

FCC Test Report

Product Name : Dual-Band Wireless USB adapter

Trade Name : ASUS

Model No. : USB-AC56, USB-AC56R

FCC ID. : MSQ-USBAC56

Applicant : ASUSTeK COMPUTER INC.

Address : 4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan

Date of Receipt : Feb. 01, 2016

Issued Date : Apr. 22, 2016

Report No. : 1620124R-RFUSP57V00-C

Report Version : V1.0



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.

Test Report Certification

Issued Date : Apr. 22, 2016

Report No. : 1620124R-RFUSP57V00-C



Product Name : Dual-Band Wireless USB adapter
Applicant : ASUSTeK COMPUTER INC.
Address : 4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan
Manufacturer : ASUSTeK COMPUTER INC.
Model No. : USB-AC56, USB-AC56R
FCC ID. : MSQ-USBAC56
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.

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Documented By :



(Demi Chang / Engineering Adm. Specialist)

Tested By :



(JuBo Shen / Senior Engineer)

Approved By :



(Roy Wang / Director)

Revision History

Report No.	Version	Description	Issued Date
135176R-RFUSP42V01	V1.0	Initial issue of report	Jun. 24, 2013
1450102R-RFUSP38V00	V1.0	Add Model No.: USB-AC56R & Change Product Name.	May 07, 2014
1620124R-RFUSP57V00-C	V1.0	Update WLAN 5G band 4 standard to FCC 15.407, and verify Power Density, Frequency Stability tested. The WLAN 2.4G test data, please refer to the 1450102R-RFUSP38V00.	Apr. 22, 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:

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1. General Information

1.1. EUT Description

Product Name	Dual-Band Wireless USB adapter	
Trade Name	ASUS	
Model No.	USB-AC56, USB-AC56R	
Frequency Range/ Channel Number	IEEE 802.11a/ IEEE 802.11n (20MHz) / IEEE 802.11ac (20MHz)	5745~5825MHz / 5 Channels
	IEEE 802.11n (40MHz) / IEEE 802.11ac (40MHz)	5755~5795MHz / 2 Channels
	IEEE 802.11ac (80MHz)	5775~5775MHz / 1 Channel
Type of Modulation	IEEE 802.11a/n	Orthogonal Frequency Division Multiplexing
Data Speed	IEEE 802.11a	6, 9, 18, 24, 36, 48,54Mbps
	IEEE 802.11n	Support a subset of the combination of GI, MCS 0~MCS 15 and bandwidth defined in 802.11n
	IEEE 802.11ac	Support a subset of the combination of GI, MCS 0~MCS 9 and bandwidth defined in 802.11ac

Antenna Information	
Antenna Type	Dipole Antenna & PIFA Antenna
Antenna Gain	Dipole Antenna : 5G : Ant0 : 2.00dBi PIFA Antenna : 5G : Ant0 : 2.28dBi , Ant1 : 2.38dBi

Component	
USB Cable	Shielded, 0.9m

ANT-TX / RX & Bandwidth

ANT-TX / RX	TX			RX		
	20MHz	40MHz	80MHz	20MHz	40MHz	80MHz
IEEE802.11a	✓			✓		
IEEE802.11n	✓	✓		✓	✓	
IEEE802.11ac	✓	✓	✓	✓	✓	✓

Mode1 (2TX /2RX)



Mode2 (2TX /2RX)



IEEE 802.11n

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

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

Table 1 – MCS parameters for TX Antenna number = 1

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

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

Table 2 – MCS parameters for TX Antenna number = 2

Symbol	Explanation
R	Code rate
N _{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

Draft IEEE 802.11ac Data Rate

Spatial Streams (Note1)	MCS Index	Modulation type	Coding rate	Data Rate(Mb/s)							
				20 MHz		40 MHz		80 MHz		160 MHz	
				Guard Interval		Guard Interval		Guard Interval		Guard Interval	
				800ns	400ns	800ns	400ns	800ns	400ns	800ns	400ns
1	0	BPSK	1/2	6.5	7.2	13.5	15	29.3	32.5	58.5	65
	1	QPSK	1/2	13	14.4	27	30	58.5	65	117	130
	2	QPSK	3/4	19.5	21.7	40.5	45	87.8	97.5	175.5	195
	3	16-QAM	1/2	26	28.9	54	60	117	130	234	260
	4	16-QAM	3/4	39	43.3	81	90	175.5	195	351	390
	5	64-QAM	2/3	52	57.8	108	120	234	260	468	520
	6	64-QAM	3/4	58.5	65	121.5	135	263.3	292.5	526.5	585
	7	64-QAM	5/6	65	72.2	135	150	292.5	325	585	650
	8	256-QAM	3/4	78	86.7	162	180	351	390	702	780
	9	256-QAM	5/6	N/A	N/A	180	200	390	433.3	780	866.7
2	0	BPSK	1/2	13	14.4	27	30	58.6	65	117	130
	1	QPSK	1/2	26	28.8	54	60	117	130	234	260
	2	QPSK	3/4	39	43.4	81	90	175.6	195	351	390
	3	16-QAM	1/2	52	57.8	108	120	234	260	468	520
	4	16-QAM	3/4	78	86.6	162	180	351	390	702	780
	5	64-QAM	2/3	104	115.6	216	240	468	520	936	1040
	6	64-QAM	3/4	117	130	243	270	526.6	585	1053	1170
	7	64-QAM	5/6	130	144.4	270	300	585	650	1170	1300
	8	256-QAM	3/4	156	173.4	324	360	702	780	1404	1560
	9	256-QAM	5/6	N/A	N/A	360	400	780	866.6	1560	1733.4

IEEE 802.11a & IEEE 802.11n/ac (20MHz) - 5.8GHz

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/ac (40MHz) - 5.8GHz

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

IEEE 802.11ac (80MHz) - 5.8GHz

Working Frequency of Each Channel	
Channel	Frequency
155	5775 MHz

Note:

1. This device is a Dual-Band Wireless USB adapter including 2.4GHz b/g/n (2x2) and 5GHz a/n/ac (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 2.4GHz and 5.2GHz transmitting is measured and makes a test report of the report number: 1450102R-RFUSP38V00 and 1620124R-RFUSP57V00-B.
5. This device has USB and Ethernet ports, which can be connected to computer. It is a Class B personal computer and peripheral. Its test report number is 1450102R-RFUSP01V00.

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 (Dipole Antenna)
	Mode 2: Transmit (PIFA Antenna)

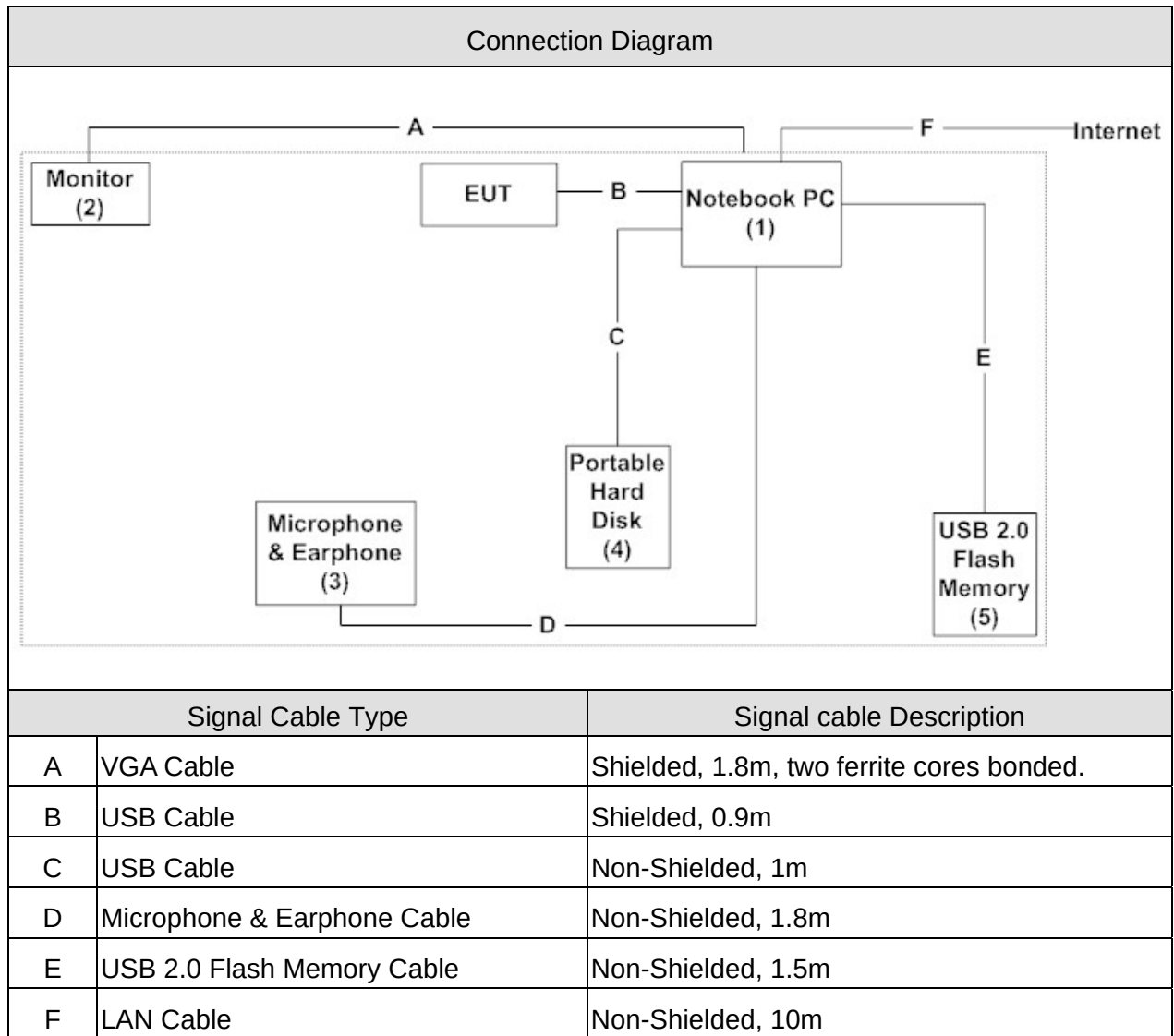
Test Items	Modulation	Channel	Antenna	Result
Conducted Emission	11ac(80MHz)	155	0+1	N/A
99 % & 26dB Bandwidth	a	149/ 157/ 165	0	N/A
	11n/ac (20MHz)	149/ 157/ 165	0+1	N/A
	11n/ac (40MHz)	151/ 159	0+1	N/A
	11ac (80MHz)	155	0+1	N/A
Peak Transmit Output	a	149/ 157/ 165	0	N/A
	11n/ac (20MHz)	149/ 157/ 165	0+1	N/A
	11n/ac (40MHz)	151/ 159	0+1	N/A
	11ac (80MHz)	155	0+1	N/A
Peak Power Spectrum Density	a	149/ 157/ 165	0	Complies
	11n/ac (20MHz)	149/ 157/ 165	0+1	Complies
	11n/ac (40MHz)	151/ 159	0+1	Complies
	11ac (80MHz)	155	0+1	Complies
Radiated Emission	a	149/ 157/ 165	0	N/A
	11n/ac (20MHz)	149/ 157/ 165	0+1	N/A
	11n/ac (40MHz)	151/ 159	0+1	N/A
	11ac (80MHz)	155	0+1	N/A
Band Edge	a	149/ 157/ 165	0	N/A
	11n/ac (20MHz)	149/ 157/ 165	0+1	N/A
	11n/ac (40MHz)	151/ 159	0+1	N/A
	11ac (80MHz)	155	0+1	N/A
RF antenna conducted test	a	149/ 157/ 165	0	N/A
	11n/ac (20MHz)	149/ 157/ 165	0+1	N/A
	11n/ac (40MHz)	151/ 159	0+1	N/A
	11ac (80MHz)	155	0+1	N/A
Frequency Stability	a	149/ 157/ 165	0	Complies
	11n/ac (20MHz)	149/ 157/ 165	0+1	Complies
	11n/ac (40MHz)	151/ 159	0+1	Complies
	11ac (80MHz)	155	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	ASUS	K45V	K45V-0343G3110M	DoC	Non-Shielded, 1.8m
2	Monitor	DELL	2407FPW	2407FPW	DoC	Non-Shielded, 1.8m
3	Microphone & Earphone	Fujiei	SBZ-38	N/A	DoC	--
4	Portable Hard Disk	WD	My Passport	WXE1AB0M5632	DoC	--
5	USB 2.0 Flash Memory	Apacer	AH223	N/A	DoC	--

