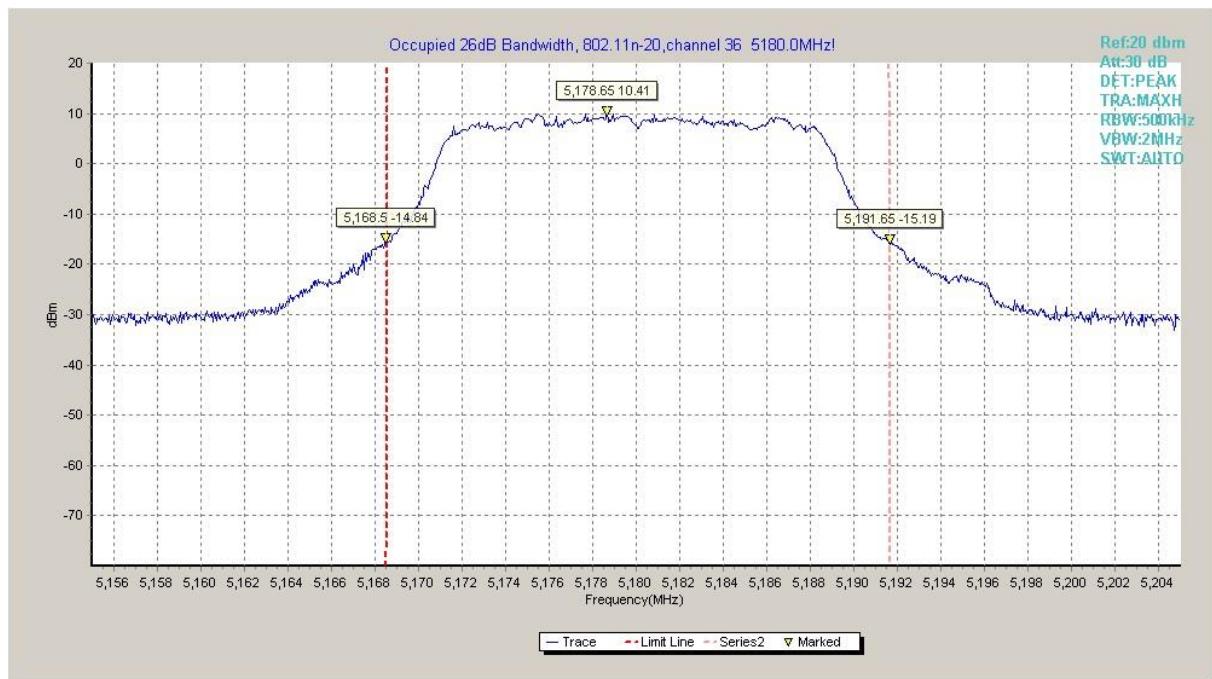


Fig. 10 Occupied 26dB Bandwidth (802.11n-HT20, 5180MHz)

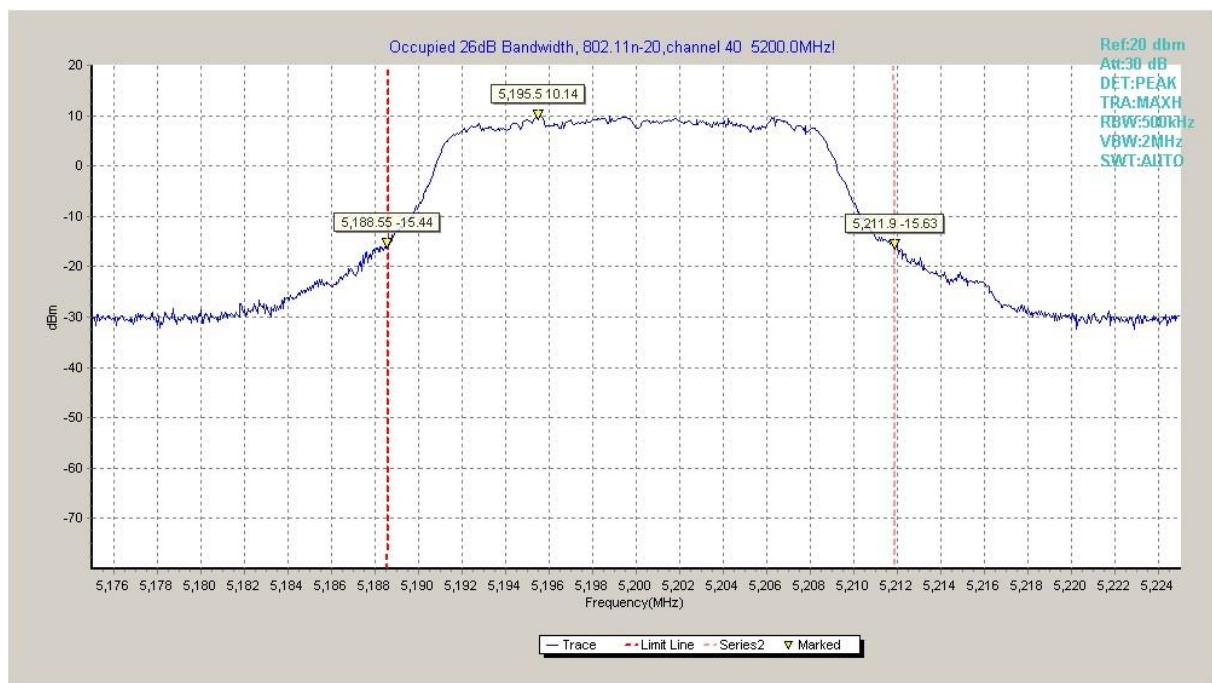


Fig. 11 Occupied 26dB Bandwidth (802.11n-HT20, 5200MHz)



Fig. 12 Occupied 26dB Bandwidth (802.11n-HT20, 5240MHz)

