FCC PART 15
TEST REPORT
No. I18Z60070-IOT07

for

TCL Communication Ltd.

GSM Quad-band/HSPA-UMTS Six-band/ LTE 20-band mobile phone

BBF100-2

With

FCC ID: 2ACCJN025

Hardware Version: 09

Software Version: 4S3L

Issued Date: 2018-05-08

TESTING
NVLAP LAB CODE 600118-0

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S.Government.

Test Laboratory:

CTTL, Telecommunication Technology Labs, CAICT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

©Copyright. All rights reserved by CTTL.

REPORT HISTORY

Report Number	Revision	Description	Issue Date
I18Z60070-IOT07	Rev.0	1st edition	2018-05-08

©Copyright. All rights reserved by CTTL.

CONTENTS

CONTENTS 3

1. TEST LATORATORY 7

1.1. TESTINGLOCATION 7

1.2. TESTINGENVIRONMENT 7

1.3. PROJECT DATA 7

1.4. SIGNATURE 8

2. CLIENT INFORMATION 9

2.1. APPLICANT INFORMATION 9

2.2. MANUFACTURER INFORMATION 9

3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARYEQUIPMENT(AE) 10

3.1. ABOUT EUT 10
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST 10
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST 10
3.4. GENERAL DESCRIPTION 11

3.5. INTERPRETATION OF THE TEST ENVIRONMENT 11

4. REFERENCE DOCUMENTS 11

4.1. DOCUMENTS SUPPLIED BY APPLICANT 11
4.2. REFERENCE DOCUMENTS FOR TESTING 11

5. LABORATORY ENVIRONMENT 11

6. SUMMARY OF TEST RESULTS 12

6.1. SUMMARY OF TEST RESULTS 12
6.2. STATEMENTS 12
6.3. TEST CONDITIONS 12

7. TEST EQUIPMENTS UTILIZED 13

8. MEASUREMENT UNCERTAINTY 14

8.1. TRANSMITTER OUTPUT POWER 14

8.2. PEAK POWER SPECTRAL DENSITY 14

8.3. OCCUPIED CHANNEL BANDWIDTH 14

8.4. BAND EDGES COMPLIANCE 14

8.5. SPURIOUS EMISSIONS 14

ANNEX A: MEASUREMENT RESULTS 15

A.1. MEASUREMENT METHOD 15

©Copyright. All rights reserved by CTTL.

A.2. MAXIMUM OUTPUT POWER 16
A.3. PEAK POWER SPECTRAL DENSITY (CONDUCTED) 18
A.4. OCCUPIED 26DB BANDWIDTH(CONDUCTED) 20
FIG. 1 OCCUPIED 26DB BANDWIDTH (802.11A, 5180MHZ) 21
FIG. 2 OCCUPIED 26DB BANDWIDTH (802.11A, 5200MHZ) 22
FIG. 3 OCCUPIED 26DB BANDWIDTH (802.11A, 5240MHZ) 22
FIG. 4 OCCUPIED 26DB BANDWIDTH (802.11A, 5260MHZ) 23
FIG. 5 OCCUPIED 26DB BANDWIDTH (802.11A, 5280MHZ) 23
FIG. 6 OCCUPIED 26DB BANDWIDTH (802.11A, 5320MHZ) 24
FIG. 7 OCCUPIED 26DB BANDWIDTH (802.11A, 5500MHZ) 24
FIG. 8 OCCUPIED 26DB BANDWIDTH (802.11A, 5580MHZ) 25
FIG. 9 OCCUPIED 26DB BANDWIDTH (802.11A, 5700MHZ) 25
FIG. 10 OCCUPIED 26DB BANDWIDTH (802.11N-HT20, 5180MHZ) 26
FIG. 11 OCCUPIED 26DB BANDWIDTH (802.11N-HT20, 5200MHZ) 26
FIG. 12 OCCUPIED 26DB BANDWIDTH (802.11N-HT20, 5240MHZ) 27
FIG. 13 OCCUPIED 26DB BANDWIDTH (802.11N-HT20, 5260MHZ) 27
FIG. 14 OCCUPIED 26DB BANDWIDTH (802.11N-HT20, 5280MHZ) 28
FIG. 15 OCCUPIED 26DB BANDWIDTH (802.11N-HT20, 5320MHZ) 28
FIG. 16 OCCUPIED 26DB BANDWIDTH (802. 11N-HT20, 5500MHZ) 29
FIG. 17 OCCUPIED 26DB BANDWIDTH (802. 11N-HT20, 5580MHZ) 29
FIG. 18 OCCUPIED 26DB BANDWIDTH (802. 11N-HT20, 5700MHZ) 30
FIG. 19 OCCUPIED 26DB BANDWIDTH (802.11AC-HT20, 5180MHZ) 30
FIG. 20 OCCUPIED 26DB BANDWIDTH (802.11AC-HT20, 5200MHZ) 31
FIG. 21 OCCUPIED 26DB BANDWIDTH (802.11AC-HT20, 5240MHZ) 31
FIG. 22 OCCUPIED 26DB BANDWIDTH (802.11AC-HT20, 5260MHZ) 32
FIG. 23 OCCUPIED 26DB BANDWIDTH (802.11AC-HT20, 5280MHZ) 32
FIG. 24 OCCUPIED 26DB BANDWIDTH (802.11AC-HT20, 5320MHZ) 33
FIG. 25 OCCUPIED 26DB BANDWIDTH (802. 11AC-HT20, 5500MHZ) 33
FIG. 26 OCCUPIED 26DB BANDWIDTH (802. 11AC-HT20, 5580MHZ) 34
FIG. 27 OCCUPIED 26DB BANDWIDTH (802. 11AC-HT20, 5700MHZ) 34
FIG. 28 OCCUPIED 26DB BANDWIDTH (802.11N-HT40, 5190MHZ) 35
FIG. 29 OCCUPIED 26DB BANDWIDTH (802.11N-HT40, 5230MHZ) 35
FIG. 30 OCCUPIED 26DB BANDWIDTH (802.11N-HT40, 5270MHZ) 36
FIG. 31 OCCUPIED 26DB BANDWIDTH (802.11N-HT40, 5310MHZ) 36
FIG. 32 OCCUPIED 26DB BANDWIDTH (802. 11N-HT40, 5510MHZ) 37
FIG. 33 OCCUPIED 26DB BANDWIDTH (802. 11N-HT40, 5550MHZ) 37
FIG. 34 OCCUPIED 26DB BANDWIDTH (802. 11N-HT40, 5670MHZ) 38
FIG. 35 OCCUPIED 26DB BANDWIDTH (802.11AC-HT40, 5190MHZ) 38
FIG. 36 OCCUPIED 26DB BANDWIDTH (802.11AC-HT40, 5230MHZ) 39
FIG. 37 OCCUPIED 26DB BANDWIDTH (802.11AC-HT40, 5270MHZ) 39
FIG. 38 OCCUPIED 26DB BANDWIDTH (802.11AC-HT40, 5310MHZ) 40
FIG. 39 OCCUPIED 26DB BANDWIDTH (802. 11AC-HT40, 5510MHZ) 40
FIG. 40 OCCUPIED 26DB BANDWIDTH (802. 11AC-HT40, 5550MHZ) 41
FIG. 41 OCCUPIED 26DB BANDWIDTH (802. 11AC-HT40, 5670MHZ) 41

©Copyright. All rights reserved by CTTL.

FIG. 42 OCCUPIED 26DB BANDWIDTH (802. 11AC-HT80, 5210MHZ)..... 42
FIG. 43 OCCUPIED 26DB BANDWIDTH (802. 11AC-HT80, 5290MHZ)..... 42
FIG. 44 OCCUPIED 26DB BANDWIDTH (802. 11AC-HT80, 5530MHZ)..... 43
FIG. 45 OCCUPIED 26DB BANDWIDTH (802. 11AC-HT80, 5610MHZ)..... 43
A.5. BAND EDGES COMPLIANCE 44
A5.1 BAND EDGES - RADIATED..... 44
FIG. 46 BAND EDGES (802.11A, 5180MHZ) 45
FIG. 47 BAND EDGES (802.11A, 5320MHZ) 45
FIG. 48 BAND EDGES (802.11A, 5500MHZ) 46
FIG. 49 BAND EDGES (802.11A, 5700MHZ) 46
FIG. 50 BAND EDGES (802.11N-HT20, 5180MHZ)..... 47
FIG. 51 BAND EDGES (802.11N-HT20, 5320MHZ)..... 47
FIG. 52 BAND EDGES (802.11N-HT20, 5500MHZ)..... 48
FIG. 53 BAND EDGES (802.11N-HT20, 5700MHZ)..... 48
FIG. 54 BAND EDGES (802.11N-HT40, 5190MHZ)..... 49
FIG. 55 BAND EDGES (802.11N-HT40, 5310MHZ)..... 49
FIG. 56 BAND EDGES (802.11N-HT40, 5510MHZ)..... 50
FIG. 57 BAND EDGES (802.11N-HT40, 5670MHZ)..... 50
FIG. 58 BAND EDGES (802.11AC-HT20, 5180MHZ)..... 51
FIG. 59 BAND EDGES (802.11AC-HT20, 5320MHZ)..... 51
FIG. 60 BAND EDGES (802.11AC-HT20, 5500MHZ)..... 52
FIG. 61 BAND EDGES (802.11AC-HT20, 5700MHZ)..... 52
FIG. 62 BAND EDGES (802.11AC-HT40, 5190MHZ)..... 53
FIG. 63 BAND EDGES (802.11AC-HT40, 5310MHZ)..... 53
FIG. 64 BAND EDGES (802.11AC-HT40, 5510MHZ)..... 54
FIG. 65 BAND EDGES (802.11AC-HT40, 5670MHZ)..... 54
FIG. 66 BAND EDGES (802.11AC-HT80, 5210MHZ)..... 55
FIG. 67 BAND EDGES (802.11AC-HT80, 5290MHZ)..... 55
FIG. 68 BAND EDGES (802.11AC-HT80, 5530MHZ)..... 56
A.6. TRANSMITTER SPURIOUS EMISSION 57
A.7. SPURIOUS EMISSIONS RADIATED (150KHZ- 30MHZ)..... 87
FIG. 69 CONDUCTED EMISSION(802.11A, CH40, TX)..... 88
FIG. 70 CONDUCTED EMISSION(802.11A, IDLE)..... 89
A.8. 99% OCCUPIED BANDWIDTH 90
FIG. 71 99% OCCUPIED BANDWIDTH (802.11A, 5180MHZ) 91
FIG. 72 99% OCCUPIED BANDWIDTH (802.11A, 5200MHZ) 92
FIG. 73 99% OCCUPIED BANDWIDTH (802.11A, 5240MHZ) 92
FIG. 74 99% OCCUPIED BANDWIDTH (802.11N-HT20, 5180MHZ)..... 93
FIG. 75 99% OCCUPIED BANDWIDTH (802.11N-HT20, 5200MHZ)..... 93
FIG. 76 99% OCCUPIED BANDWIDTH (802.11N-HT20, 5240MHZ)..... 94
FIG. 77 99% OCCUPIED BANDWIDTH (802.11AC-HT20, 5180MHZ)..... 94
FIG. 78 99% OCCUPIED BANDWIDTH (802.11AC-HT20, 5200MHZ)..... 95
FIG. 79 99% OCCUPIED BANDWIDTH (802.11AC-HT20, 5240MHZ)..... 95
FIG. 80 99% OCCUPIED BANDWIDTH (802.11N-HT40, 5190MHZ)..... 96

©Copyright. All rights reserved by CTTL.

FIG. 81 99% OCCUPIED BANDWIDTH (802.11N-HT40, 5230MHZ) 96
FIG. 82 99% OCCUPIED BANDWIDTH (802.11AC-HT40, 5190MHZ) 97
FIG. 83 99% OCCUPIED BANDWIDTH (802.11AC-HT40, 5230MHZ) 97
FIG. 84 99% OCCUPIED BANDWIDTH (802.11AC-HT80, 5210MHZ) 98
A.9. FREQUENCY STABILITY 99
A.10. POWER CONTROL 99

ANNEX B: PHOTOGRAPHS OF THE TEST SET-UP 100

ANNEX C: ACCREDITATION CERTIFICATE 101

©Copyright. All rights reserved by CTTL.

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. 52, Huayuan North Road, Haidian District, Beijing, P. R. China100191

Location 2:CTTL(Shouxiang)

Address: No. 51 Shouxiang Science Building, Xueyuan Road, Haidian District, Beijing, P. R. China100191

Location 3:CTTL(Yuetan)

Address: No. 11 Yue Tan Nan Jie, Xicheng District, Beijing, P. R. China100045

Location 4:CTTL(BDA)

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

Location 5:CTTL(South Branch)

Address: No.12, ShangSha Innovation and Technology Park, Futian District, Shenzhen, Guangdong, P. R. China518048

1.2. TestingEnvironment

Normal Temperature: 15-35℃

Extreme Temperature: -20/+55℃

Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2018-04-08

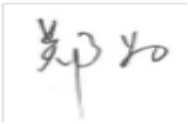
Testing End Date: 2018-05-04

©Copyright. All rights reserved by CTTL.

1.4. Signature

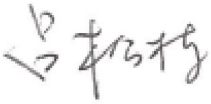
Jiang Xue

(Prepared this test report)



Zheng Wei

(Reviewed this test report)



Lv Songdong

(Approved this test report)

©Copyright. All rights reserved by CTTL.

2. CLIENT INFORMATION

2.1. Applicant Information

Company Name:	TCL Communication Ltd.
Address:	7/F, Block F4, TCL International E City, Zhong Shan Yuan Road, Nanshan District, Shenzhen, Guangdong, P.R. China 518052 Shenzhen, Guangdong
City:	Shenzhen
Postal Code:	518052
Country:	China
Telephone:	0086-755-36611722
Fax:	0086-75536612000-81722

2.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address:	7/F, Block F4, TCL International E City, Zhong Shan Yuan Road, Nanshan District, Shenzhen, Guangdong, P.R. China 518052 Shenzhen, Guangdong
City:	Shenzhen
Postal Code:	518052
Country:	China
Telephone:	0086-755-36611722
Fax:	0086-75536612000-81722

©Copyright. All rights reserved by CTTL.

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

3.1. About EUT

Description	GSM Quad-band/HSPA-UMTS Six-band/ LTE 20-band mobile phone
Model name	BBF100-2
FCC ID	2ACCJN025
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
EUT5	015103000009816	09	4S3L
EUT2	015103000009907	09	4S3L

*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	/	Inbuilt
AE2	Charger	/	18TCT-CH-0157
AE3	USB Cable	/	18TCT-DC-0049

AE1

Model	TLp035B1
Manufacturer	BYD
Capacitance	3360mAh
Nominal voltage	3.85V

AE2

Model	CBA0064AGBC1(QC13US)
Manufacturer	BYD
Length of cable	/

©Copyright. All rights reserved by CTTL.

AE3

Model	CDA0000105CF(DC10)
Manufacturer	LUXSHARE
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 20-band mobile phone with integrated antennaand inbuilt battery.
It has Bluetooth (EDR)function.
It consists of normal options: travel charger, USB cable and Phone.
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	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E	2014-06

5. LABORATORY ENVIRONMENT

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.

©Copyright. All rights reserved by CTTL.

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	/	**P**
Power Spectral Density	15.407	/	**P**
Occupied 26dB Bandwidth	15.403	/	**P**
Band edge compliance	15.209	/	**P**
Transmitter spurious emissions radiated	15.407	/	**P**
Spurious emissions radiated < 30 MHz	15.407	/	**P**
Spurious emissions conducted < 30 MHz	15.407	/	**P**
Frequency Stability	15.407	/	**P**
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.
NM	Not measured, The test was not measured by CTTL
NA	Not Applicable, The test was not applicable
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

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℃
Voltage	3.85V
Humidity	44%

©Copyright. All rights reserved by CTTL.

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	2018-06-01
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
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	3 years	2020-05-31
6	EMI Antenna	3117	00139065	ETS-Lindgren	3 Years	2020-11-15
7	Spectrum Analyzer	FSV40	101047	Rohde & Schwarz	1 year	2018-07-22

©Copyright. All rights reserved by CTTL.

8. Measurement Uncertainty

8.1. Transmitter Output Power

Measurement Uncertainty: 0.339dB,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

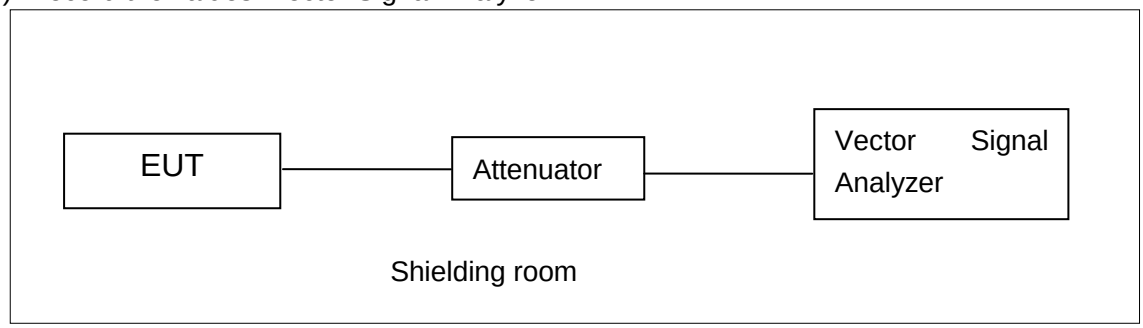
©Copyright. All rights reserved by CTTL.

ANNEX A: MEASUREMENT RESULTS

A.1. Measurement Method

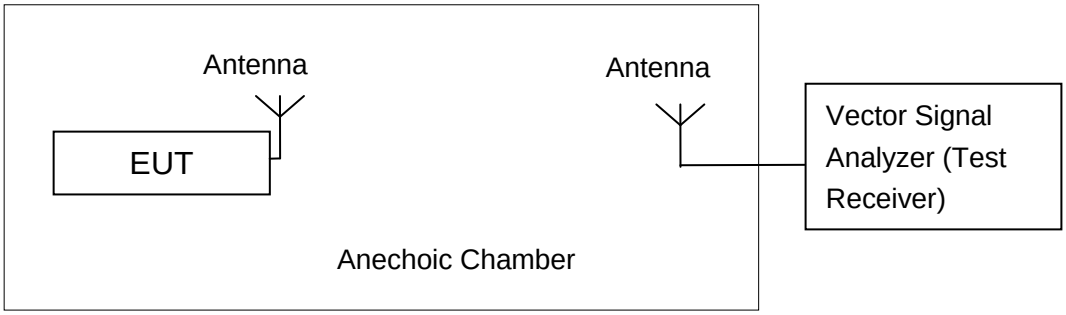
A.1.1. Conducted Measurements

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.

©Copyright. All rights reserved by CTTL.