1.4. Configuration of tested System



1.5. EUT Exercise Software

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

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC PART 15 E 15.407 Conducted Emission	15 - 35	20°C
Humidity (%RH)		25 - 75	50%RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 E 15.407 99 % & 26dB Bandwidth	15 - 35	25°C
Humidity (%RH)		25 - 75	45%RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 E 15.407 Peak Transmit Power	15 - 35	25°C
Humidity (%RH)		25 - 75	65%RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 E 15.407 Peak Power Spectrum 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 Radiated Emission	15 - 35	25°C
Humidity (%RH)		25 - 75	45%RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 E 15.407 Band Edge	15 - 35	25°C
Humidity (%RH)		25 - 75	45%RH
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 E 15.247 RF antenna conducted test	15 - 35	25
Humidity (%RH)		25 - 75	45
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

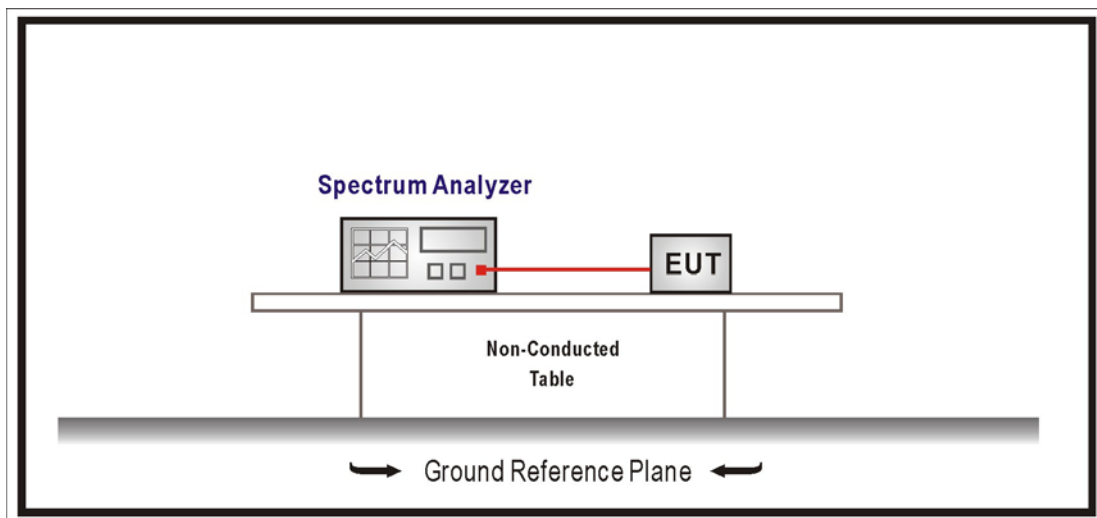
The following test equipments are used during the radiated emission tests:

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.

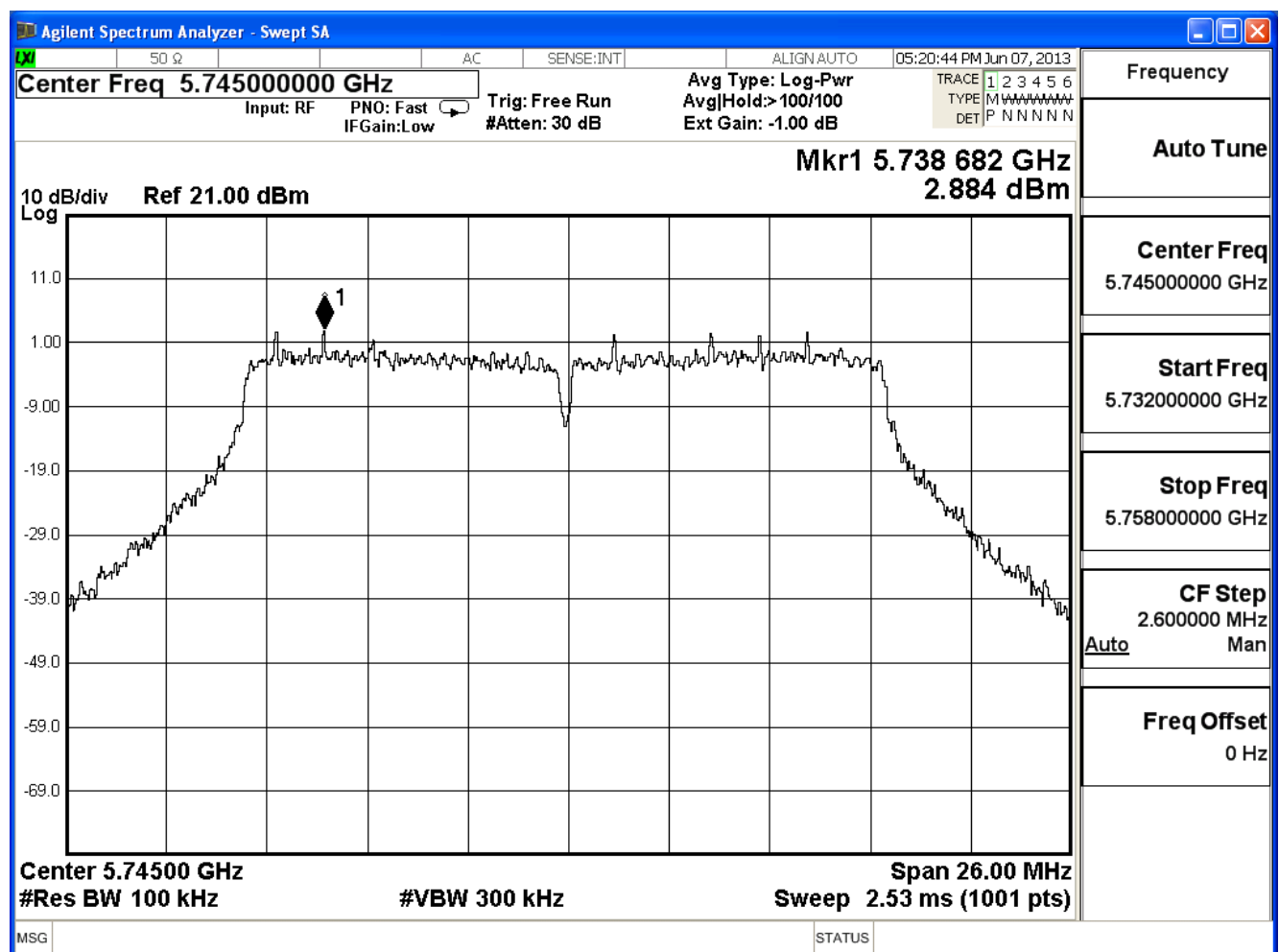
For Band4 : Set RBW=500KHz, VBW=1.5MHz with RMS detector. The PPSD is the highest level found across the emission in any 500KHz band after 100 sweeps of averaging.

2.5. Uncertainty

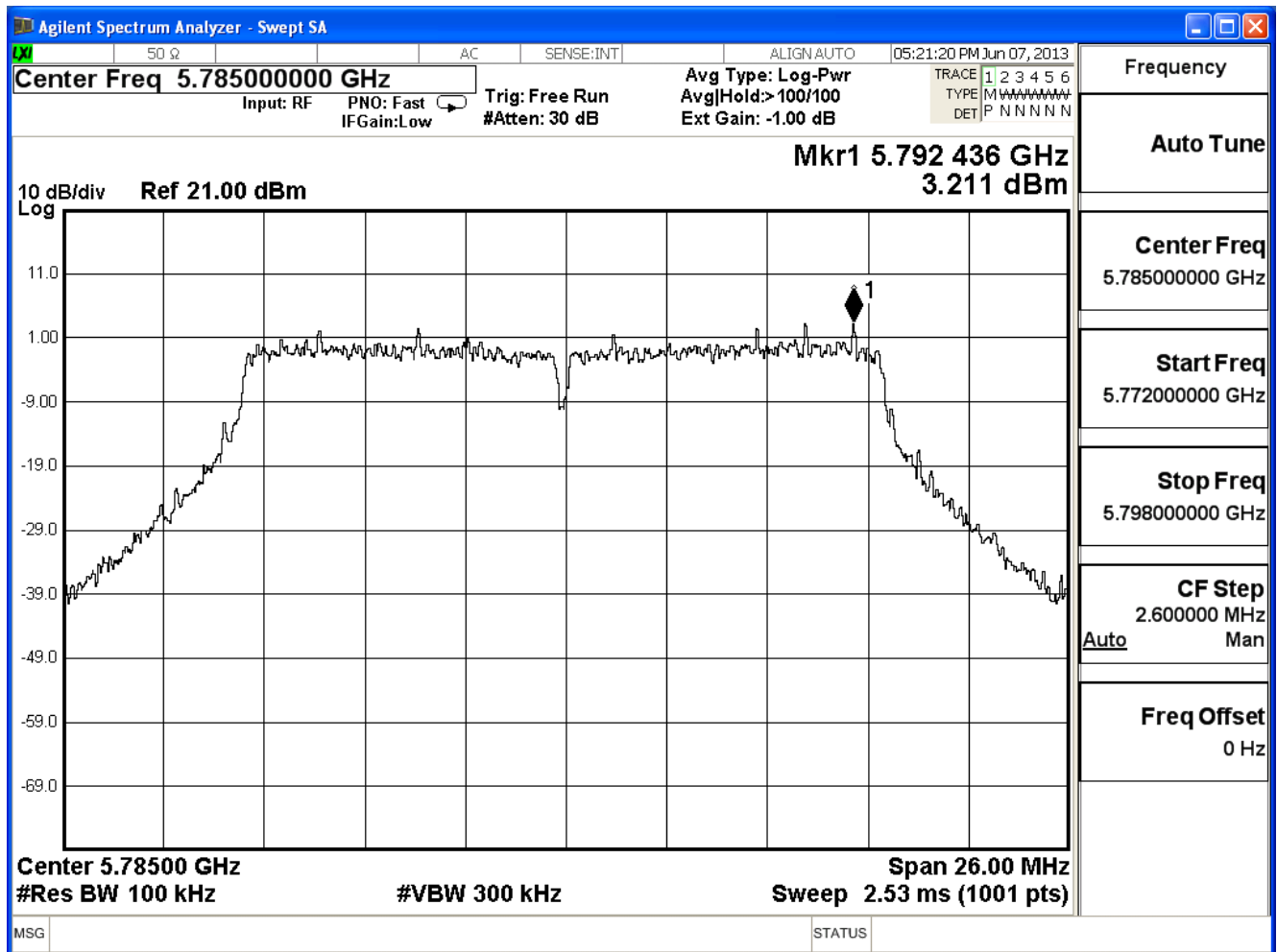
The measurement uncertainty is defined as ± 1.27 dB