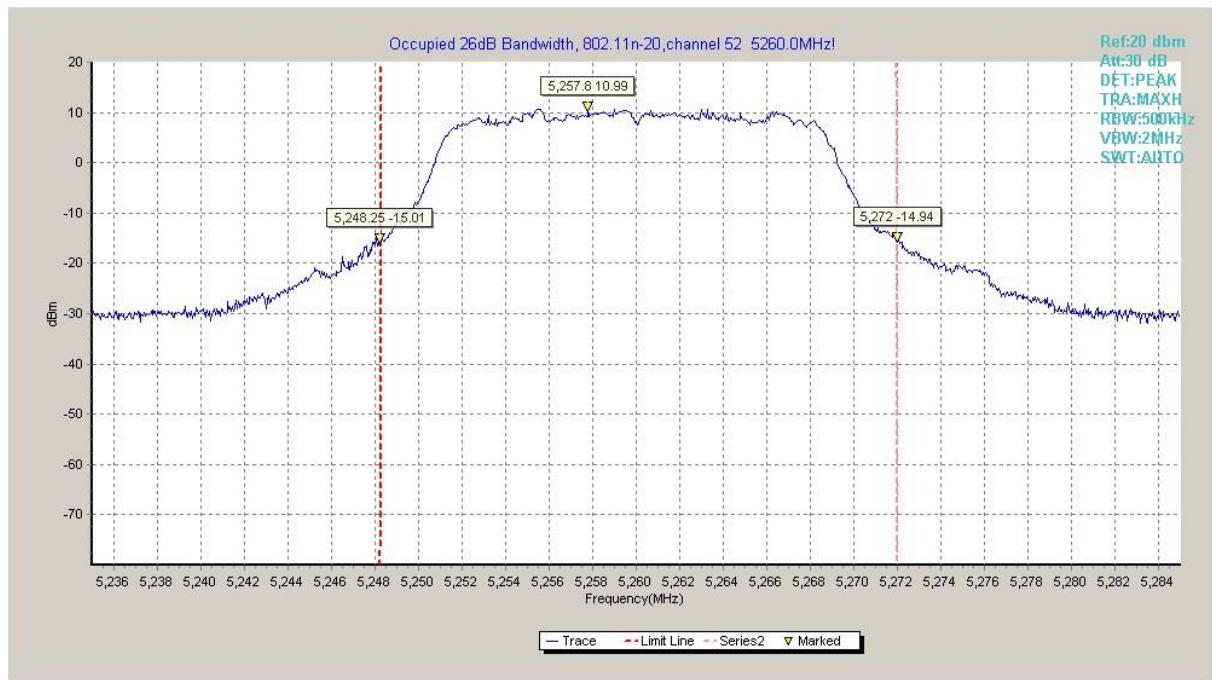


Fig. 13 Occupied 26dB Bandwidth (802.11n-HT20, 5260MHz)



Fig. 14 Occupied 26dB Bandwidth (802.11n-HT20, 5280MHz)



Fig. 15 Occupied 26dB Bandwidth (802.11n-HT20, 5320MHz)



Fig. 16
Occupied 26dB Bandwidth (802. 11n-HT20, 5500MHz)

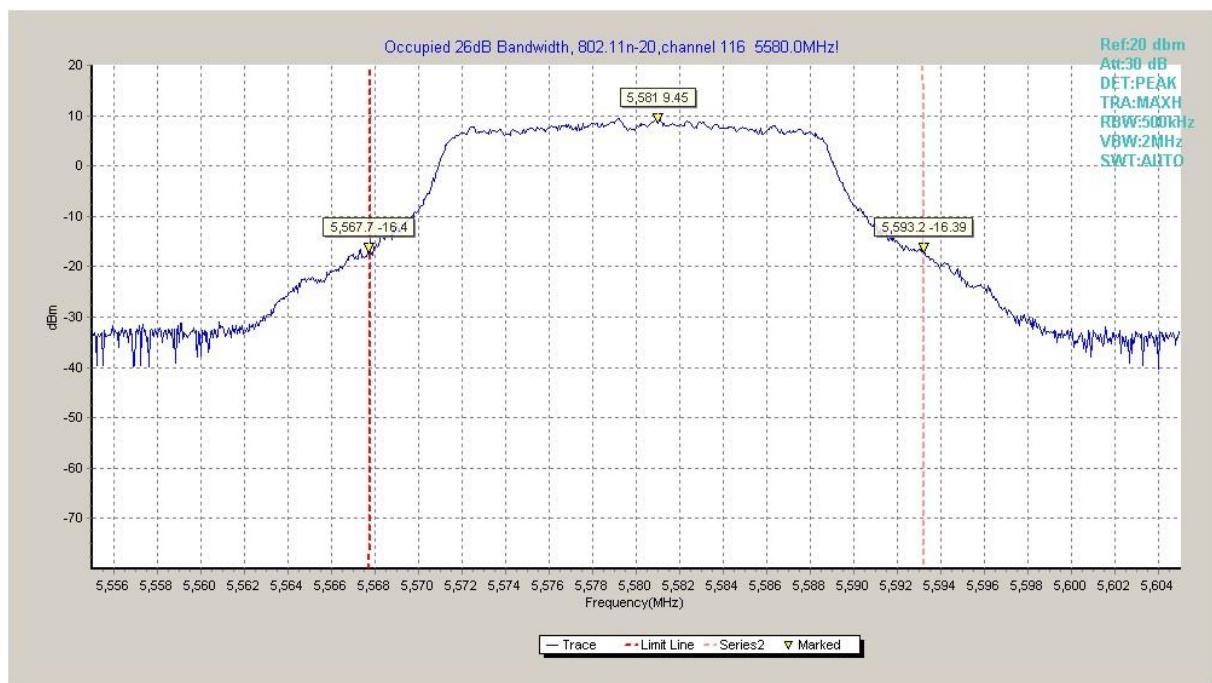


Fig. 17
Occupied 26dB Bandwidth (802. 11n-HT20, 5580MHz)