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	17.63	17.59	17.48	17.97	17.64	17.08	16.77	16.63
	5200MHz	/	/	/	17.91	/	/	/	/
	5240MHz	/	/	/	16.03	/	/	/	/
	5260MHz	/	/	/	17.41	/	/	/	/
	5280MHz	/	/	/	17.67	/	/	/	/
	5320MHz	/	/	/	17.81	/	/	/	/
	5500MHz	/	/	/	17.35	/	/	/	/
	5580MHz	/	/	/	17.01	/	/	/	/
	5700MHz	/	/	/	17.48	/	/	/	/

The data rate 18Mbps 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	14.90	14.51	15.22	15.01	14.62	14.31	14.24	14.08
	5200MHz	/	/	15.08	/	/	/	/	/
	5240MHz	/	/	14.96	/	/	/	/	/
	5260MHz	/	/	14.75	/	/	/	/	/
	5280MHz	/	/	14.91	/	/	/	/	/
	5320MHz	/	/	14.46	/	/	/	/	/
	5500MHz	/	/	15.43	/	/	/	/	/
	5580MHz	/	/	15.68	/	/	/	/	/
	5700MHz	/	/	15.65	/	/	/	/	/

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

©Copyright. All rights reserved by CTTL.

802.11ac-HT20 mode

Mode	Channel	Test Result (dBm)									
		Data Rate									
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
802.11ac (HT20)	5180MHz	11.74	11.37	12.06	11.81	11.40	11.11	11.05	10.91	11.73	11.35
	5200MHz	/	/	11.94	/	/	/	/	/	/	/
	5240MHz	/	/	12.01	/	/	/	/	/	/	/
	5260MHz	/	/	11.66	/	/	/	/	/	/	/
	5280MHz	/	/	11.68	/	/	/	/	/	/	/
	5320MHz	/	/	11.52	/	/	/	/	/	/	/
	5500MHz	/	/	12.45	/	/	/	/	/	/	/
	5580MHz	/	/	12.85	/	/	/	/	/	/	/
	5700MHz	/	/	12.88	/	/	/	/	/	/	/

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	14.98	14.60	14.31	14.13	14.46	14.17	13.98	13.91
	5230MHz	14.97	/	/	/	/	/	/	/
	5270MHz	14.61	/	/	/	/	/	/	/
	5310MHz	14.36	/	/	/	/	/	/	/
	5510MHz	15.43	/	/	/	/	/	/	/
	5550MHz	15.46	/	/	/	/	/	/	/
	5670MHz	15.72	/	/	/	/	/	/	/

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	11.74	11.38	11.14	10.92	11.10	10.78	10.72	10.54	11.79	11.42
	5230MHz	/	/	/	/	/	/	/	/	11.80	/
	5270MHz	/	/	/	/	/	/	/	/	11.31	/
	5310MHz	/	/	/	/	/	/	/	/	11.03	/
	5510MHz	/	/	/	/	/	/	/	/	12.30	/
	5550MHz	/	/	/	/	/	/	/	/	12.36	/
	5670MHz	/	/	/	/	/	/	/	/	12.72	/

©Copyright. All rights reserved by CTTL.

The data rate MCS8 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	11.11	10.67	10.49	10.00	9.96	9.60	9.53	9.54	9.20	9.20
	5290MHz	10.73	/	/	/	/	/	/	/	/	/
	5530MHz	11.71	/	/	/	/	/	/	/	/	/
	5610MHz	11.92	/	/	/	/	/	/	/	/	/

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	9.67	P
	5200 MHz	10.20	P
	5240 MHz	10.17	P
	5260 MHz	10.16	P
	5280 MHz	9.60	P
	5320 MHz	10.15	P
	5500 MHz	9.61	P
	5580 MHz	9.99	P
	5700 MHz	9.88	P
802.11n HT20	5180 MHz	9.33	P
	5200 MHz	9.87	P
	5240 MHz	9.25	P
	5260 MHz	9.26	P
	5280 MHz	9.25	P
	5320 MHz	9.07	P
	5500 MHz	9.62	P
	5580 MHz	9.09	P

©Copyright. All rights reserved by CTTL.

	5700 MHz	9.25	P
802.11ac HT20	5180 MHz	6.33	P
	5200 MHz	7.29	P
	5240 MHz	6.90	P
	5260 MHz	7.53	P
	5280 MHz	6.41	P
	5320 MHz	5.92	P
	5500 MHz	6.85	P
	5580 MHz	6.41	P
	5700 MHz	6.84	P
802.11n HT40	5190 MHz	5.89	P
	5230 MHz	6.72	P
	5270 MHz	6.06	P
	5310 MHz	5.68	P
	5510 MHz	6.15	P
	5550 MHz	6.27	P
	5670 MHz	5.75	P
802.11ac HT40	5190 MHz	3.39	P
	5230 MHz	3.29	P
	5270 MHz	3.16	P
	5310 MHz	2.70	P
	5510 MHz	3.50	P
	5550 MHz	3.16	P
	5670 MHz	3.39	P
802.11ac HT80	5210MHz	0.0	P
	5290MHz	0.09	P
	5530MHz	0.48	P
	5610MHz	0.05	P

Conclusion: PASS

©Copyright. All rights reserved by CTTL.

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

Measurement Result:

Mode	Channel	Occupied 26dB Bandwidth (MHz)		conclusion
802.11a	5180 MHz	Fig.1	21.80	P
	5200 MHz	Fig.2	22.90	P
	5240 MHz	Fig.3	22.40	P
	5260 MHz	Fig.4	21.75	P
	5280 MHz	Fig.5	22.05	P
	5320 MHz	Fig.6	21.75	P
	5500 MHz	Fig.7	21.50	P
	5580 MHz	Fig.8	22.65	P
	5700 MHz	Fig.9	22.70	P
802.11n HT20	5180 MHz	Fig.10	23.80	P
	5200 MHz	Fig.11	23.10	P
	5240 MHz	Fig.12	25.45	P
	5260 MHz	Fig.13	23.10	P
	5280 MHz	Fig.14	22.75	P
	5320 MHz	Fig.15	22.90	P
	5500 MHz	Fig.16	24.00	P
	5580 MHz	Fig.17	23.45	P
	5700 MHz	Fig.18	23.55	P
802.11ac HT20	5180 MHz	Fig.19	22.90	P
	5200 MHz	Fig.20	23.30	P
	5240 MHz	Fig.21	22.30	P
	5260 MHz	Fig.22	22.55	P
	5280 MHz	Fig.23	21.75	P
	5320 MHz	Fig.24	22.40	P
	5500 MHz	Fig.25	22.60	P
	5580 MHz	Fig.26	23.10	P
	5700 MHz	Fig.27	22.45	P
802.11n	5190 MHz	Fig.28	40.96	P

©Copyright. All rights reserved by CTTL.

HT40	5230 MHz	Fig.29	41.60	P
	5270 MHz	Fig.30	41.44	P
	5310 MHz	Fig.31	41.12	P
	5510 MHz	Fig.32	41.44	P
	5550 MHz	Fig.33	40.88	P
	5670 MHz	Fig.34	41.36	P

802.11ac HT40	5190 MHz	Fig.35	40.88	P
	5230 MHz	Fig.36	41.68	P
	5270 MHz	Fig.37	41.04	P
	5310 MHz	Fig.38	40.72	P
	5510 MHz	Fig.39	40.72	P
	5550 MHz	Fig.40	40.56	P
	5670 MHz	Fig.41	41.36	P

802.11ac HT80	5210MHz	Fig.42	83.04	P
	5290MHz	Fig.43	81.76	P
	5530MHz	Fig.44	83.20	P
	5610MHz	Fig.45	83.84	P

Conclusion: PASS

Test graphs as below:

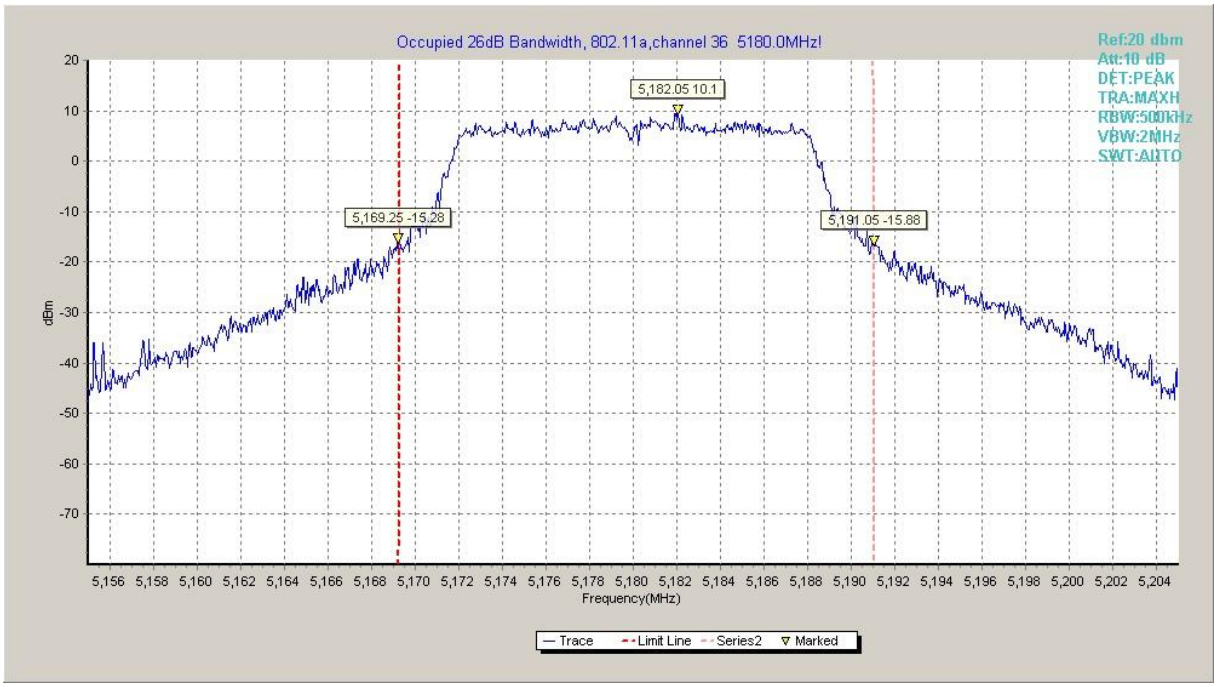


Fig. 1 Occupied 26dB Bandwidth (802.11a, 5180MHz)

©Copyright. All rights reserved by CTTL.

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

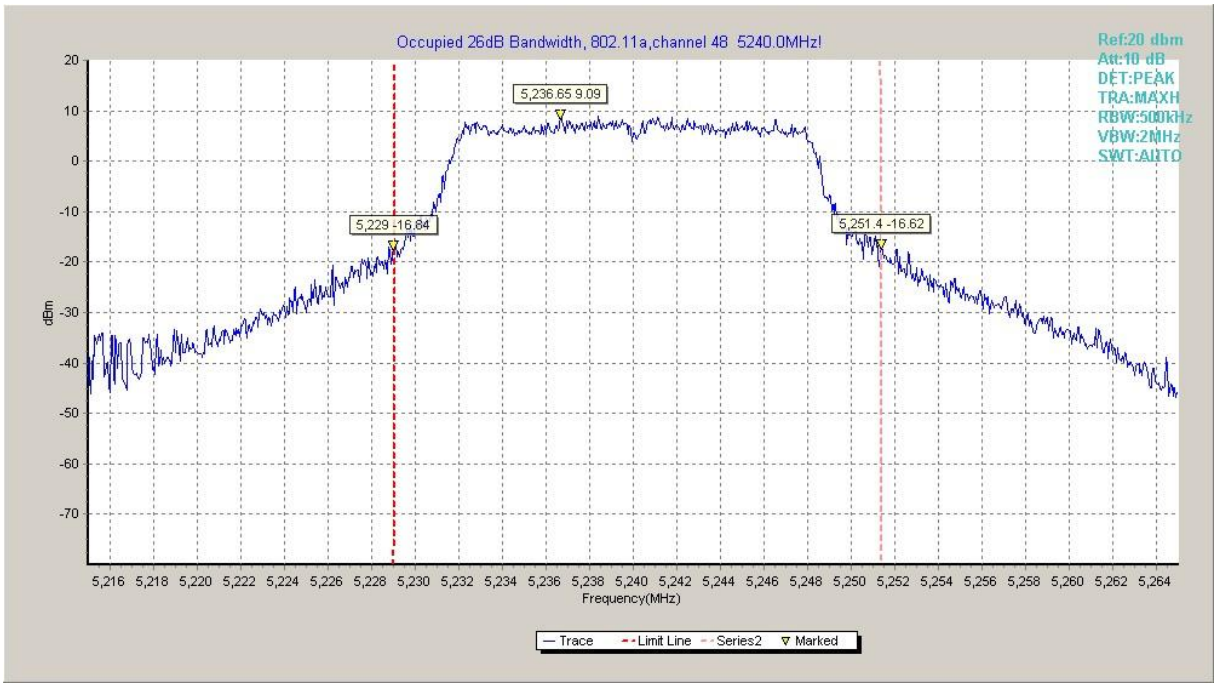


Fig. 3 Occupied 26dB Bandwidth (802.11a, 5240MHz)

©Copyright. All rights reserved by CTTL.

Fig. 4 Occupied 26dB Bandwidth (802.11a, 5260MHz)

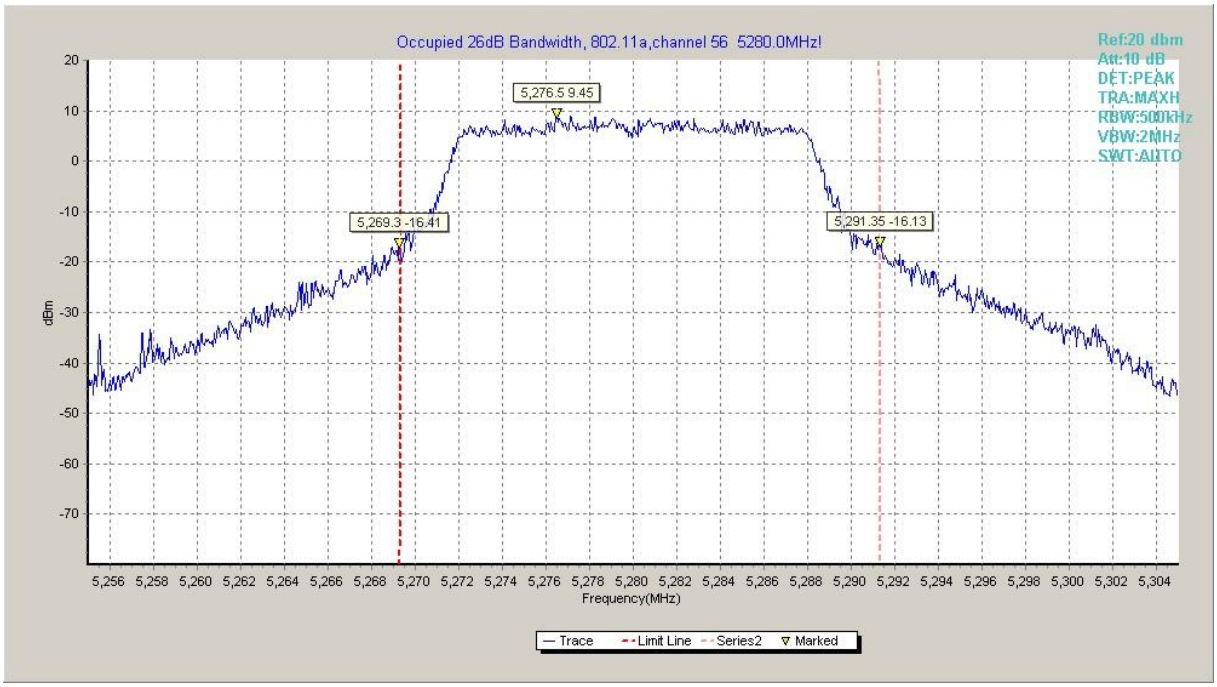


Fig. 5 Occupied 26dB Bandwidth (802.11a, 5280MHz)

©Copyright. All rights reserved by CTTL.

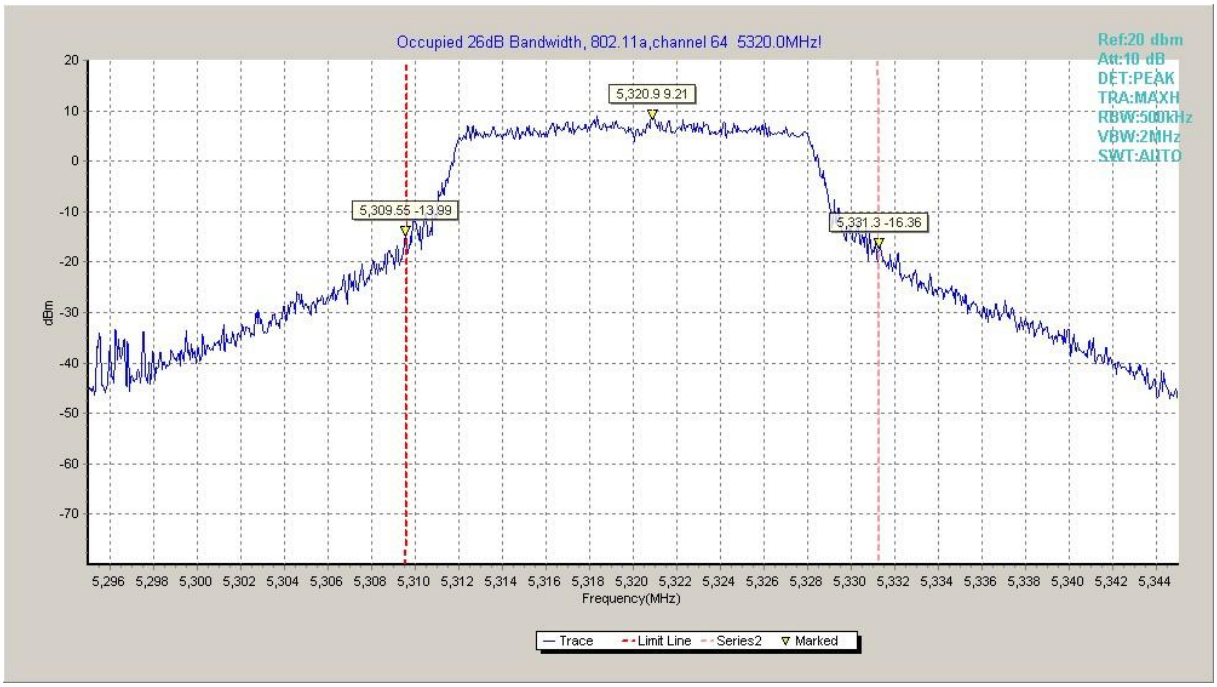


Fig. 6 Occupied 26dB Bandwidth (802.11a, 5320MHz)

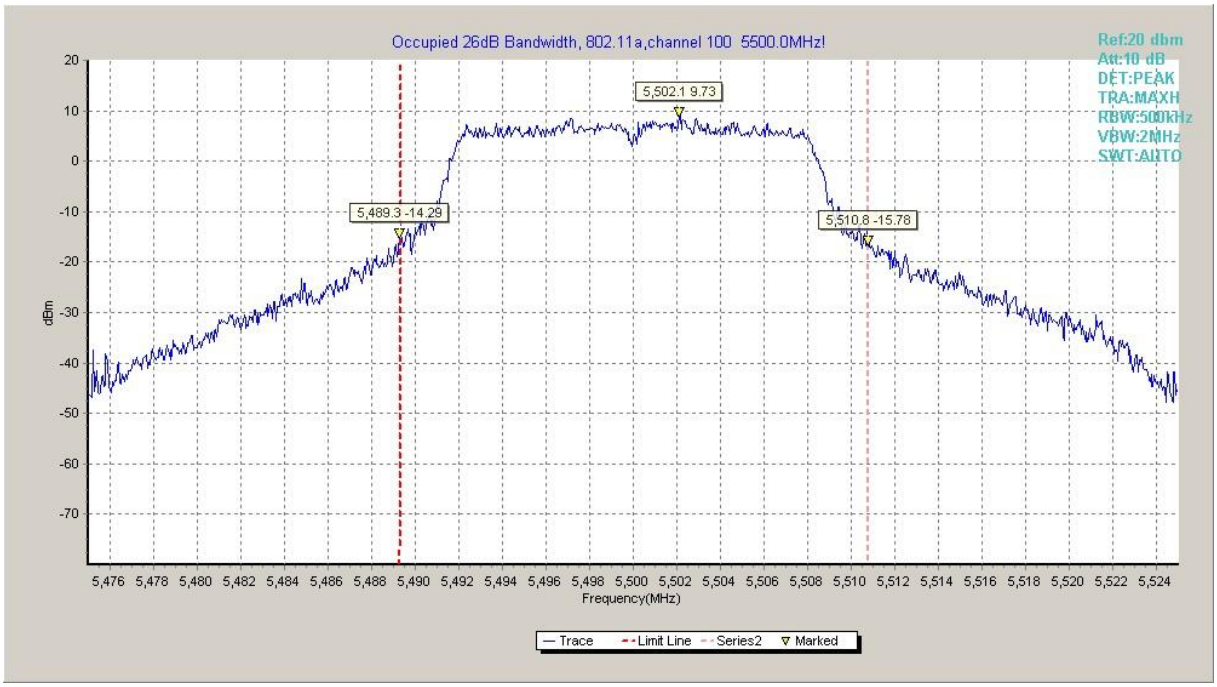


Fig. 7 Occupied 26dB Bandwidth (802.11a, 5500MHz)

©Copyright. All rights reserved by CTTL.