Product	Dual-Band Wireless USB adapter		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 1: Transmit (Dipole Antenna)		
Date of Test	2016/04/20	Test Site	SR7

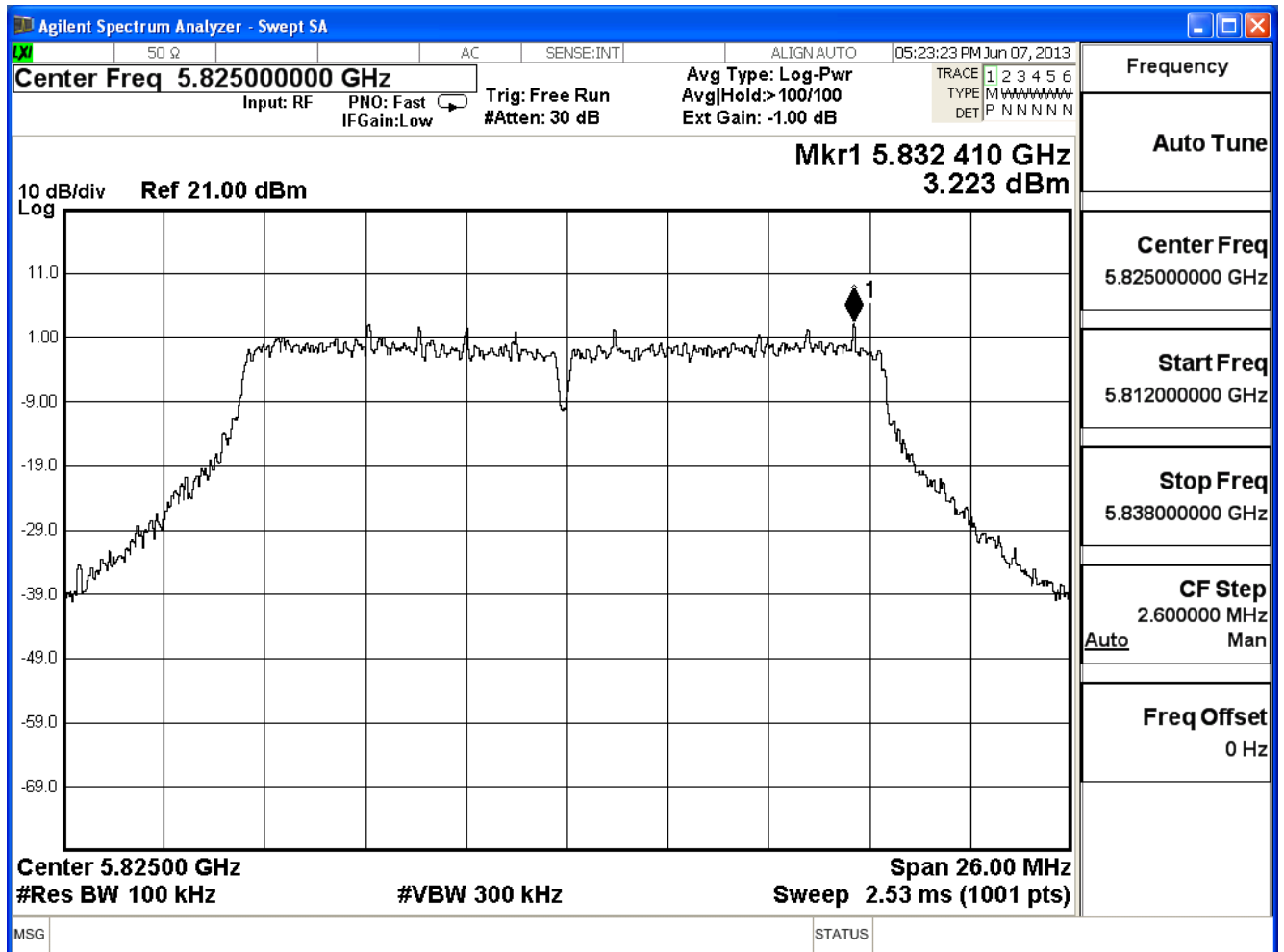
IEEE 802.11a (ANT 0)				
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)
149	5745	2.88	9.87	≤ 30
157	5785	3.21	10.20	≤ 30
165	5825	3.22	10.21	≤ 30

$$\text{Measure} = \text{Reading} + \text{correct factor}$$


Channel 157



Channel 165



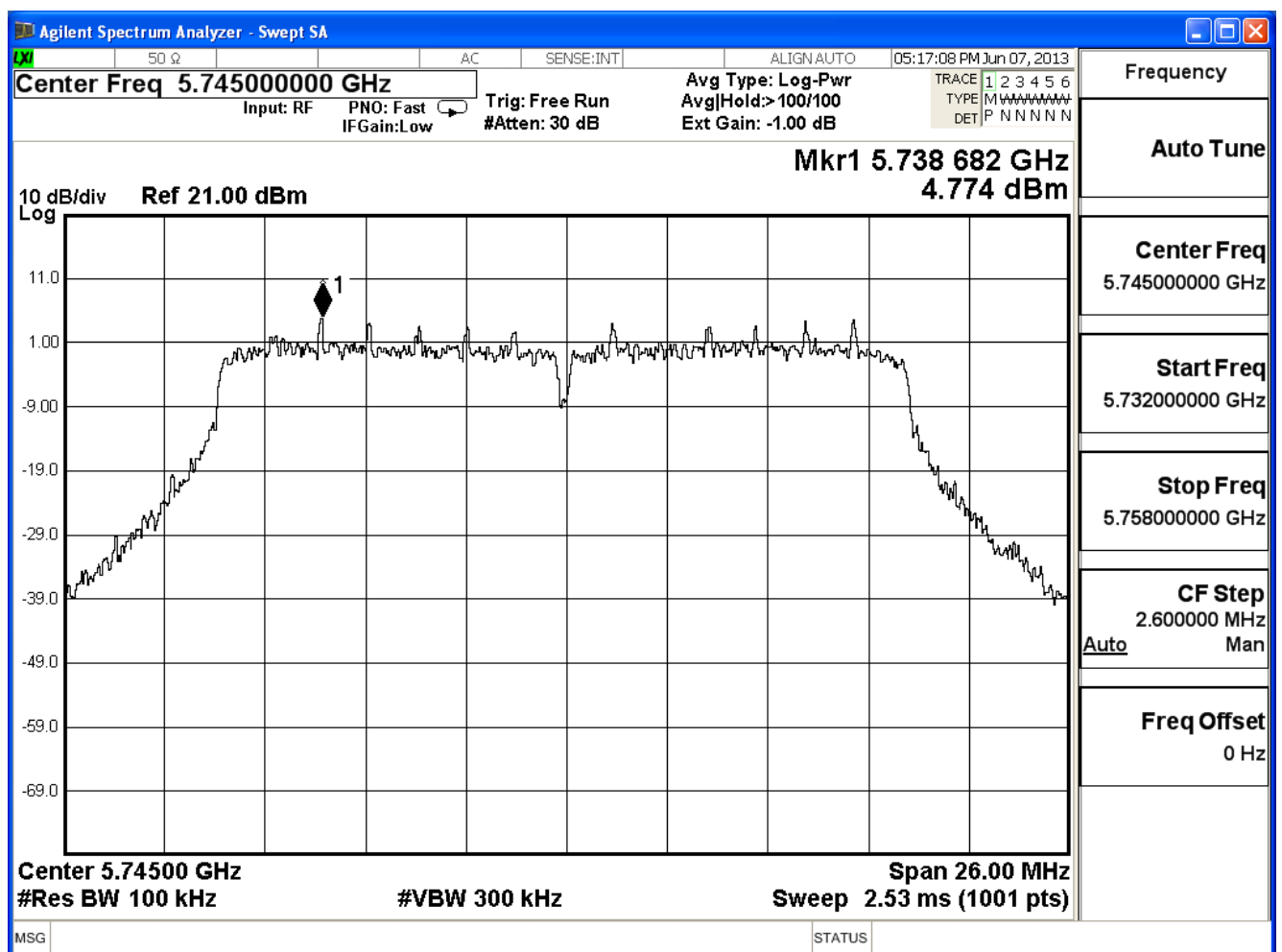
Product	Dual-Band Wireless USB adapter		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 1: Transmit (Dipole Antenna)		
Date of Test	2016/04/20	Test Site	SR7

IEEE802.11n_20MHz_(ANT 0)				
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)
149	5745	4.77	11.76	≤ 30
157	5785	5.22	12.21	≤ 30
165	5825	3.89	10.88	≤ 30