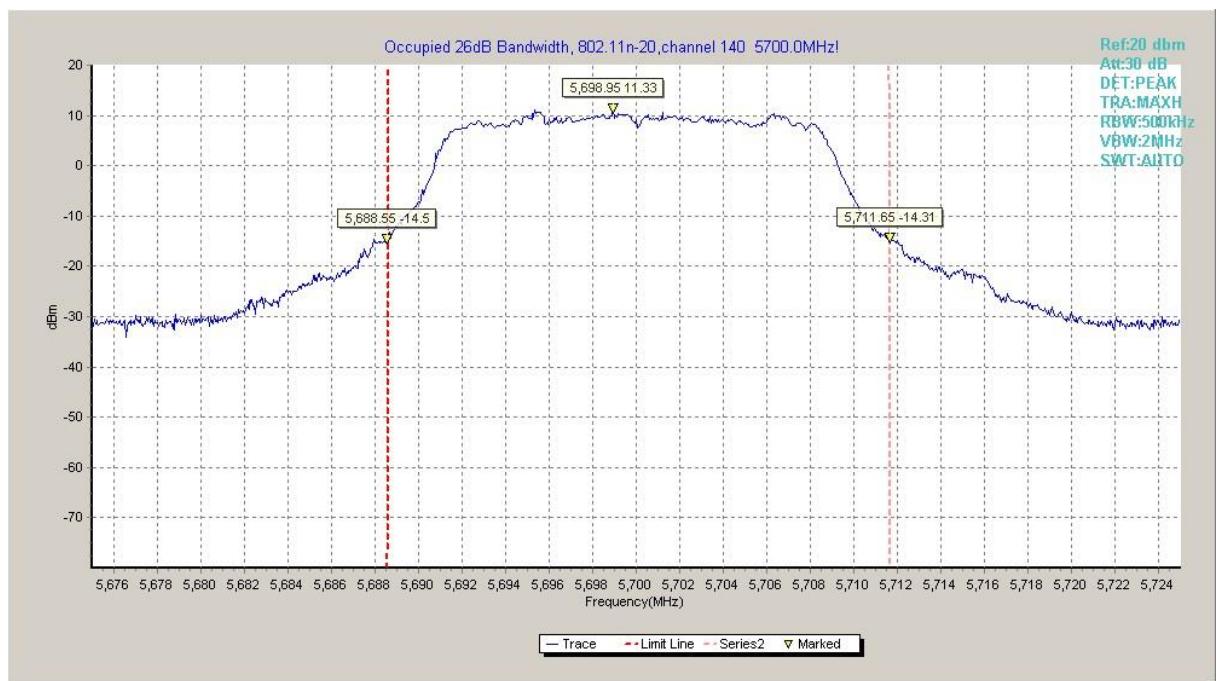
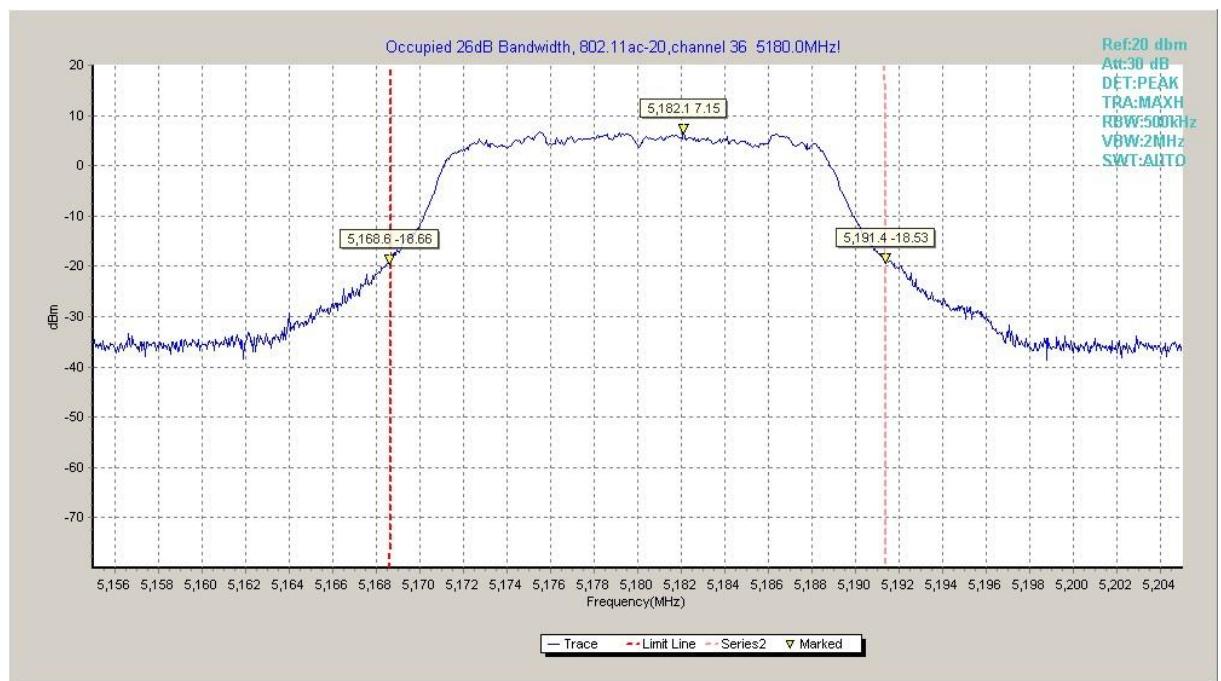
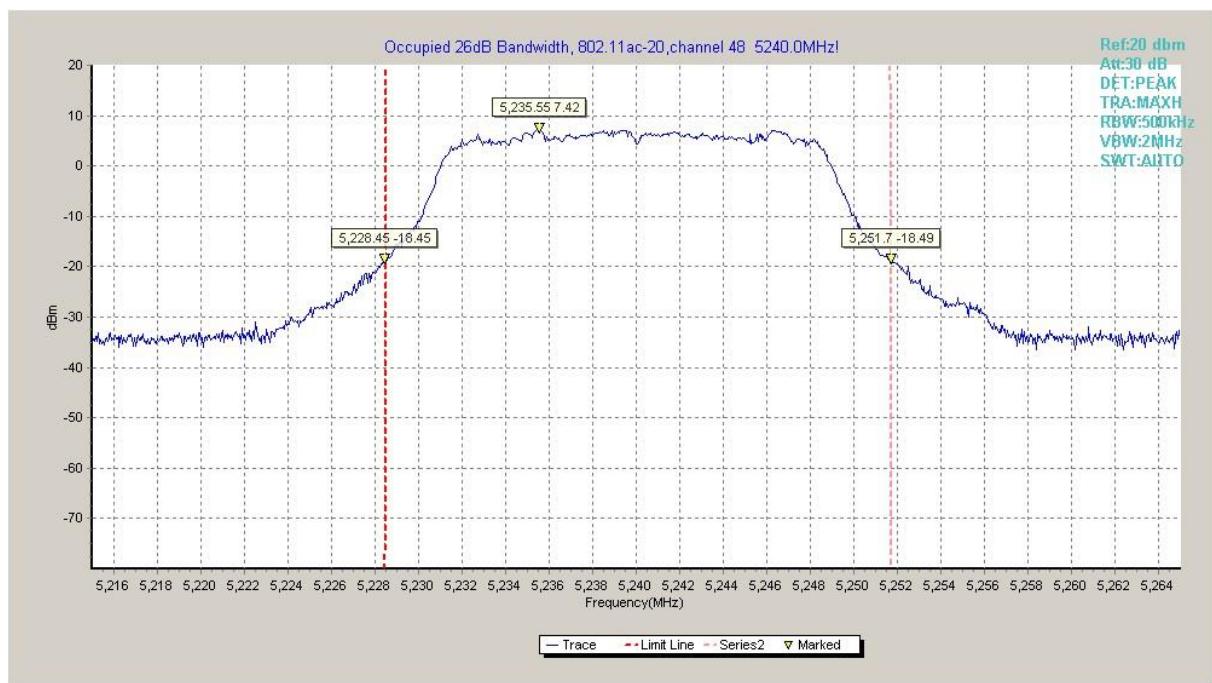

Fig. 18 Occupied 26dB Bandwidth (802. 11n-HT20, 5700MHz)

Fig. 19 Occupied 26dB Bandwidth (802.11ac-HT20, 5180MHz)


Fig. 20
Occupied 26dB Bandwidth (802.11ac-HT20, 5200MHz)

Fig. 21
Occupied 26dB Bandwidth (802.11ac-HT20, 5240MHz)

