FCC Partial Test Report

Product Name ： Secure Smartphone

Trade Name ： Bittium

Model No. ： Tough Mobile 2

FCC ID. ： V27SD-61

Applicant ： BITTIUM WIRELESS OY

Address ： Ritaharjuntie 1, 90590 Oulu, Finland

Date of Receipt ： Jan. 03, 2019

Issued Date ： Dec. 16, 2019

Report No. ： 1910040R-RFUSP42V00

Report Version ： V3.0

The test results relate only to the samples tested.
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Test Report Certification

Issued Date : Dec. 16, 2019
Report No. : 1910040R-RFUSP42V00

Product Name	:	Secure Smartphone
Applicant	:	BITTIUM WIRELESS OY
Address	:	Ritaharjuntie 1, 90590 Oulu, Finland
Manufacturer	:	BITTIUM WIRELESS OY
Model No.	:	Tough Mobile 2
FCC ID.	:	V27SD-61
EUT Voltage	:	DC 3.8V
Testing Voltage	:	DC 3.8V
Trade Name	:	Bittium
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart E Section 15.407: 2018 ANSI C63.10: 2013 KDB 789033 D02 v02r01 KDB 662911 D01 v02r01
Laboratory Name	:	Hsin Chu Laboratory
Address	:	No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 310, Taiwan, R.O.C. TEL: +886-3-582-8001 / FAX: +886-3-582-8958

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(Lyla Yang / Engineering Adm. Specialist)

Tested By : Clemens Fang

(Clemens Fang / Senior Engineer)

Approved By : Louis Hsu

(Louis Hsu / Deputy Manager)

Revision History

Report No.	Version	Description	Issued Date
1910040R-RFUSP42V00	V1.0	This is partial report. Only test items for 26 dB & 99% Bandwidth , Maximum conducted output power and Maximum power spectral density test was performed in this report. For customers request.	Jun. 17, 2019
1910040R-RFUSP42V00	V2.0	Revise voltage to DC 3.8V.	Nov. 29, 2019
1910040R-RFUSP42V00	V3.0	Revise Antenna Gain to -1.1 dBi.	Dec. 16, 2019

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1. General Information

1.1. EUT Description

Product Name	Secure Smartphone	
Trade Name	Bittium	
Model No.	Tough Mobile 2	
Frequency Range/ Channel Number	IEEE 802.11a/ IEEE 802.11n (20MHz) /	5180~5240MHz / 4 Channels 5260~5320MHz / 4 Channels 5500~5700MHz / 11 Channels
	IEEE 802.11n (40MHz) / IEEE 802.11ac (40MHz)	5190~5230MHz / 2 Channels
	IEEE 802.11ac (80MHz)	5210~5210MHz / 1 Channel
Type of Modulation	IEEE 802.11a/n/ac	Orthogonal Frequency Division Multiplexing (OFDM)
Data Speed	IEEE 802.11a	6, 9,12, 18, 24, 36, 48, 54Mbps
	IEEE 802.11n	Support a subset of the combination of GI, MCS 0~MCS 15 and bandwidth defined in 802.11n
	IEEE 802.11ac	Support a subset of the combination of GI, MCS 0~MCS 9 and bandwidth defined in 802.11ac
Hw version	0302	
Sw version	40.1	

Antenna Information	
Antenna Type	monopole antenna
Effective Antenna Gain	Antenna 0: -1.1 dBi Antenna 1: -1.1 dBi

ANT-TX / RX & Bandwidth

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

IEEE 802.11n

MCS Index	Modulation	R	N_{BPSCS}	N_{CBPS}		N_{DBPS}		Data Rate(Mb/s)			
								800ns GI		400ns GI	
				20MHz	40MHz	20MHz	40MHz	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)			
								800ns GI		400ns GI	
				20MHz	40MHz	20MHz	40MHz	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 802.11ac Data Rate

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

IEEE 802.11a & IEEE 802.11n (20MHz) & IEEE 802.11ac (20MHz)

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

IEEE 802.11n (40MHz) & IEEE 802.11ac (40MHz)

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz				

IEEE 802.11ac (80MHz)

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz						

Note:

1. This device is a Secure Smartphone supports 5GHz a/n/ac transmitting functions.
2. Regards to the frequency band operation; the lowest、middle and highest frequency of channel were selected to perform the test, and then shown on this report.

1.2. Test Mode

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

Test Mode	Mode 1: Transmit Mode

Test Items	Modulation	Channel	Antenna	Result
26dB& 99% Bandwidth	a	36/44/48/52/60/ 64/100/116/140	0/1	Complies
	11n/ac (20MHz)	36/44/48/52/60/ 64/100/116/140	0/1	Complies
	11n/ac (40MHz)	38/46	0/1	Complies
	11ac (80MHz)	42	0/1	Complies
Maximum conducted output power	a	36/44/48/52/60/ 64/100/116/140	0+1	Complies
	11n/ac (20MHz)	36/44/48/52/60/ 64/100/116/140	0+1	Complies
	11n/ac (40MHz)	38/46	0+1	Complies
	11ac (80MHz)	42	0+1	Complies
Maximum power spectral density	a	36/44/48/52/60/ 64/100/116/140	0+1	Complies
	11n/ac (20MHz)	36/44/48/52/60/ 64/100/116/140	0+1	Complies
	11n/ac (40MHz)	38/46	0+1	Complies
	11ac (80MHz)	42	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	N/A					

1.4. Configuration of tested System

Connection Diagram

1.5. EUT Exercise Software

1	Set the EUT as shown in Section 1.4.
2	Execute the "Wlan Test" on the EUT.
3	Configure test mode, test channel and data rate.
4	EUT start transmitting or receiving continuously.
5	Verify that the device is working properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual	Test Site
Temperature (°C)	FCC Part 15E 15.407 26dB& 99% Bandwidth	15 - 35	25°C	3
Humidity (%RH)		25 - 75	45%RH	
Barometric pressure (mbar)		860 - 1060	950-1000	
Temperature (°C)	FCC Part 15E 15.407 Maximum conducted output power	15 - 35	25°C	3
Humidity (%RH)		25 - 75	65%RH	
Barometric pressure (mbar)		860 - 1060	950-1000	
Temperature (°C)	FCC Part 15E 15.407 Maximum power spectral density	15 - 35	25°C	3
Humidity (%RH)		25 - 75	45%RH	
Barometric pressure (mbar)		860 - 1060	950-1000	

Note: Test Site information refers to Laboratory Information.

Laboratory Information

USA	**:**	**FCC Registration Number: TW3024**
Canada		**IC Registration Number: 22397-1 / 22397-2 / 22397-3**

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:
http://www.dekra.com.tw/english/about/certificates.aspx?bval=5
The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en.aspx

If you have any comments, Please don't hesitate to contact us. Our test sites as below:

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1.7. List of Test Equipment

26dB& 99% Bandwidth / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Spectrum Analyzer	Keysight	N9030B	MY57140404	2018/06/26	2019/06/25
Spectrum Analyzer	Keysight	N9010B	MY57110159	2018/05/25	2019/05/24
Spectrum Analyzer	Agilent	N9010A	US47140172	2018/07/18	2019/07/17
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/12/21	2019/12/20

Maximum conducted output power / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	2018/12/17	2019/12/16
Pulse Power Sensor	Anritsu	MA2411B	1531043	2018/12/17	2019/12/16
Pulse Power Sensor	Anritsu	MA2411B	1531044	2018/12/17	2019/12/16
Power Meter	Keysight	8990B	MY51000248	2018/06/07	2019/06/06
Power Sensor	Keysight	N1923A	MY57240005	2018/06/07	2019/06/06

Maximum power spectral density / SR10-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Spectrum Analyzer	Keysight	N9030B	MY57140404	2018/06/26	2019/06/25
Spectrum Analyzer	Keysight	N9010B	MY57110159	2018/05/25	2019/05/24
Spectrum Analyzer	Agilent	N9010A	US47140172	2018/07/18	2019/07/17
Signal & Spectrum Analyzer	R&S	FSV40	101049	2018/12/21	2019/12/20

