FCC Test Report

Product Name	:	Dual-band Wireless USB Adapter
Trade Name	:	ASUS
Model No.	:	USB-N53
FCC ID.	:	MSQ-USBN53

Applicant	:	ASUSTeK COMPUTER INC.
Address	:	4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

Date of Receipt	:	Apr. 06, 2016
Issued Date	:	May. 06, 2016
Report No.	:	1640156R-RFUSP45V00
Report Version	:	V1.0

Testing Laboratory
3024

Test Report Certification

Issued Date : May. 06, 2016
Report No. : 1640156R-RFUSP45V00

Product Name	:	Dual-band Wireless USB Adapter
Applicant	:	ASUSTeK COMPUTER INC.
Address	:	4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan
Manufacturer	:	Askey Technology (Jiangsu) LTD.
Model No.	:	USB-N53
FCC ID.	:	MSQ-USBN53
EUT Voltage	:	DC 5V(Power by PC)
Testing Voltage	:	DC 5V(Power by PC)
Trade Name	:	ASUS
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart E Section 15.407: 2015 ANSI C63.10: 2009
Test Lab	:	QuieTek Hsin Chu Laboratory
Test Result	:	Complied

The test results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

Documented By : Lyla Yang
(Lyla Yang / Engineering Adm. Assistant)

Tested By : Bruno Tsai
(Bruno Tsai / Engineer)

Approved By : Roy Wang
(Roy Wang / Director)

Revision History

Report No.	Version	Description	Issued Date
115250R-RFUSP42V01	V1.0	Initial issue of report	Jun. 29, 2011
1640156R-RFUSP45V00	V1.0	Update WLAN 5G band 4 standard to FCC 15E new rule, and verify Power Density, Frequency Stability tested. The WLAN 2.4G test data, please refer to the 115250R-RFUSP42V01.	May. 06, 2016

Laboratory Information

We, **QuieTek Corporation**, 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: 365520**
Canada	**:**	**IC, Submission No: 181665 / IC Registration Number: 4075C-4**

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site:http://www.quietek.com/english/about/certificates.aspx?bval=5
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/index_en.aspx
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory:
No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

LinKou Testing Laboratory:
No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

TABLE OF CONTENTS

1. General Information

1.1. EUT Description

Product Name	Dual-band Wireless USB Adapter
Trade Name	ASUS
Model No.	USB-N53
Frequency Range	IEEE 802.11a & IEEE 802.11n (20MHz): 5745~5825MHz IEEE 802.11n (40MHz): 5755~5795MHz
Channel Number	IEEE 802.11a & IEEE 802.11n (20MHz): 5 IEEE 802.11n (40MHz): 2
Type of Modulation	IEEE 802.11b: Direct Sequence Spread Spectrum (DSSS) IEEE 802.11a/g/n: Orthogonal Frequency Division Multiplexing (OFDM)
Data Speed	IEEE 802.11b: 1Mbps, 2Mbps, 5.5Mbps, 11Mbps IEEE 802.11a/g: 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps IEEE 802.11n: Support a subset of the combination of GI, MCS 0~MCS 15 and bandwidth defined in 802.11n
Channel Control	Manual

Antenna Information	
Antenna Type	PIFA Antenna
Antenna Gain	3.17dBi

Accessories Information	
LAN Cable	Non-Shielded, 0.15m

ANT-TX / RX & Bandwidth

ANT-TX / RX	SINGLE-TX		TWO-TX		RX	
Mode/ Channel Bandwidth	20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
IEEE802.11a	✓				✓	
IEEE802.11b	✓				✓	
IEEE802.11g	✓					
IEEE802.11n			✓	✓	✓	✓

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 (Note1)	
								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_{BPSC}	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
149	5745 MHz	153	5765 MHz	157	5785 MHz	161	5805 MHz
165	5825 MHz						

IEEE 802.11n (40MHz)

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz				

Note:

1. This device is a Dual-band Wireless USB Adapter including 2.4GHz b/g/n and 5GHz a/n (2x2) transmitting and receiving function.
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with Part 15 Subpart E Paragraph 15.407.
3. 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.
4. The function of the 2.4G & 5.2GHz transmitting is measured and makes a test report of the report number: 115250R-RFUSP42V01 & 1640156R-RFUSP45V00.
5. This device is a composite device in accordance with Part 15 regulations. The receiving function receiving was tested and its test report number is 115250R-RFUSP37V02 under Declaration of Conformity.

1.2. Test Mode

QuieTek 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: Transmit

Test Items	Modulation	Channel	Antenna	Result
Conducted Emission	11n(40MHz)	151	0+1	N/A
99 % & 26dB Bandwidth	a	149/ 157/ 165	0	N/A
	11n(20MHz)	149/ 157/ 165	0/1	N/A
	11n(40MHz)	151/ 159	0/1	N/A
Peak Transmit Output	a	149/ 157/ 165	0	N/A
	11n(20MHz)	149/ 157/ 165	0+1	N/A
	11n(40MHz)	151/ 159	0+1	N/A
Peak Power Spectrum Density	a	149/ 157/ 165	0	Complies
	11n(20MHz)	149/ 157/ 165	0+1	Complies
	11n(40MHz)	151/ 159	0+1	Complies
Radiated Emission	a	149/ 157/ 165	0	N/A
	11n(20MHz)	149/ 157/ 165	0+1	N/A
	11n(40MHz)	151/ 159	0+1	N/A
RF antenna conducted test	a	149/ 165	0	N/A
	11n(20MHz)	149/ 165	0/1	N/A
	11n(40MHz)	151/ 159	0/1	N/A
Frequency Stability	a	149/ 165	0	Complies
	11n(20MHz)	149/ 165	0/1	Complies
	11n(40MHz)	151/ 159	0/1	Complies

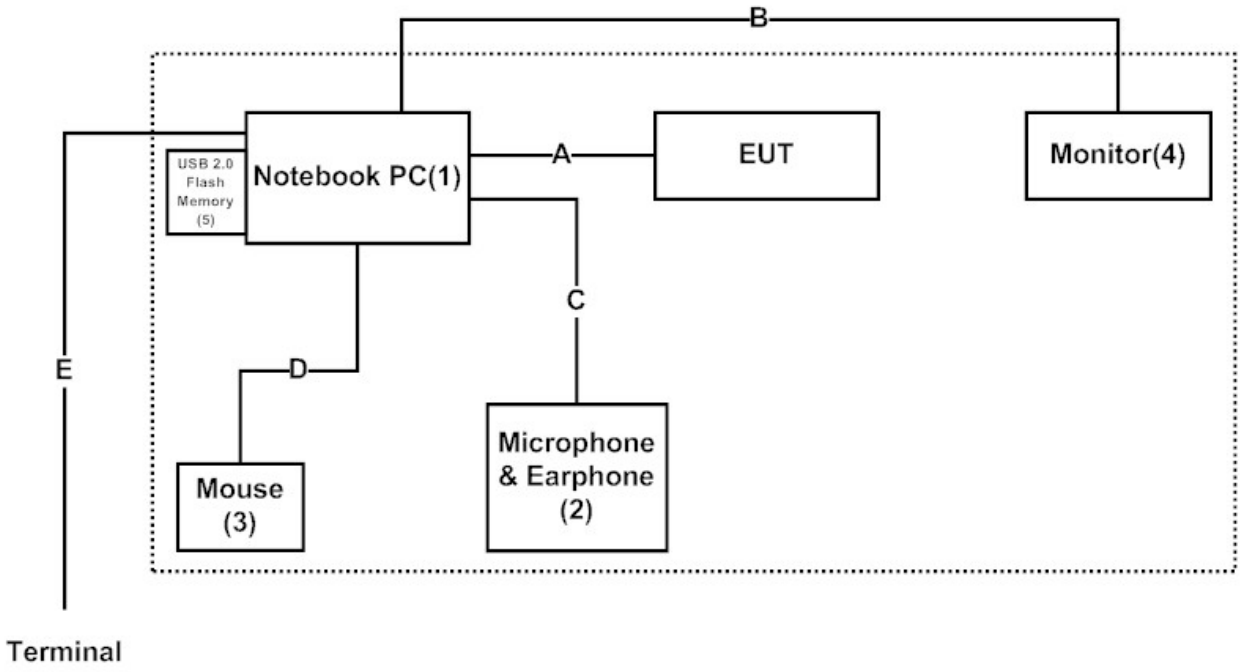
1.3. Tested System Details

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	ACER	PAV70	LUSEW0D0371105 FE221601	DoC	Non-Shielded, 2.5m
2	Microphone & Earphone	Fujiei	SBZ-38	N/A	DoC	--
3	Mouse	Logitech	M-SBF83	HCA52200185	DoC	--
4	Monitor	CHI MEI	A170E1-09	3UC120955SA1250	DoC	Non-Shielded, 1.8m
5	USB 2.0 Flash Memory	Sony	USM2GJX	N/A	DoC	--

1.4. Configuration of tested System

Connection Diagram



Signal Cable Type		Signal cable Description
A	USB Cable	Shielded, 0.15m
B	VGA Cable	Shielded, 1.6m
C	Microphone & Earphone Cable	Non-Shielded, 1.2m
D	Mouse Cable	Shielded, 1.5m
E	LAN Cable	Non-Shielded, 3.0m

1.5. EUT Exercise Software

1	Setup the EUT as shown in Section 1.5
2	Execute the RT3x7xQA.exe on the EUT
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 Peak Power Spectrum Density	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. Peak Power Spectrum Density