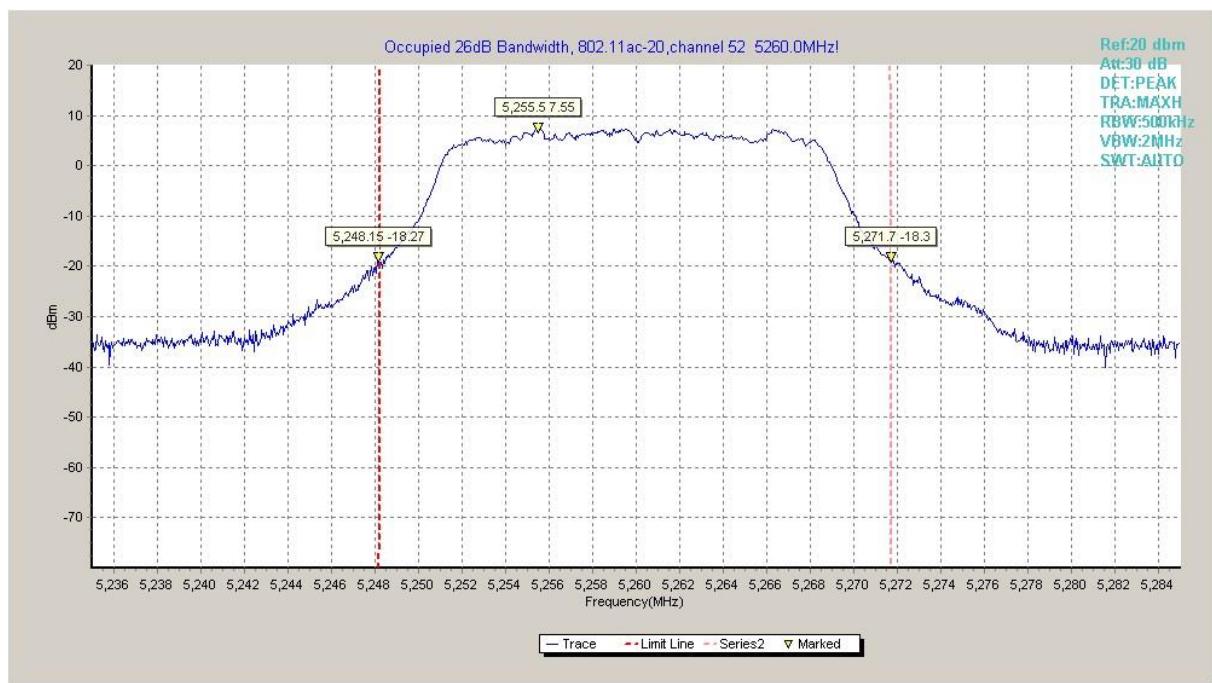

Fig. 22
Occupied 26dB Bandwidth (802.11ac-HT20, 5260MHz)

Fig. 23
Occupied 26dB Bandwidth (802.11ac-HT20, 5280MHz)

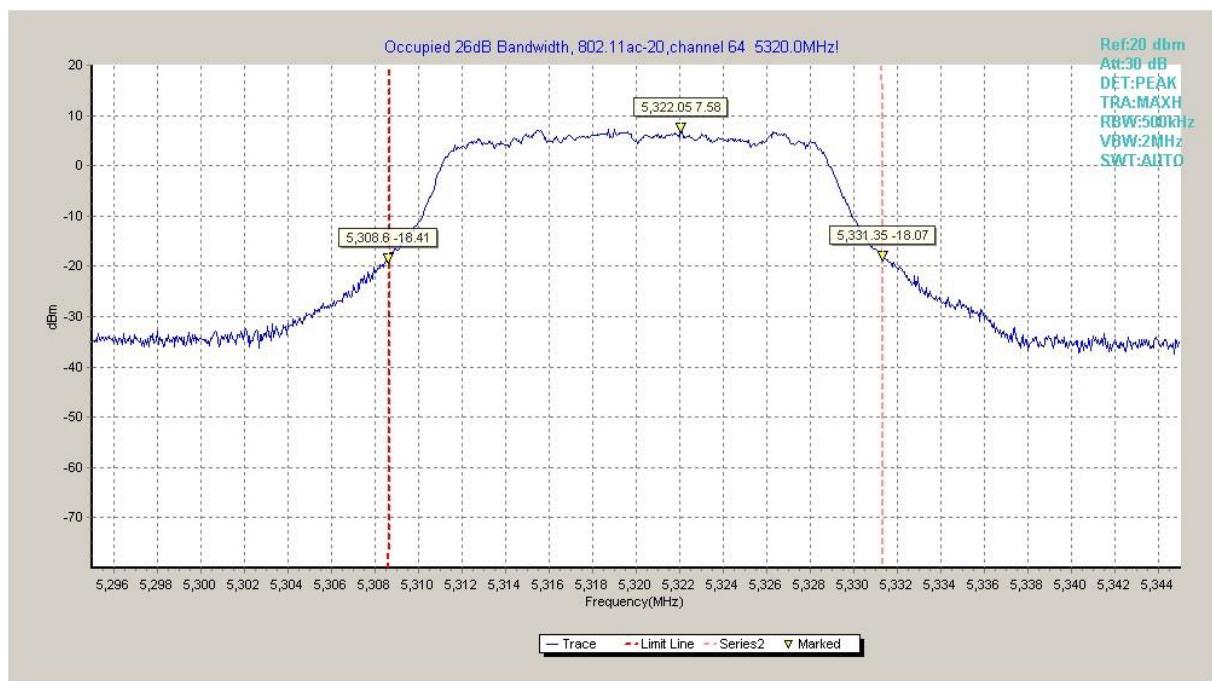


Fig. 24 Occupied 26dB Bandwidth (802.11ac-HT20, 5320MHz)