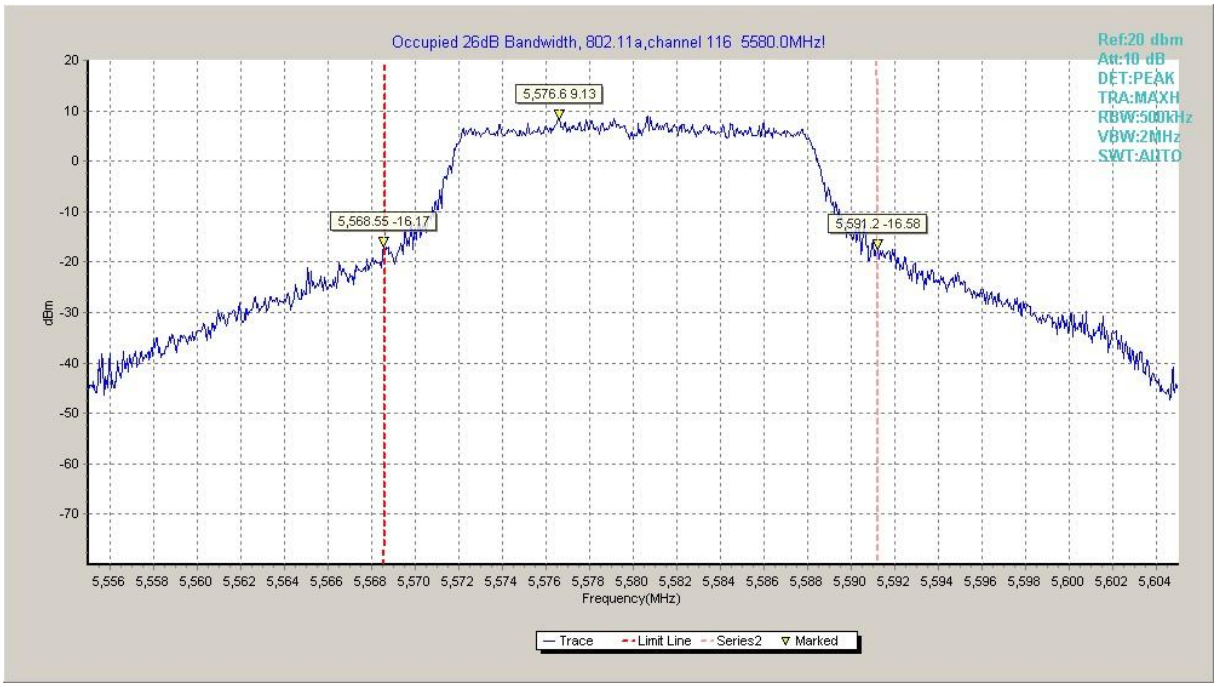


Fig. 8 Occupied 26dB Bandwidth (802.11a, 5580MHz)

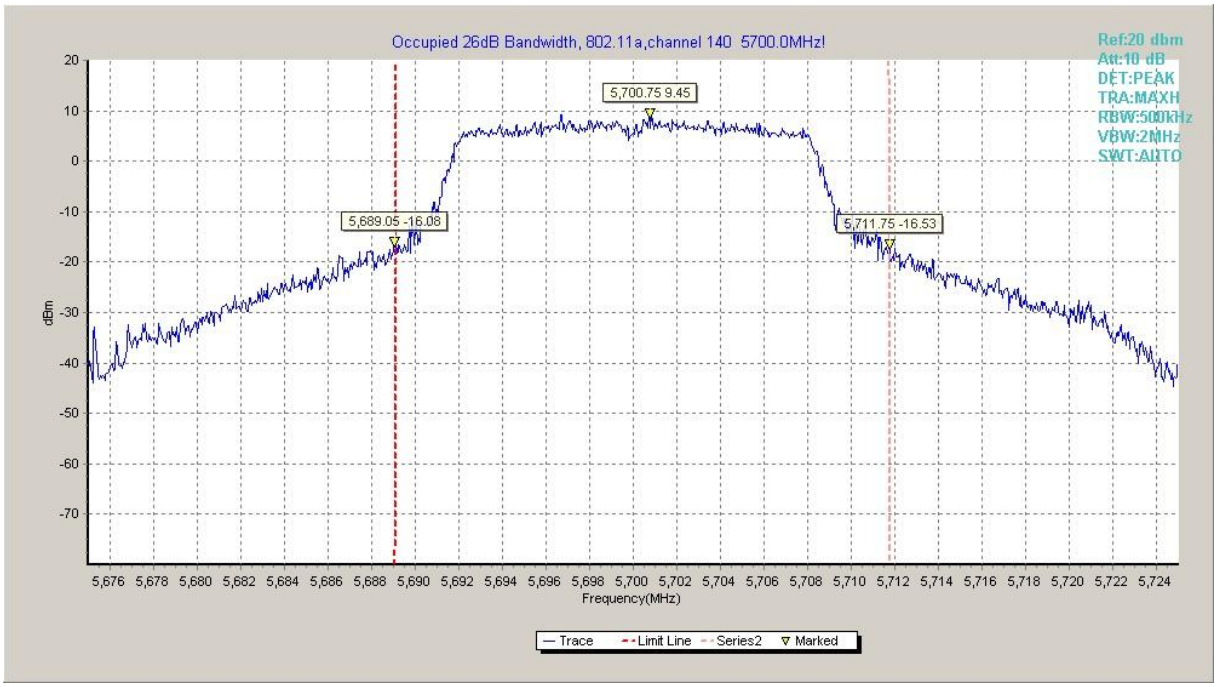


Fig. 9 Occupied 26dB Bandwidth (802.11a, 5700MHz)

©Copyright. All rights reserved by CTTL.

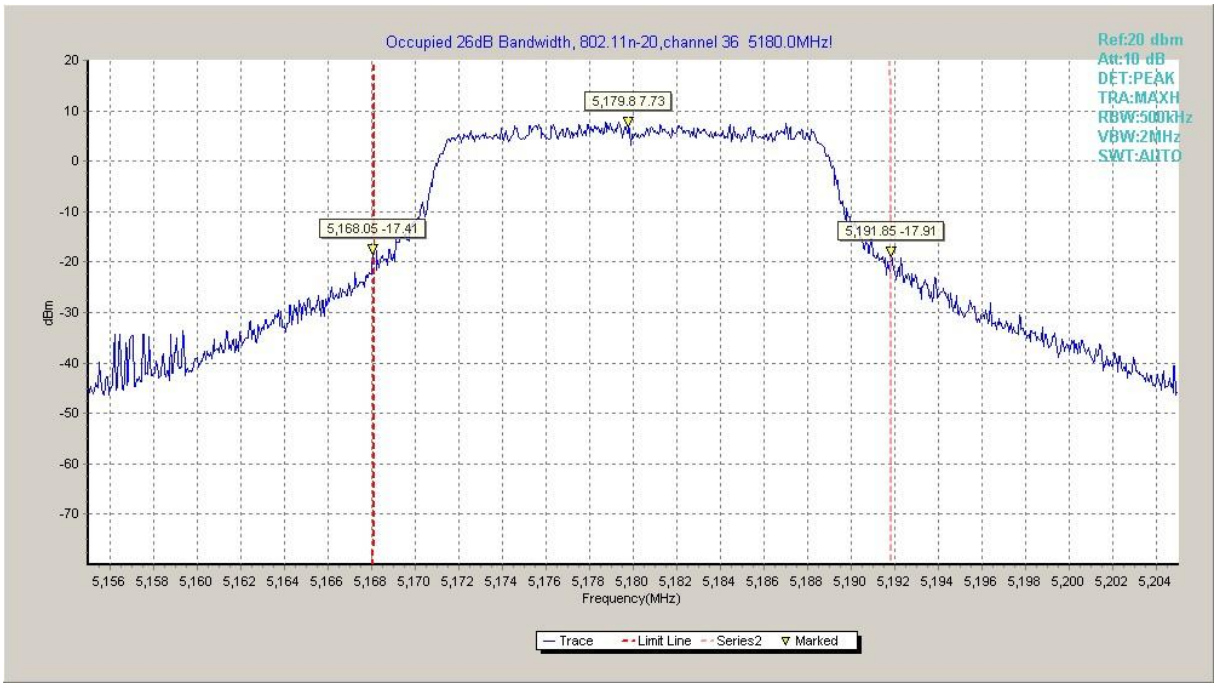


Fig. 10 Occupied 26dB Bandwidth (802.11n-HT20, 5180MHz)

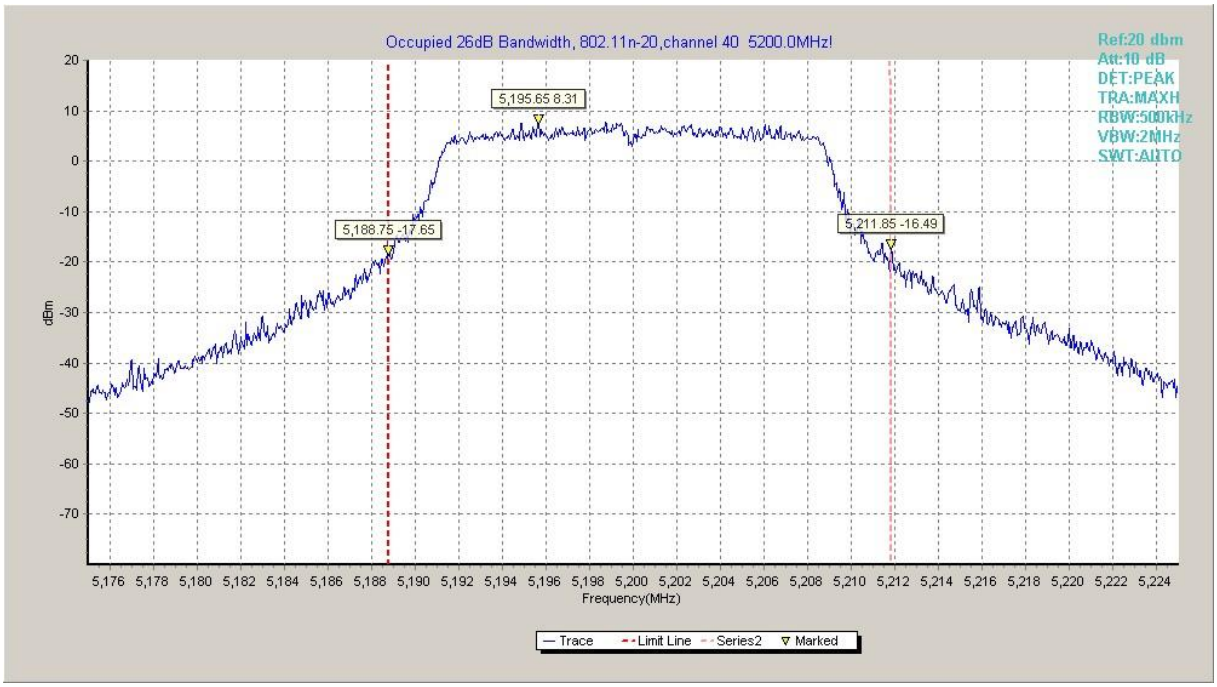


Fig. 11 Occupied 26dB Bandwidth (802.11n-HT20, 5200MHz)

©Copyright. All rights reserved by CTTL.

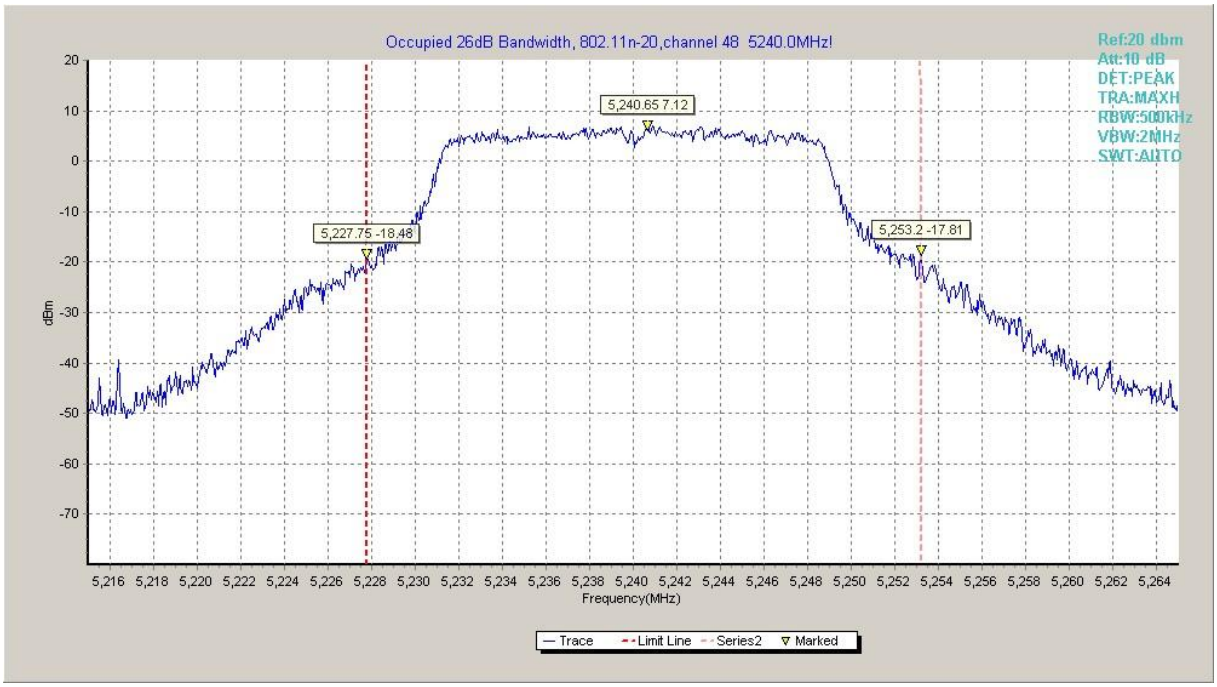


Fig. 12 Occupied 26dB Bandwidth (802.11n-HT20, 5240MHz)

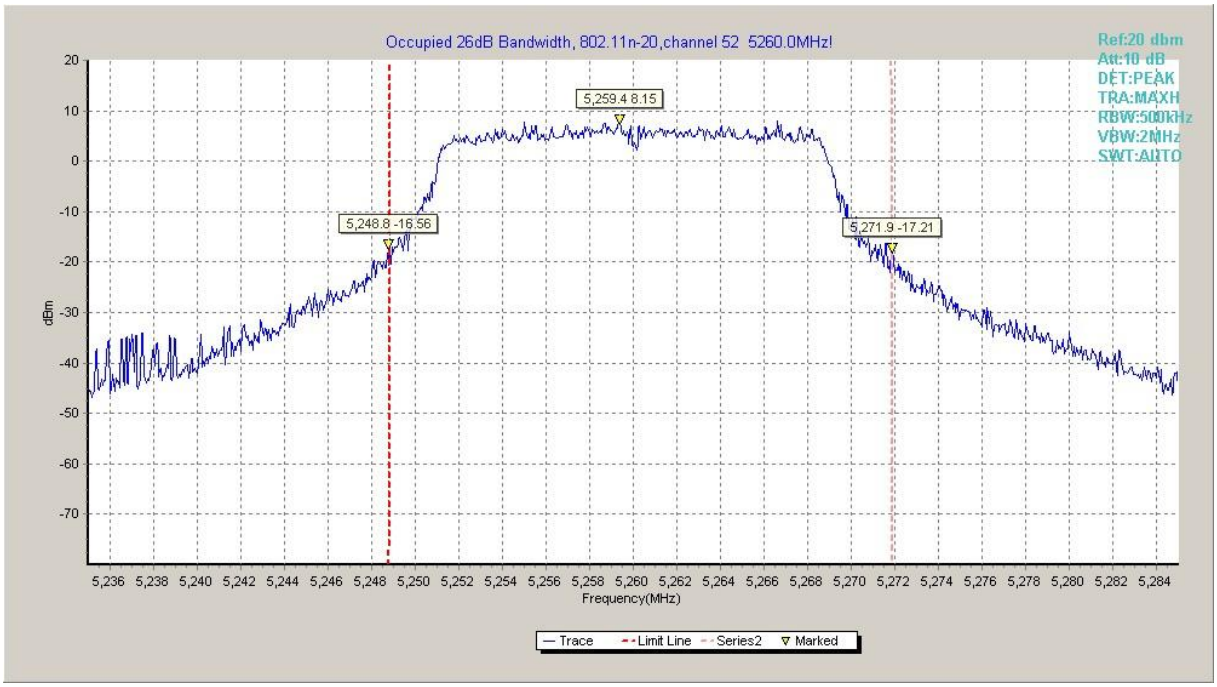


Fig. 13 Occupied 26dB Bandwidth (802.11n-HT20, 5260MHz)

©Copyright. All rights reserved by CTTL.