2.1. Test Equipment

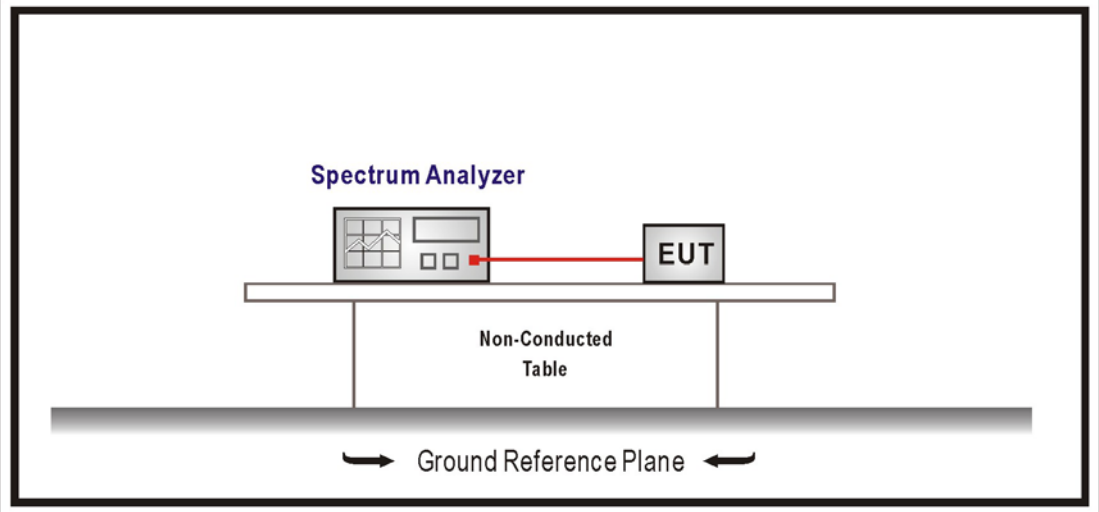
The following test equipments are used during the radiated emission tests:

Peak Power Spectrum Density / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2016/08/23
Signal & Spectrum Analyzer	R&S	FSV40	101049	2017/01/05
Signal Analyzer	R&S	FSV7	101650	2016/11/30

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

2.2. Test Setup



2.3. Limits

1. For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 17 dBm in any 1MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
2. For client devices in the 5.15-5.25 GHz band, 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
3. For the band 5.25-5.35 GHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
4. For the band 5.725-5.850 GHz, the peak power spectral density shall not exceed 30 dBm in any 500KHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.

2.4. Test Procedure

The EUT was setup to ANSI C63.10: 2009; tested to U-NII test procedure of KDB 789033 D02 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.

2.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

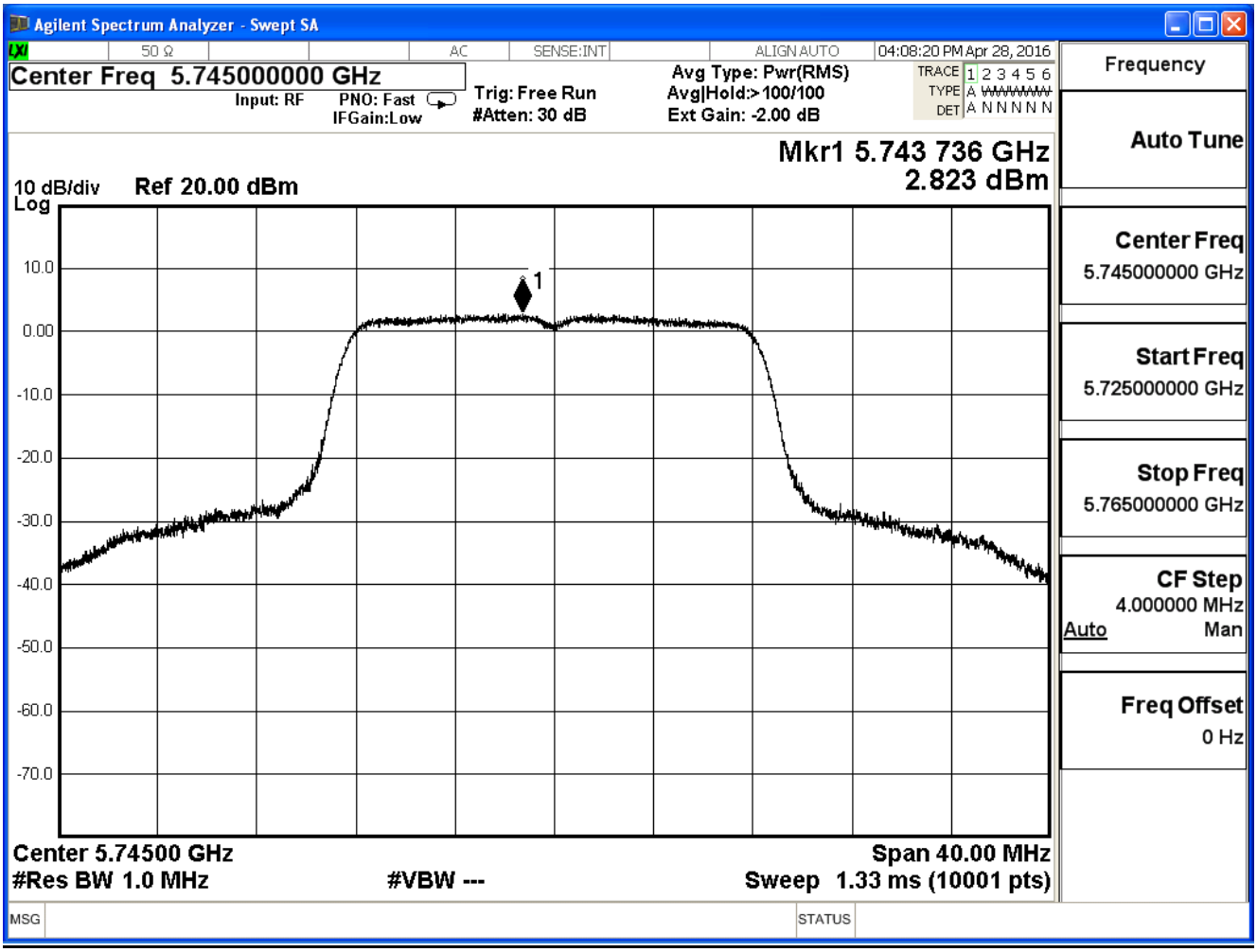
2.6. Test Result

Product	Dual-band Wireless USB Adapter		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2016/04/28	Test Site	SR7

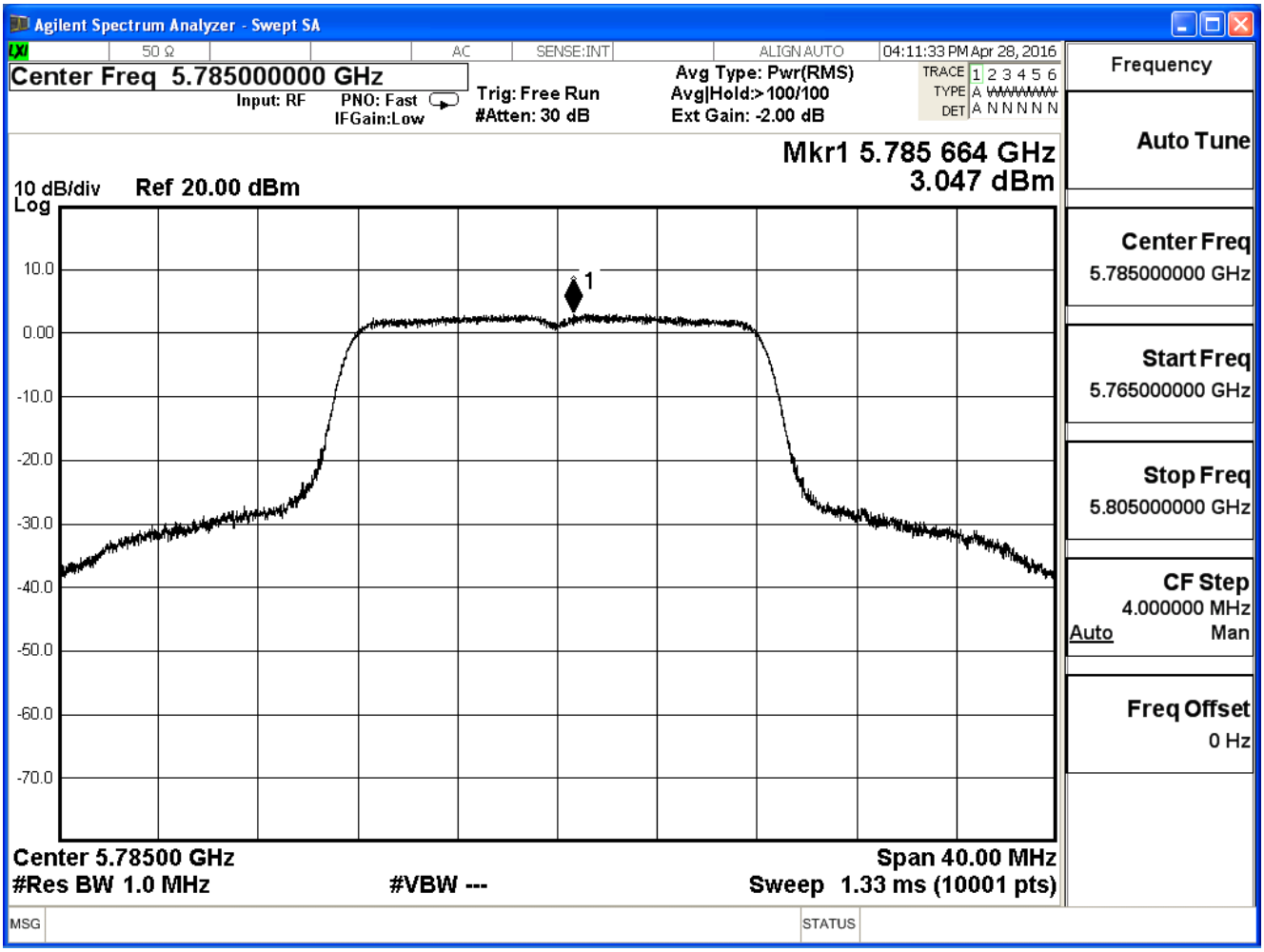
IEEE 802.11a

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
149	5745	2.823	≦30	Pass
157	5785	3.047	≦30	Pass
165	5825	3.101	≦30	Pass