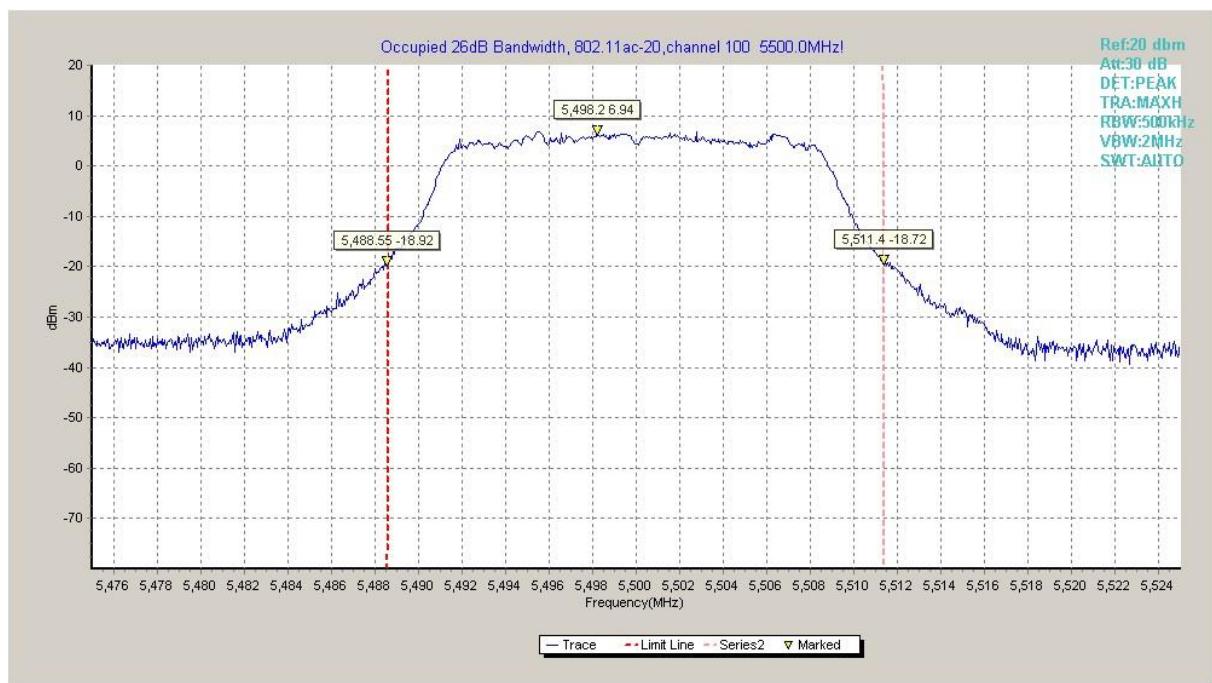
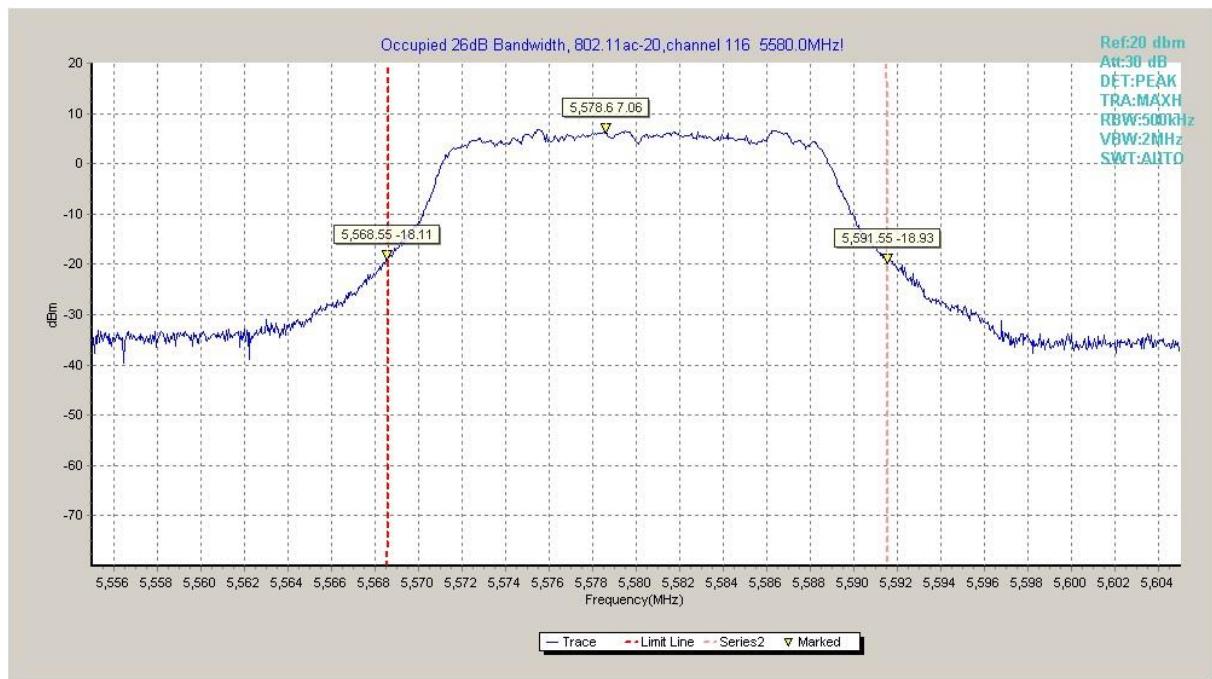
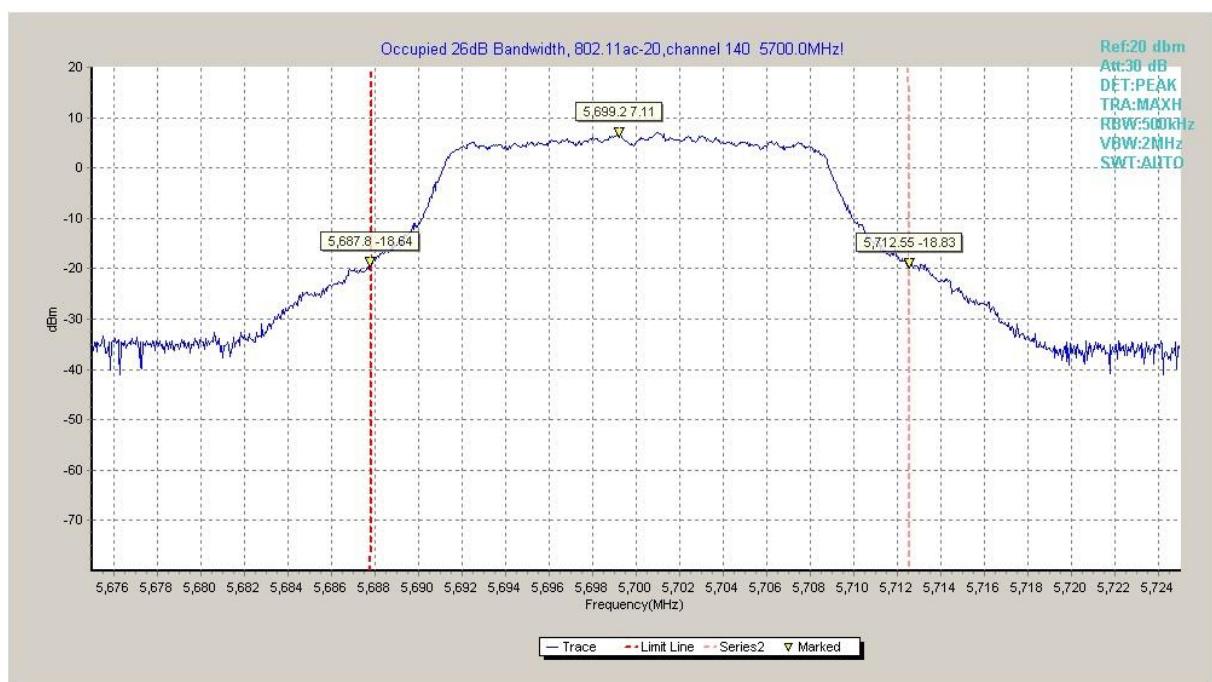