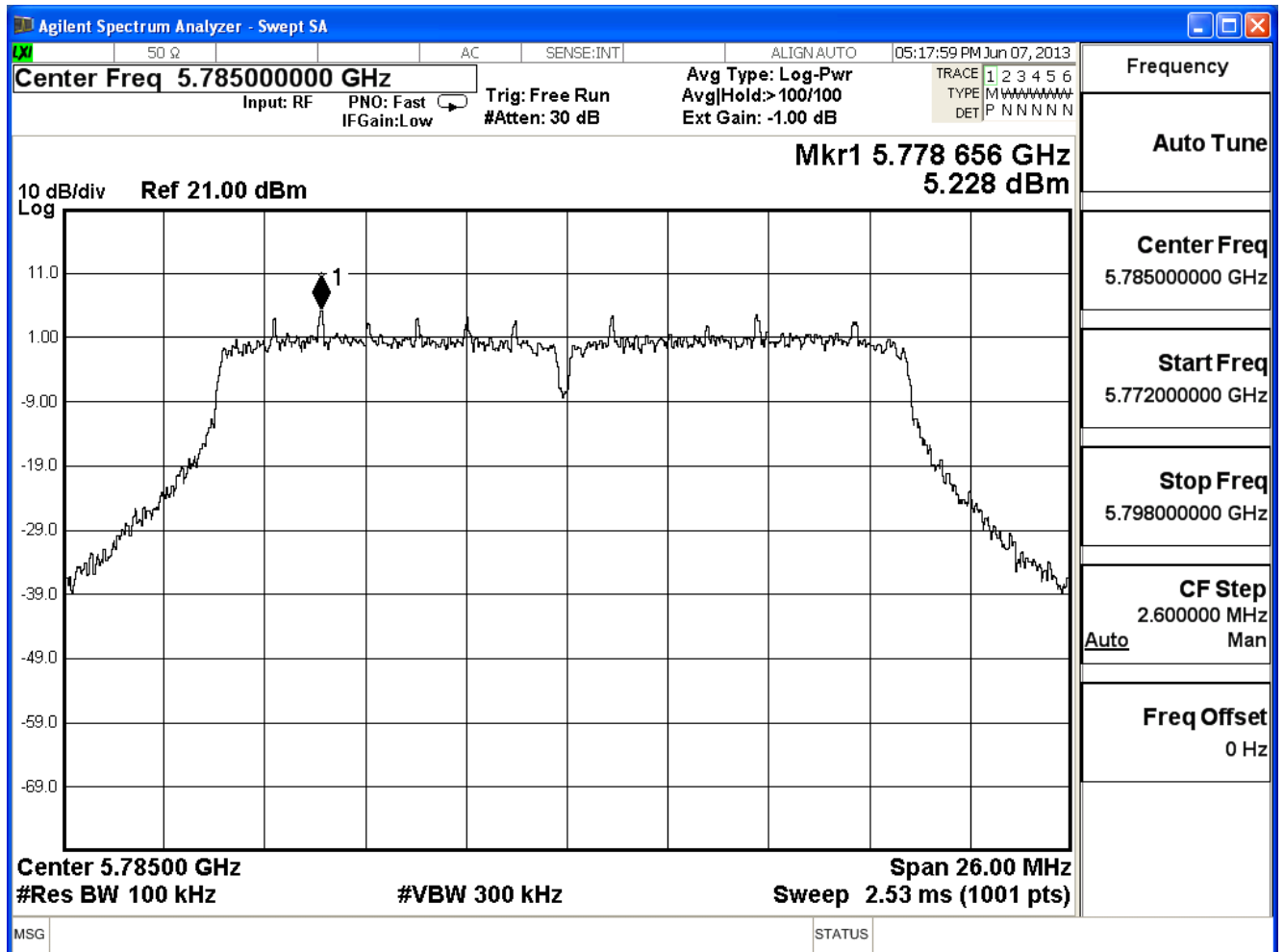
Correct factor= $10\log(500\text{kHz}/100\text{KHz})=6.99\text{dB}$

$$\text{Measure} = \text{Reading} + \text{correct factor}$$

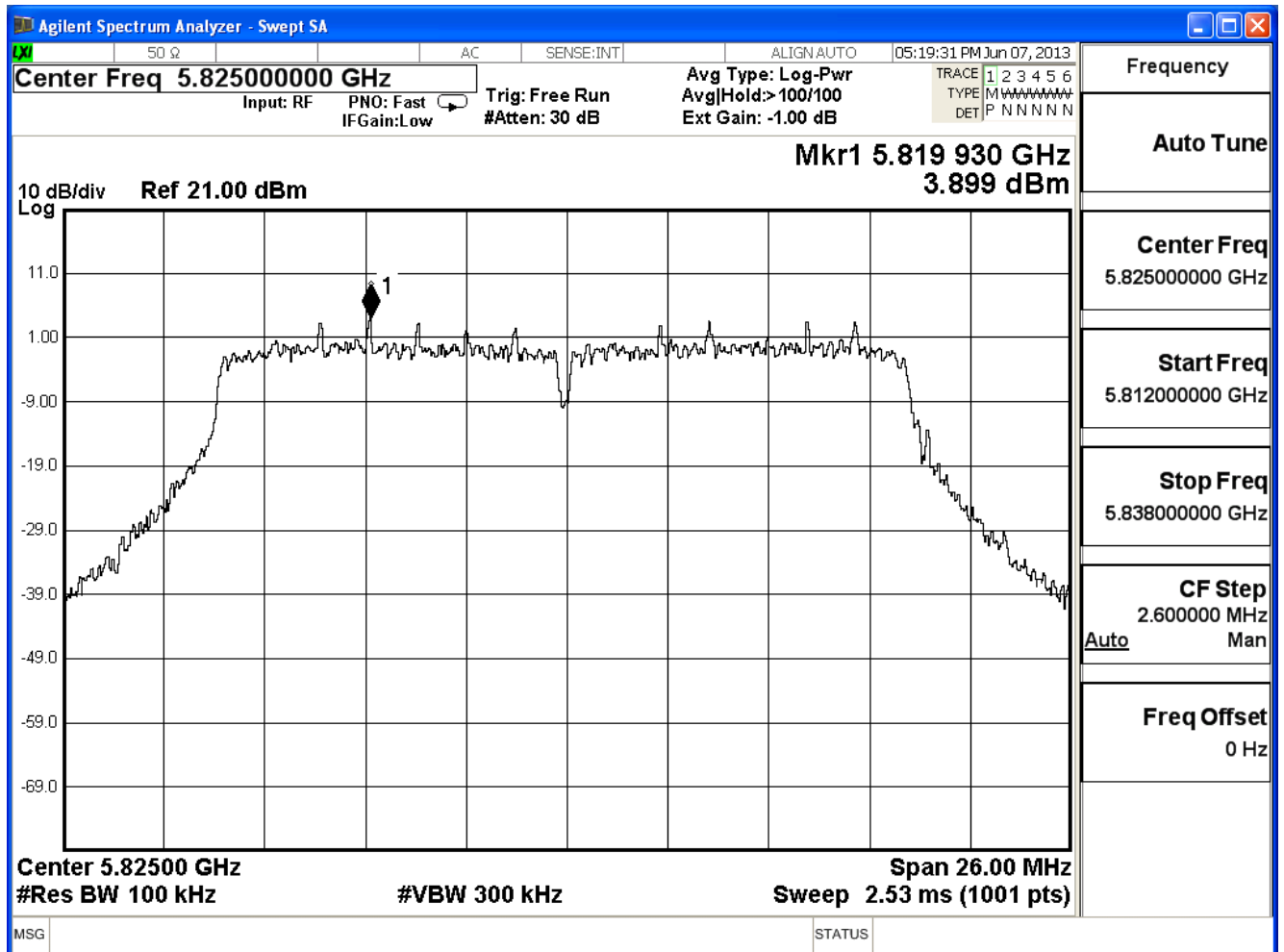
Channel 149



Channel 157



Channel 165



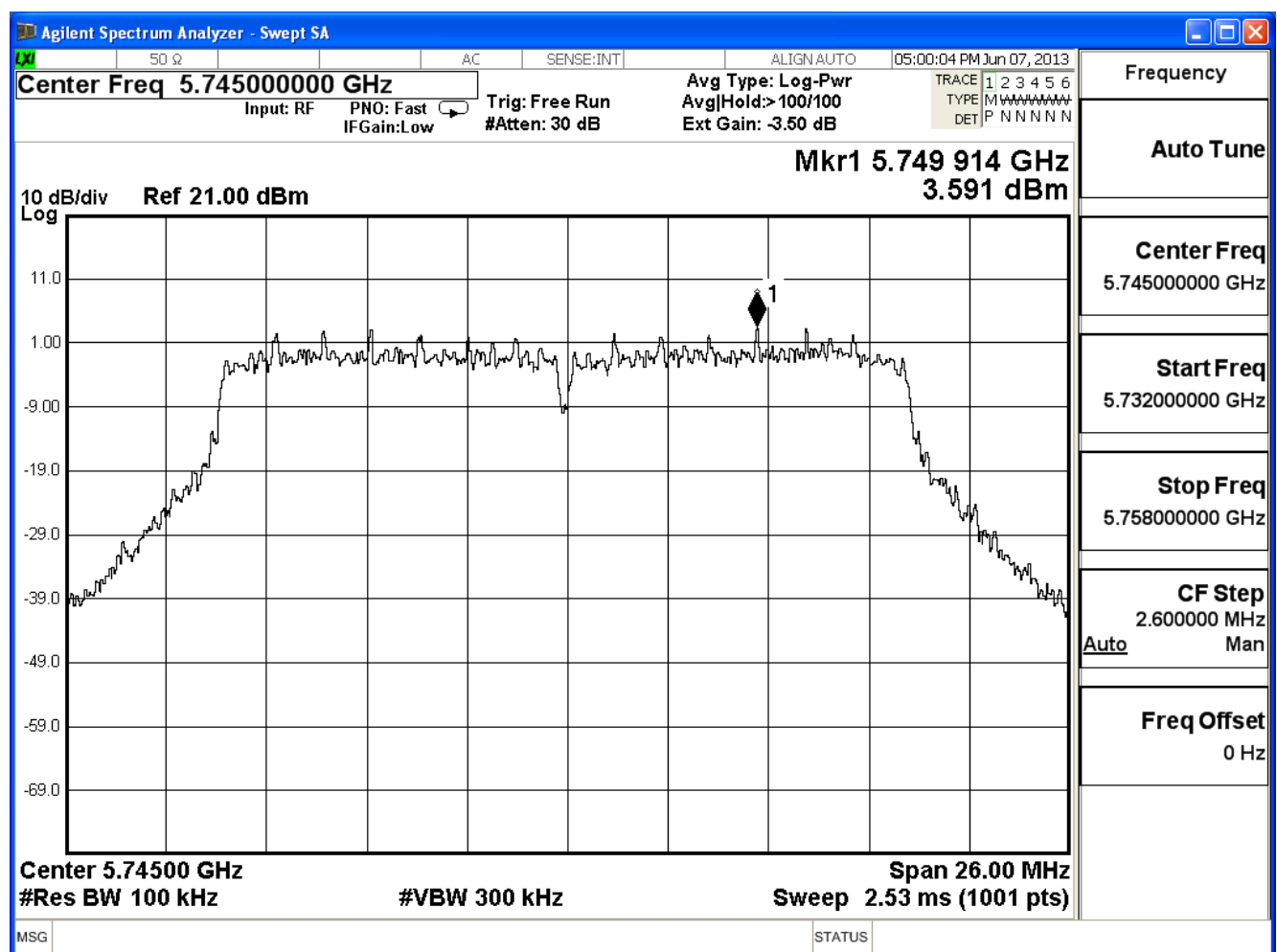
Product	Dual-Band Wireless USB adapter		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 1: Transmit (Dipole Antenna)		
Date of Test	2016/04/20	Test Site	SR7