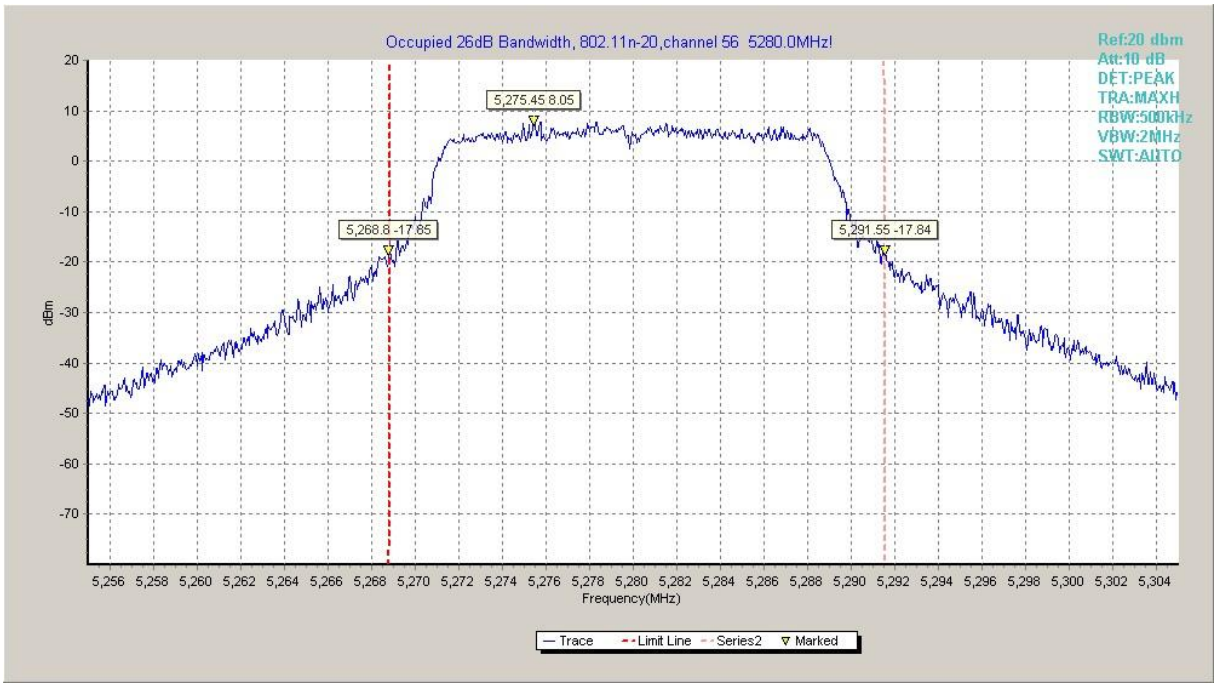


Fig. 14 Occupied 26dB Bandwidth (802.11n-HT20, 5280MHz)

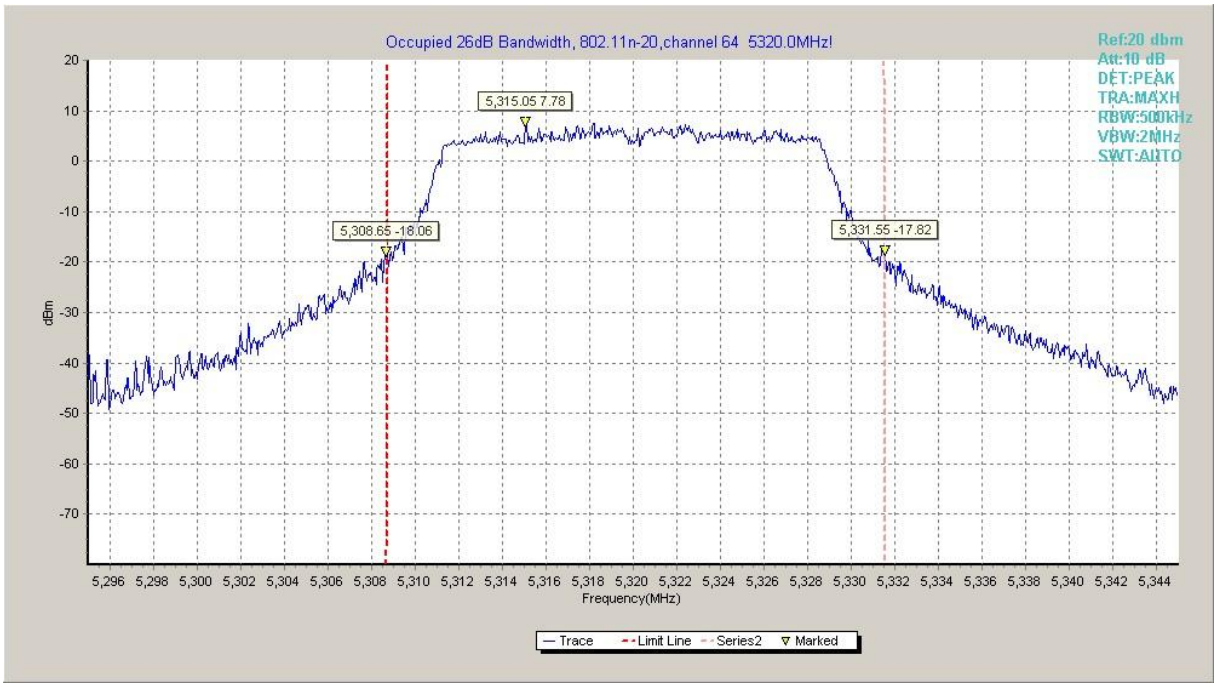


Fig. 15 Occupied 26dB Bandwidth (802.11n-HT20, 5320MHz)

©Copyright. All rights reserved by CTTL.

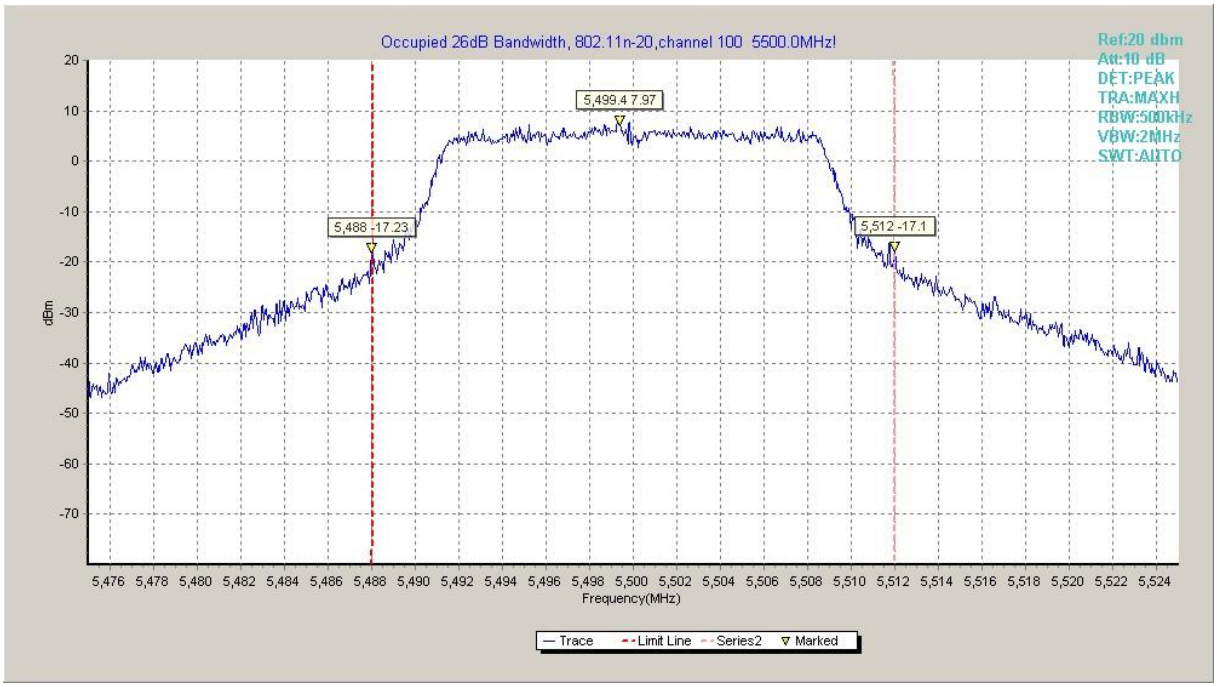


Fig. 16 Occupied 26dB Bandwidth (802. 11n-HT20, 5500MHz)

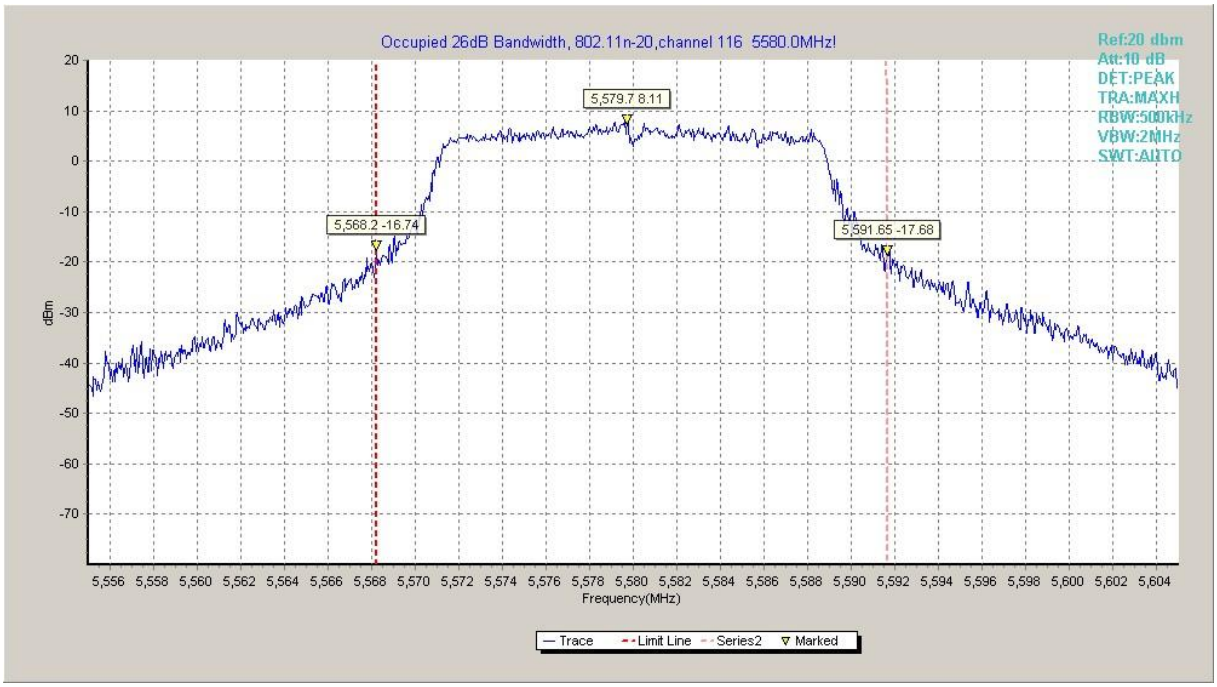


Fig. 17 Occupied 26dB Bandwidth (802. 11n-HT20, 5580MHz)

©Copyright. All rights reserved by CTTL.

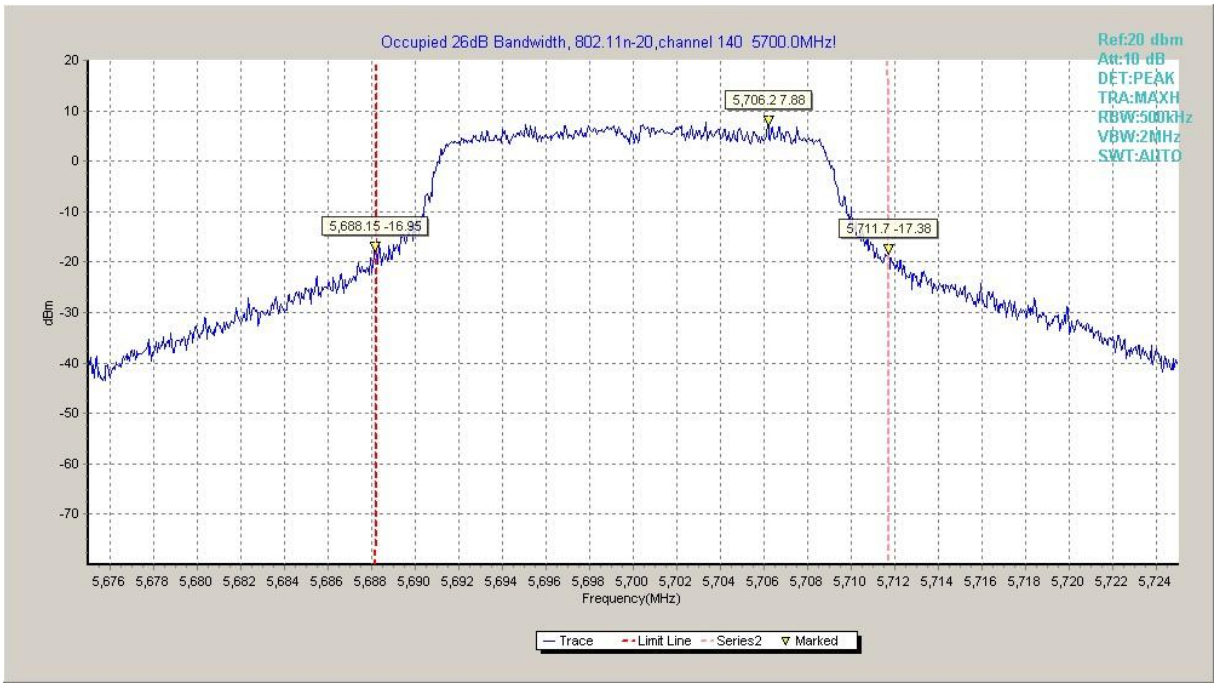


Fig. 18 Occupied 26dB Bandwidth (802. 11n-HT20, 5700MHz)

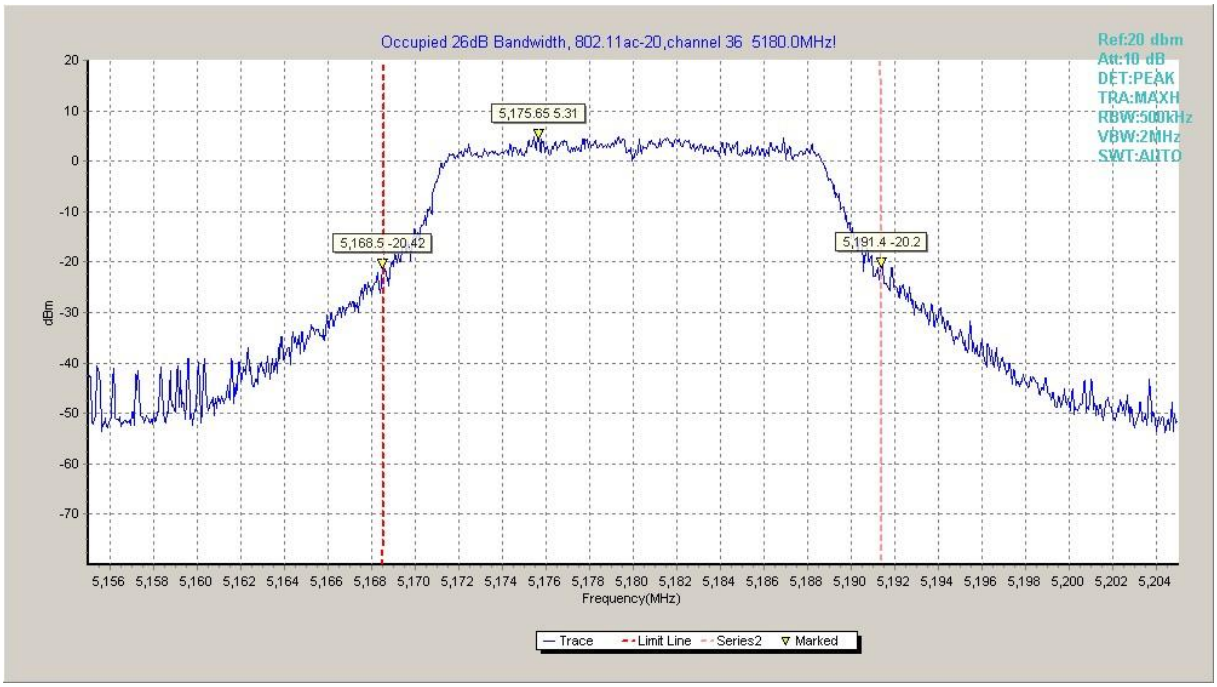


Fig. 19 Occupied 26dB Bandwidth (802.11ac-HT20, 5180MHz)

©Copyright. All rights reserved by CTTL.

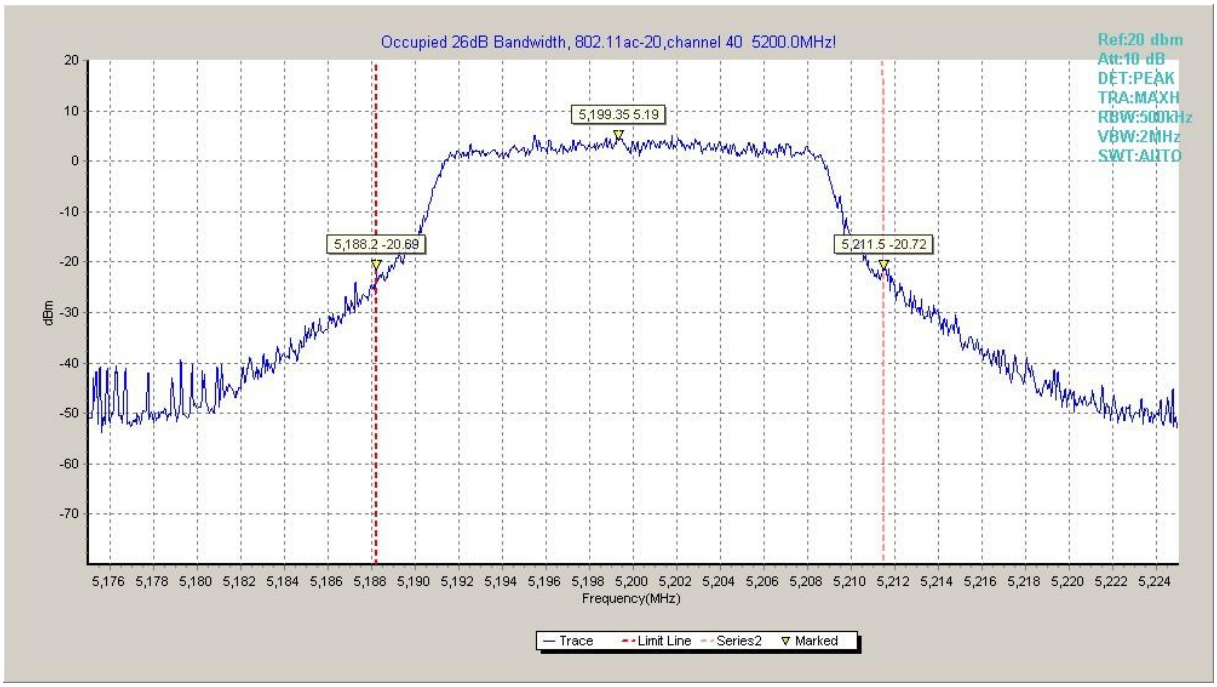


Fig. 20 Occupied 26dB Bandwidth (802.11ac-HT20, 5200MHz)

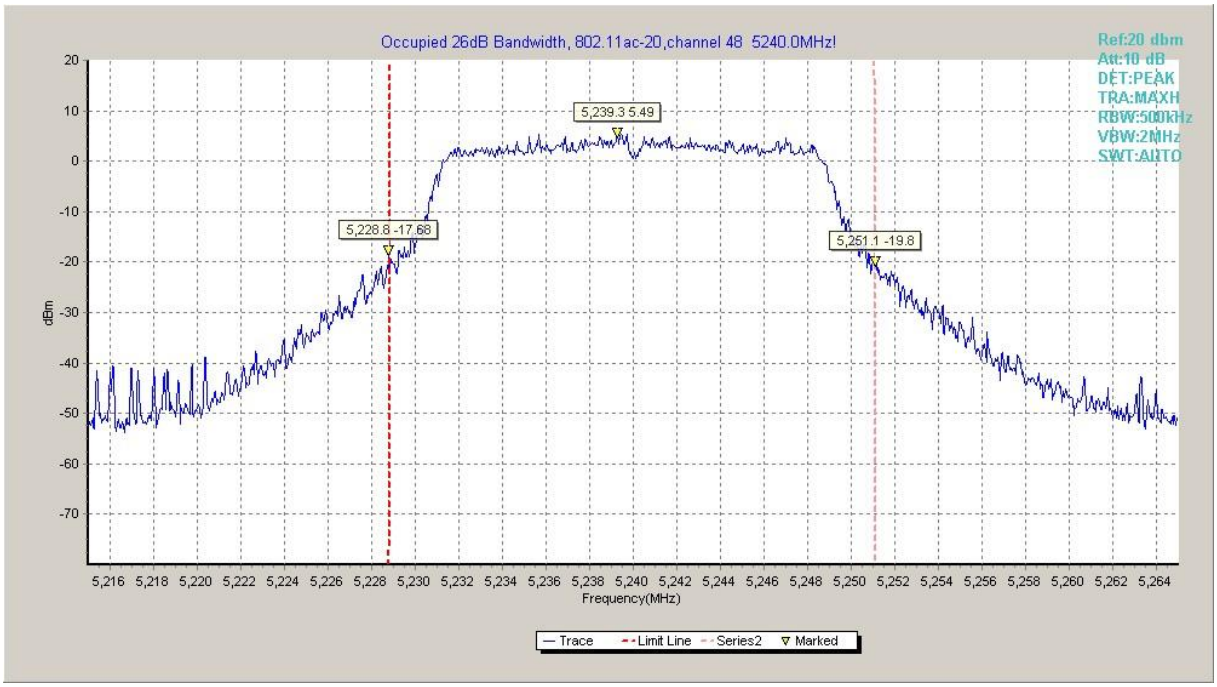


Fig. 21 Occupied 26dB Bandwidth (802.11ac-HT20, 5240MHz)

©Copyright. All rights reserved by CTTL.