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

1.8. Uncertainty

Test item	Uncertainty
26dB& 26dB& 99% Bandwidth	± 50Hz
Maximum conducted output power	± 1.27 dB
Maximum power spectral density	± 1.27 dB

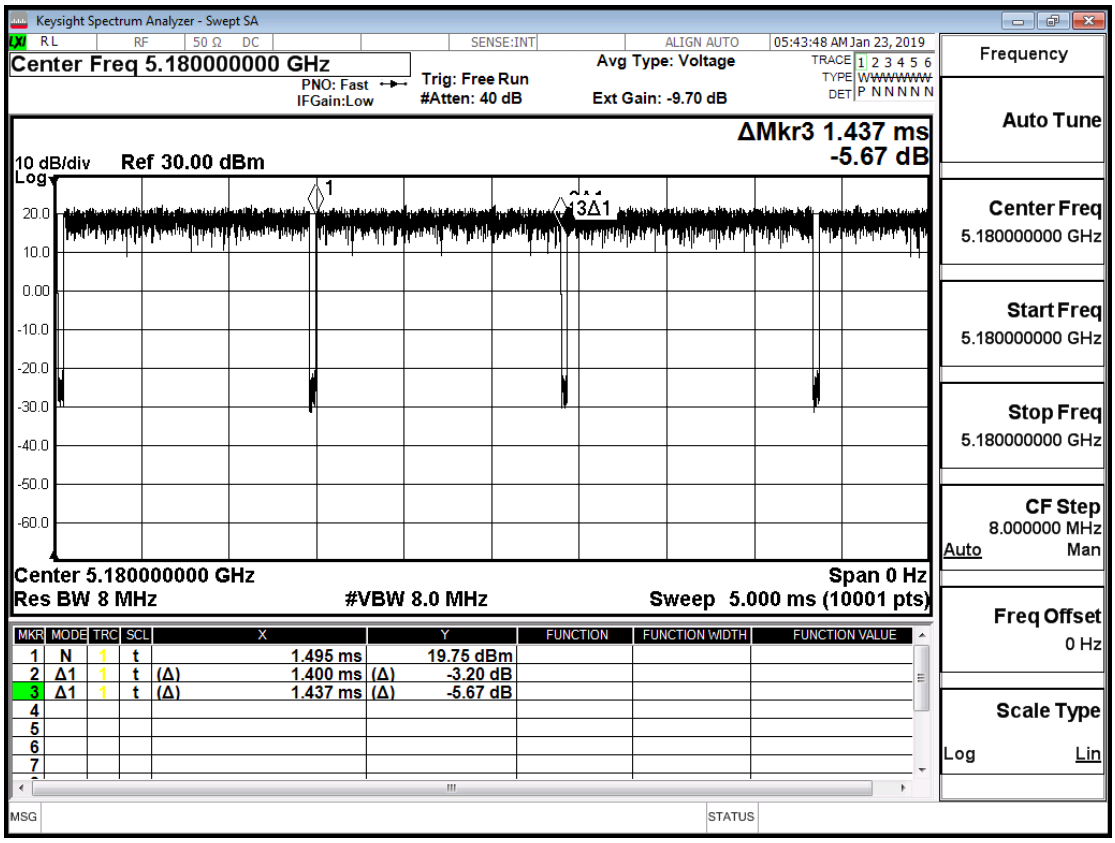
1.9. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor(dB) linear voltage	Duty Factor(dB) Power	1/T Minimum VBW (kHz)
802.11a	1.400	1.437	97.43%	0.226575	0.11	0.714
802.11ac VHT20	2.588	2.625	98.59%	0.123301	0.06	0.010
802.11ac VHT40	1.272	1.308	97.25%	0.242413	0.12	0.786
802.11ac VHT80	0.612	0.648	94.36%	0.504671	0.25	1.635

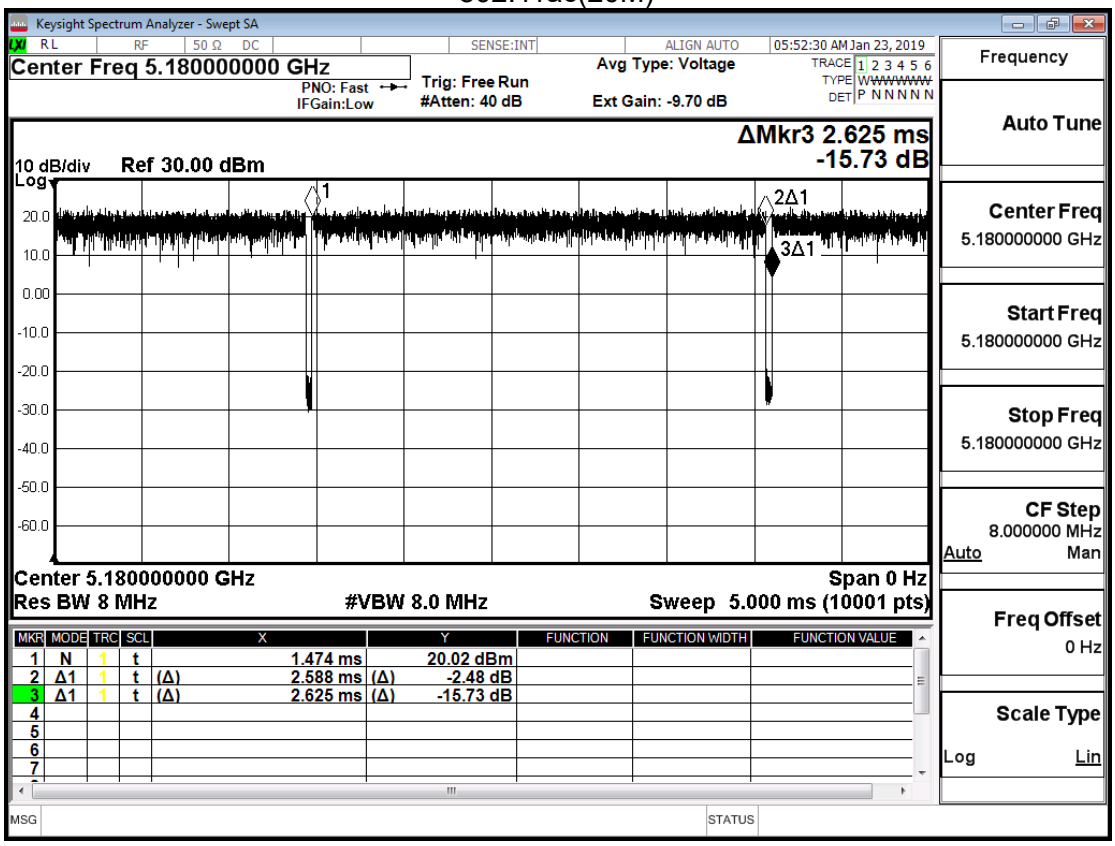
Note:
Offset = 20 log(1/duty cycle)
Accotding to KDB 789033
If power averaging (rms) mode was used in step (iv) above, the correction factor is 10 log (1/x), where x is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB must be added to the measured emission levels.

If linear voltage averaging mode was used in step (iv) above, the correction factor is 20 log (1/x), where x is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB must be added to the measured emission levels.