Fig. 25 Occupied 26dB Bandwidth (802.11ac-HT20, 5500MHz)


Fig. 26
Occupied 26dB Bandwidth (802. 11ac-HT20, 5580MHz)

Fig. 27
Occupied 26dB Bandwidth (802. 11ac-HT20, 5700MHz)

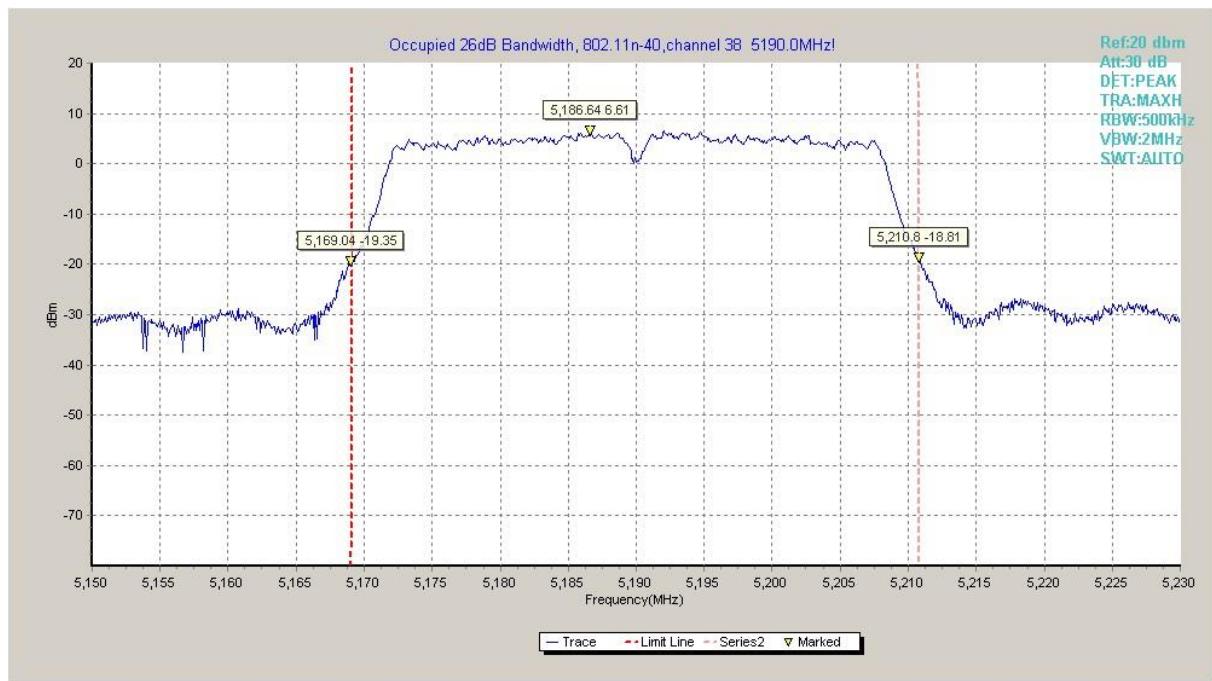

Fig. 28 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

Fig. 29 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)



Fig. 30 Occupied 26dB Bandwidth (802.11n-HT40, 5270MHz)



Fig. 31 Occupied 26dB Bandwidth (802.11n-HT40, 5310MHz)

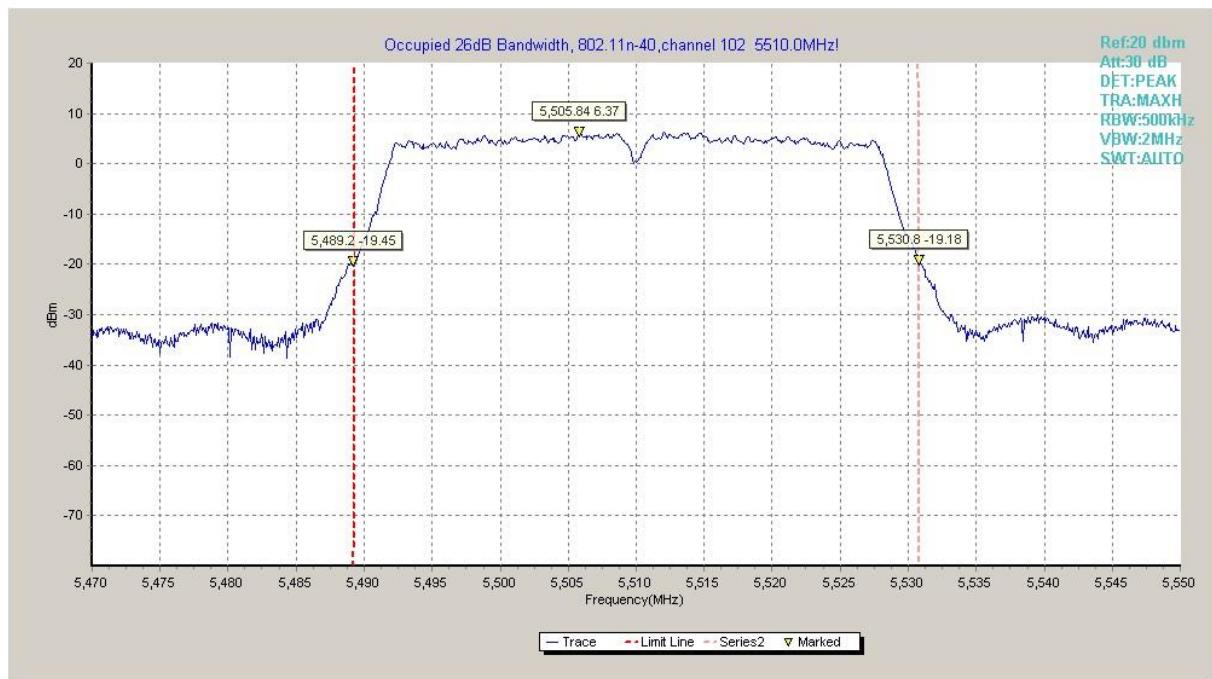


Fig. 32 Occupied 26dB Bandwidth (802. 11n-HT40, 5510MHz)