IEEE802.11n_20MHz_(ANT 1)				
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)
149	5745	3.59	10.58	≤ 30
157	5785	3.82	10.81	≤ 30
165	5825	3.46	10.45	≤ 30

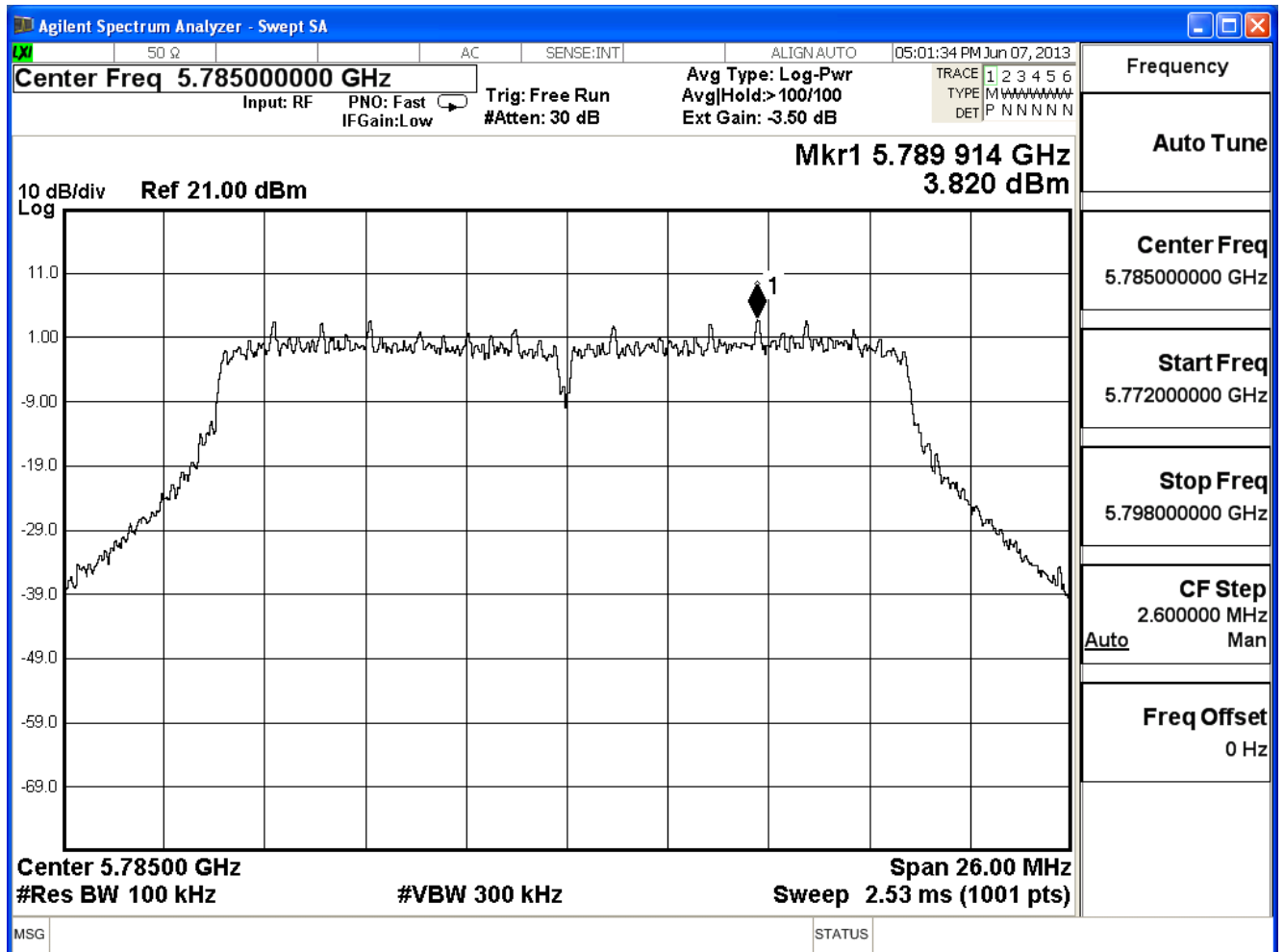
Correct factor= $10\log(500\text{kHz}/100\text{kHz})=6.99\text{dB}$

Measure = Reading + correct factor

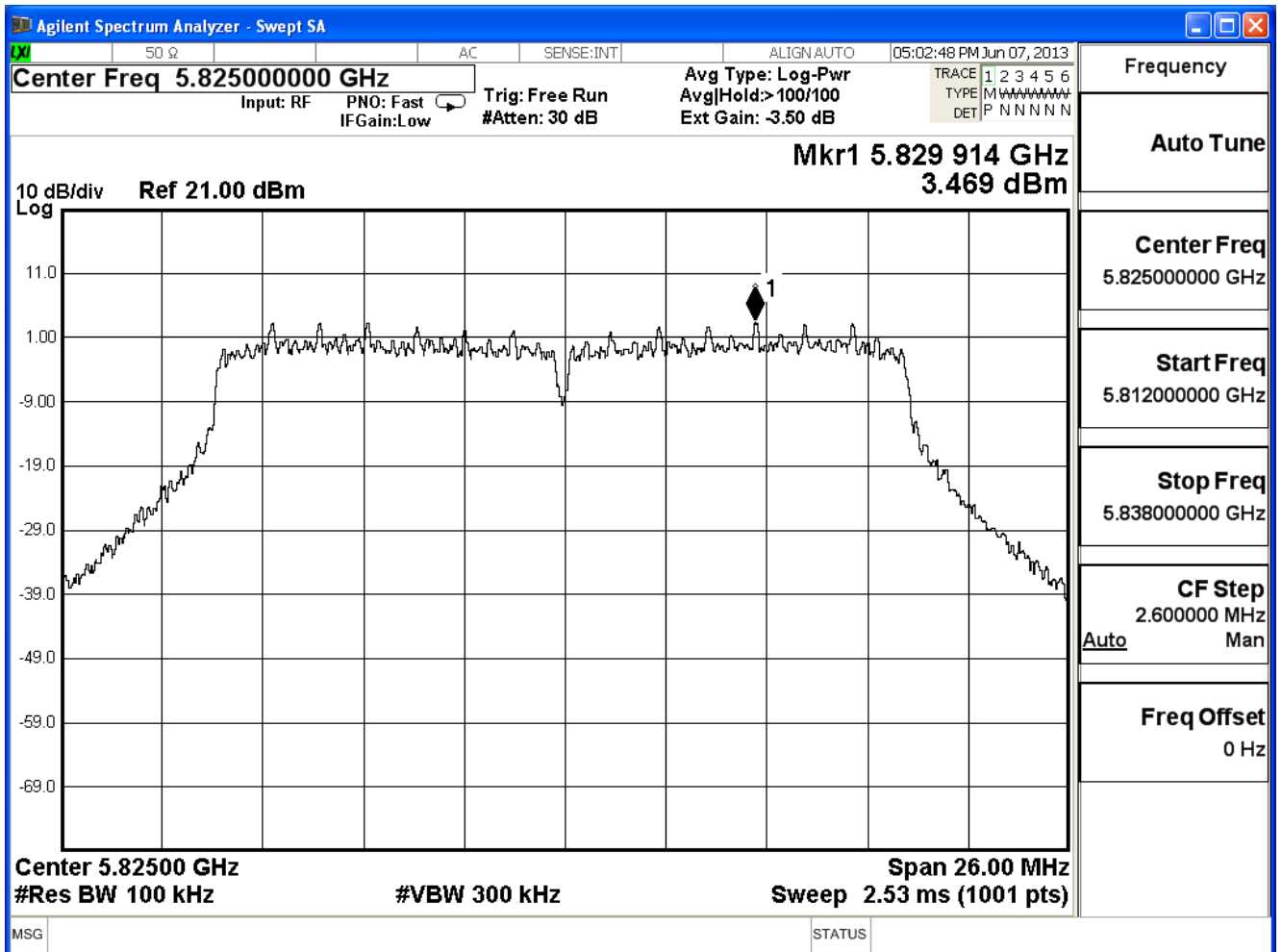
Channel 149



Channel 157



Channel 165



Product	Dual-Band Wireless USB adapter		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 1: Transmit (Dipole Antenna)		
Date of Test	2016/04/20	Test Site	SR7

IEEE802.11n_20MHz_(ANT 0+1)			
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)
149	5745	14.22	≤ 30
157	5785	14.58	≤ 30
165	5825	13.68	≤ 30

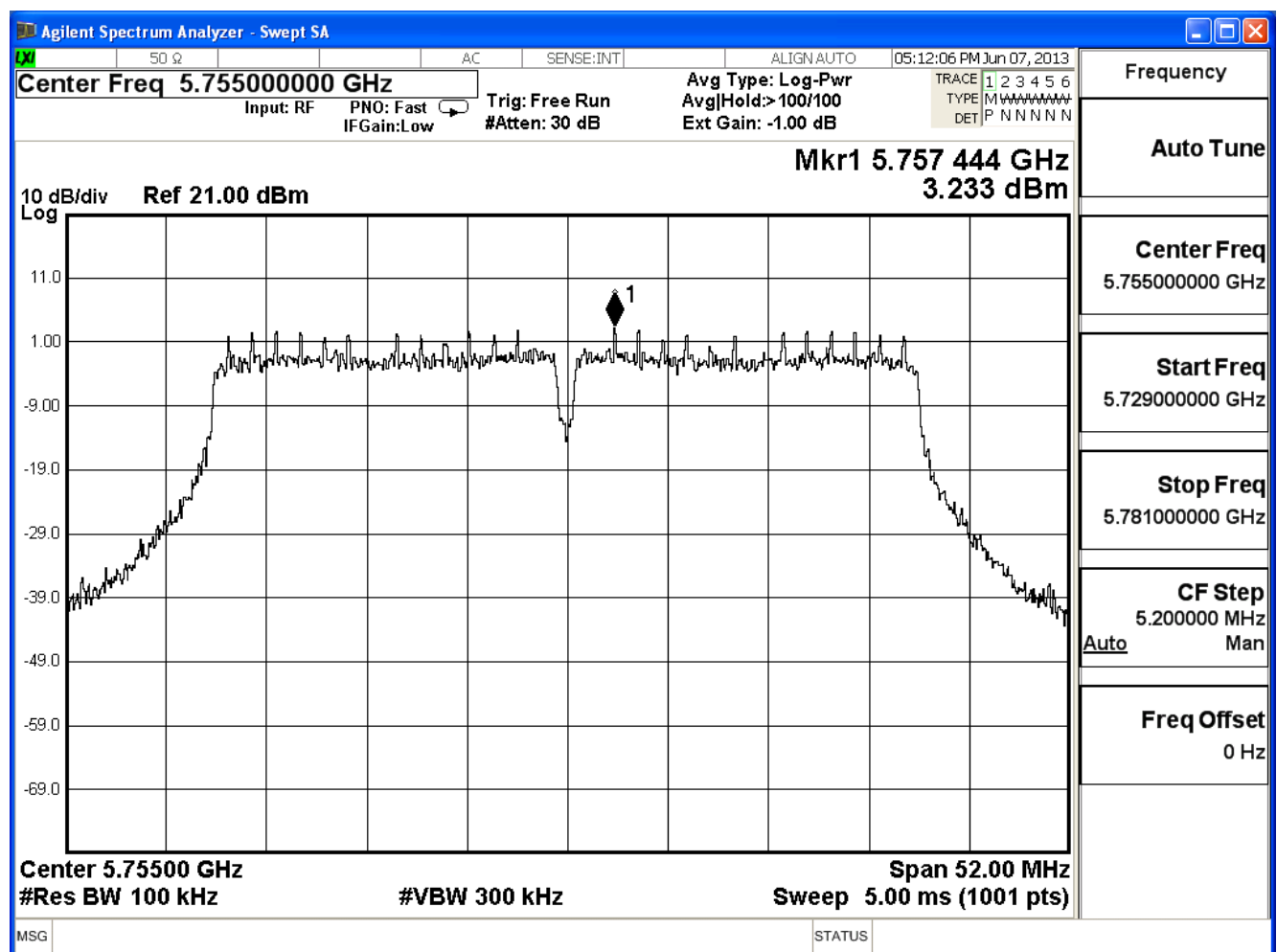
Product	Dual-Band Wireless USB adapter		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 1: Transmit (Dipole Antenna)		
Date of Test	2016/04/20	Test Site	SR7