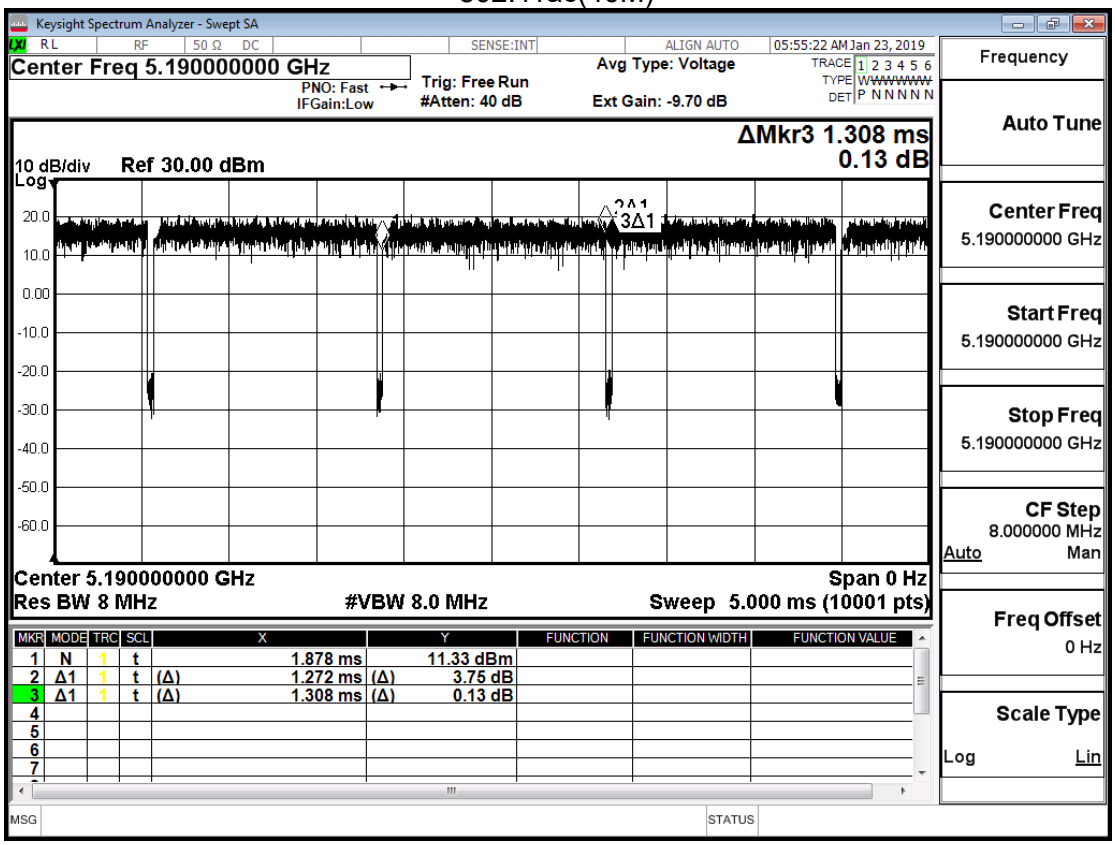
802.11a



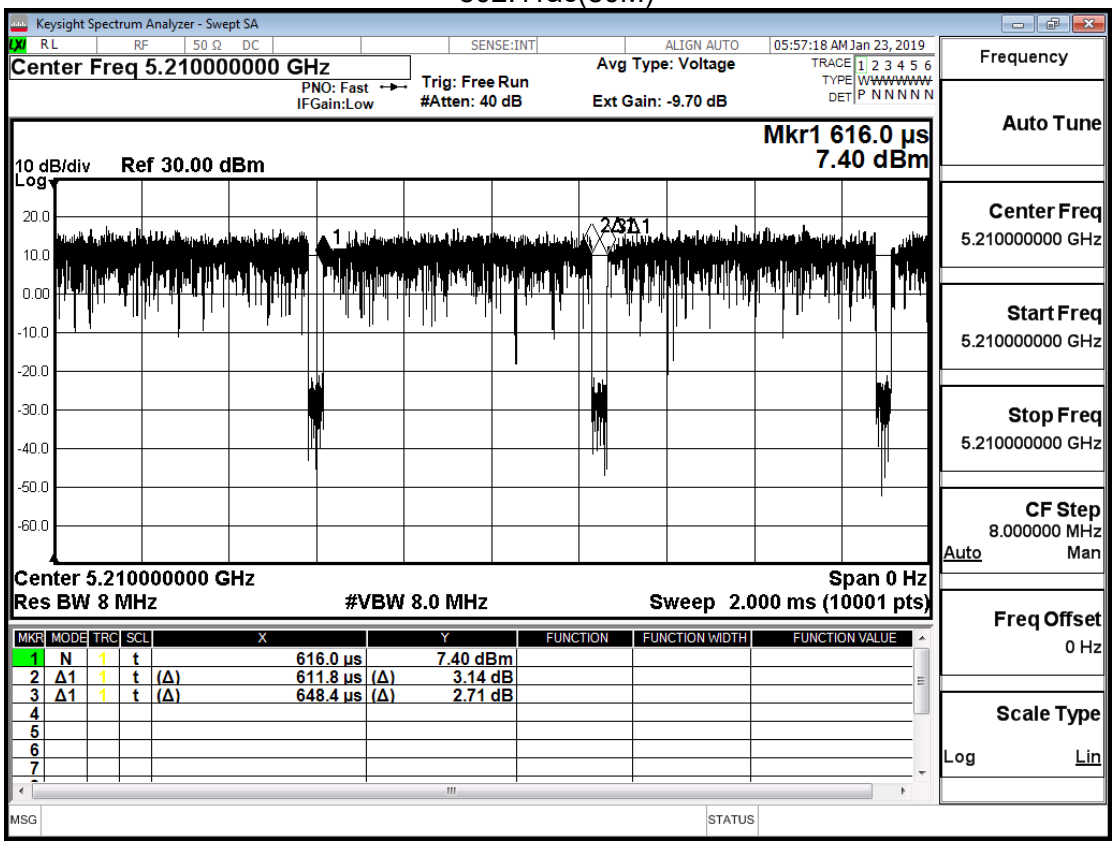
802.11ac(20M)



802.11ac(40M)

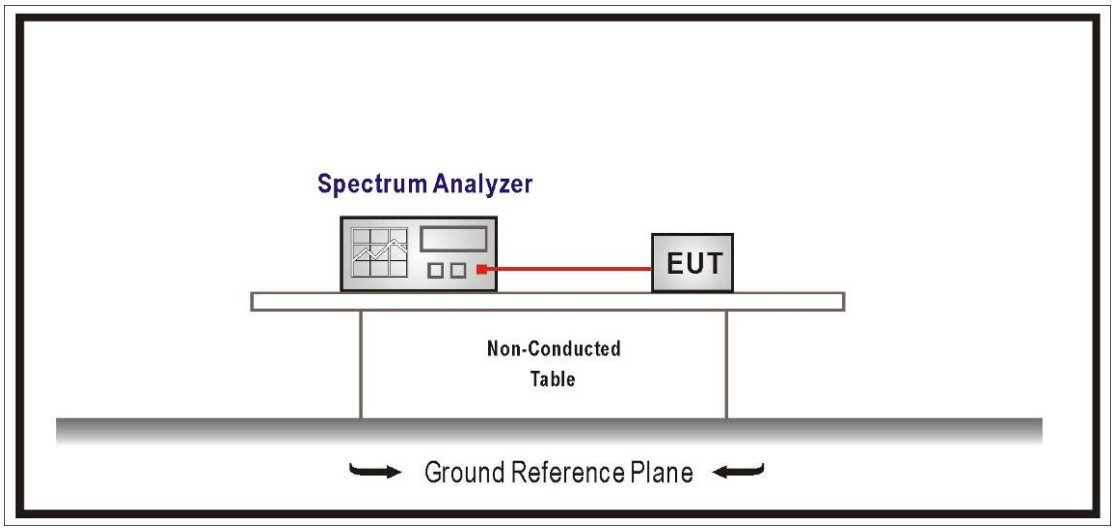


802.11ac(80M)