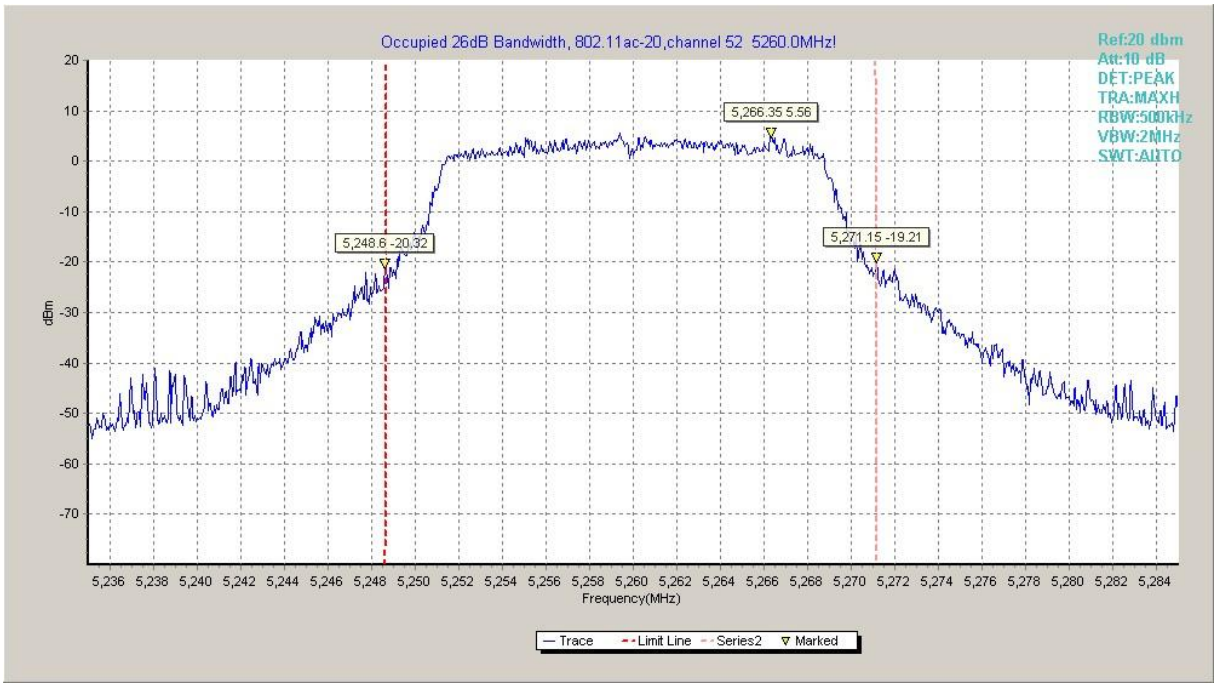


Fig. 22 Occupied 26dB Bandwidth (802.11ac-HT20, 5260MHz)

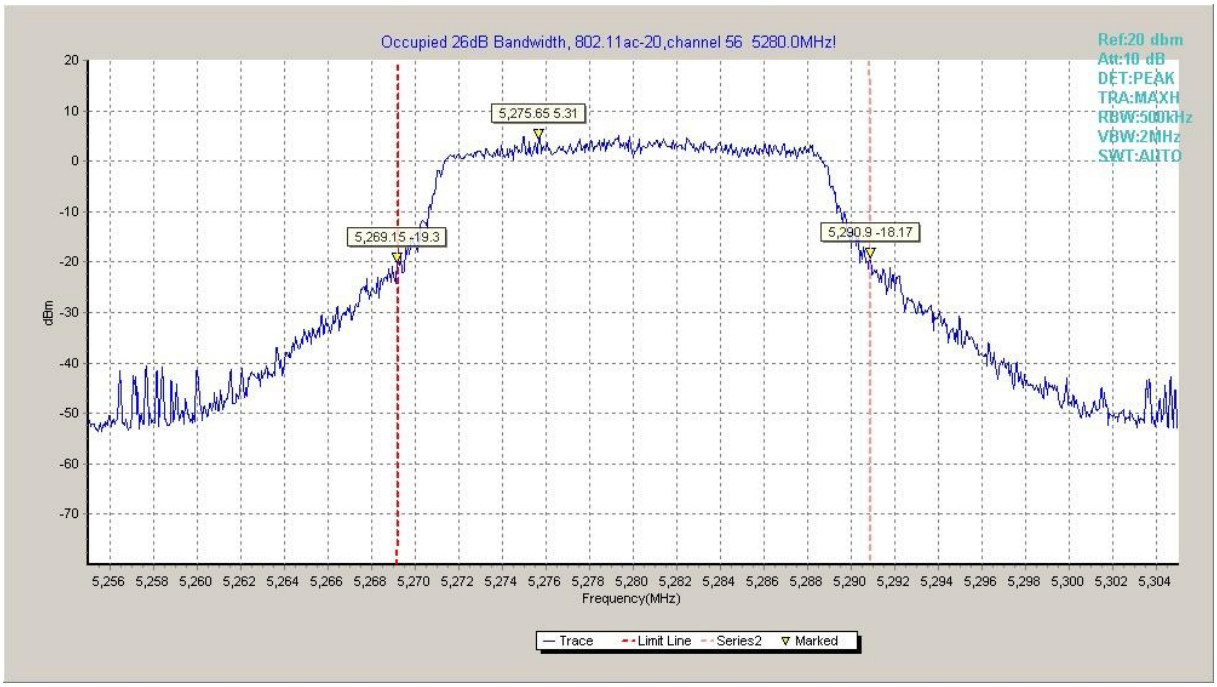


Fig. 23 Occupied 26dB Bandwidth (802.11ac-HT20, 5280MHz)

©Copyright. All rights reserved by CTTL.

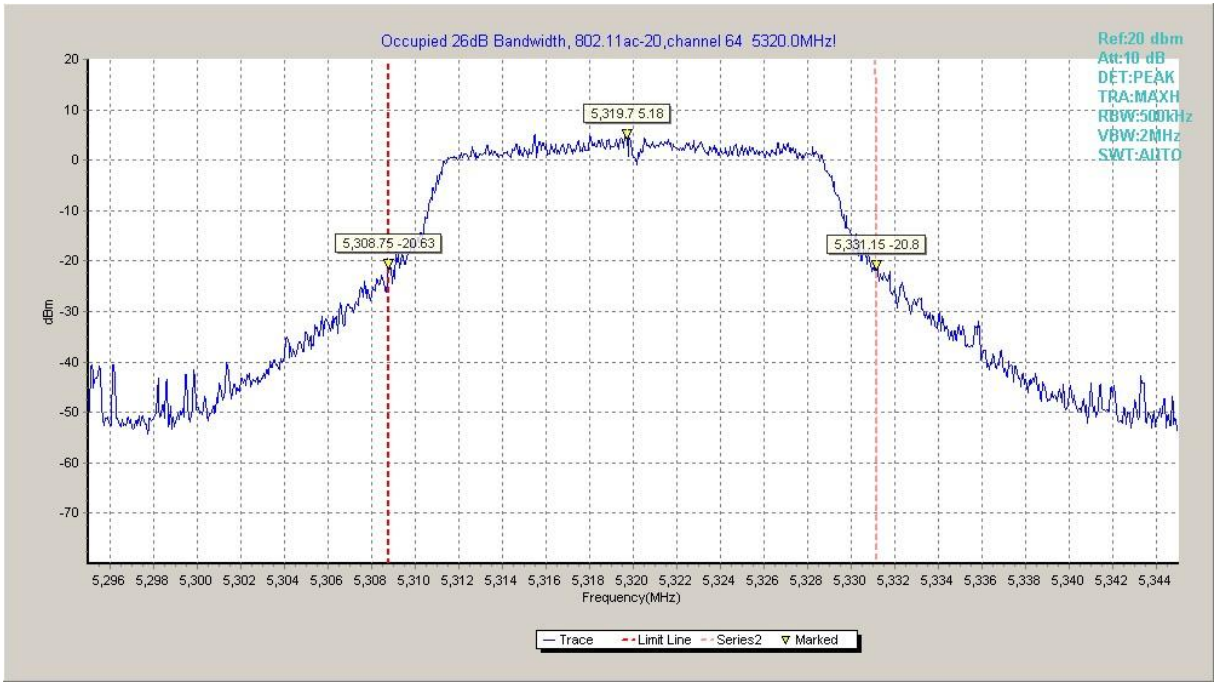


Fig. 24 Occupied 26dB Bandwidth (802.11ac-HT20, 5320MHz)

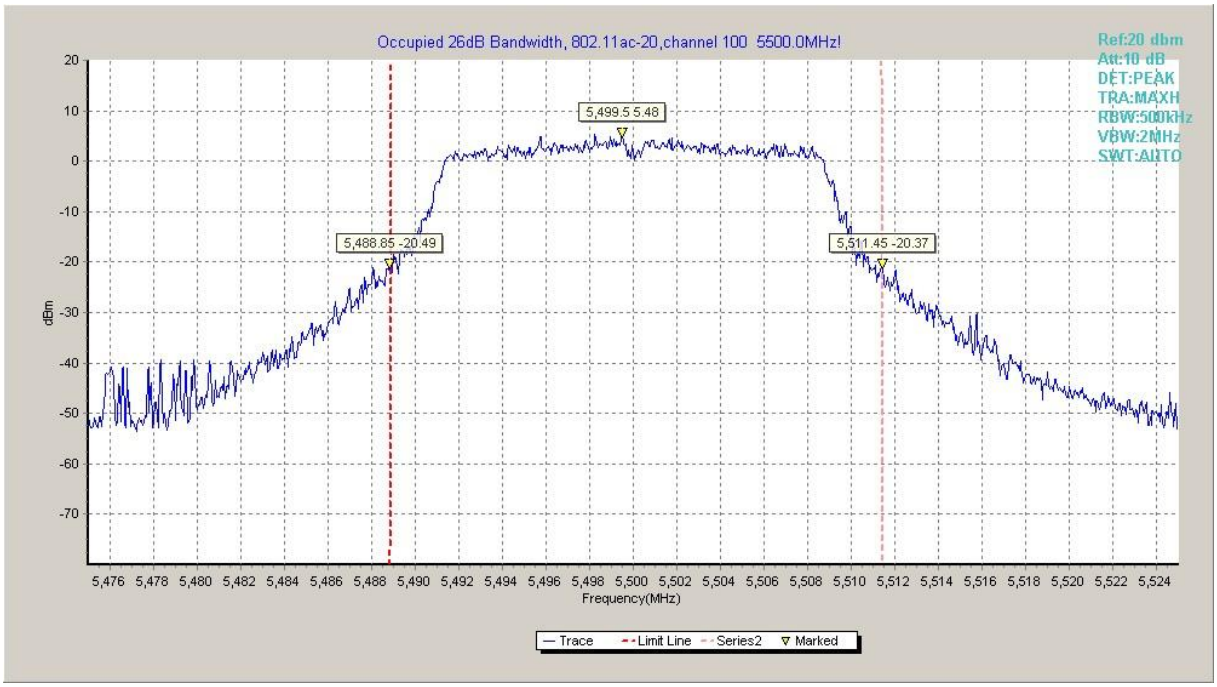


Fig. 25 Occupied 26dB Bandwidth (802. 11ac-HT20, 5500MHz)

©Copyright. All rights reserved by CTTL.

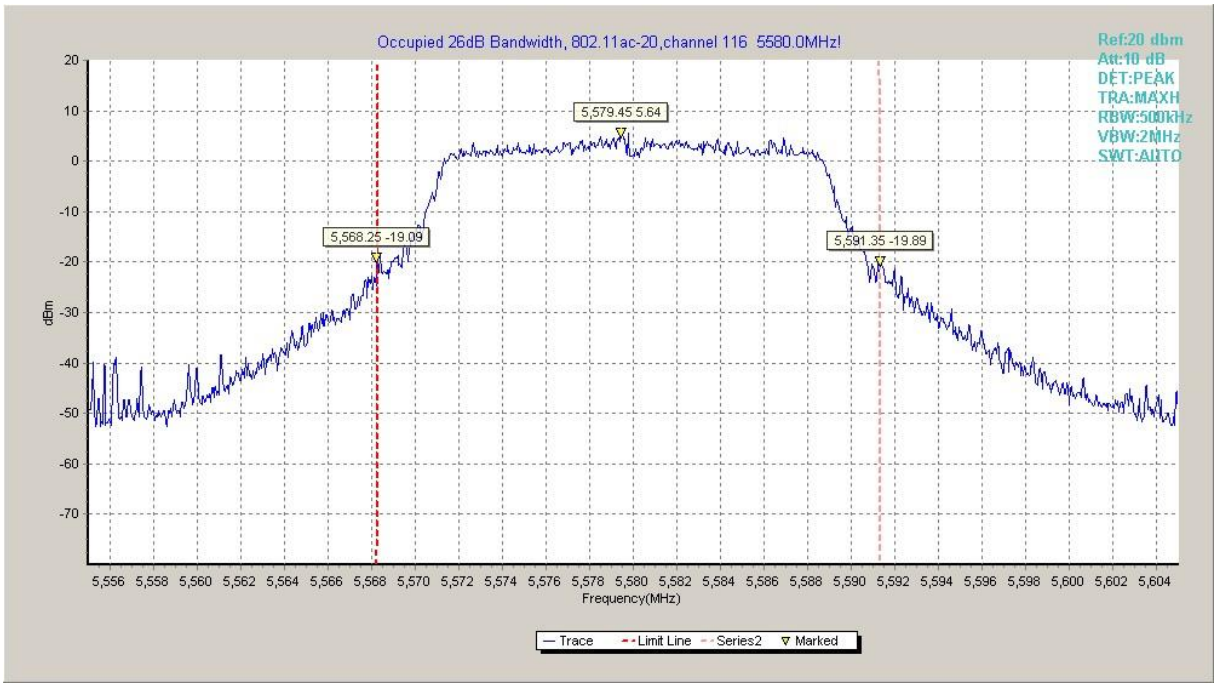


Fig. 26 Occupied 26dB Bandwidth (802. 11ac-HT20, 5580MHz)

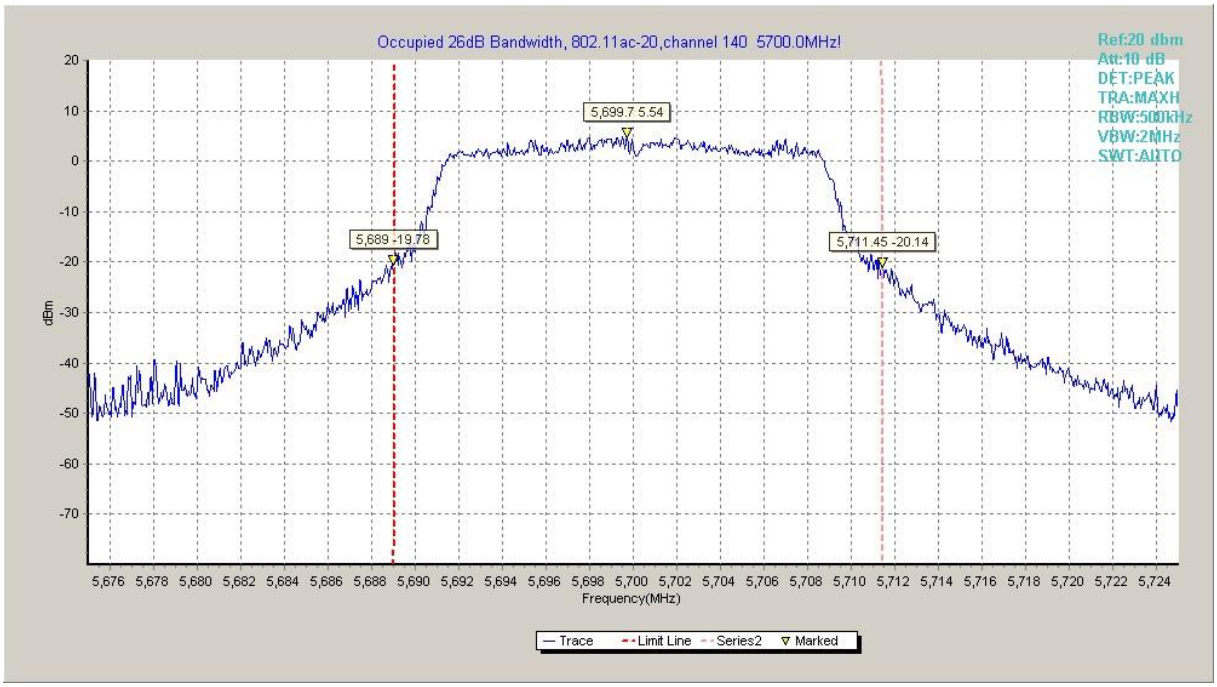


Fig. 27 Occupied 26dB Bandwidth (802. 11ac-HT20, 5700MHz)

©Copyright. All rights reserved by CTTL.