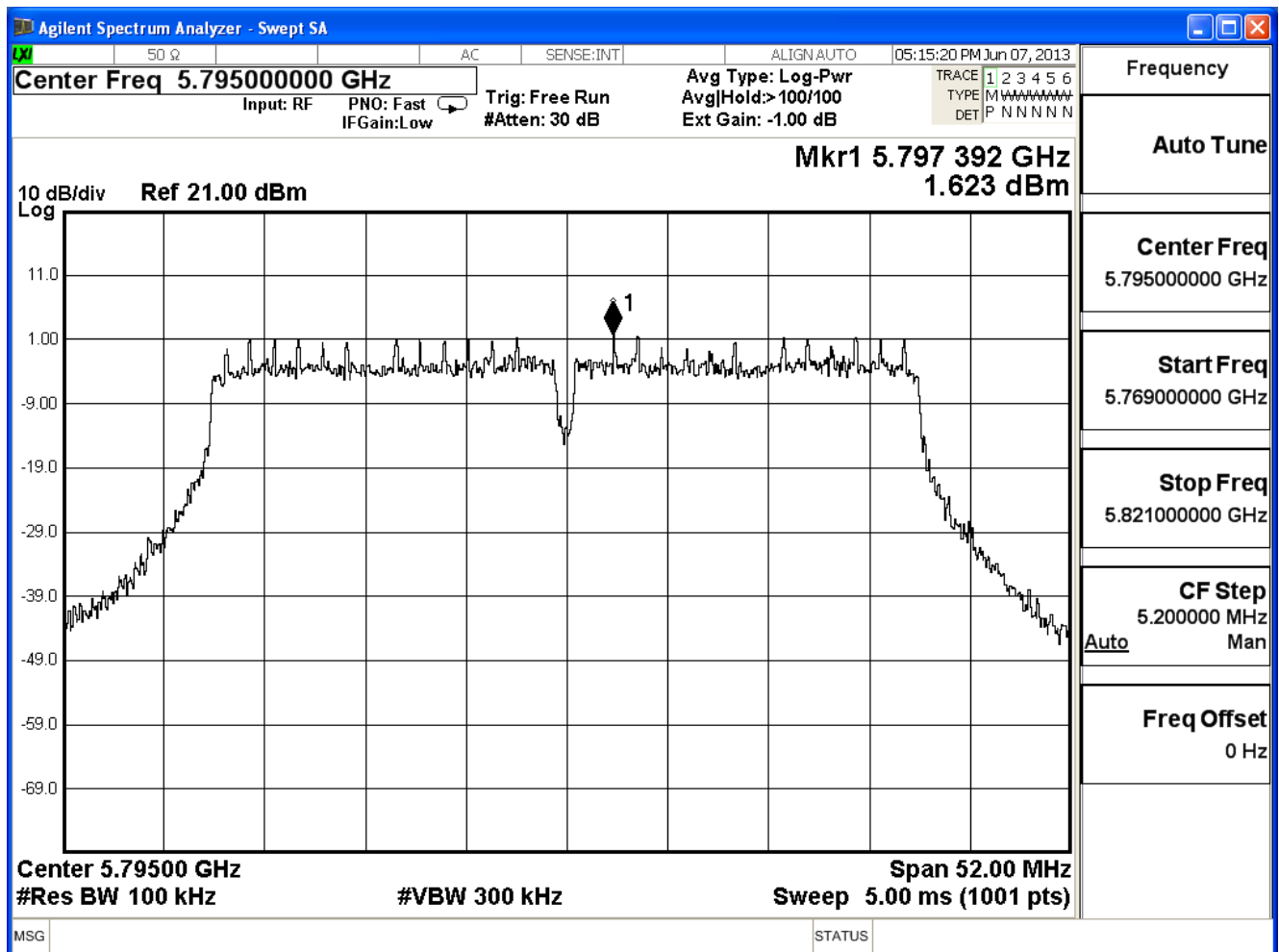
IEEE 802.11n_40MHz (ANT 0)				
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)
151	5755	3.23	10.22	≤ 30
159	5795	1.62	8.61	≤ 30

Correct factor= $10\log(500\text{kHz}/100\text{kHz})=6.99\text{dB}$

Measure = Reading + correct factor

Channel 151





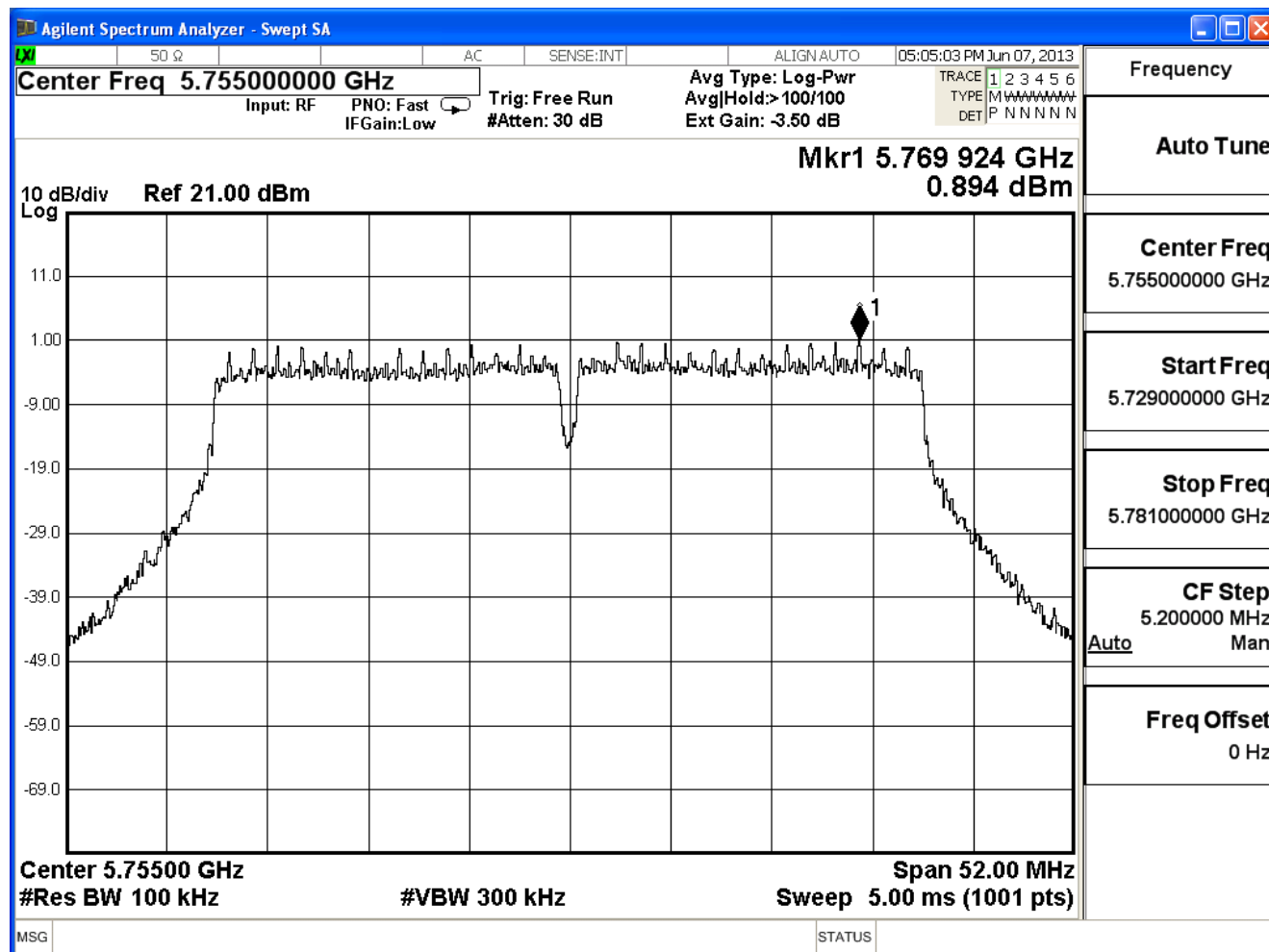
Product	Dual-Band Wireless USB adapter		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 1: Transmit (Dipole Antenna)		
Date of Test	2016/04/20	Test Site	SR7

IEEE 802.11n_40MHz (ANT 1)				
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)
151	5755	0.89	7.88	≤ 30
159	5795	1.99	8.98	≤ 30