2. 26dB & 99% Bandwidth

2.1. Test Setup



2.2. Limits

99% & 26dB Bandwidth : No Required

2.3. Test Procedure

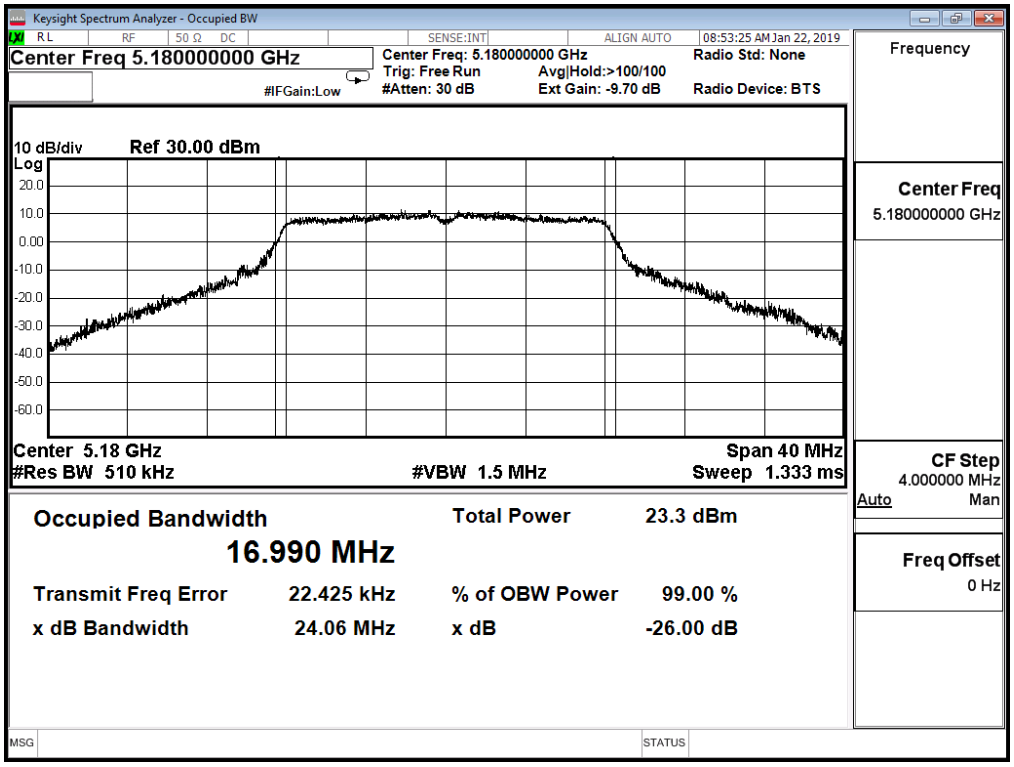
99% & 26dB Bandwidth :
The EUT was tested according to U-NII test procedure of KDB 789033.D02 v02r01
Set RBW 1% of the emission bandwidth, VBW equal to 3 times the RBW.

2.4. Test Result

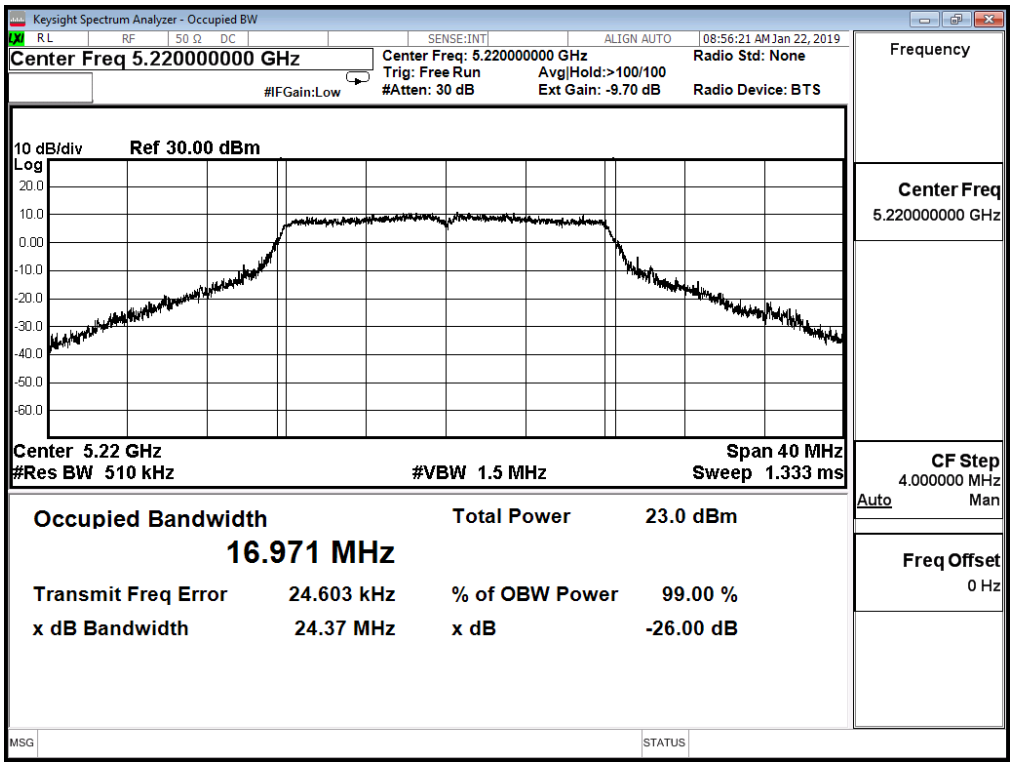
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT 0)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
36	5180	24.060	16.990	--	Pass
44	5220	24.370	16.971	--	Pass
48	5240	24.260	16.864	--	Pass

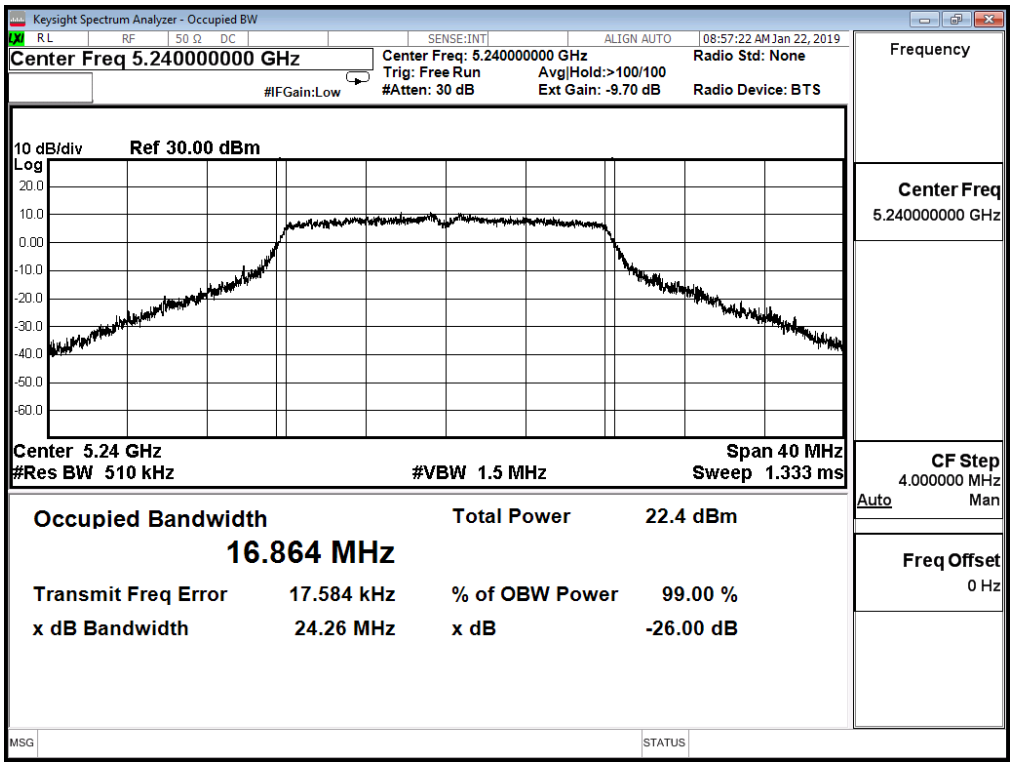
Channel 36 (5180MHz)



Channel 44 (5220MHz)