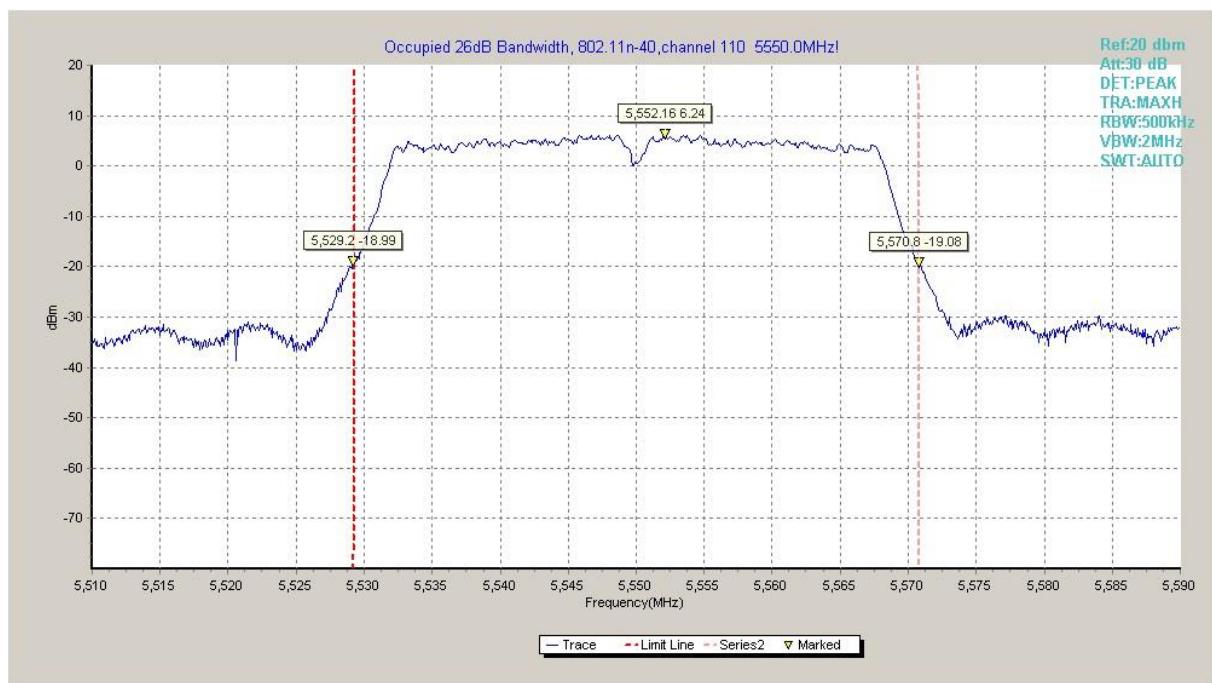


Fig. 33 Occupied 26dB Bandwidth (802. 11n-HT40, 5590MHz)

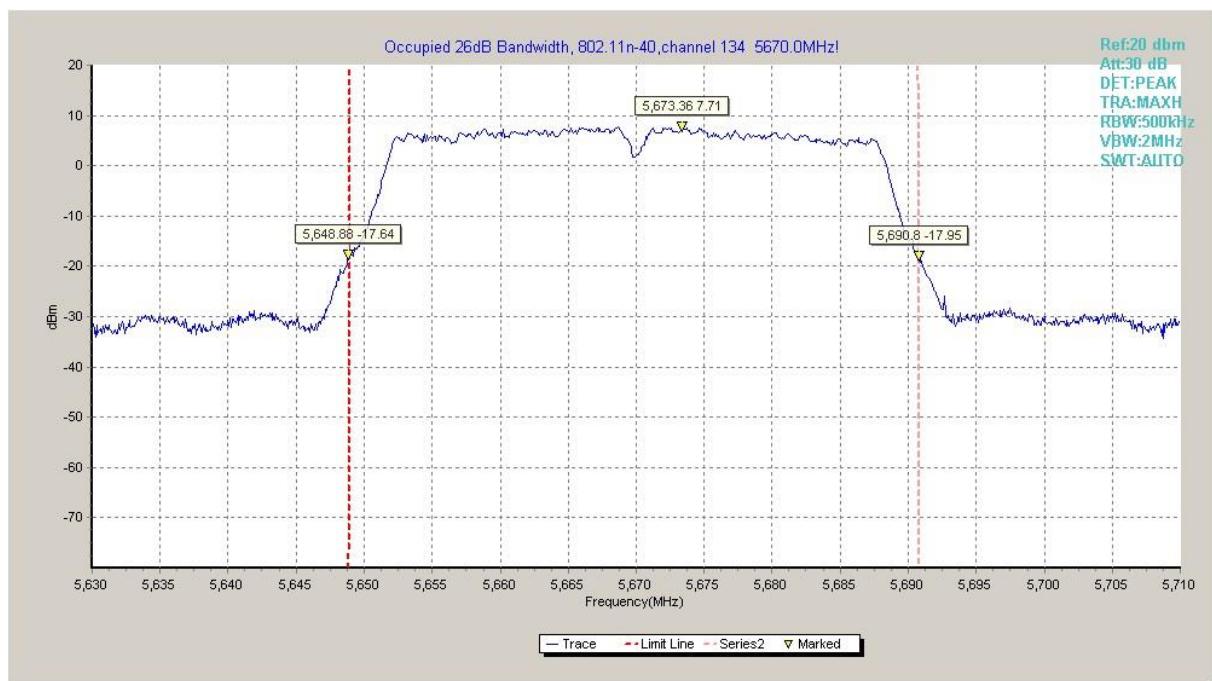


Fig. 34 Occupied 26dB Bandwidth (802.11n-HT40, 5670MHz)