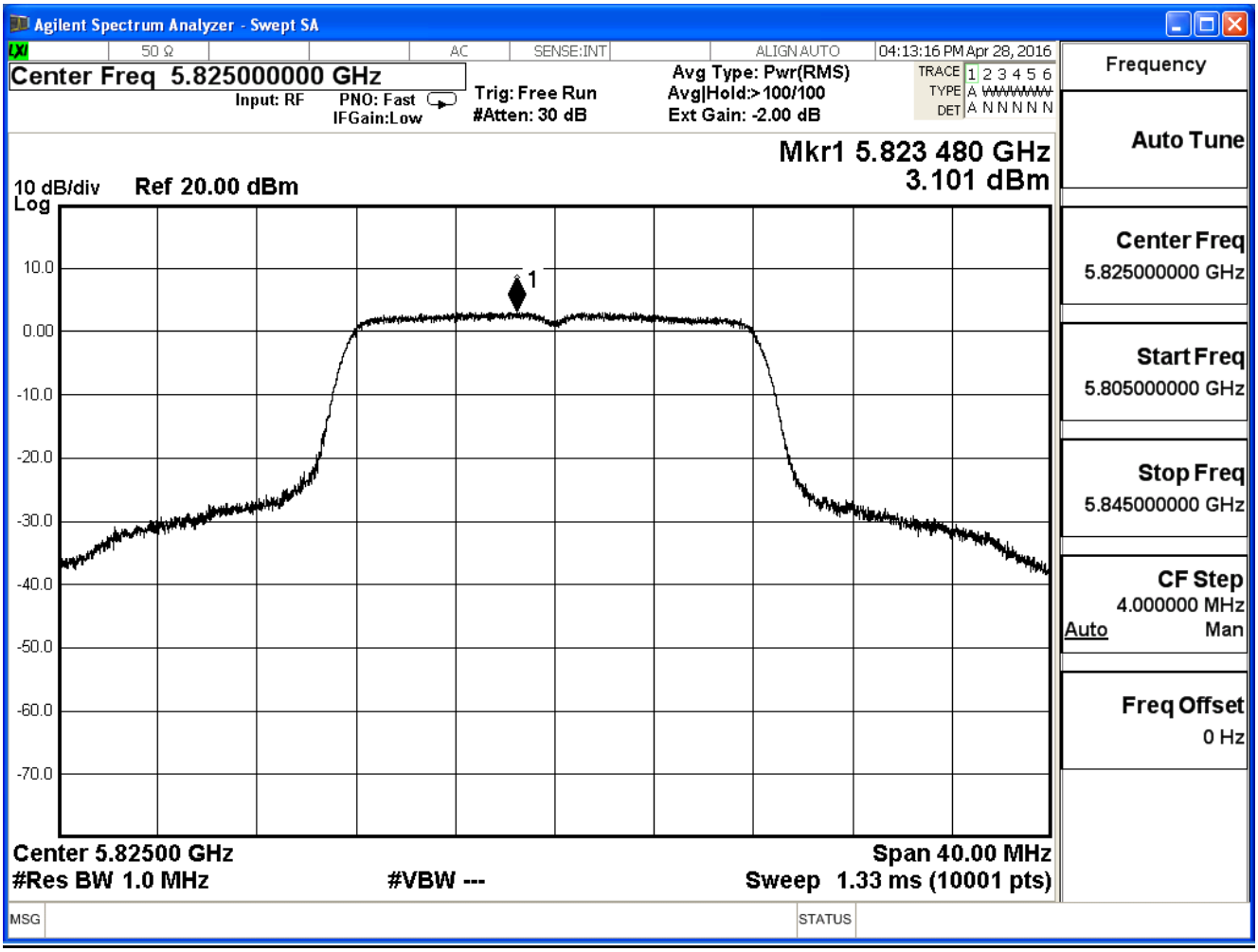
Channel 149



Channel 157


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.785000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Pwr(RMS)
Avg|Hold:>100/100
Ext Gain: -2.00 dB
04:11:33 PM Apr 28, 2016
Mkr1 5.785 664 GHz
3.047 dBm
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 5.78500 GHz
#Res BW 1.0 MHz
#VBW ---
Span 40.00 MHz
Sweep 1.33 ms (10001 pts)
Frequency
Auto Tune
Center Freq
5.785000000 GHz
Start Freq
5.765000000 GHz
Stop Freq
5.805000000 GHz
CF Step
4.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

Channel 165

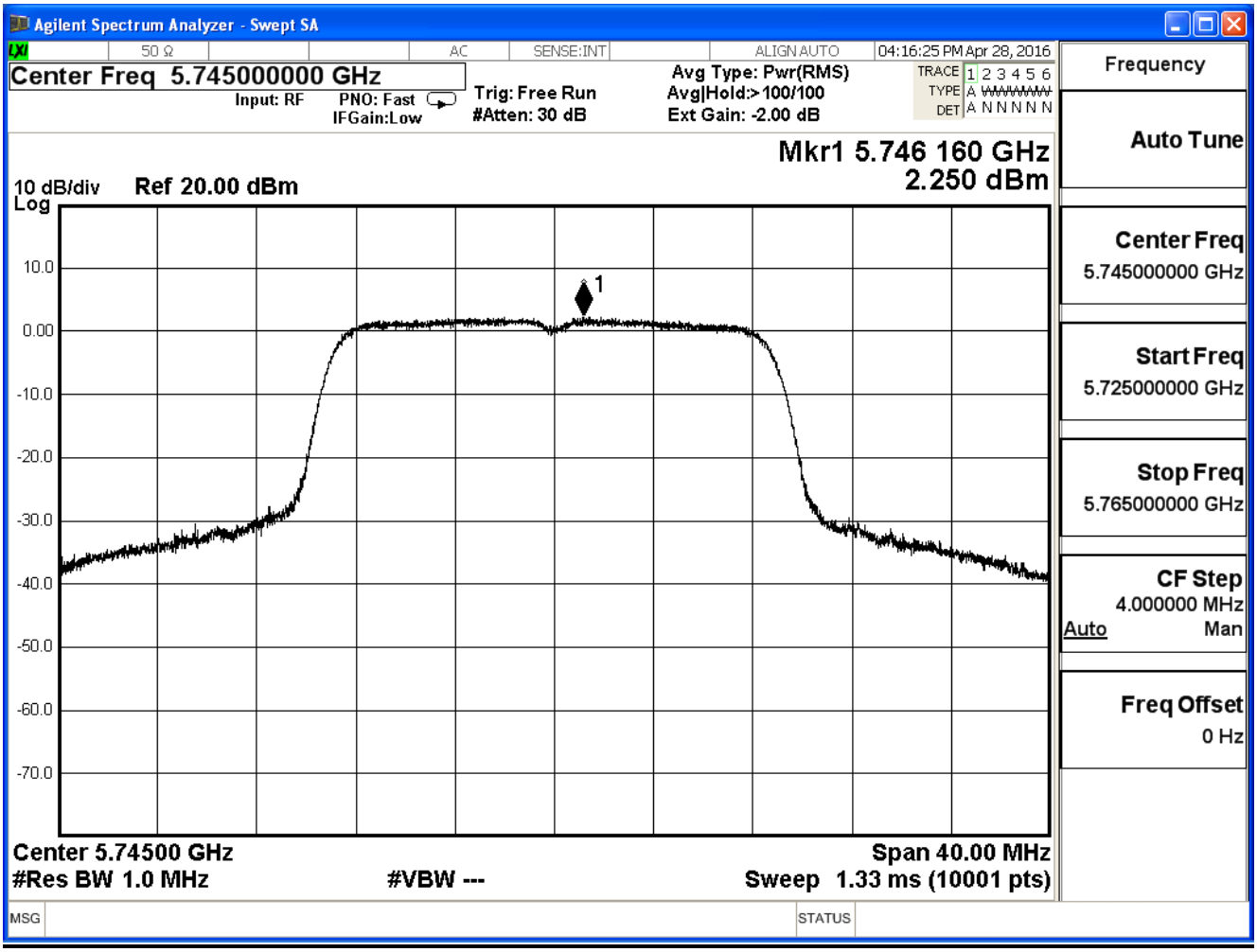

Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
04:13:16 PM Apr 28, 2016
Center Freq 5.825000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Pwr(RMS)
Avg|Hold:>100/100
Ext Gain: -2.00 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET A N N N N N
Mkr1 5.823 480 GHz
3.101 dBm
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 5.82500 GHz
#Res BW 1.0 MHz
#VBW ---
Span 40.00 MHz
Sweep 1.33 ms (10001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
5.825000000 GHz
Start Freq
5.805000000 GHz
Stop Freq
5.845000000 GHz
CF Step
4.000000 MHz
Auto
Man
Freq Offset
0 Hz

Product	Dual-band Wireless USB Adapter		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2016/04/28	Test Site	SR7