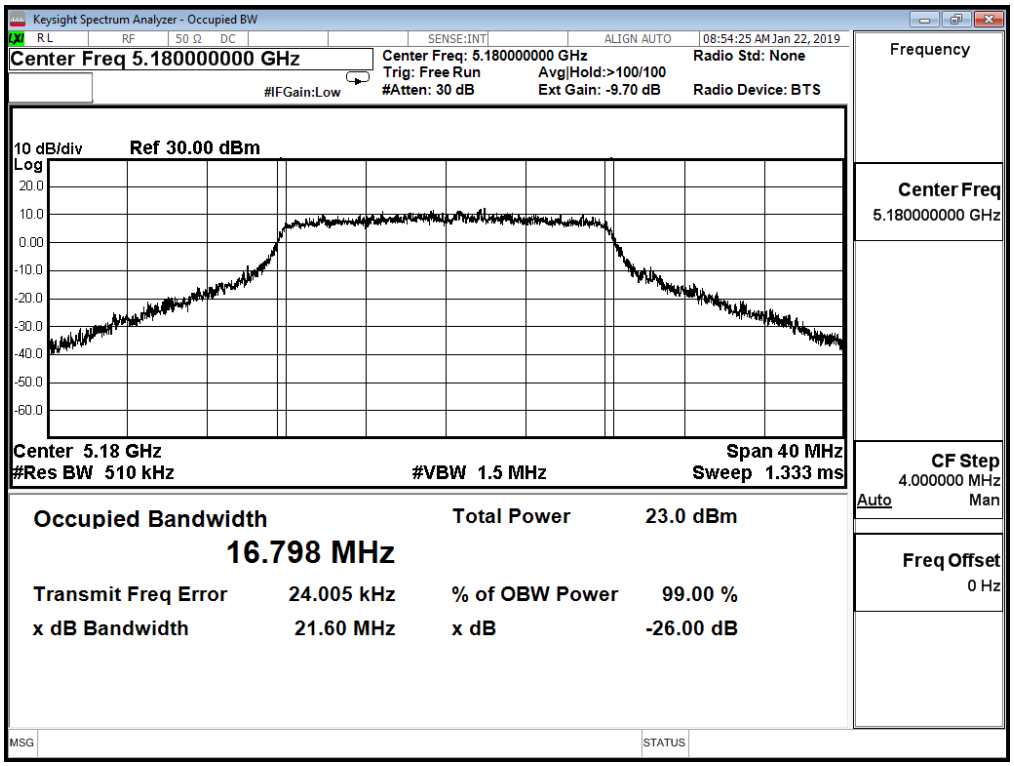
Channel 48 (5240MHz)



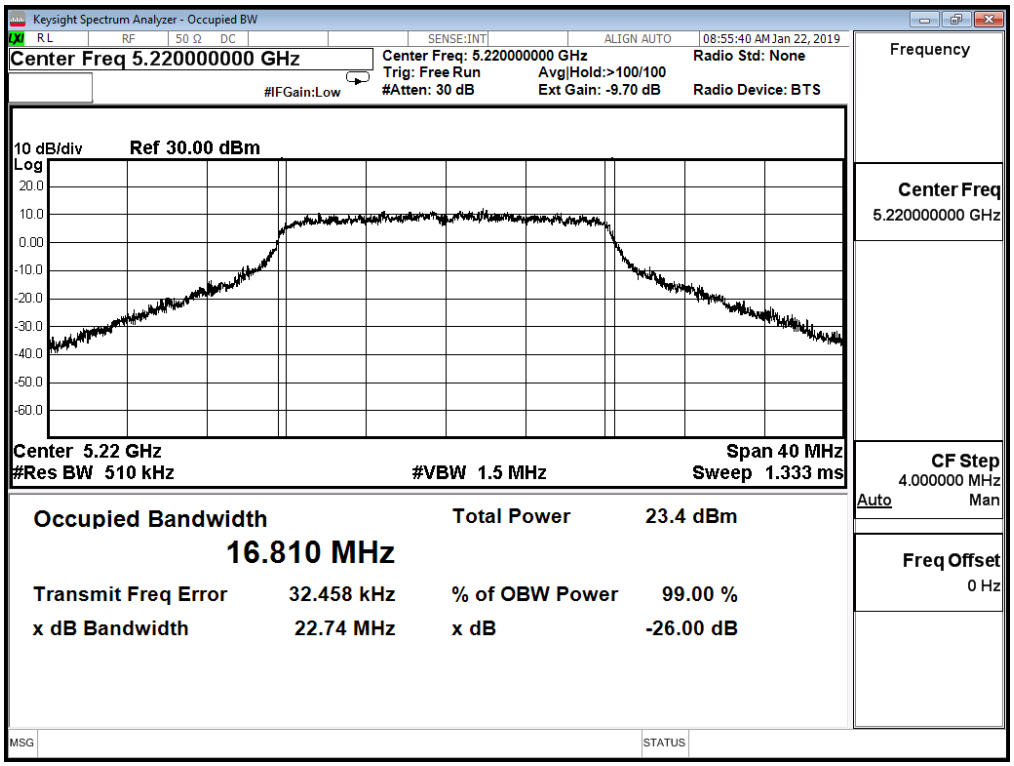
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT 1)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
36	5180	21.600	16.798	--	Pass
44	5220	22.740	16.810	--	Pass
48	5240	22.350	16.822	--	Pass

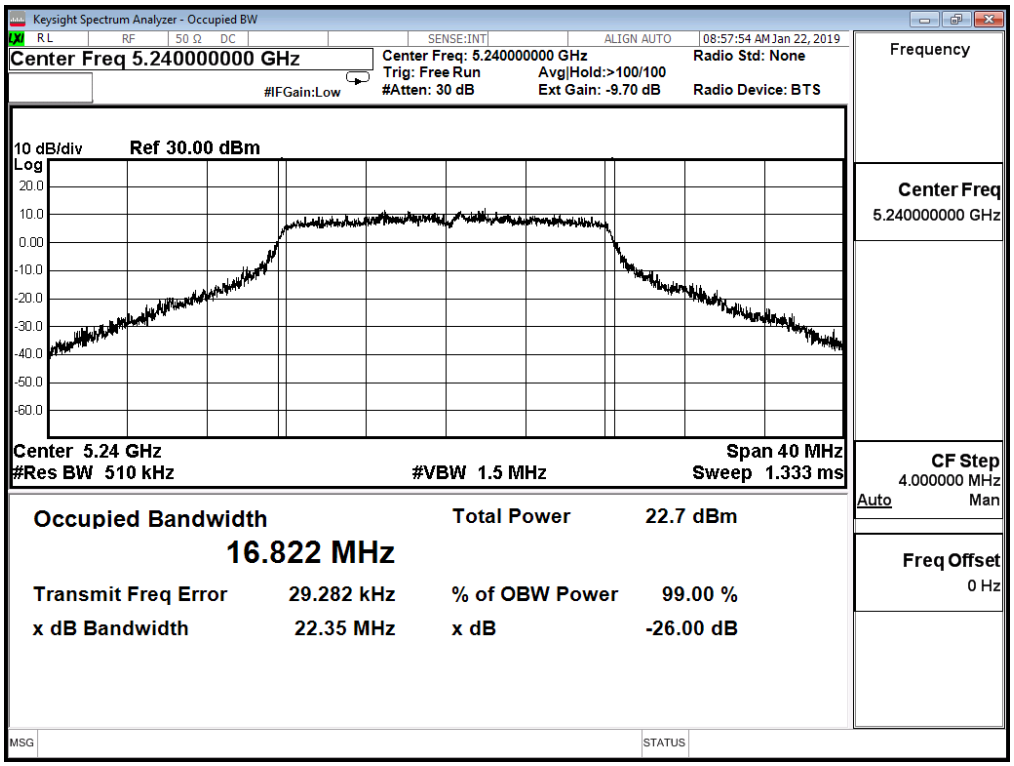
Channel 36 (5180MHz)



Channel 44 (5220MHz)