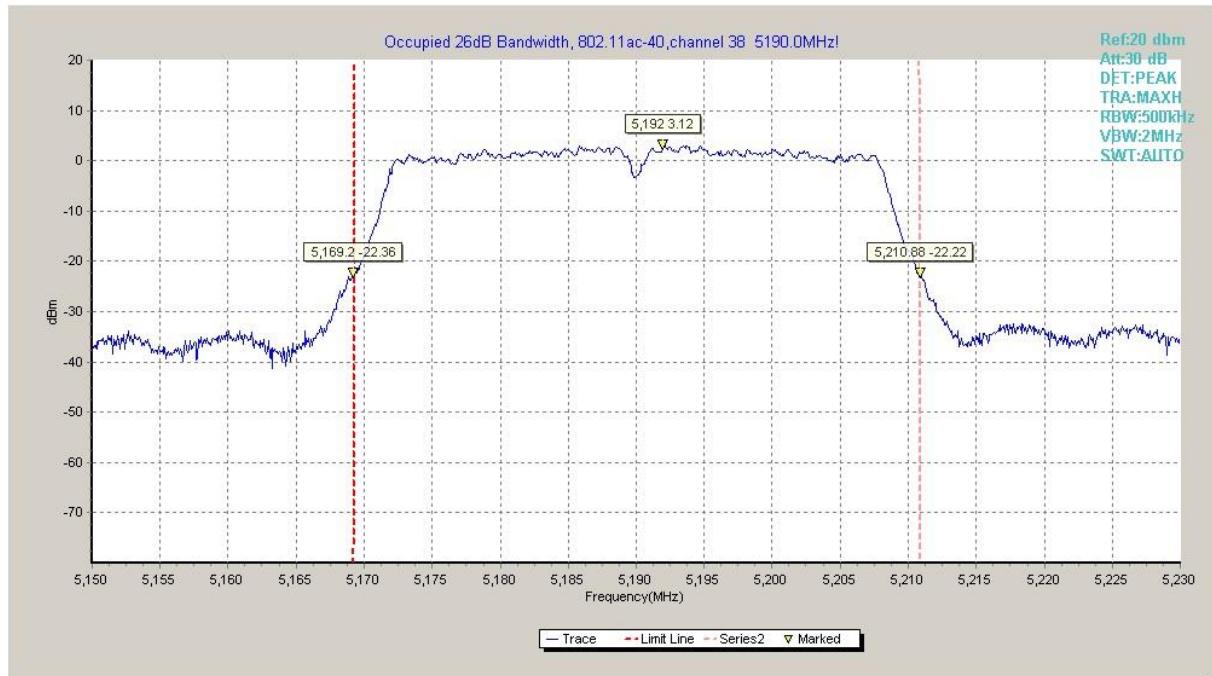


Fig. 35 Occupied 26dB Bandwidth (802.11ac-HT40, 5190MHz)

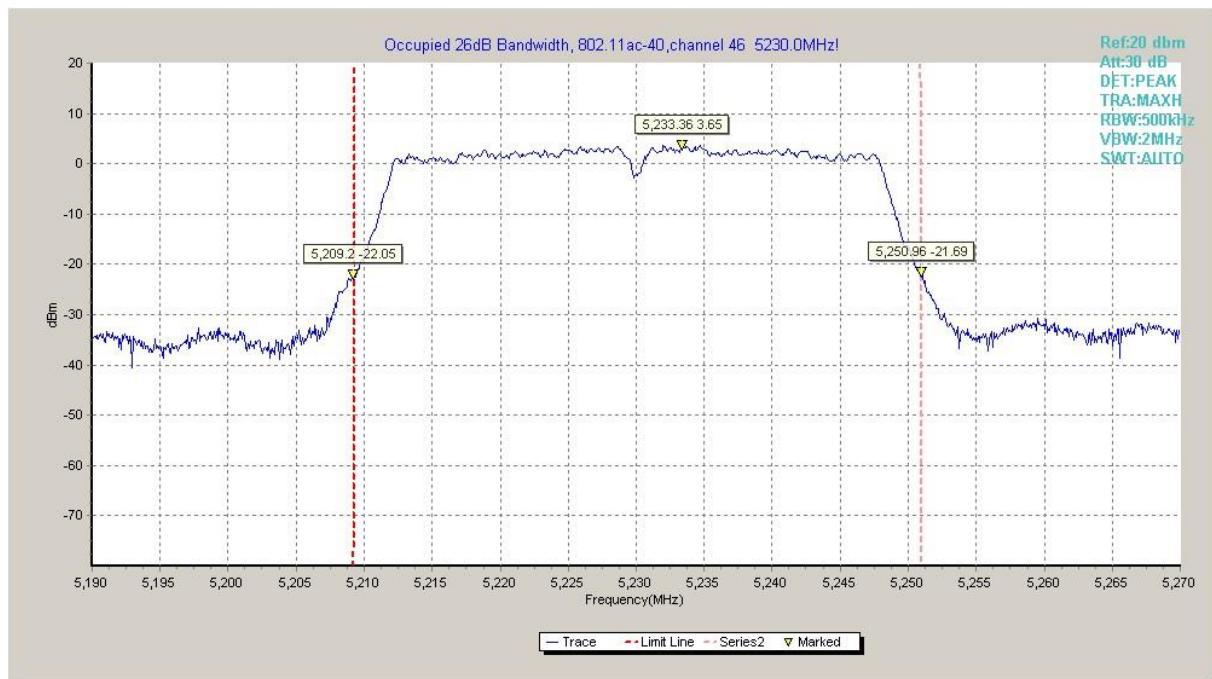


Fig. 36 Occupied 26dB Bandwidth (802.11ac-HT40, 5230MHz)

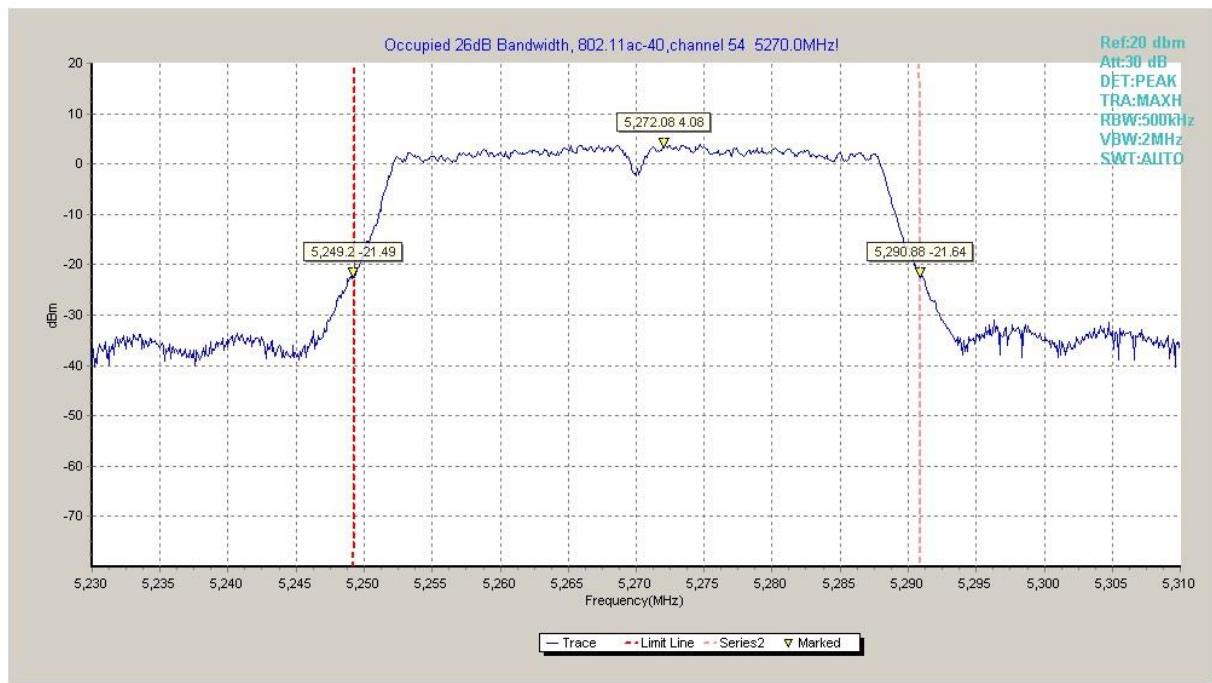


Fig. 37 Occupied 26dB Bandwidth (802.11ac-HT40, 5270MHz)