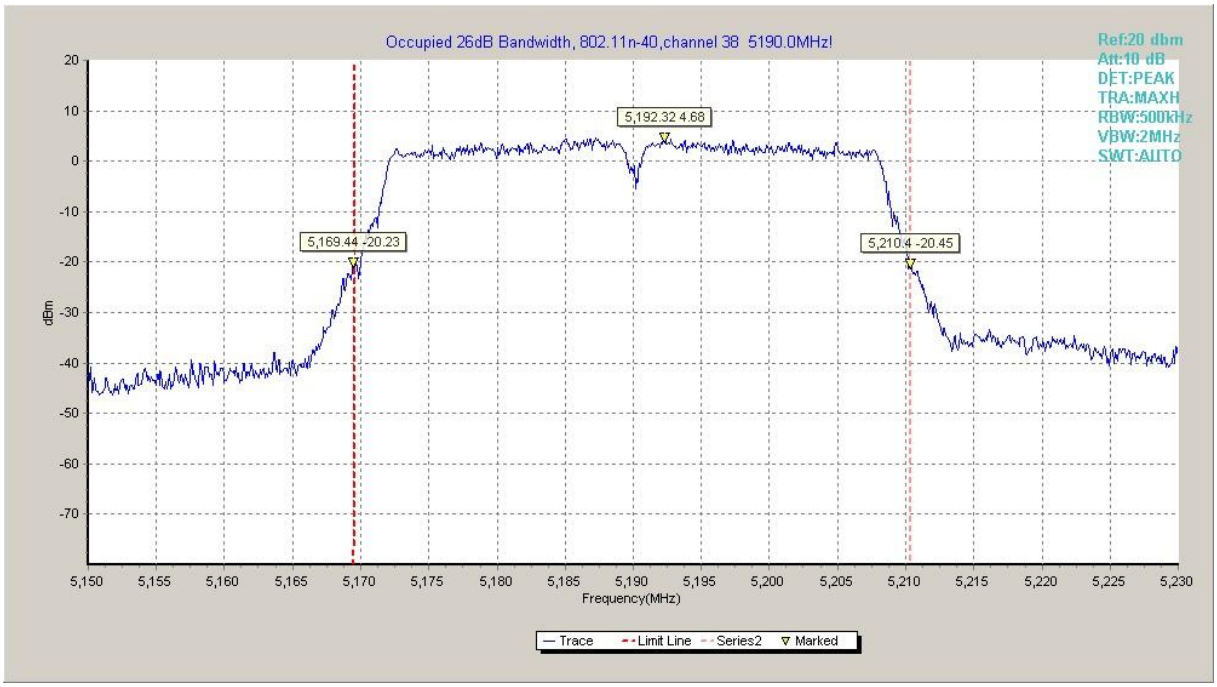


Fig. 28 Occupied 26dB Bandwidth (802.11n-HT40, 5190MHz)

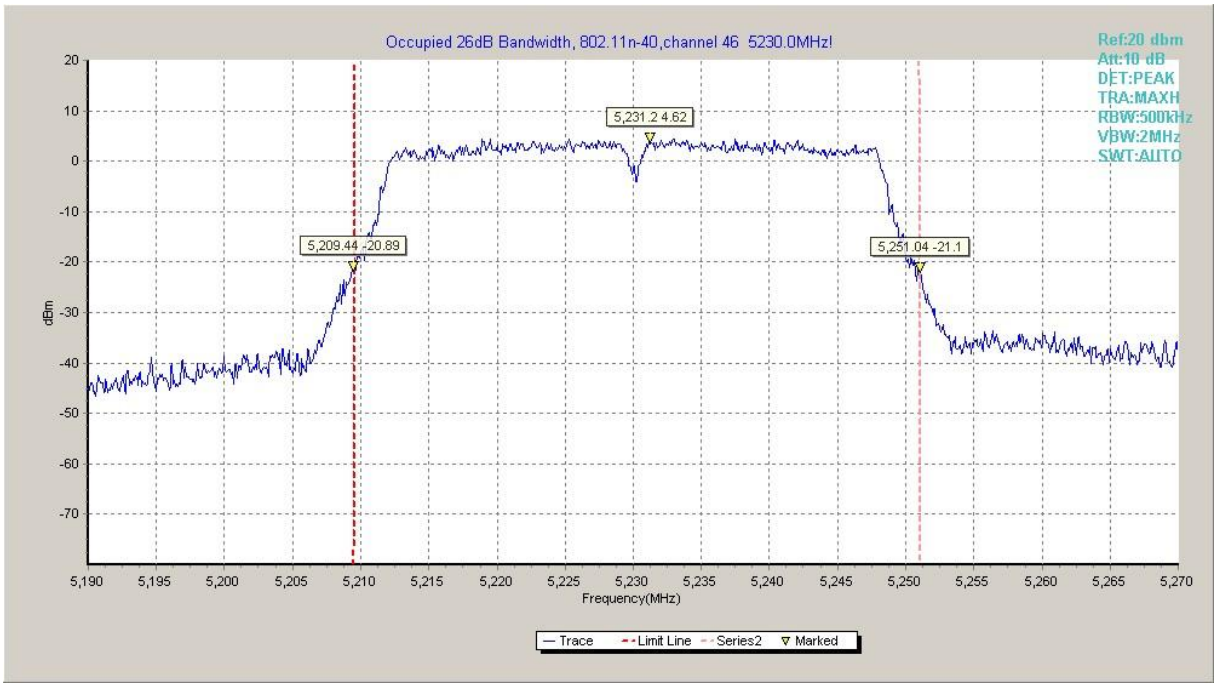


Fig. 29 Occupied 26dB Bandwidth (802.11n-HT40, 5230MHz)

©Copyright. All rights reserved by CTTL.

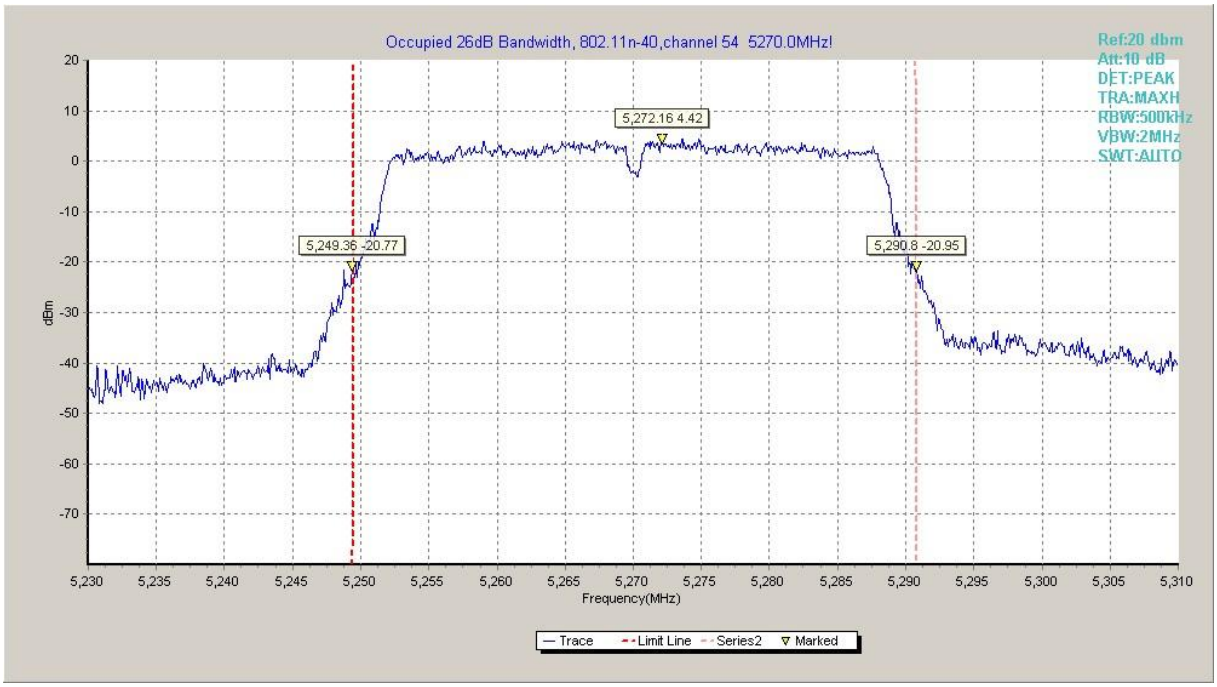


Fig. 30 Occupied 26dB Bandwidth (802.11n-HT40, 5270MHz)

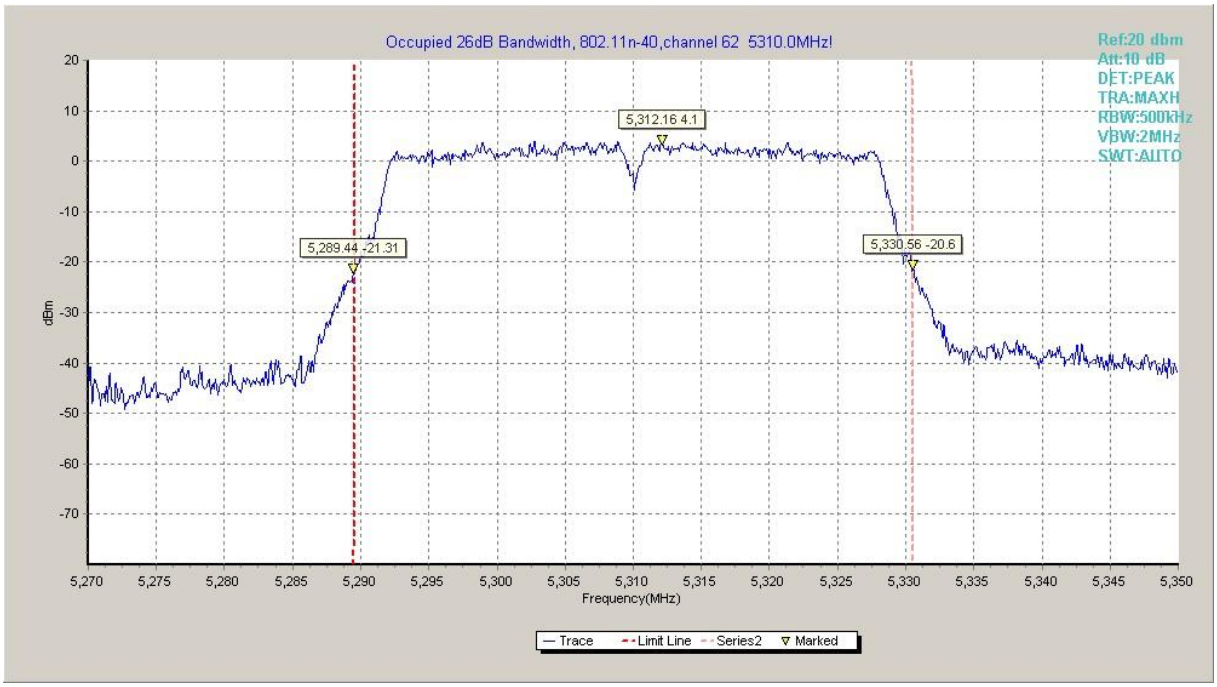


Fig. 31 Occupied 26dB Bandwidth (802.11n-HT40, 5310MHz)

©Copyright. All rights reserved by CTTL.

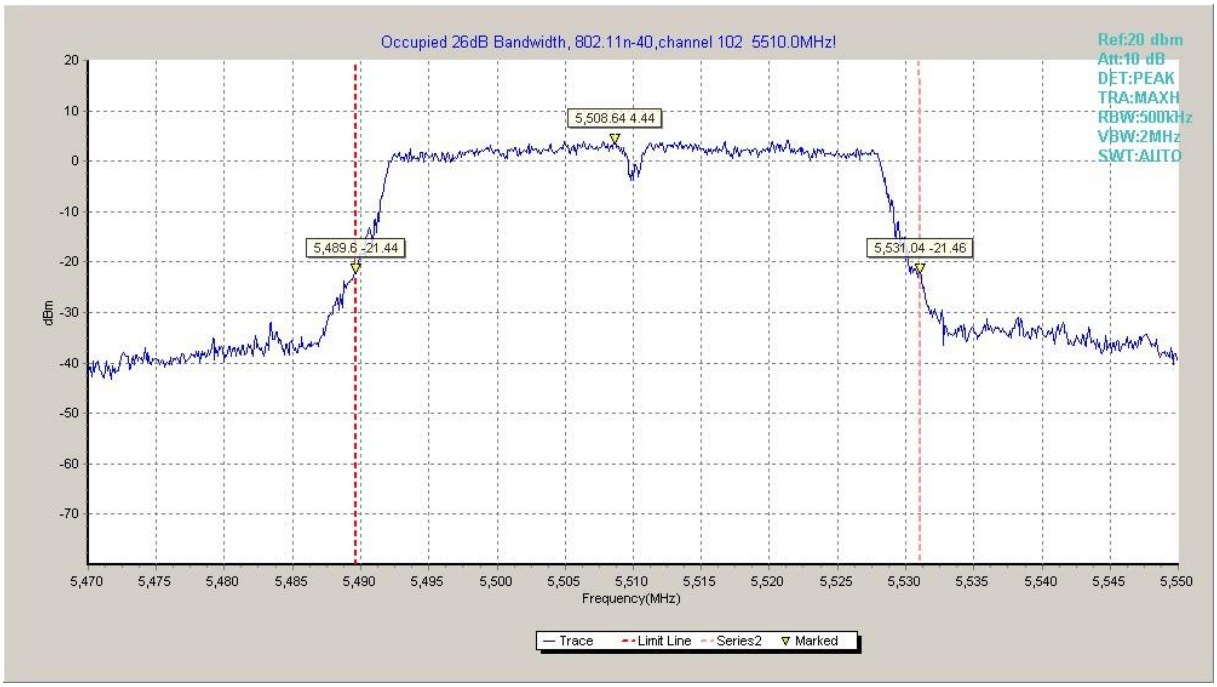


Fig. 32 Occupied 26dB Bandwidth (802. 11n-HT40, 5510MHz)

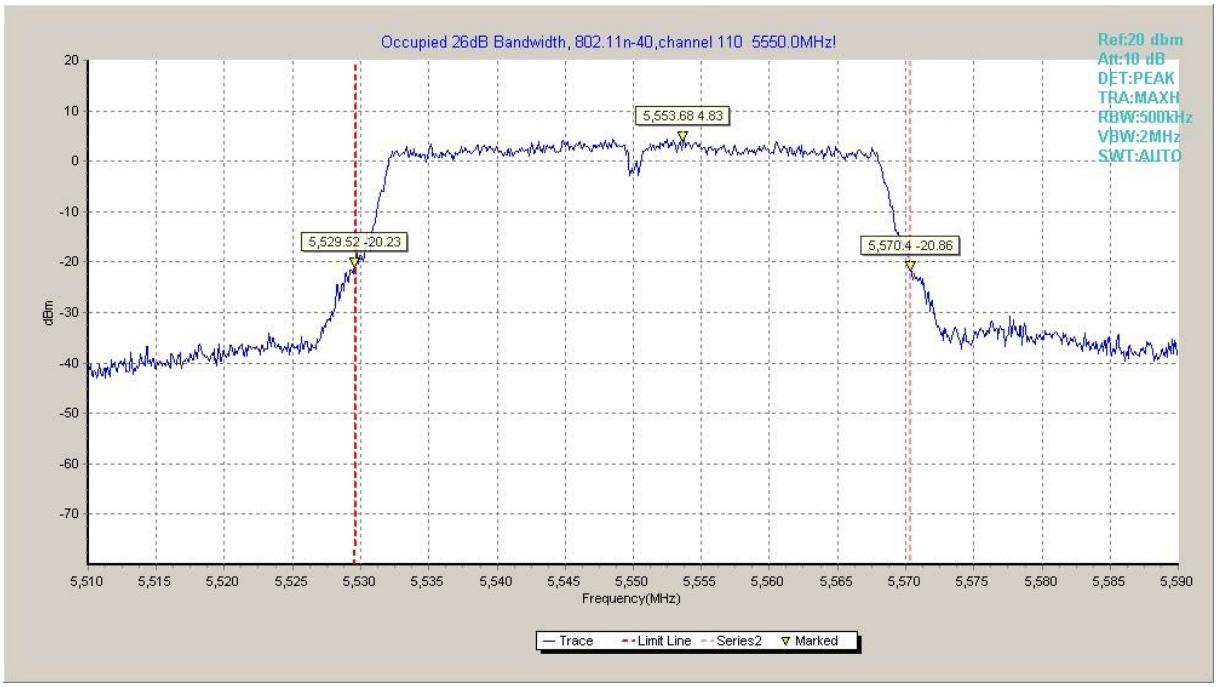


Fig. 33 Occupied 26dB Bandwidth (802. 11n-HT40, 5550MHz)

©Copyright. All rights reserved by CTTL.