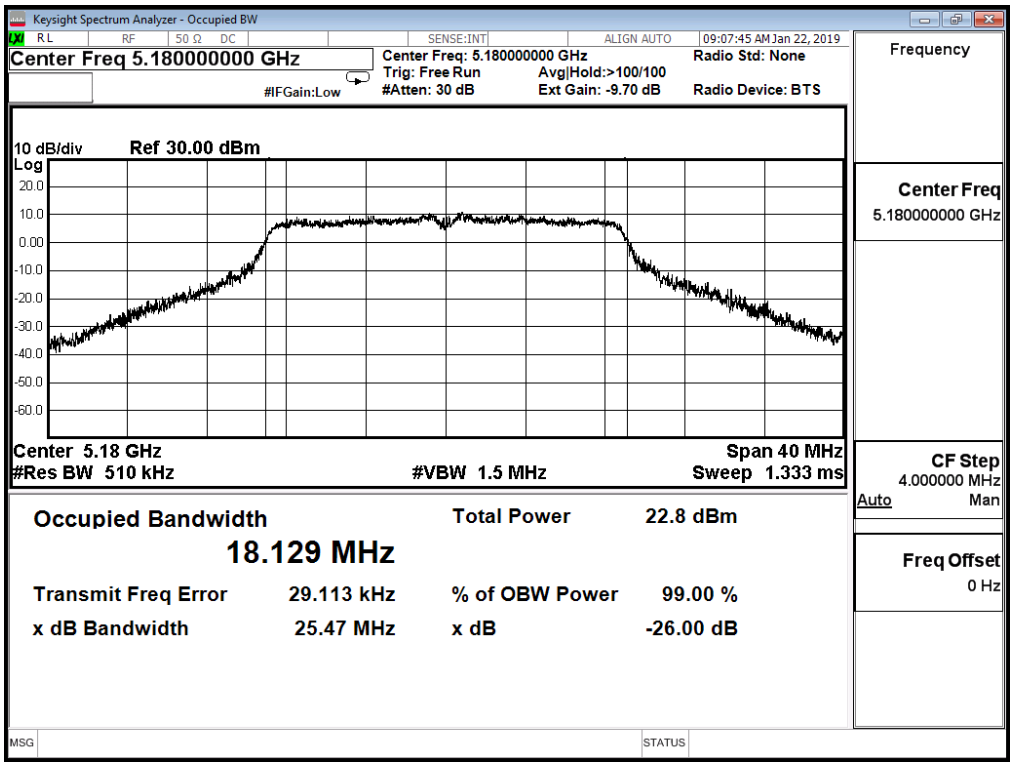
Channel 48 (5240MHz)



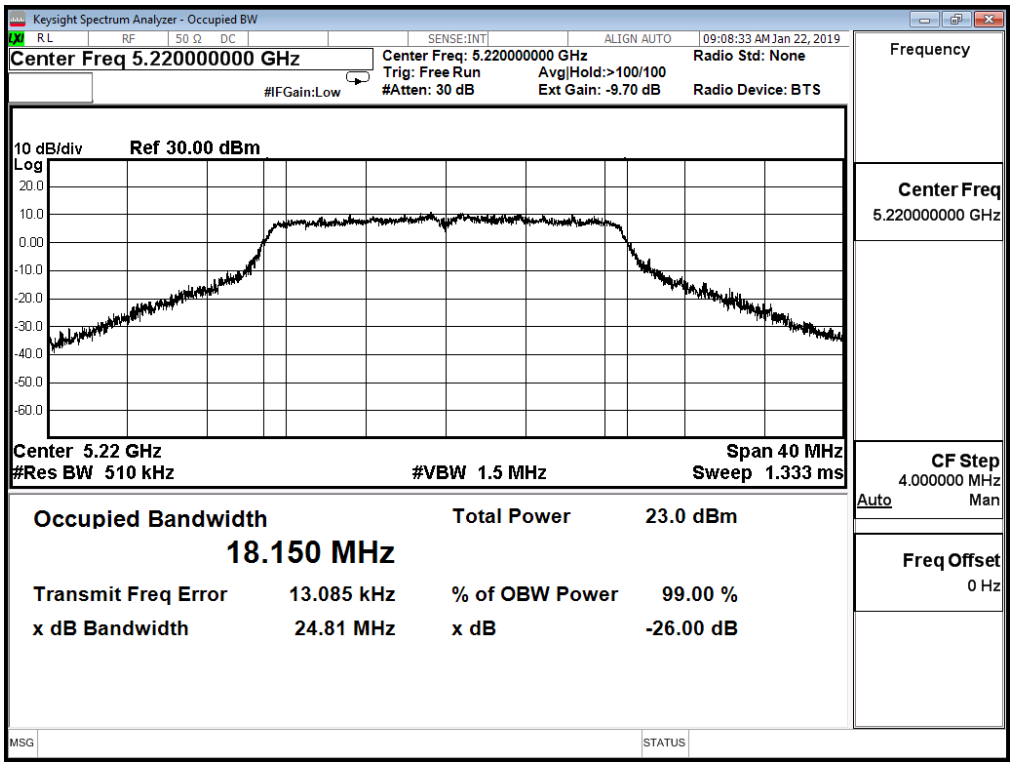
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac_20M(ANT 0)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
36	5180	25.470	18.129	--	Pass
44	5220	24.810	18.150	--	Pass
48	5240	24.830	18.024	--	Pass

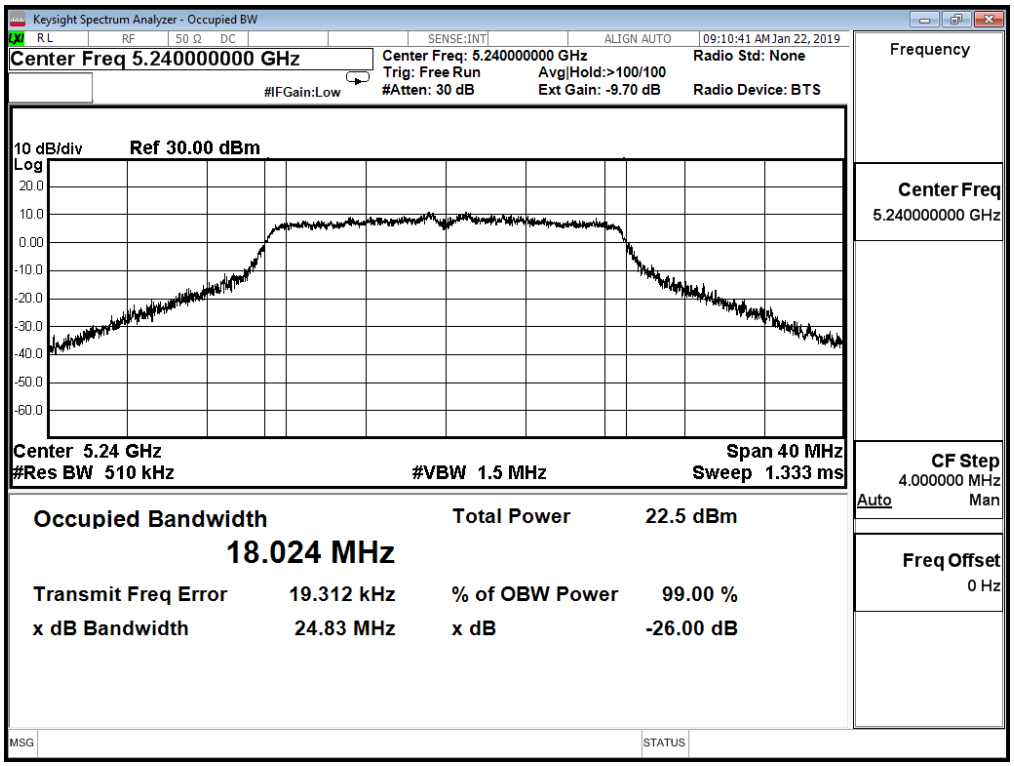
Channel 36 (5180MHz)



Channel 44 (5220MHz)