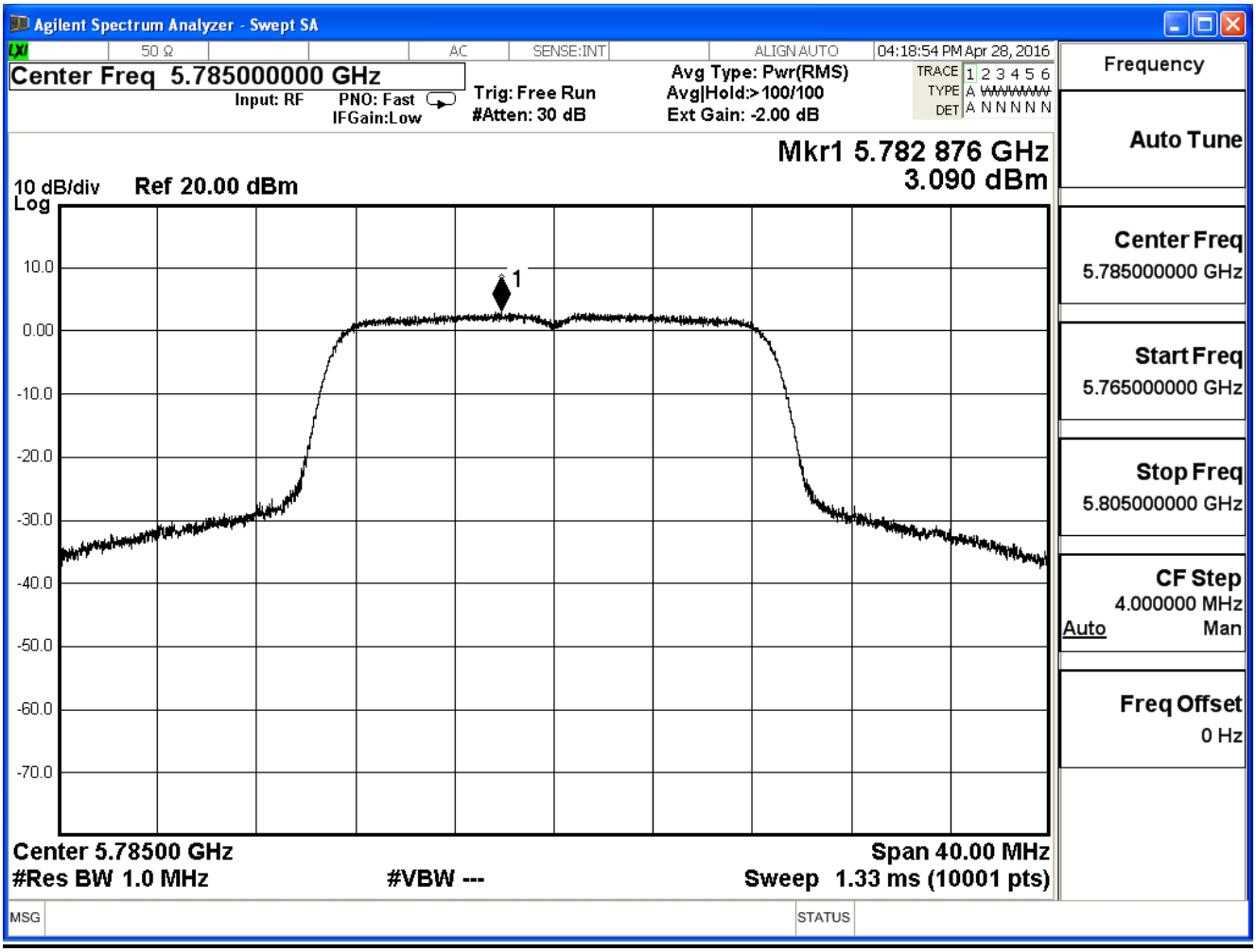
IEEE802.11n_20MHz_(ANT 0)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
149	5745	2.250	≦30	Pass
157	5785	3.090	≦30	Pass
165	5825	2.878	≦30	Pass

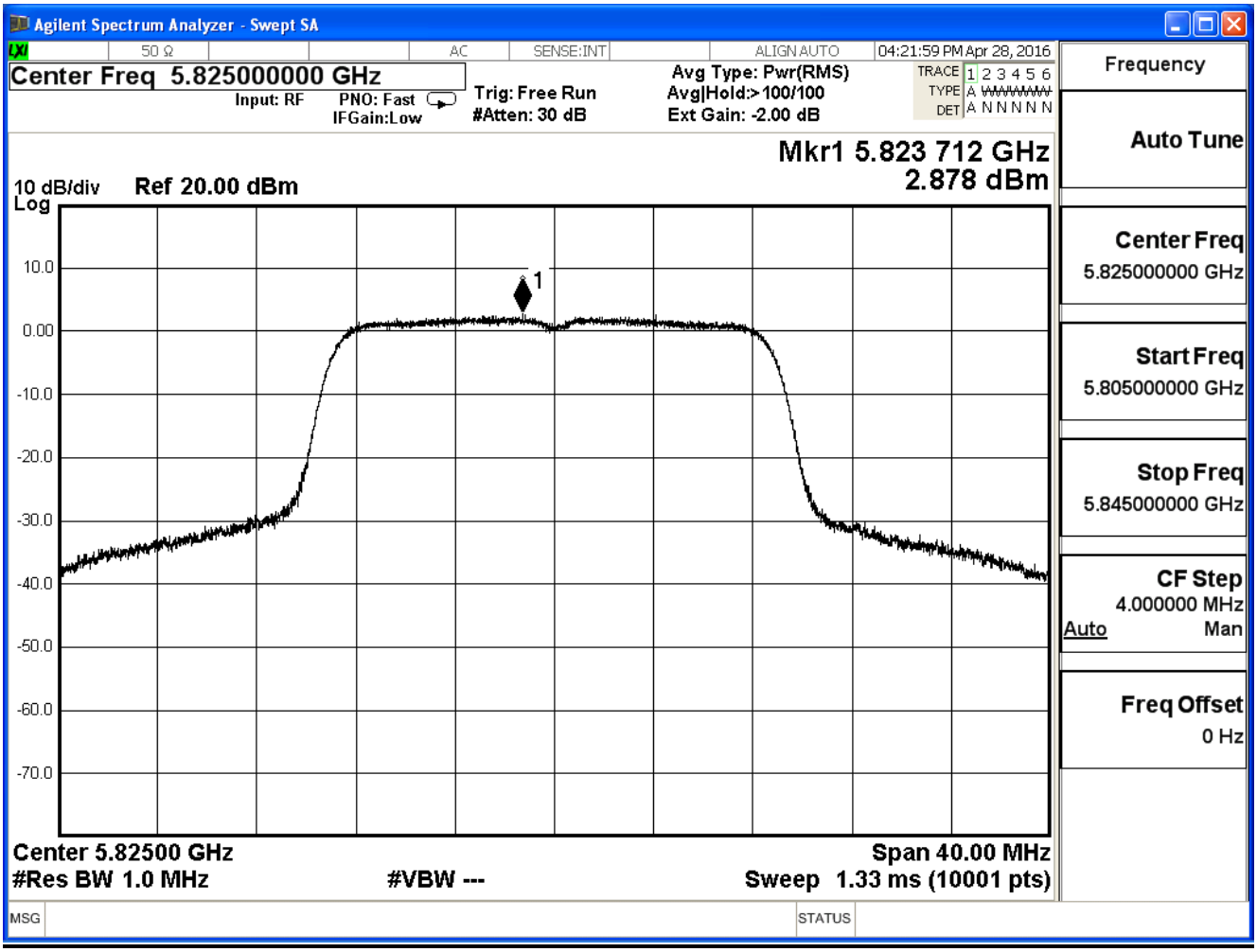
Channel 149



Channel 157


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
04:18:54 PM Apr 28, 2016
Center Freq 5.785000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Pwr(RMS)
Avg|Hold:>100/100
Ext Gain: -2.00 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET A N N N N N
Mkr1 5.782 876 GHz
3.090 dBm
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center 5.78500 GHz
#Res BW 1.0 MHz
#VBW ---
Span 40.00 MHz
Sweep 1.33 ms (10001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
5.785000000 GHz
Start Freq
5.765000000 GHz
Stop Freq
5.805000000 GHz
CF Step
4.000000 MHz
Auto
Man
Freq Offset
0 Hz