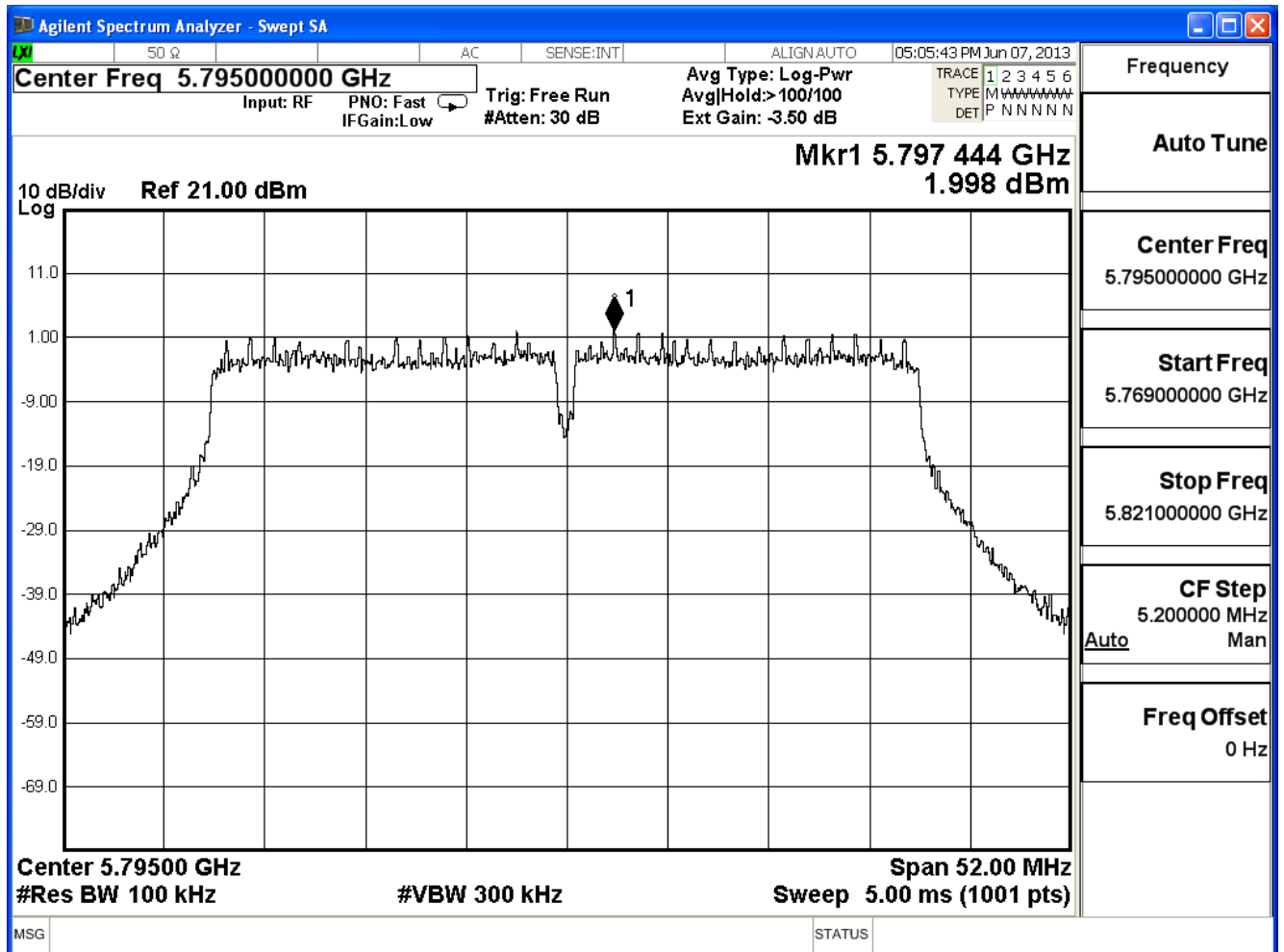
Correct factor= $10\log(500\text{kHz}/100\text{kHz})=6.99\text{dB}$

Measure = Reading + correct factor

Channel 151



Channel 159



Product	Dual-Band Wireless USB adapter		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 1: Transmit (Dipole Antenna)		
Date of Test	2016/04/20	Test Site	SR7

IEEE 802.11n_40MHz (ANT 0+1)			
Channel No.	Frequency (MHz)	Measurement (dBm)	Limit (dBm)
151	5755	12.22	≤ 30
159	5795	11.81	≤ 30

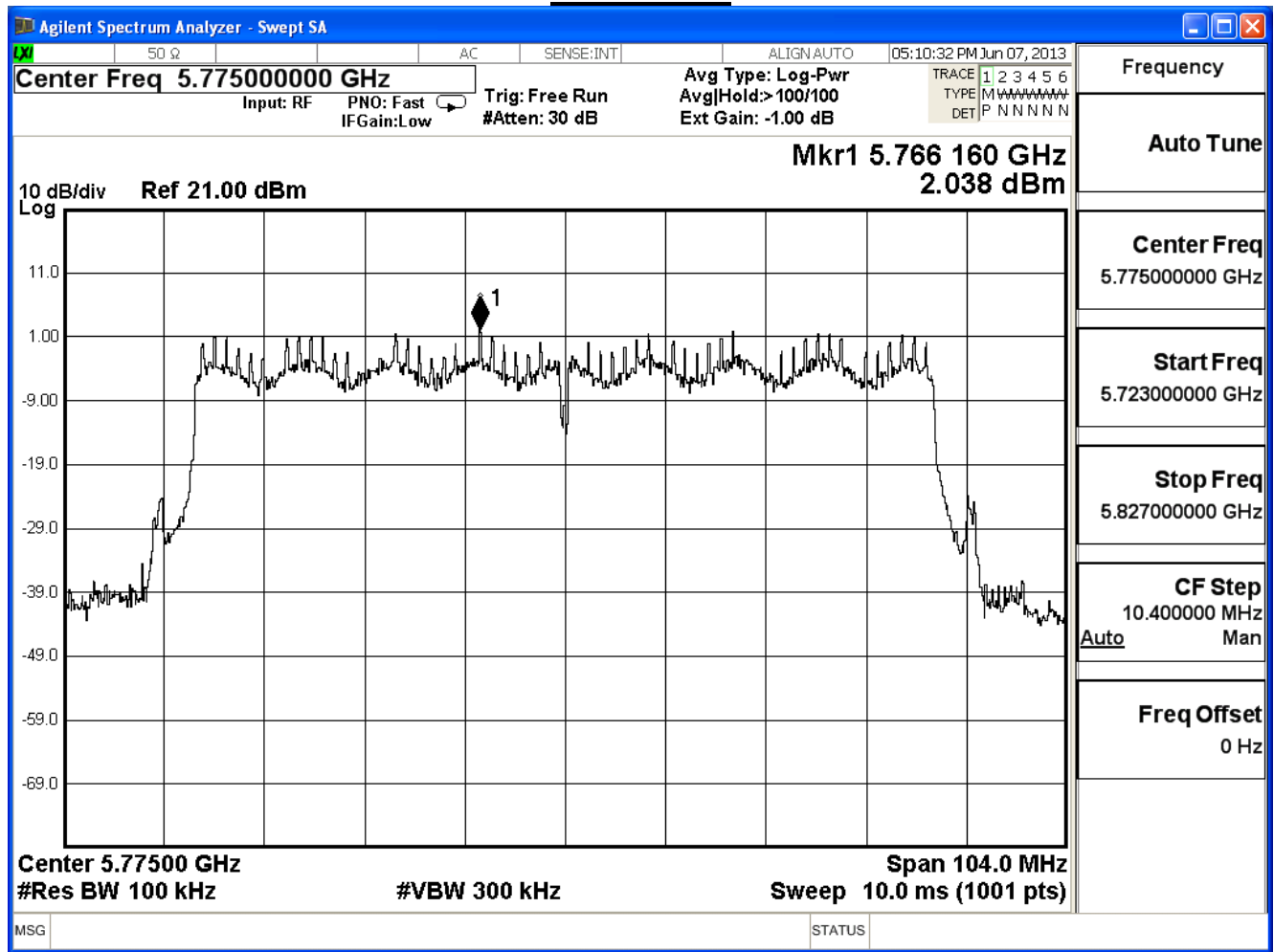
Product	Dual-Band Wireless USB adapter		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 1: Transmit (Dipole Antenna)		
Date of Test	2016/04/20	Test Site	SR7

IEEE 802.11ac_80MHz (ANT 0)				
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)
155	5775	2.03	9.02	≤ 30

Correct factor= $10\log(500\text{kHz}/100\text{kHz})=6.99\text{dB}$

Measure = Reading + correct factor

Channel 155



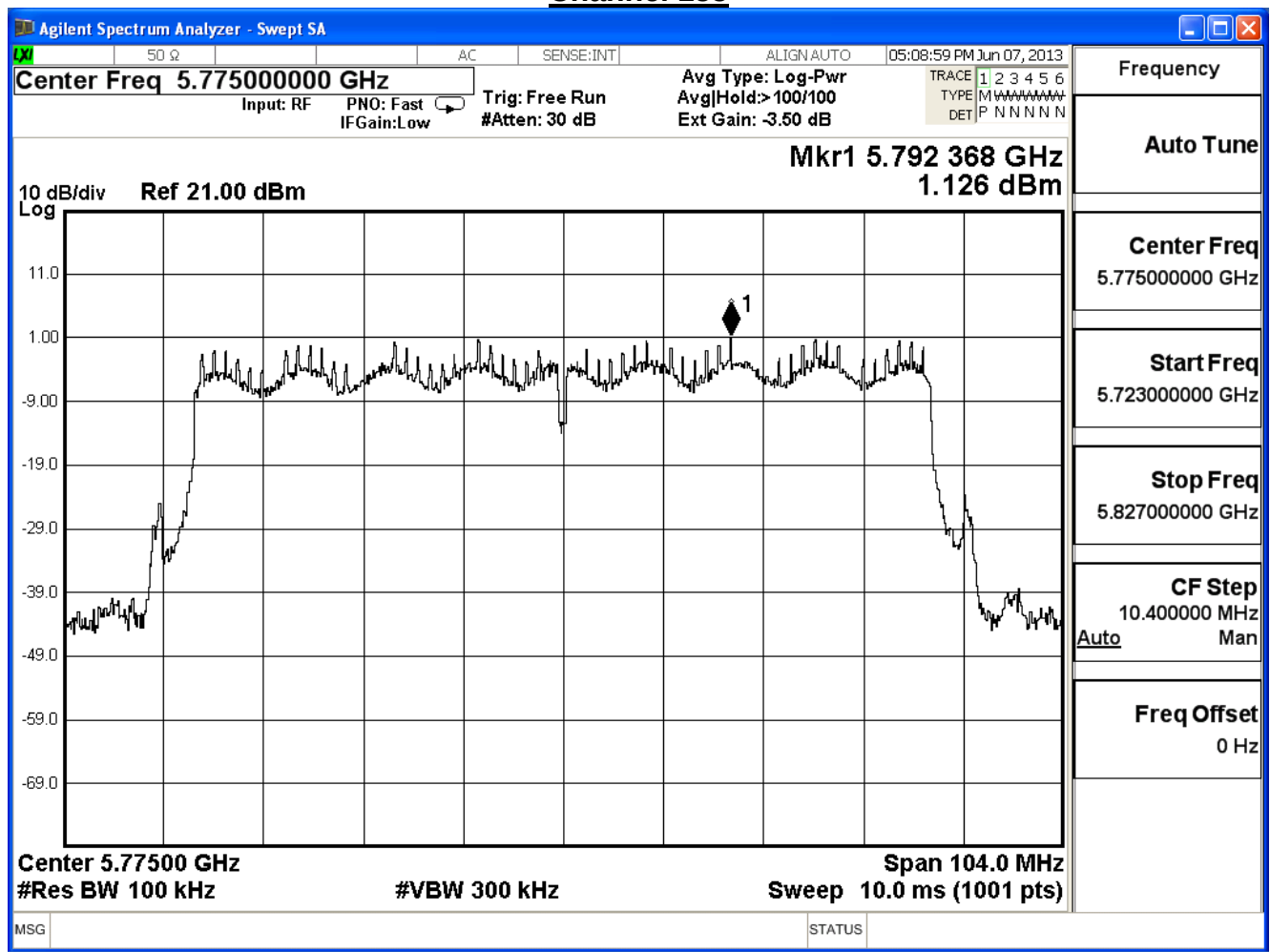
Product	Dual-Band Wireless USB adapter		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 1: Transmit (Dipole Antenna)		
Date of Test	2016/04/20	Test Site	SR7