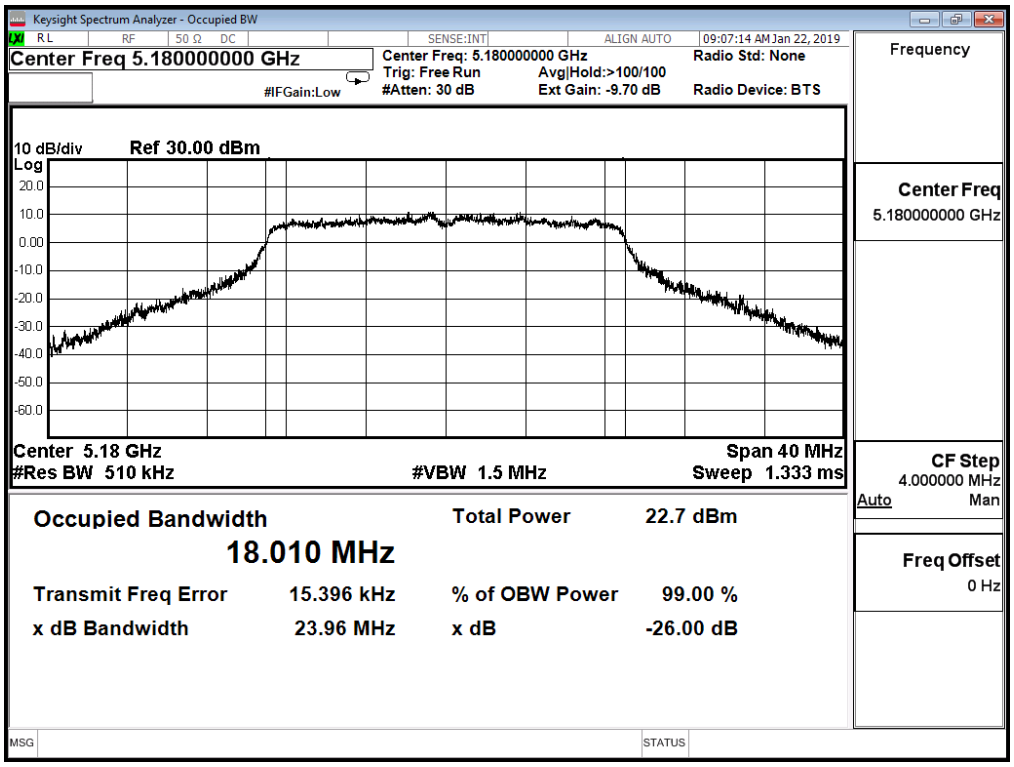
Channel 48 (5240MHz)



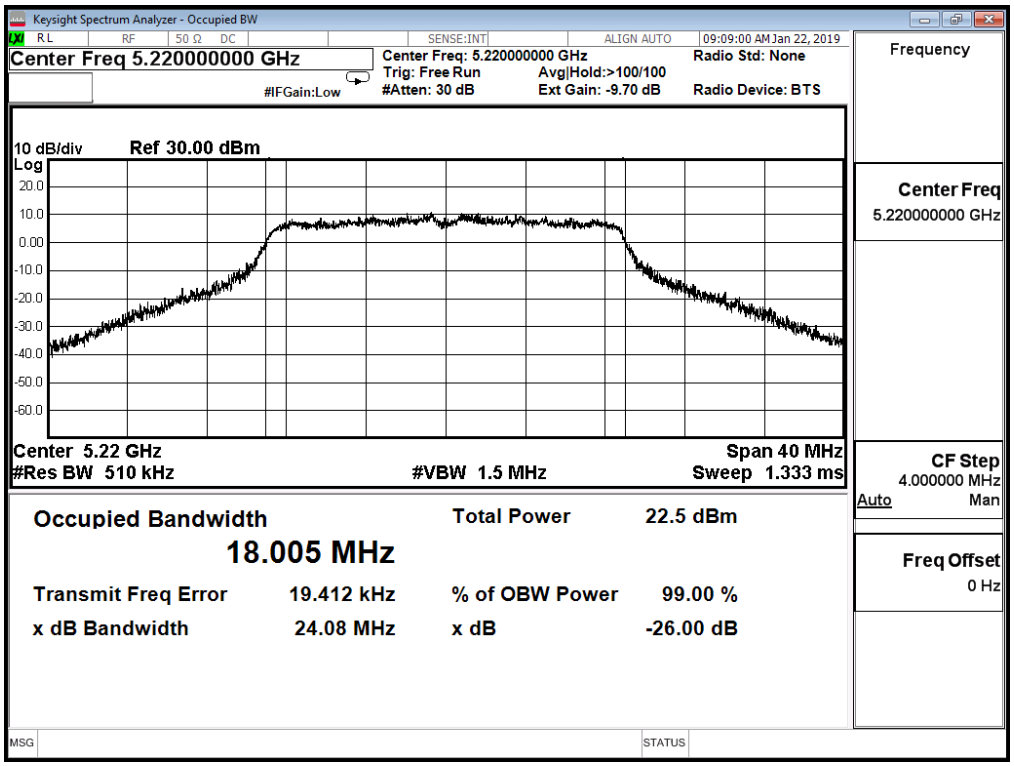
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac_20M(ANT 1)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
36	5180	23.960	18.010	--	Pass
44	5220	24.080	18.005	--	Pass
48	5240	24.230	18.004	--	Pass

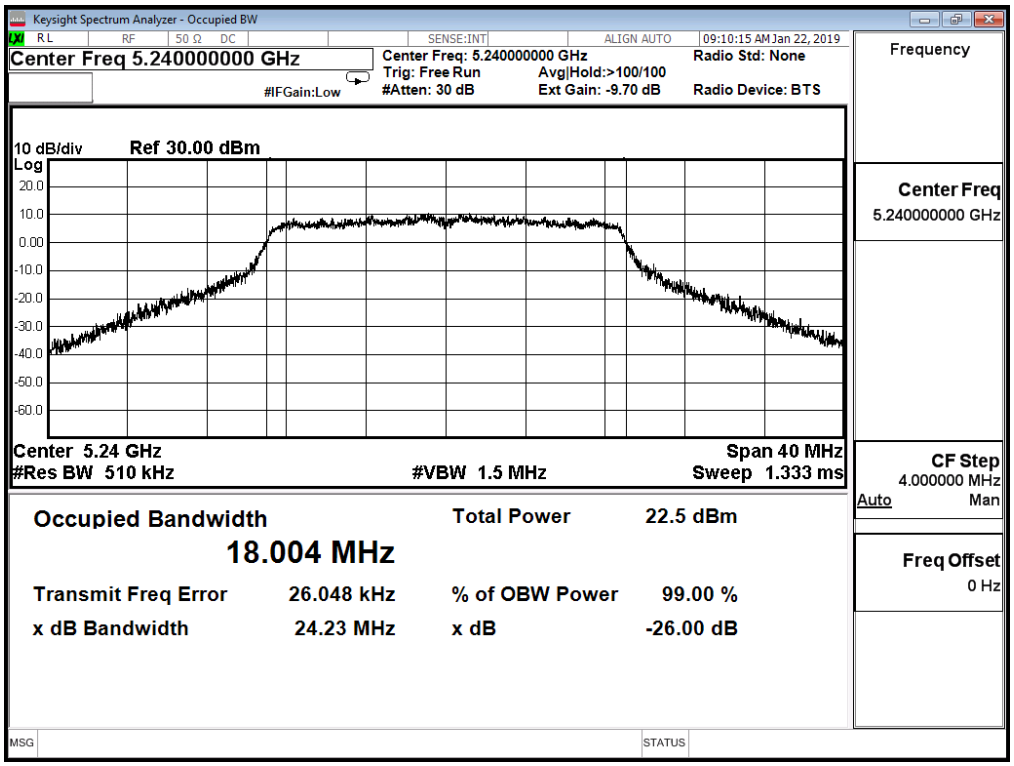
Channel 36 (5180MHz)



Channel 44 (5220MHz)