Channel 165

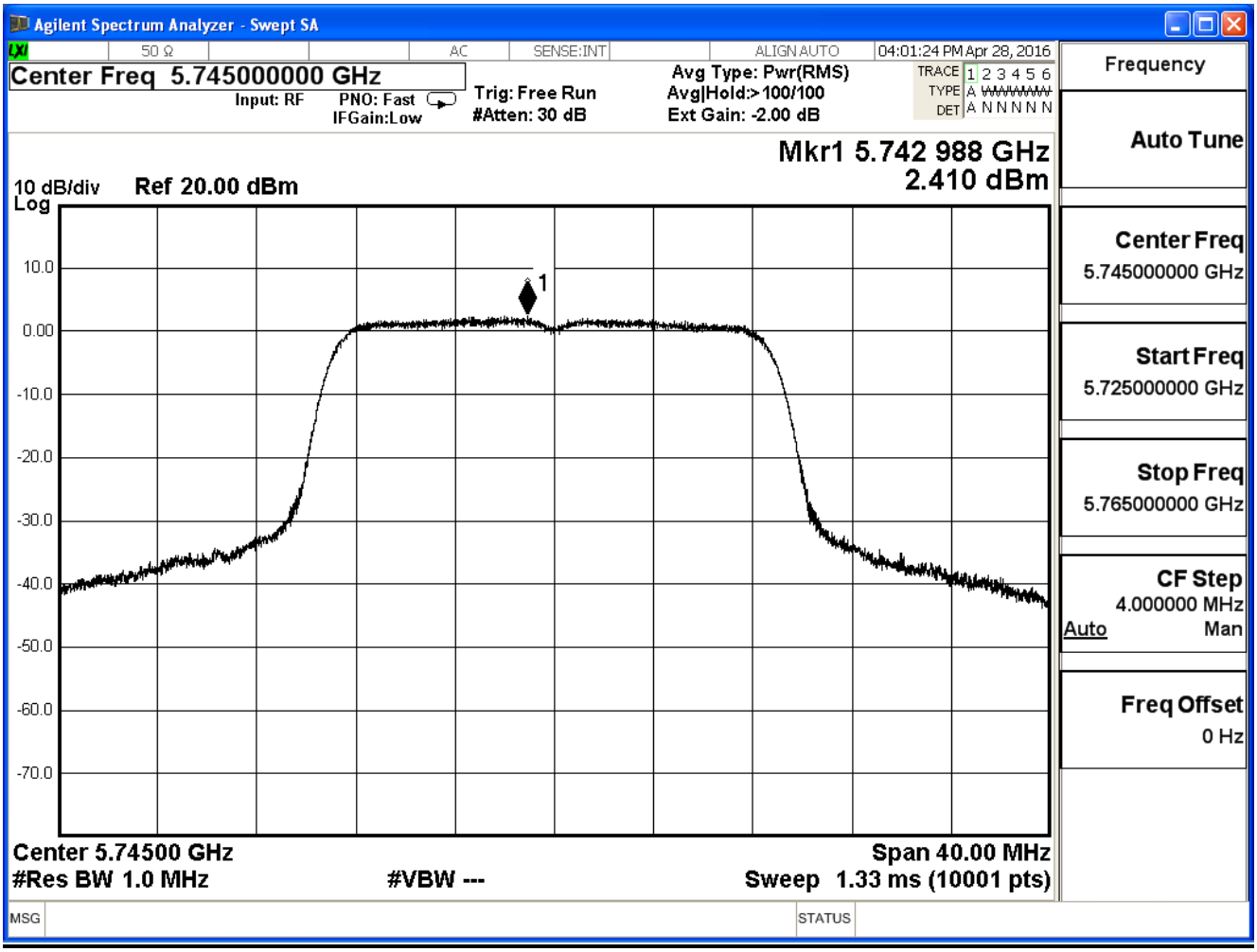

Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
04:21:59 PM Apr 28, 2016
Center Freq 5.825000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Pwr(RMS)
Avg|Hold:>100/100
Ext Gain: -2.00 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET A N N N N N
Mkr1 5.823 712 GHz
2.878 dBm
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 5.82500 GHz
#Res BW 1.0 MHz
#VBW ---
Span 40.00 MHz
Sweep 1.33 ms (10001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
5.825000000 GHz
Start Freq
5.805000000 GHz
Stop Freq
5.845000000 GHz
CF Step
4.000000 MHz
Auto
Man
Freq Offset
0 Hz

Product	Dual-band Wireless USB Adapter		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2016/04/28	Test Site	SR7

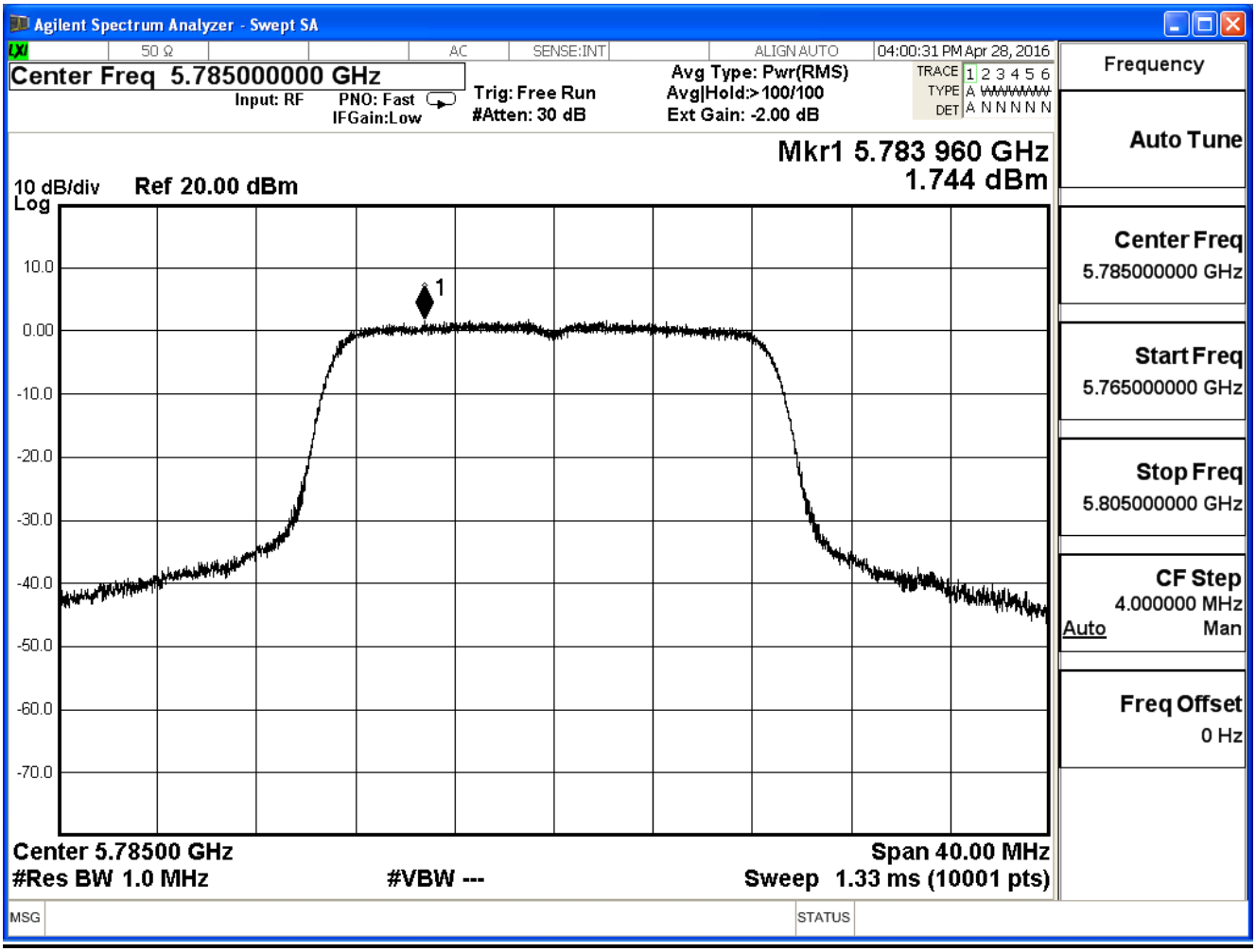
IEEE802.11n_20MHz_(ANT 1)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
149	5745	2.410	≦30	Pass
157	5785	1.744	≦30	Pass
165	5825	1.588	≦30	Pass