IEEE 802.11ac_80MHz (ANT 1)				
Channel No.	Frequency (MHz)	Reading Level (dBm)	Measure Level (dBm)	Limit (dBm)
155	5775	1.12	8.11	≤ 30

Correct factor= $10\log(500\text{kHz}/100\text{kHz})=6.99\text{dB}$

Measure = Reading + correct factor

Channel 155



Product	Dual-Band Wireless USB adapter		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 1: Transmit (Dipole Antenna)		
Date of Test	2016/04/20	Test Site	SR7

IEEE 802.11ac_80MHz (ANT 0+1)			
Channel No.	Frequency (MHz)	Measurement (dBm)	Limit (dBm)
155	5775	11.60	≤ 30

3. Frequency Stability

3.1. Test Equipment

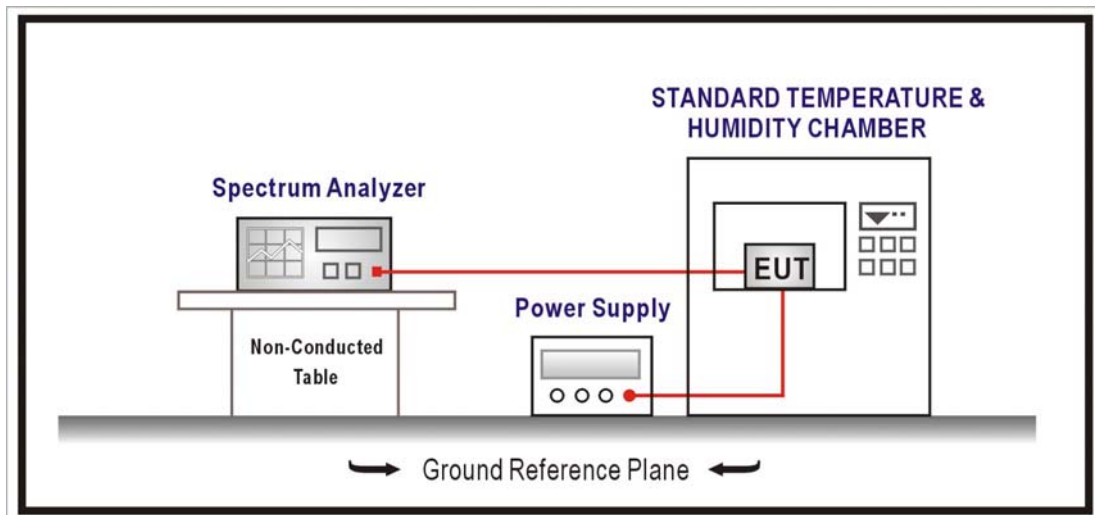
The following test equipments are used during the radiated emission tests:

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 all 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 (Dipole Antenna) - 802.11a - 5745MHz(ANT 0)		
Date of Test	2016/04/20	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5745.00005	0.0087	PASS
-10		5745.00009	0.0154	PASS
0		5745.00016	0.0282	PASS
10		5744.99989	-0.0183	PASS
20		5744.99991	-0.0160	PASS
30		5744.99980	-0.0351	PASS
40		5744.99994	-0.0109	PASS
50		5744.99969	-0.0546	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5744.99968	-0.0565	PASS
	120	5744.99986	-0.0237	PASS
	138	5744.99969	-0.0536	PASS

Product	Dual-Band Wireless USB adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit (Dipole Antenna) - 802.11a - 5825MH(ANT 0)		
Date of Test	2016/04/20	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5825.00039	0.0663	PASS
-10		5825.00003	0.0058	PASS
0		5825.00011	0.0185	PASS
10		5824.99989	-0.0190	PASS
20		5824.99994	-0.0099	PASS
30		5824.99977	-0.0400	PASS
40		5825.00000	-0.0001	PASS
50		5824.99975	-0.0423	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5824.99972	-0.0487	PASS
	120	5824.99994	-0.0106	PASS
	138	5824.99977	-0.0388	PASS

Product	Dual-Band Wireless USB adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit (Dipole Antenna) - 802.11n_20M - 5745MHz(ANT 0)		
Date of Test	2016/03/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5745.00042	0.0730	PASS
-10		5745.00013	0.0230	PASS
0		5745.00025	0.0441	PASS
10		5744.99993	-0.0114	PASS
20		5744.99990	-0.0175	PASS
30		5744.99990	-0.0182	PASS
40		5744.99965	-0.0611	PASS
50		5745.00000	-0.0002	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5744.99975	-0.0429	PASS
	120	5744.99976	-0.0420	PASS
	138	5744.99973	-0.0471	PASS

Product	Dual-Band Wireless USB adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit (Dipole Antenna) - 802.11n_20M - 5825MHz(ANT 0)		
Date of Test	2016/03/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5825.00000	0.0004	PASS
-10		5825.00000	0.0006	PASS
0		5825.00029	0.0493	PASS
10		5824.99990	-0.0178	PASS
20		5824.99983	-0.0293	PASS
30		5824.99988	-0.0204	PASS
40		5824.99986	-0.0247	PASS
50		5824.99963	-0.0634	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5824.99975	-0.0421	PASS
	120	5824.99993	-0.0112	PASS
	138	5824.99992	-0.0130	PASS

Product	Dual-Band Wireless USB adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit (Dipole Antenna) - 802.11n_20M - 5745MHz(ANT 1)		
Date of Test	2016/03/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5745.00034	0.0598	PASS
-10		5745.00044	0.0762	PASS
0		5745.00026	0.0448	PASS
10		5744.99995	-0.0087	PASS
20		5744.99987	-0.0221	PASS
30		5744.99980	-0.0355	PASS
40		5744.99975	-0.0443	PASS
50		5744.99967	-0.0578	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5744.99984	-0.0278	PASS
	120	5744.99996	-0.0066	PASS
	138	5744.99976	-0.0413	PASS

Product	Dual-Band Wireless USB adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit (Dipole Antenna) - 802.11n_20M - 5825MHz(ANT 1)		
Date of Test	2016/03/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5825.00047	0.0802	PASS
-10		5825.00002	0.0029	PASS
0		5825.00014	0.0235	PASS
10		5824.99981	-0.0320	PASS
20		5824.99980	-0.0340	PASS
30		5824.99975	-0.0427	PASS
40		5824.99999	-0.0017	PASS
50		5824.99999	-0.0010	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5824.99968	-0.0543	PASS
	120	5824.99991	-0.0160	PASS
	138	5824.99994	-0.0109	PASS

Product	Dual-Band Wireless USB adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit (Dipole Antenna) - 802.11n_40M - 5755MHz(ANT 0)		
Date of Test	2016/03/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5755.00009	0.0160	PASS
-10		5755.00044	0.0768	PASS
0		5755.00014	0.0238	PASS
10		5754.99990	-0.0170	PASS
20		5754.99982	-0.0309	PASS
30		5754.99994	-0.0109	PASS
40		5754.99994	-0.0097	PASS
50		5754.99977	-0.0398	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5754.99983	-0.0302	PASS
	120	5754.99985	-0.0255	PASS
	138	5754.99967	-0.0570	PASS

Product	Dual-Band Wireless USB adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit (Dipole Antenna) - 802.11n_40M - 5795MHz(ANT 0)		
Date of Test	2016/03/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5795.00017	0.0299	PASS
-10		5795.00013	0.0221	PASS
0		5795.00001	0.0013	PASS
10		5794.99990	-0.0170	PASS
20		5794.99996	-0.0063	PASS
30		5794.99980	-0.0339	PASS
40		5794.99964	-0.0619	PASS
50		5794.99970	-0.0526	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5794.99974	-0.0442	PASS
	120	5794.99966	-0.0581	PASS
	138	5794.99990	-0.0170	PASS

Product	Dual-Band Wireless USB adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit (Dipole Antenna) - 802.11n_40M - 5755MHz(ANT 1)		
Date of Test	2016/03/29	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5755.00008	0.0141	PASS
-10		5755.00037	0.0640	PASS
0		5755.00002	0.0031	PASS
10		5754.99998	-0.0041	PASS
20		5754.99992	-0.0145	PASS
30		5754.99974	-0.0459	PASS
40		5754.99980	-0.0350	PASS
50		5754.99964	-0.0623	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5754.99985	-0.0261	PASS
	120	5754.99994	-0.0112	PASS
	138	5754.99998	-0.0038	PASS

Product	Dual-Band Wireless USB adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit (Dipole Antenna) - 802.11n_40M - 5795MHz(ANT 1)		
Date of Test	2016/04/20	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5795.00031	0.0529	PASS
-10		5795.00030	0.0512	PASS
0		5795.00026	0.0445	PASS
10		5794.99983	-0.0287	PASS
20		5794.99981	-0.0334	PASS
30		5794.99971	-0.0495	PASS
40		5795.00000	-0.0002	PASS
50		5794.99957	-0.0743	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5794.99976	-0.0421	PASS
	120	5794.99984	-0.0274	PASS
	138	5794.99971	-0.0502	PASS

Product	Dual-Band Wireless USB adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit (Dipole Antenna) - 802.11ac_80M-5775MHz(ANT 0)		
Date of Test	2016/04/20	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5775.00043	0.0749	PASS
-10		5775.00005	0.0084	PASS
0		5775.00002	0.0037	PASS
10		5774.99994	-0.0103	PASS
20		5774.99995	-0.0081	PASS
30		5774.99989	-0.0187	PASS
40		5774.99968	-0.0561	PASS
50		5774.99977	-0.0398	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5774.99978	-0.0382	PASS
	120	5774.99976	-0.0422	PASS
	138	5774.99985	-0.0257	PASS

Product	Dual-Band Wireless USB adapter		
Test Item	Frequency Stability		
Test Mode	Mode 1: Transmit (Dipole Antenna) - 802.11ac_80M-5775MHz(ANT 1)		
Date of Test	2016/04/20	Test Site	SR7

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5775.00016	0.0271	PASS
-10		5775.00013	0.0218	PASS
0		5775.00016	0.0274	PASS
10		5774.99995	-0.0078	PASS
20		5774.99994	-0.0102	PASS
30		5774.99985	-0.0264	PASS
40		5774.99969	-0.0539	PASS
50		5774.99976	-0.0414	PASS

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5774.99993	-0.0120	PASS
	120	5774.99968	-0.0556	PASS
	138	5774.99973	-0.0460	PASS

Attachment 1

➤ Original Report