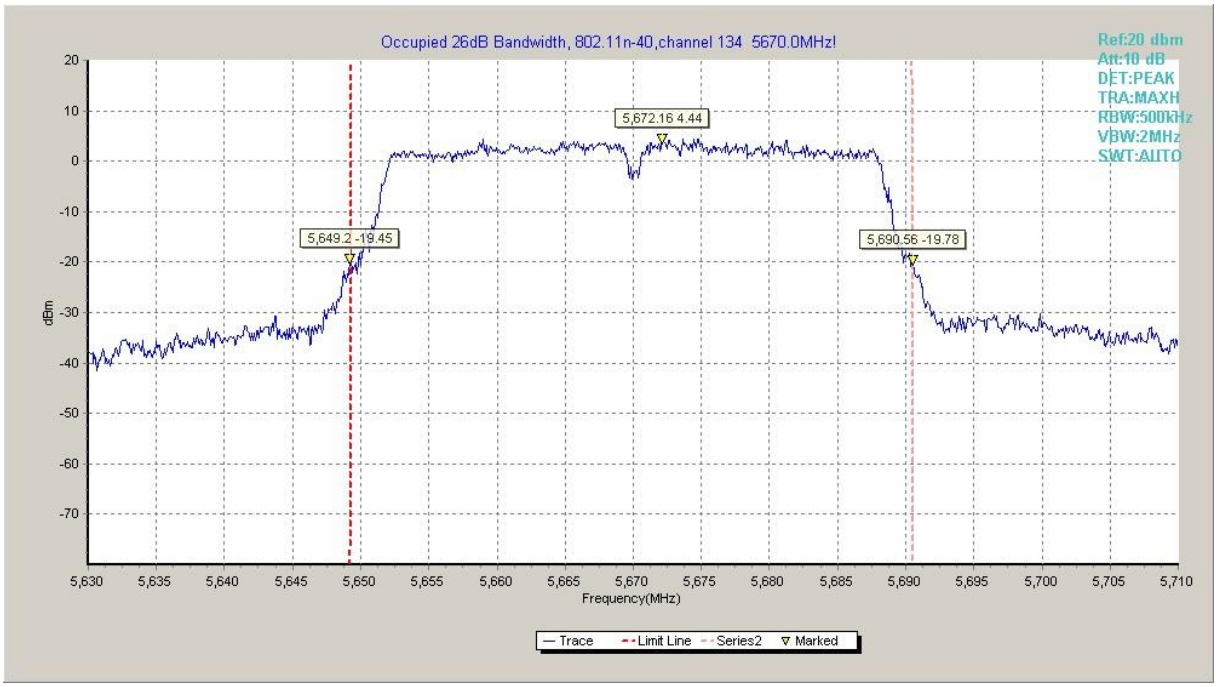


Fig. 34 Occupied 26dB Bandwidth (802. 11n-HT40, 5670MHz)

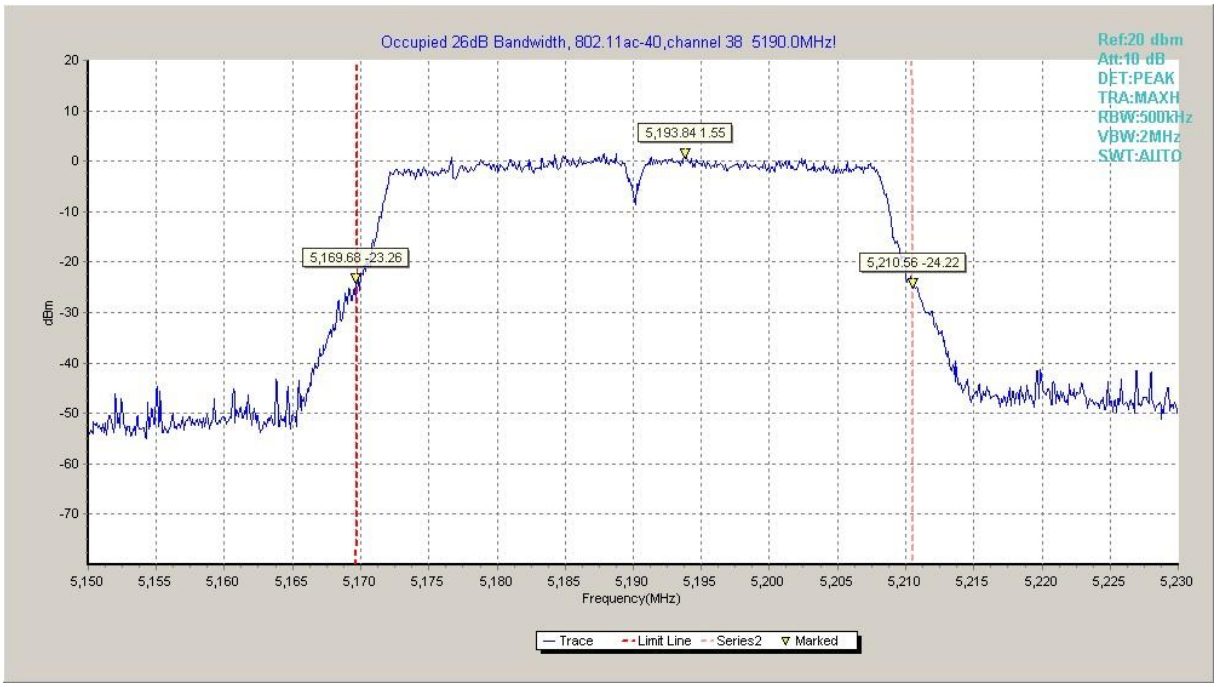


Fig. 35 Occupied 26dB Bandwidth (802.11ac-HT40, 5190MHz)

©Copyright. All rights reserved by CTTL.

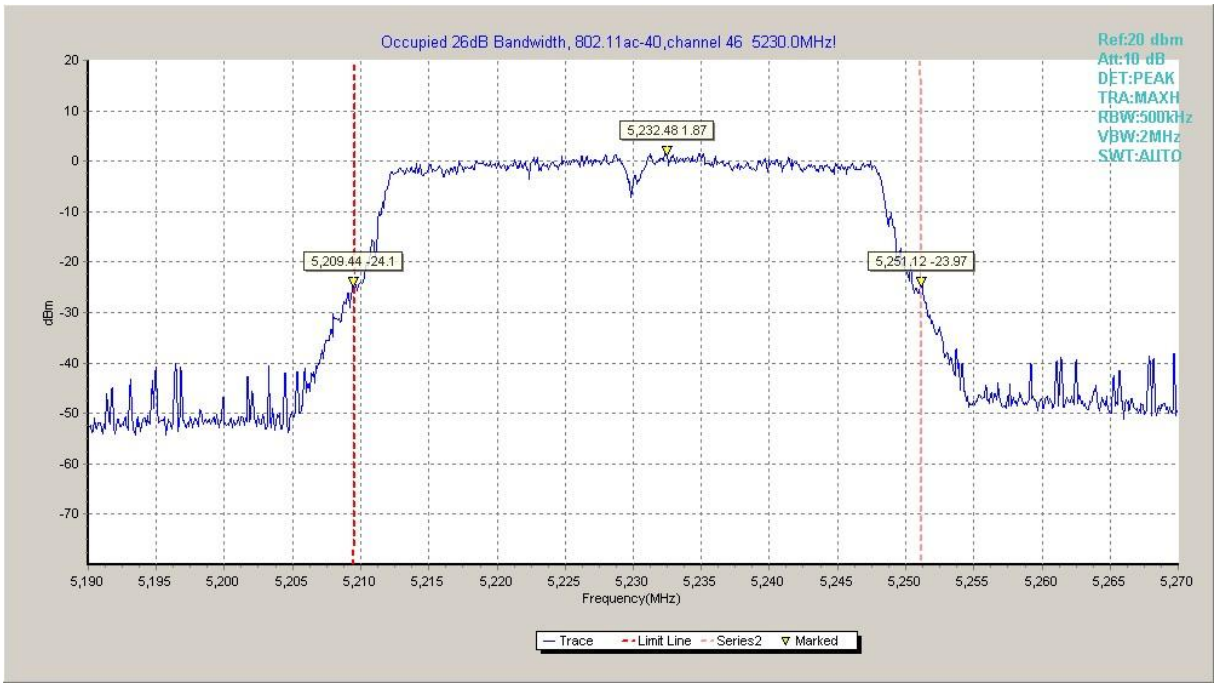


Fig. 36 Occupied 26dB Bandwidth (802.11ac-HT40, 5230MHz)

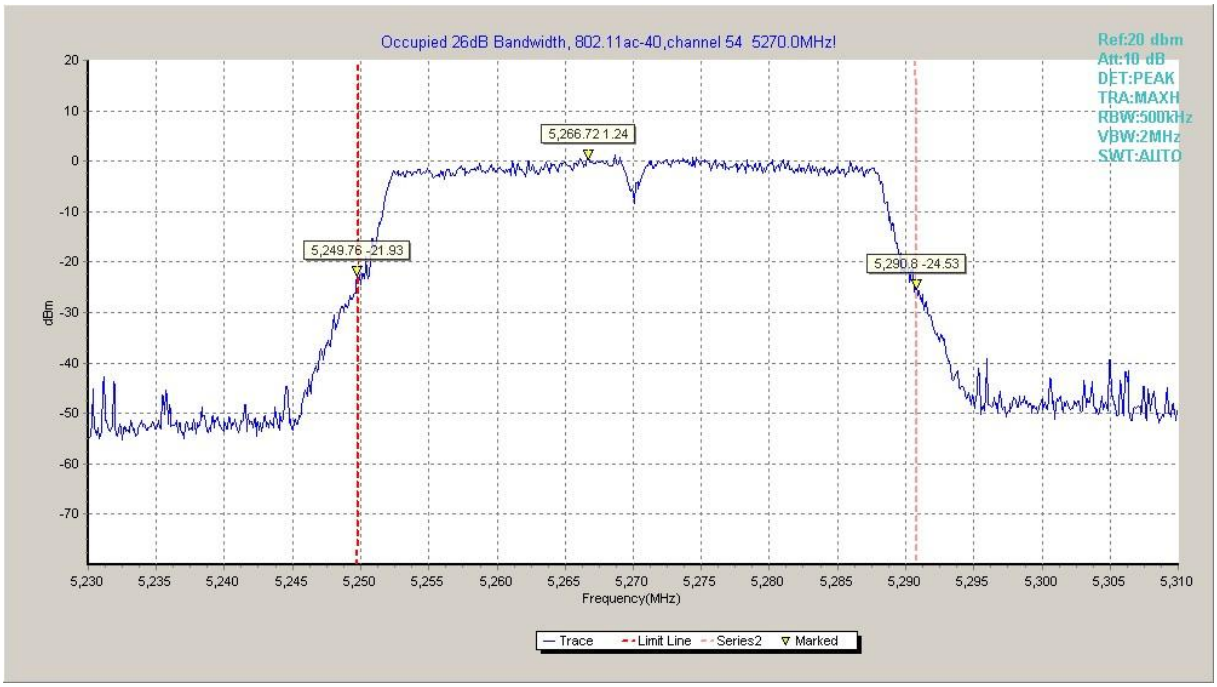


Fig. 37 Occupied 26dB Bandwidth (802.11ac-HT40, 5270MHz)

©Copyright. All rights reserved by CTTL.

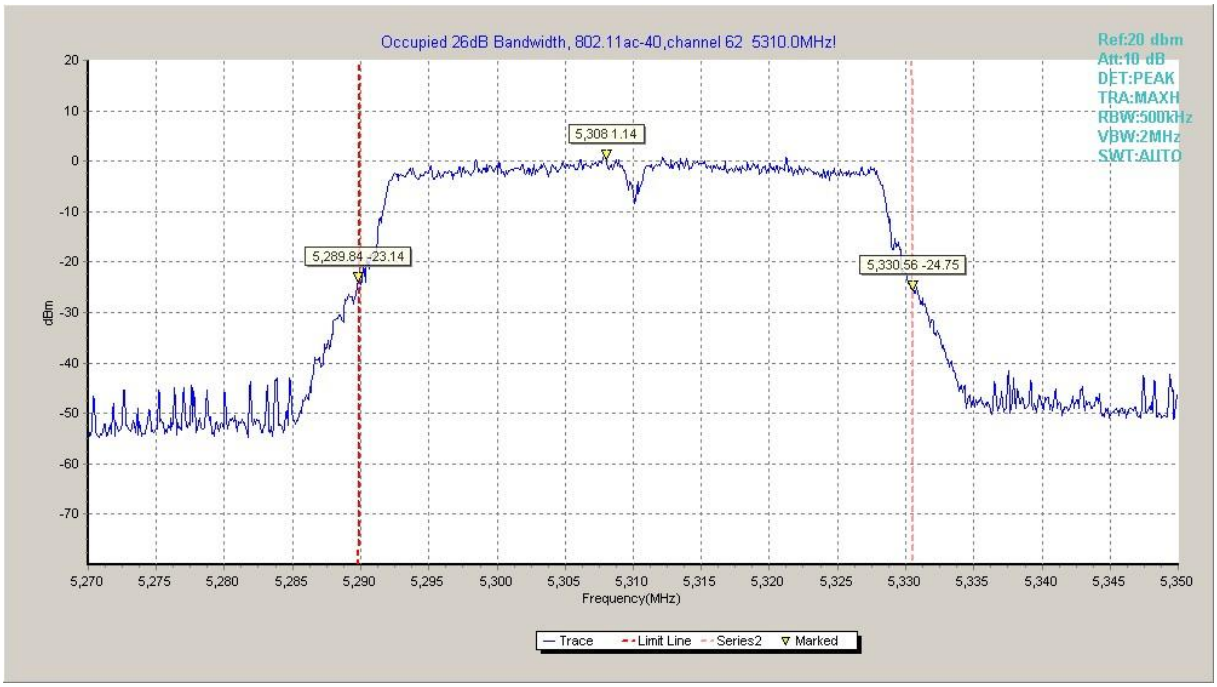


Fig. 38 Occupied 26dB Bandwidth (802.11ac-HT40, 5310MHz)

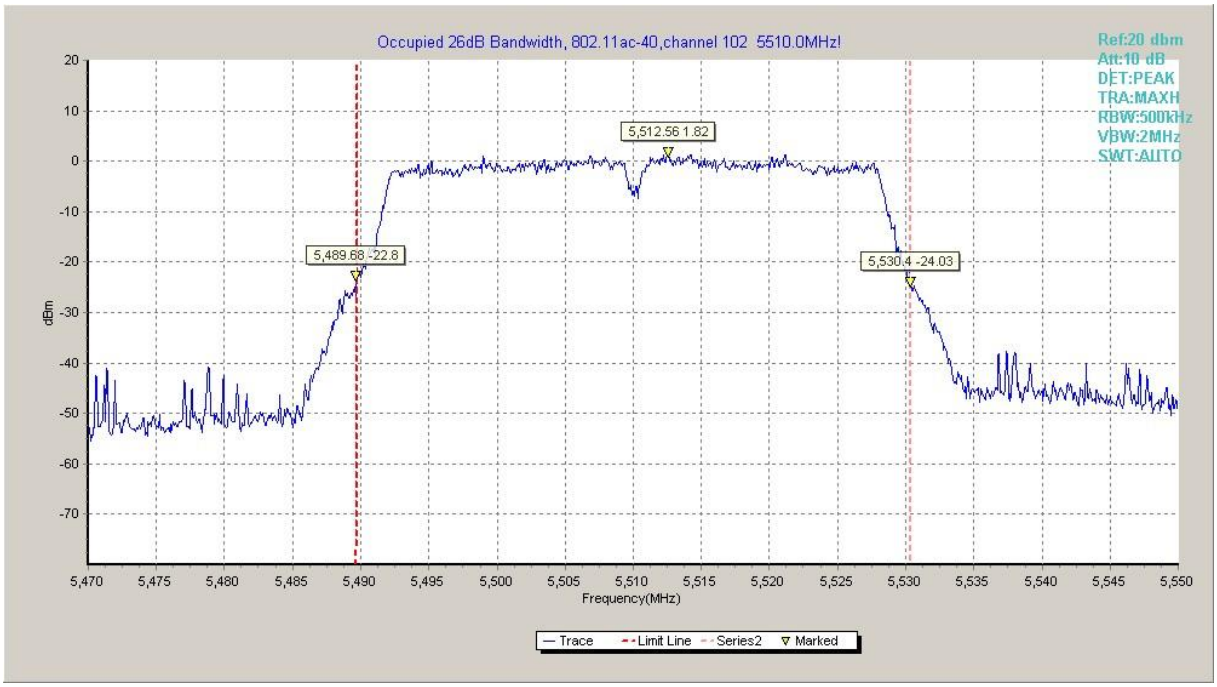


Fig. 39 Occupied 26dB Bandwidth (802. 11ac-HT40, 5510MHz)

©Copyright. All rights reserved by CTTL.

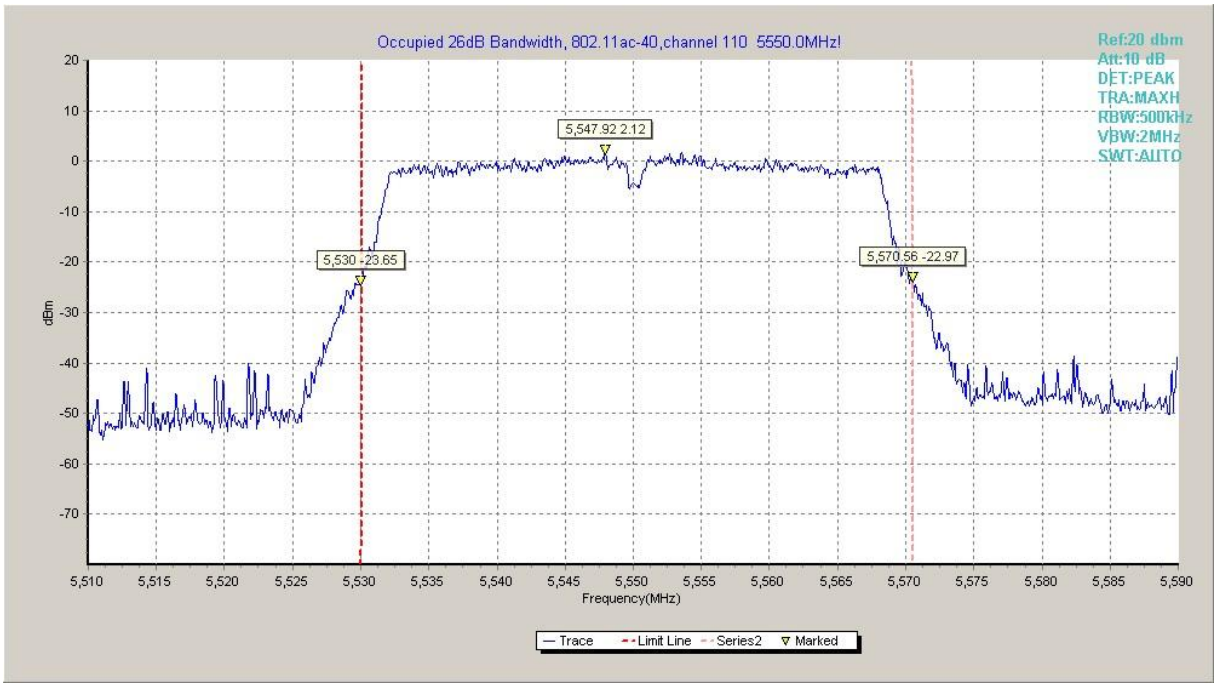


Fig. 40 Occupied 26dB Bandwidth (802. 11ac-HT40, 5550MHz)

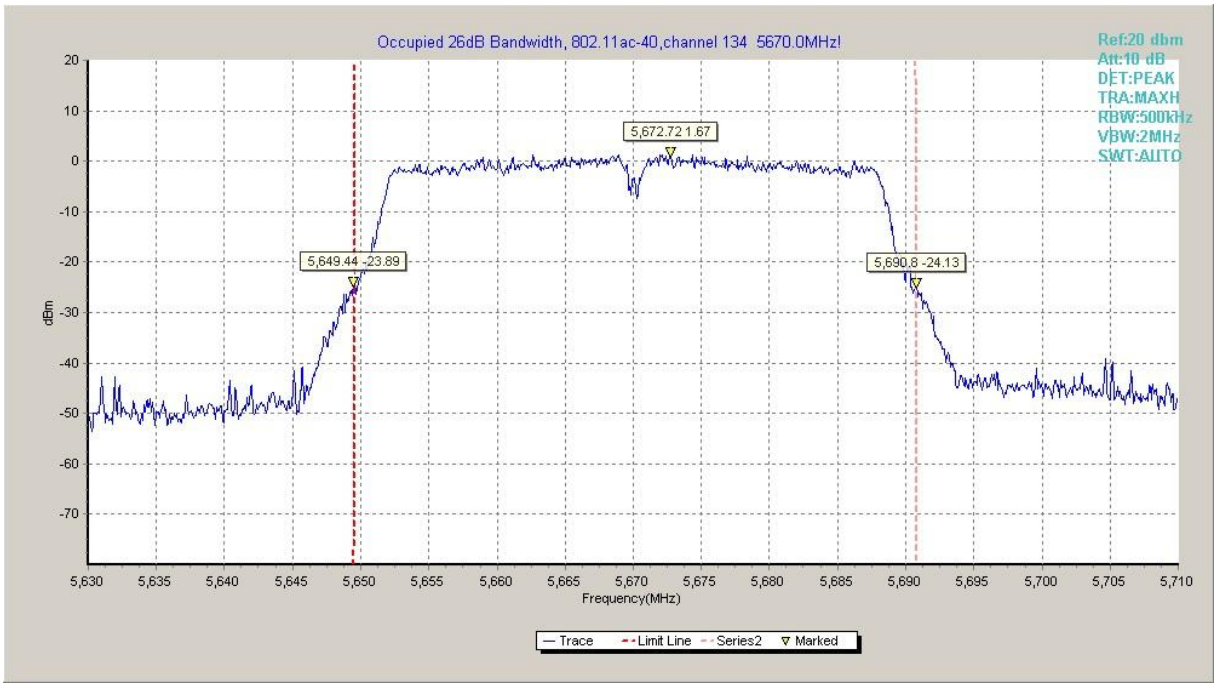


Fig. 41 Occupied 26dB Bandwidth (802. 11ac-HT40, 5670MHz)

©Copyright. All rights reserved by CTTL.