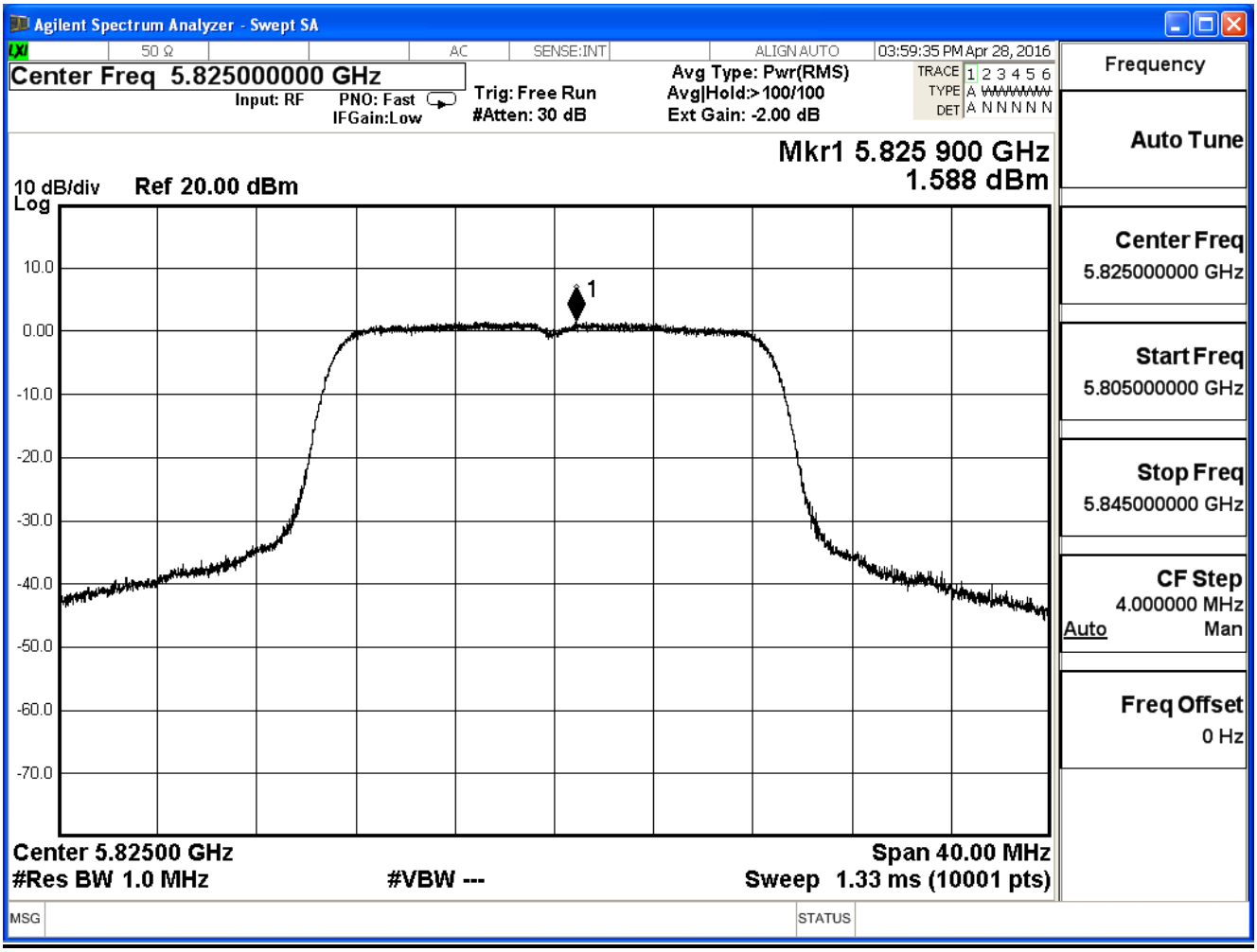
Channel 149



Channel 157


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
04:00:31 PM Apr 28, 2016
Center Freq 5.785000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Pwr(RMS)
Avg|Hold:>100/100
Ext Gain: -2.00 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET A N N N N N
Mkr1 5.783 960 GHz
1.744 dBm
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Center 5.78500 GHz
#Res BW 1.0 MHz
#VBW ---
Span 40.00 MHz
Sweep 1.33 ms (10001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
5.785000000 GHz
Start Freq
5.765000000 GHz
Stop Freq
5.805000000 GHz
CF Step
4.000000 MHz
Auto
Man
Freq Offset
0 Hz

Channel 165


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
03:59:35 PM Apr 28, 2016
Center Freq 5.825000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Pwr(RMS)
Avg|Hold:>100/100
Ext Gain: -2.00 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET A N N N N N
Mkr1 5.825 900 GHz
1.588 dBm
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center 5.82500 GHz
#Res BW 1.0 MHz
#VBW ---
Span 40.00 MHz
Sweep 1.33 ms (10001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
5.825000000 GHz
Start Freq
5.805000000 GHz
Stop Freq
5.845000000 GHz
CF Step
4.000000 MHz
Auto
Man
Freq Offset
0 Hz

Product	Dual-band Wireless USB Adapter		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2016/04/28	Test Site	SR7

IEEE802.11n 20MHz(ANT 0+1)

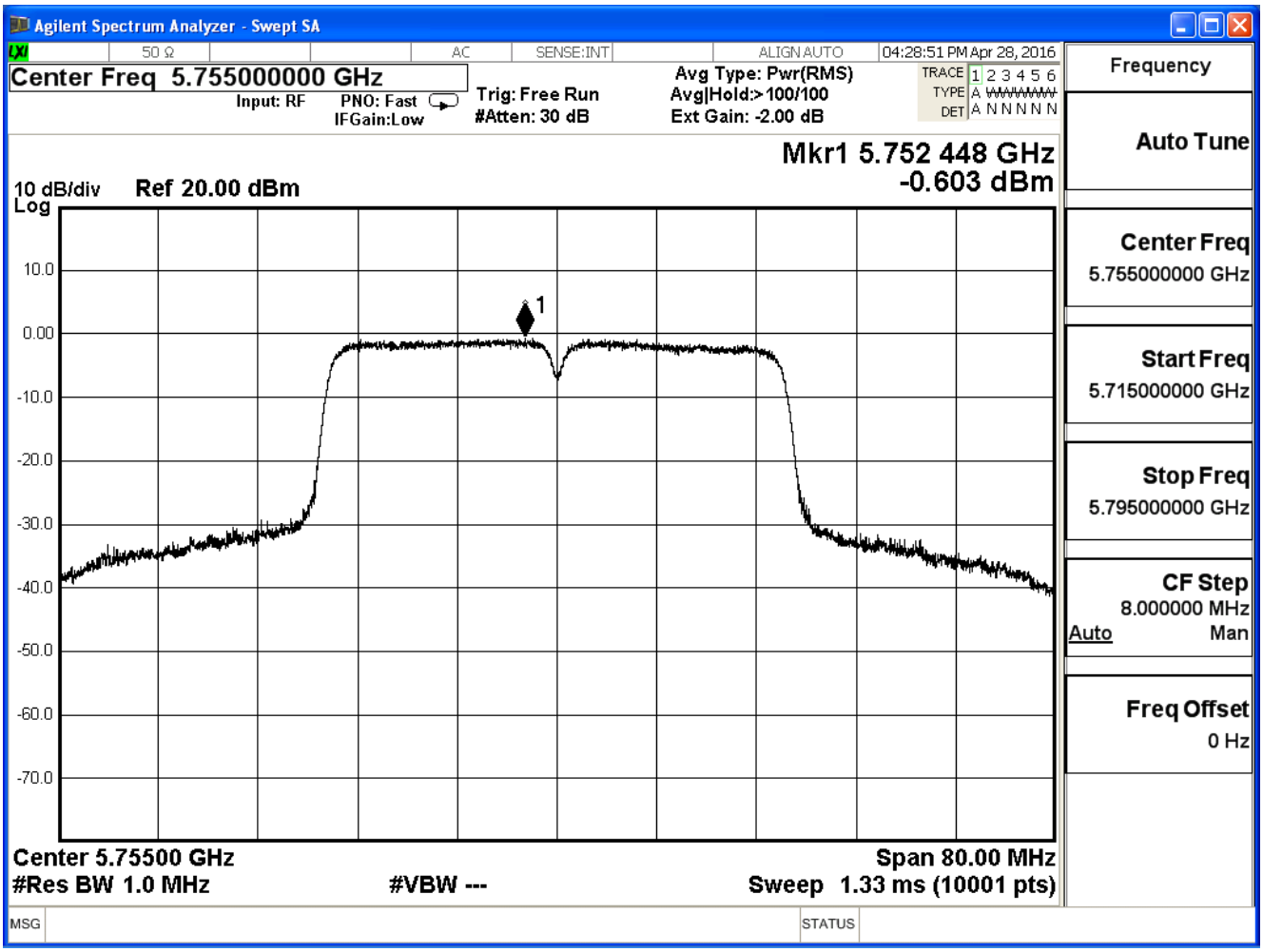
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
149	5745	5.34	≦30	Pass
157	5785	5.48	≦30	Pass
165	5825	5.29	≦30	Pass

Product	Dual-band Wireless USB Adapter		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2016/04/28	Test Site	SR7

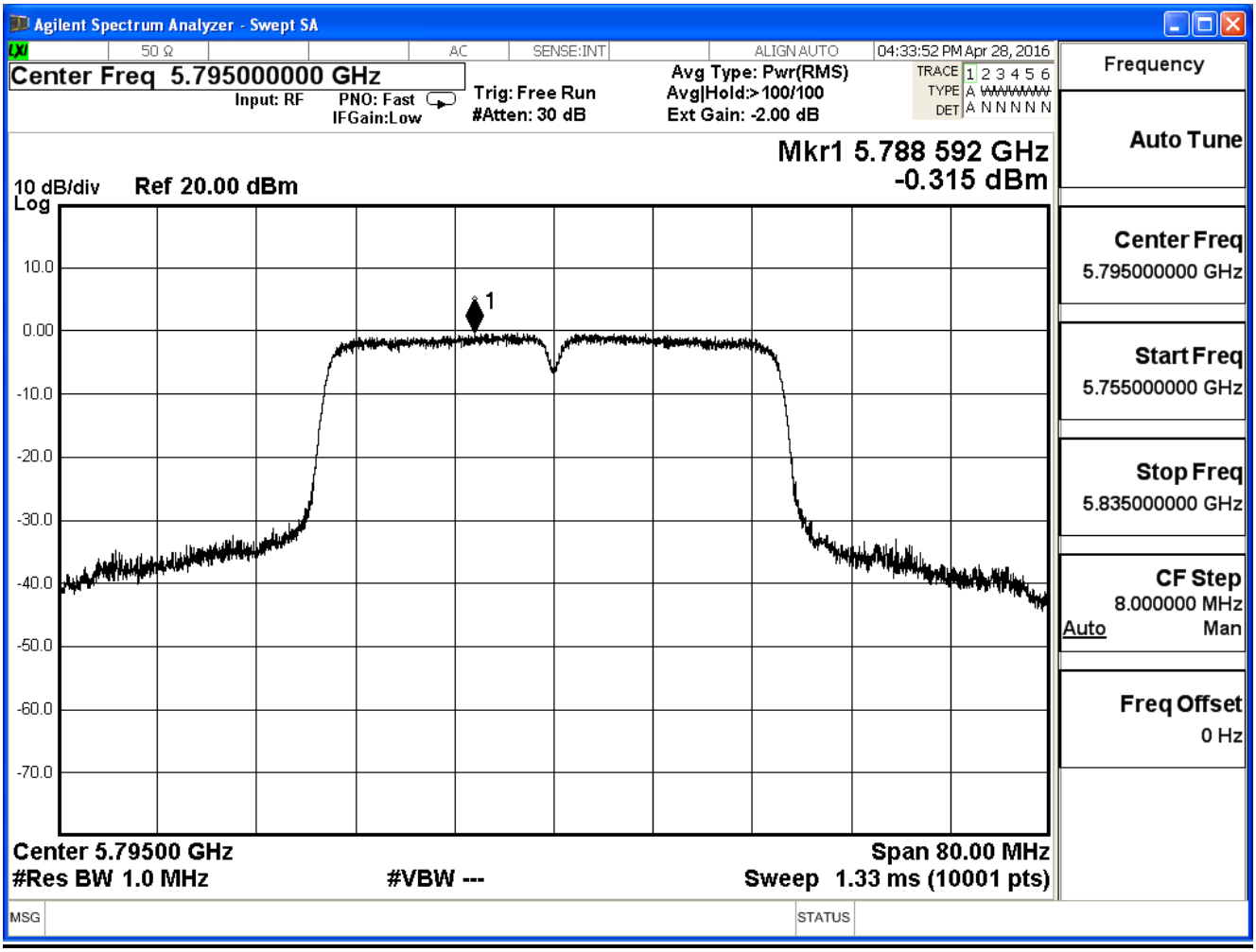
IEEE 802.11n_40MHz (ANT 0)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
151	5755	-0.603	≦30	Pass
159	5795	-0.315	≦30	Pass

Channel 151



Channel 159

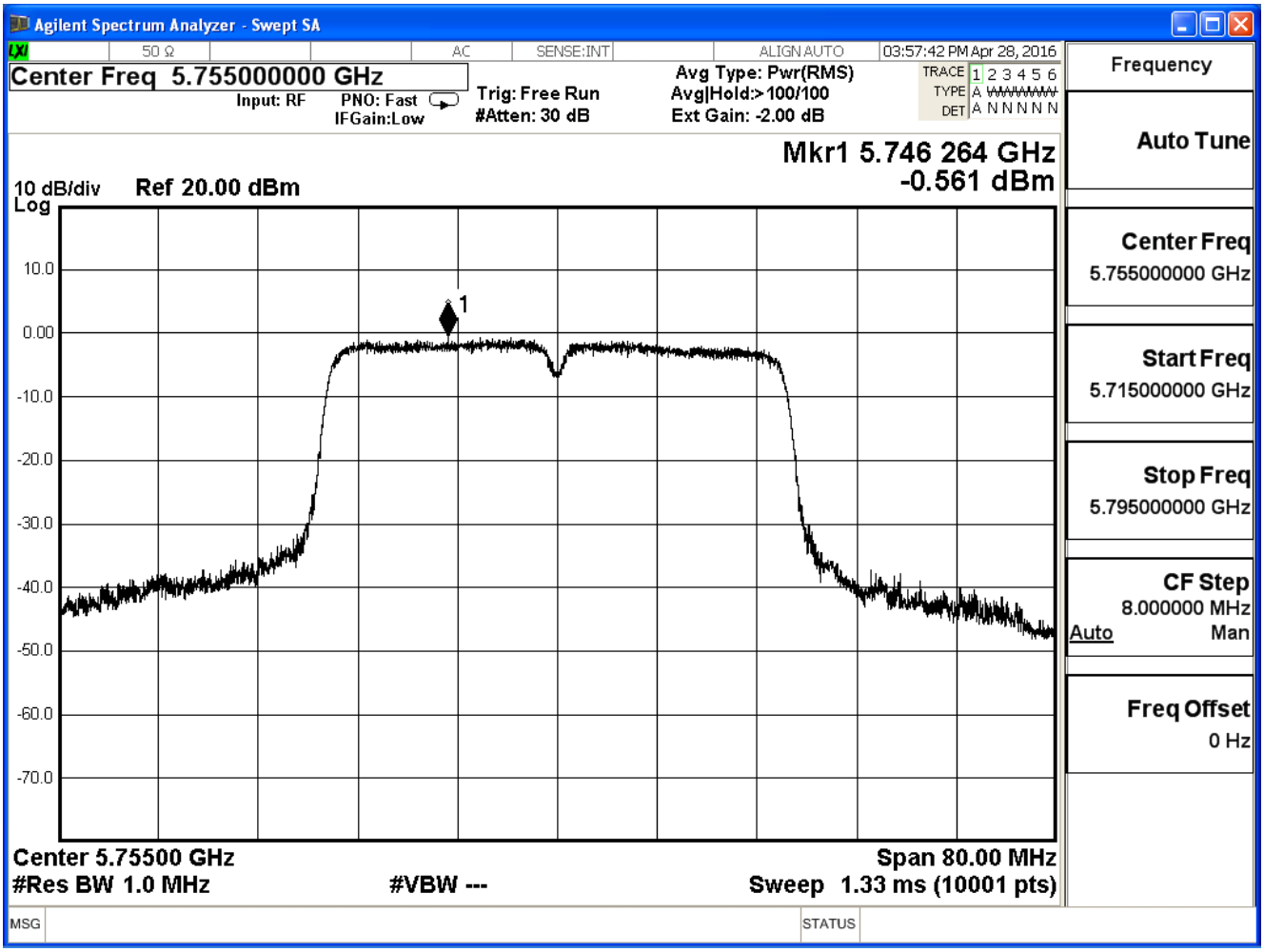

Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
04:33:52 PM Apr 28, 2016
Center Freq 5.795000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Pwr(RMS)
Avg|Hold:>100/100
Ext Gain: -2.00 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET A N N N N N
Mkr1 5.788 592 GHz
-0.315 dBm
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center 5.79500 GHz
#Res BW 1.0 MHz
#VBW ---
Span 80.00 MHz
Sweep 1.33 ms (10001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
5.795000000 GHz
Start Freq
5.755000000 GHz
Stop Freq
5.835000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz

Product	Dual-band Wireless USB Adapter		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2016/04/28	Test Site	SR7

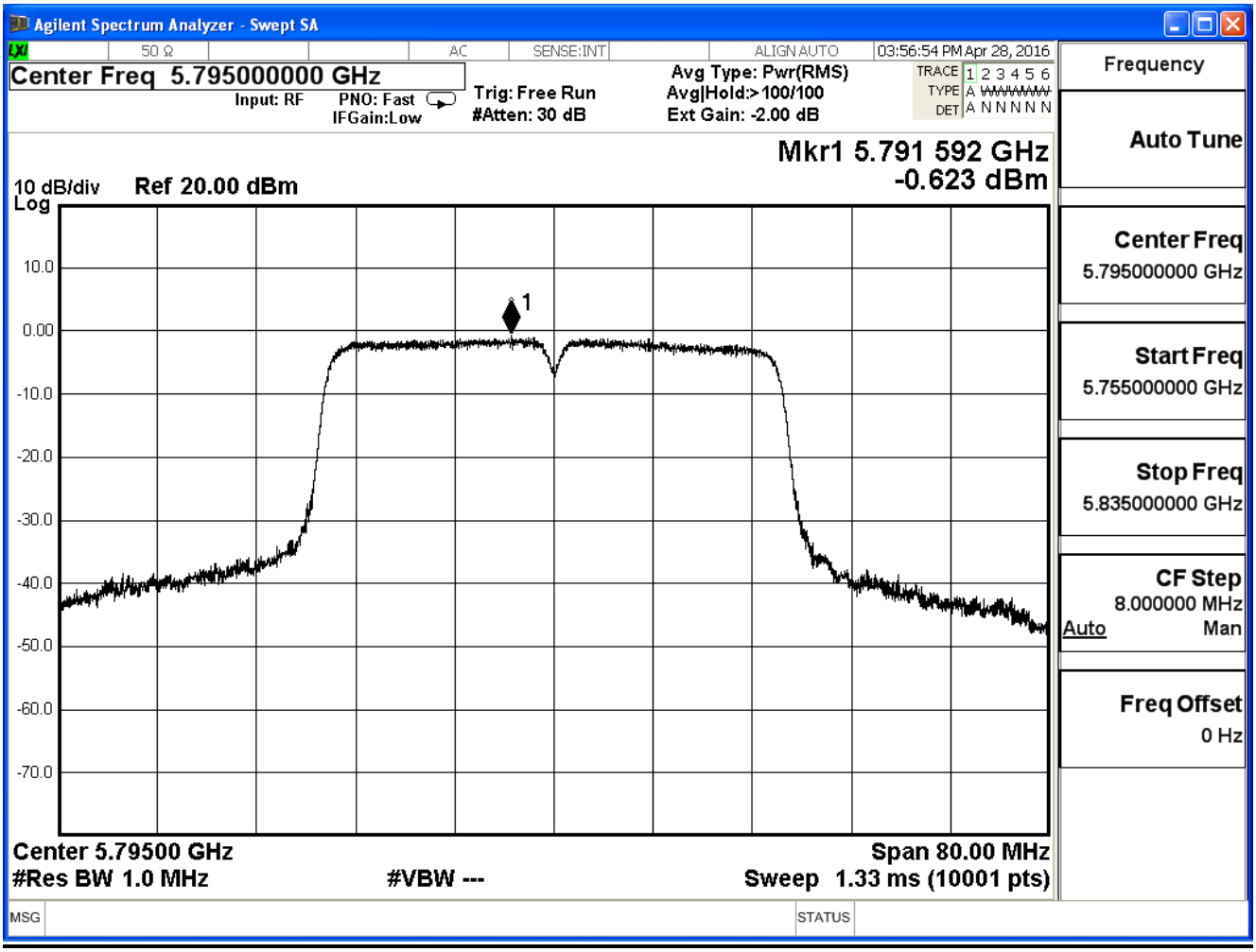
IEEE 802.11n_40MHz (ANT 1)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
151	5755	-0.561	≦30	Pass
159	5795	-0.623	≦30	Pass