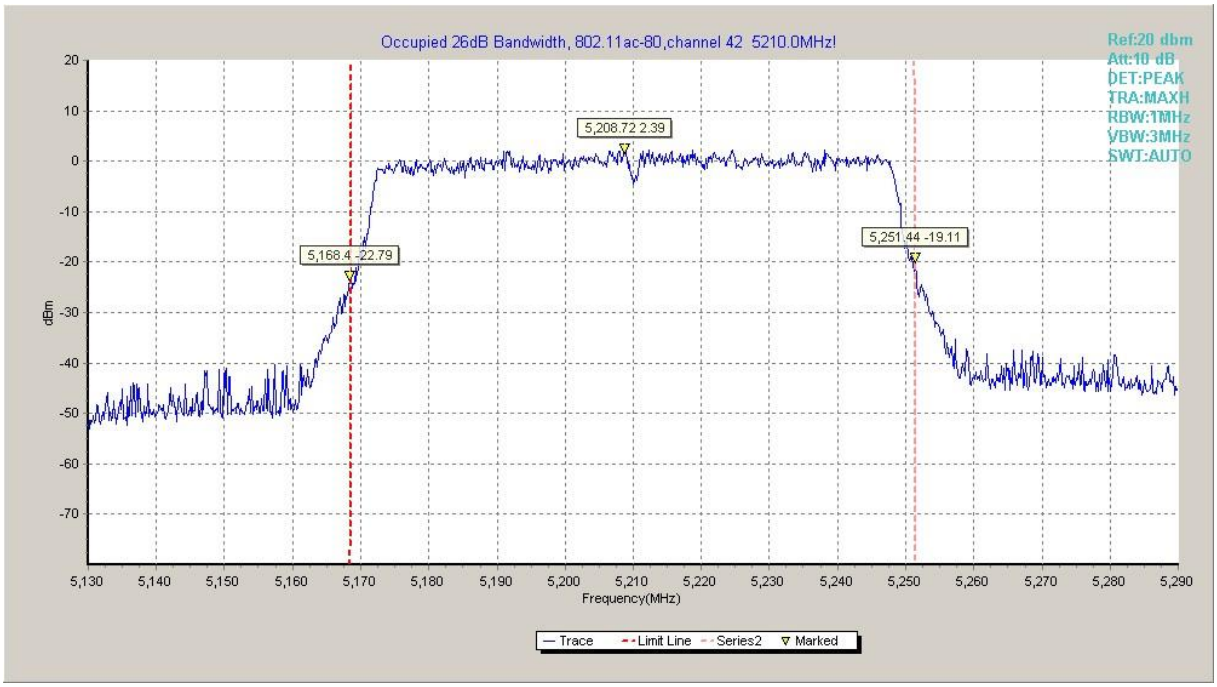


Fig. 42 Occupied 26dB Bandwidth (802. 11ac-HT80, 5210MHz)

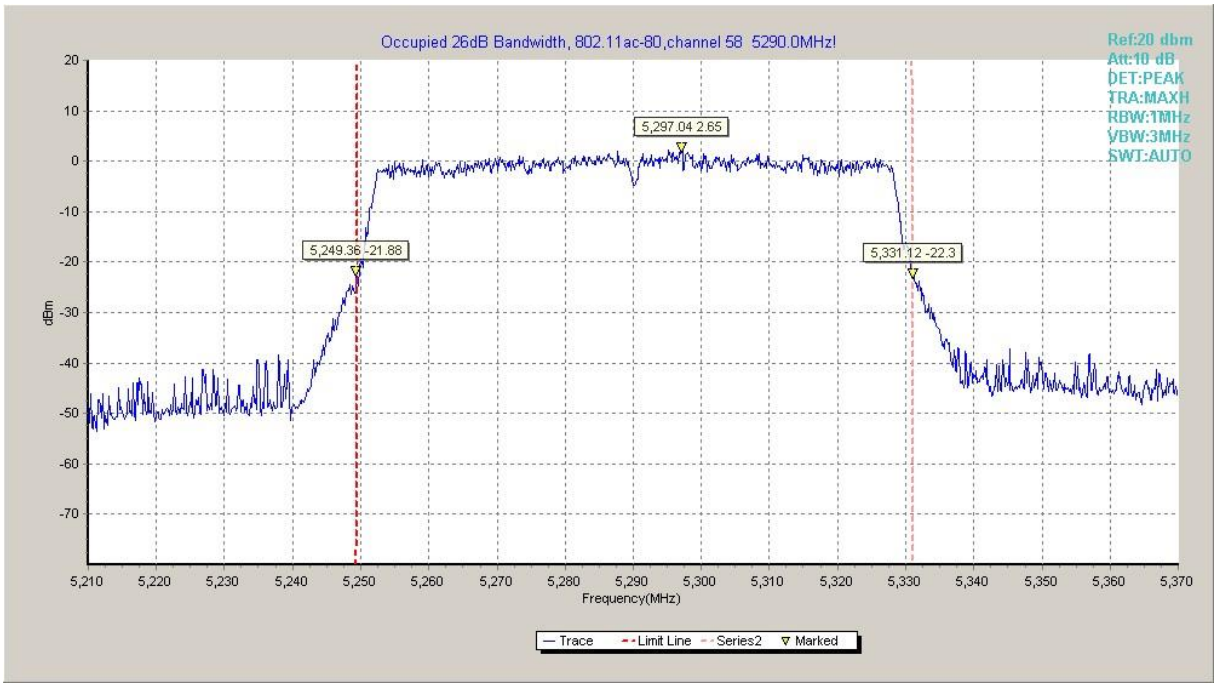


Fig. 43 Occupied 26dB Bandwidth (802. 11ac-HT80, 5290MHz)

©Copyright. All rights reserved by CTTL.

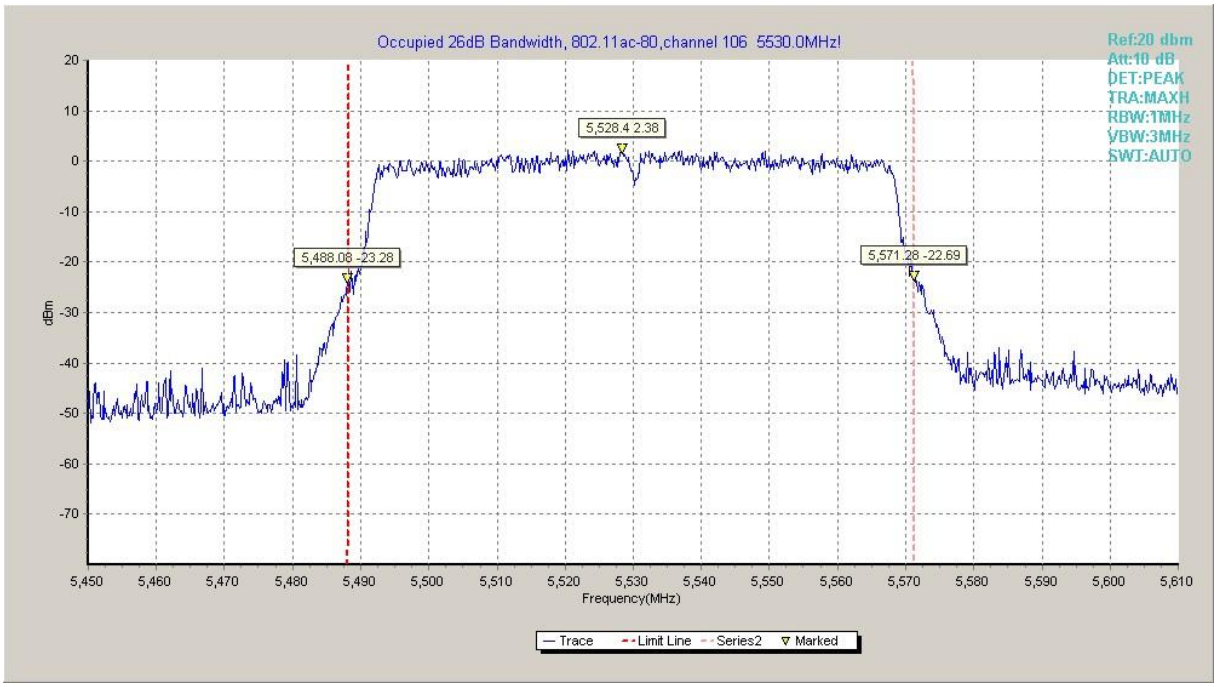


Fig. 44 Occupied 26dB Bandwidth (802. 11ac-HT80, 5530MHz)

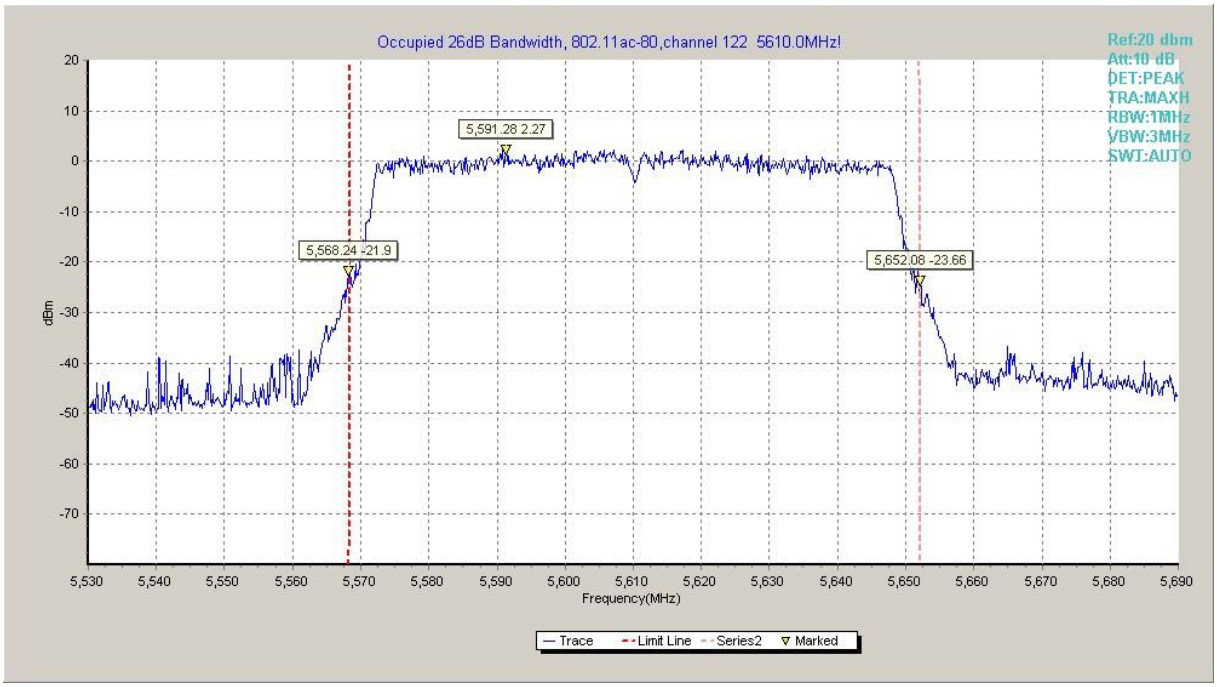


Fig. 45 Occupied 26dB Bandwidth (802. 11ac-HT80, 5610MHz)

©Copyright. All rights reserved by CTTL.

A.5. Band Edges Compliance

A5.1 Band Edges - Radiated

Measurement Limit:

Standard	Limit (dB μ V/m)	
FCC 47 CFR Part 15.209	Peak	74
	Average	54

The measurement is made according to KDB 789033

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Measurement Uncertainty:

Measurement Uncertainty	0.75dB

Measurement Result:

Mode	Channel	Test Results	Conclusion
802.11a	5180 MHz	Fig.46	P
	5320 MHz	Fig.47	P
	5500 MHz	Fig.48	P
	5700 MHz	Fig.49	P
802.11n HT20	5180 MHz	Fig.50	P
	5320 MHz	Fig.51	P
	5500 MHz	Fig.52	P
	5700 MHz	Fig.53	P
802.11n HT40	5190 MHz	Fig.54	P
	5310 MHz	Fig.55	P
	5510 MHz	Fig.56	P
	5670 MHz	Fig.57	P
802.11ac HT20	5180 MHz	Fig.58	P
	5320 MHz	Fig.59	P
	5500 MHz	Fig.60	P
	5700 MHz	Fig.61	P
802.11ac HT40	5190 MHz	Fig.62	P
	5310 MHz	Fig.63	P
	5510 MHz	Fig.64	P
	5670 MHz	Fig.65	P
802.11ac HT80	5210 MHz	Fig.66	P
	5290 MHz	Fig.67	P
	5530 MHz	Fig.68	P

Conclusion: PASS

Test graphs as below:

©Copyright. All rights reserved by CTTL.

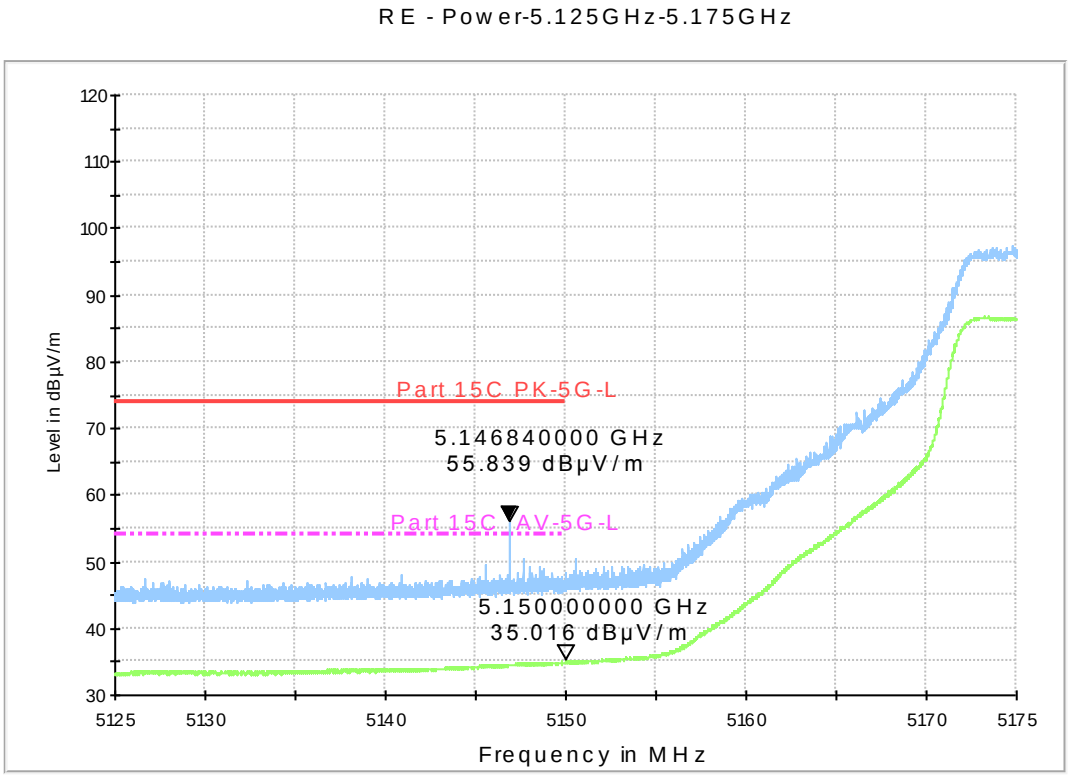


Fig. 46 Band Edges (802.11a, 5180MHz)

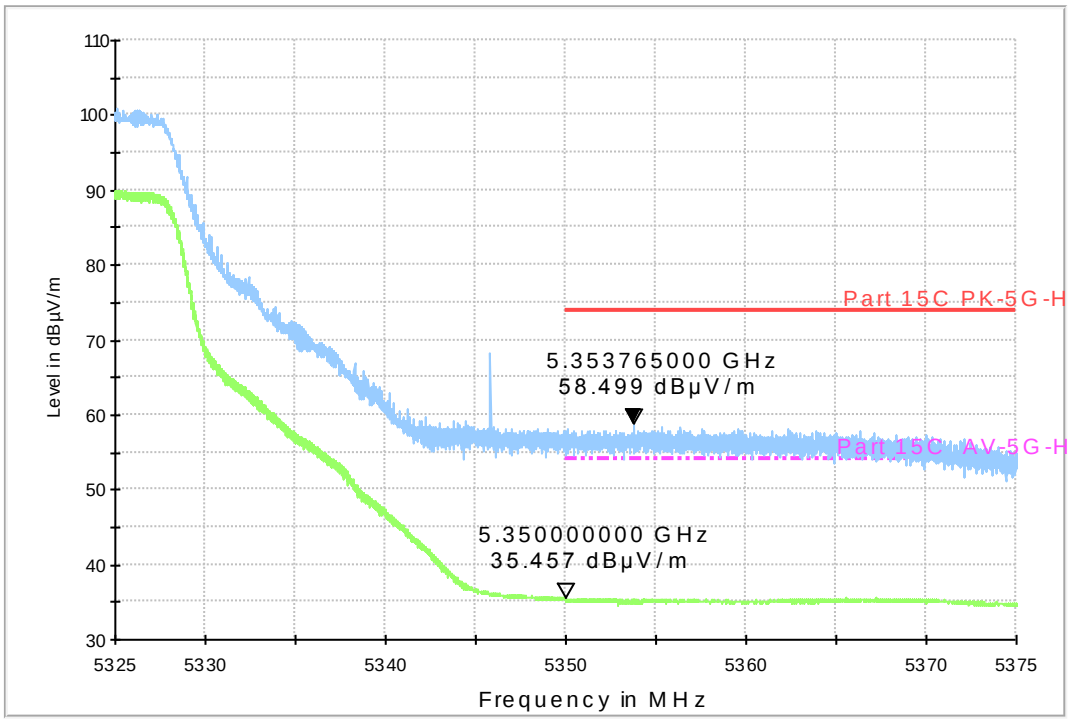


Fig. 47 Band Edges (802.11a, 5320MHz)

©Copyright. All rights reserved by CTTL.