Channel 151



Channel 159


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
03:56:54 PM Apr 28, 2016
Center Freq 5.795000000 GHz
Input: RF
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Pwr(RMS)
Avg|Hold:>100/100
Ext Gain: -2.00 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET A N N N N N
Mkr1 5.791 592 GHz
-0.623 dBm
10 dB/div
Log
Ref 20.00 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center 5.79500 GHz
#Res BW 1.0 MHz
#VBW ---
Span 80.00 MHz
Sweep 1.33 ms (10001 pts)
MSG
STATUS
Frequency
Auto Tune
Center Freq
5.795000000 GHz
Start Freq
5.755000000 GHz
Stop Freq
5.835000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz

Product	Dual-band Wireless USB Adapter		
Test Item	Power Density		
Test Mode	Mode 1: Transmit		
Date of Test	2016/04/28	Test Site	SR7

IEEE802.11n 40MHz(ANT 0+1)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
151	5755	2.43	≦30	Pass
159	5795	2.54	≦30	Pass

3. Frequency Stability

3.1. Test Equipment

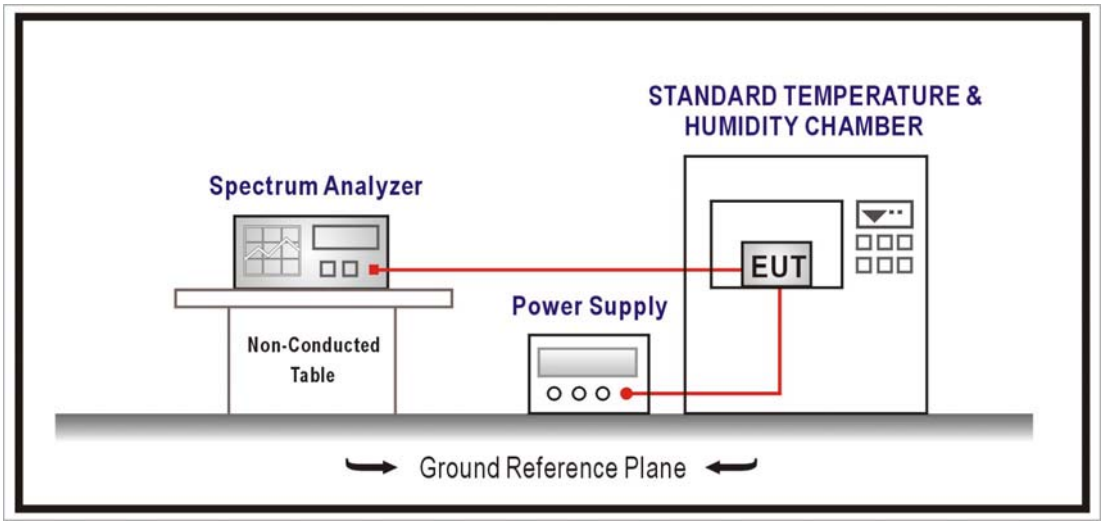
The following test equipments are used during the radiated emission tests:

Frequency Stability / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2016/08/23
Temperature & Humidity Chamber	WIT	TH-1S-B	1082101	2017/01/18

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

3.2. Test Setup



3.3. Limits

Manufactures of aII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified

3.4. Test Procedure

The EUT was setup to ANSI C63.10: 2009; tested to U-NII test procedure of KDB 789033 D02 for compliance to FCC 47CFR Subpart E requirements.

3.5. Uncertainty

The measurement uncertainty is defined as ± 150 Hz

3.6. Test Result

Product	Dual-band Wireless USB Adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit_802.11a - 5745MHz(ANT 0)		
Date of Test	2016/04/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5745.03811	6.6398	PASS
-10		5745.00703	1.2238	PASS
0		5745.01981	3.4479	PASS
10		5744.99863	-0.2386	PASS
20		5744.99501	-0.8679	PASS
30		5744.97972	-3.5304	PASS
40		5744.96370	-6.3179	PASS
50		5744.98037	-3.4163	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5744.99933	-0.1163	PASS
	120	5744.99632	-0.6399	PASS
	138	5744.96870	-5.4487	PASS

Product	Dual-band Wireless USB Adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit_ 802.11a - 5825MH(ANT 0)		
Date of Test	2016/04/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5825.00212	0.3692	PASS
-10		5825.02712	4.6563	PASS
0		5825.02786	4.7836	PASS
10		5824.99931	-0.1189	PASS
20		5824.99814	-0.3187	PASS
30		5824.99677	-0.5540	PASS
40		5824.98225	-3.0465	PASS
50		5824.97649	-4.0356	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5824.99848	-0.2616	PASS
	120	5824.96774	-5.5387	PASS
	138	5824.99572	-0.7342	PASS

Product	Dual-band Wireless USB Adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit_802.11n_20M - 5745MHz(ANT 0)		
Date of Test	2016/04/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5745.03808	6.6343	PASS
-10		5745.03997	6.9566	PASS
0		5745.01990	3.4646	PASS
10		5744.99049	-1.6560	PASS
20		5744.98528	-2.5624	PASS
30		5744.98449	-2.6992	PASS
40		5744.95971	-7.0134	PASS
50		5744.98083	-3.3376	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5744.99895	-0.1825	PASS
	120	5744.99391	-1.0609	PASS
	138	5744.95525	-7.7890	PASS

Product	Dual-band Wireless USB Adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit_802.11n_20M - 5745MHz(ANT 1)		
Date of Test	2016/04/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5745.00533	0.9337	PASS
-10		5745.00025	0.0434	PASS
0		5745.01862	3.2413	PASS
10		5744.99628	-0.6471	PASS
20		5744.98580	-2.4724	PASS
30		5744.97016	-5.1934	PASS
40		5744.99040	-1.6709	PASS
50		5744.97332	-4.6434	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5744.99794	-0.3588	PASS
	120	5744.97059	-5.1196	PASS
	138	5744.98104	-3.3005	PASS

Product	Dual-band Wireless USB Adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit_802.11n_20M - 5825MHz(ANT 0)		
Date of Test	2016/04/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5825.01835	3.1570	PASS
-10		5825.00434	0.7448	PASS
0		5825.01437	2.4664	PASS
10		5824.98086	-3.2862	PASS
20		5824.99309	-1.1869	PASS
30		5824.97711	-3.9297	PASS
40		5824.98381	-2.7798	PASS
50		5824.96191	-6.5390	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5824.99988	-0.0206	PASS
	120	5824.98060	-3.3304	PASS
	138	5824.97110	-4.9608	PASS

Product	Dual-band Wireless USB Adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit_802.11n_20M - 5825MHz(ANT 1)		
Date of Test	2016/04/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5825.02091	3.5952	PASS
-10		5825.02600	4.4630	PASS
0		5825.02452	4.2099	PASS
10		5824.99965	-0.0607	PASS
20		5824.98837	-1.9970	PASS
30		5824.99217	-1.3441	PASS
40		5824.98923	-1.8490	PASS
50		5824.96642	-5.7654	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5824.99836	-0.2816	PASS
	120	5824.98585	-2.4296	PASS
	138	5824.96657	-5.7387	PASS

Product	Dual-band Wireless USB Adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit_802.11n_40M-5755MHz(ANT 0)		
Date of Test	2016/04/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5755.00283	0.4973	PASS
-10		5755.00563	0.9787	PASS
0		5755.02366	4.1117	PASS
10		5754.98386	-2.8049	PASS
20		5754.99031	-1.6833	PASS
30		5754.99331	-1.1627	PASS
40		5754.96092	-6.7904	PASS
50		5754.97451	-4.4284	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5754.99993	-0.0119	PASS
	120	5754.96616	-5.8801	PASS
	138	5754.97299	-4.6941	PASS

Product	Dual-band Wireless USB Adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit_802.11n_40M-5755MHz(ANT 1)		
Date of Test	2016/04/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5755.03264	5.6783	PASS
-10		5755.00319	0.5536	PASS
0		5755.01178	2.0474	PASS
10		5754.98515	-2.5812	PASS
20		5754.99268	-1.2727	PASS
30		5754.98335	-2.8933	PASS
40		5754.94505	-9.5490	PASS
50		5754.99157	-1.4655	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5754.99804	-0.3401	PASS
	120	5754.97568	-4.2261	PASS
	138	5754.98885	-1.9380	PASS

Product	Dual-band Wireless USB Adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit_802.11n_40M-5795MHz(ANT 0)		
Date of Test	2016/04/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5795.03007	5.1956	PASS
-10		5795.01340	2.3127	PASS
0		5795.00277	0.4786	PASS
10		5794.99711	-0.4979	PASS
20		5794.99498	-0.8659	PASS
30		5794.99418	-1.0037	PASS
40		5794.97230	-4.7799	PASS
50		5794.97215	-4.8063	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5794.99921	-0.1371	PASS
	120	5794.98119	-3.2450	PASS
	138	5794.97995	-3.4592	PASS

Product	Dual-band Wireless USB Adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit_802.11n_40M-5795MHz(ANT 1)		
Date of Test	2016/04/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5795.02275	3.9317	PASS
-10		5795.03053	5.2687	PASS
0		5795.02181	3.7638	PASS
10		5794.99332	-1.1522	PASS
20		5794.98489	-2.6079	PASS
30		5794.97522	-4.2758	PASS
40		5794.96692	-5.7091	PASS
50		5794.99285	-1.2336	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5794.99827	-0.2983	PASS
	120	5794.97550	-4.2282	PASS
	138	5794.96466	-6.0983	PASS

Attachment 1

- **Original Report**