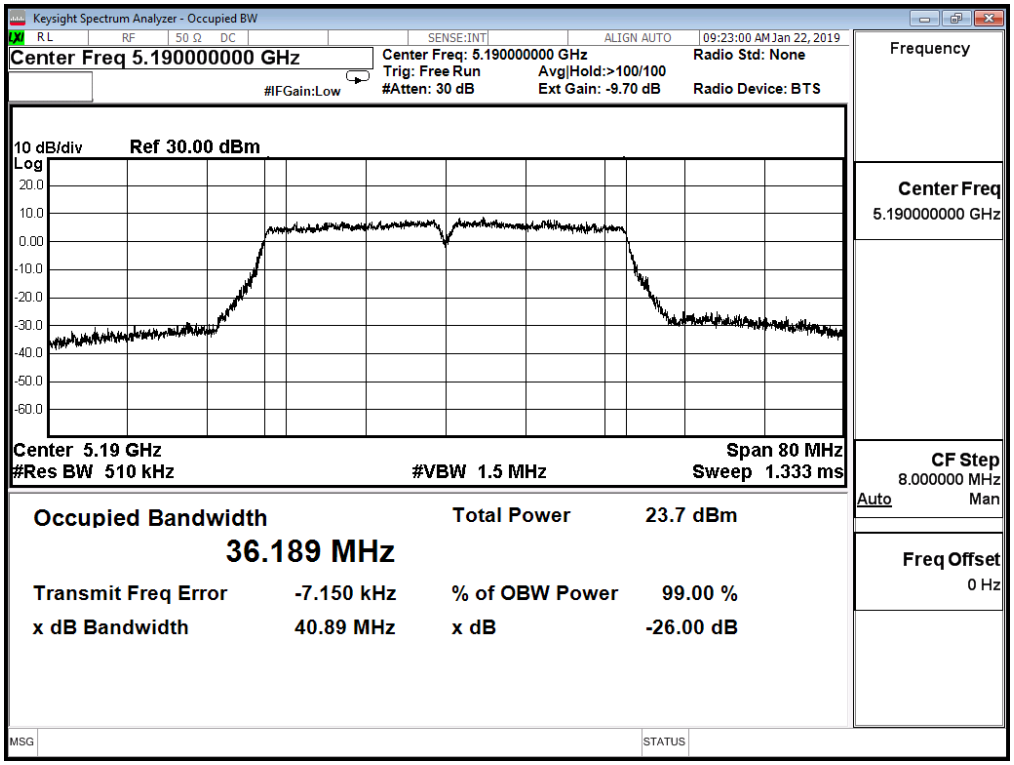
Channel 48 (5240MHz)



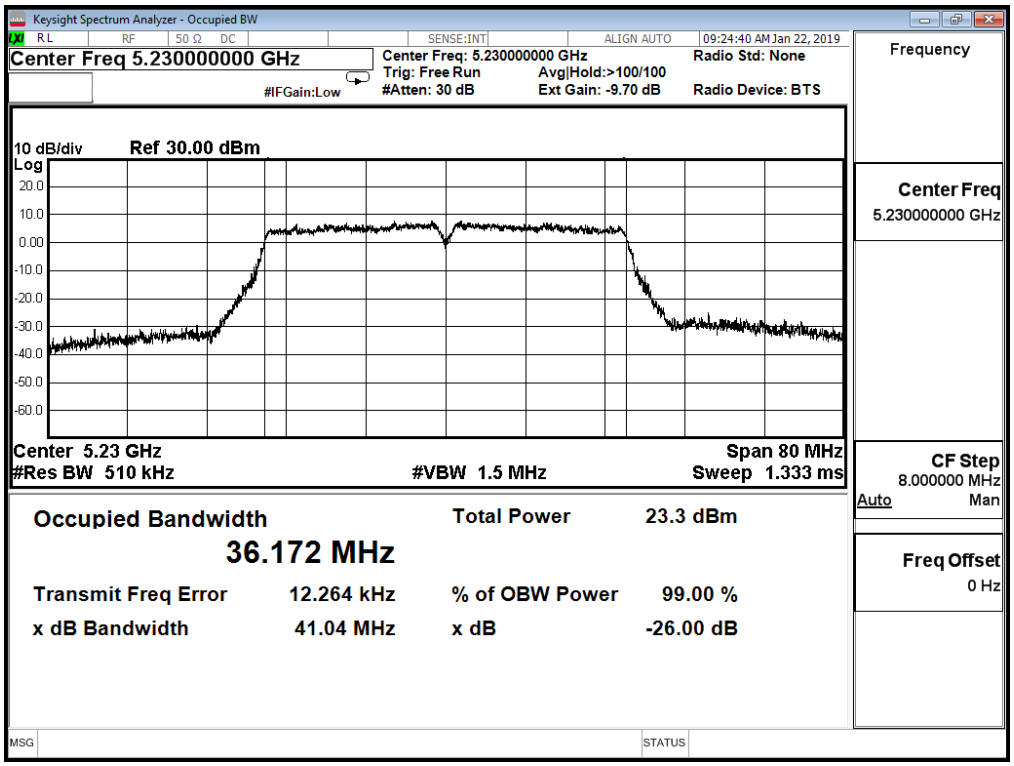
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac_40M(ANT 0)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
38	5190	40.890	36.189	--	Pass
46	5230	41.040	36.172	--	Pass

Channel 38 (5190MHz)



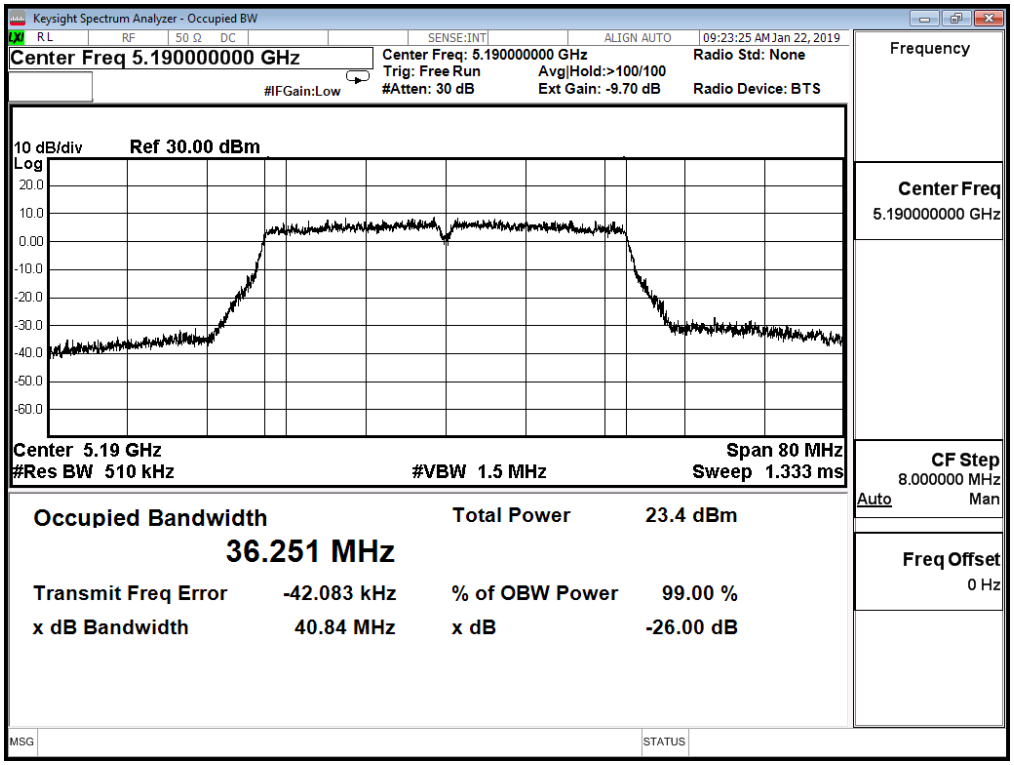
Channel 46 (5230MHz)



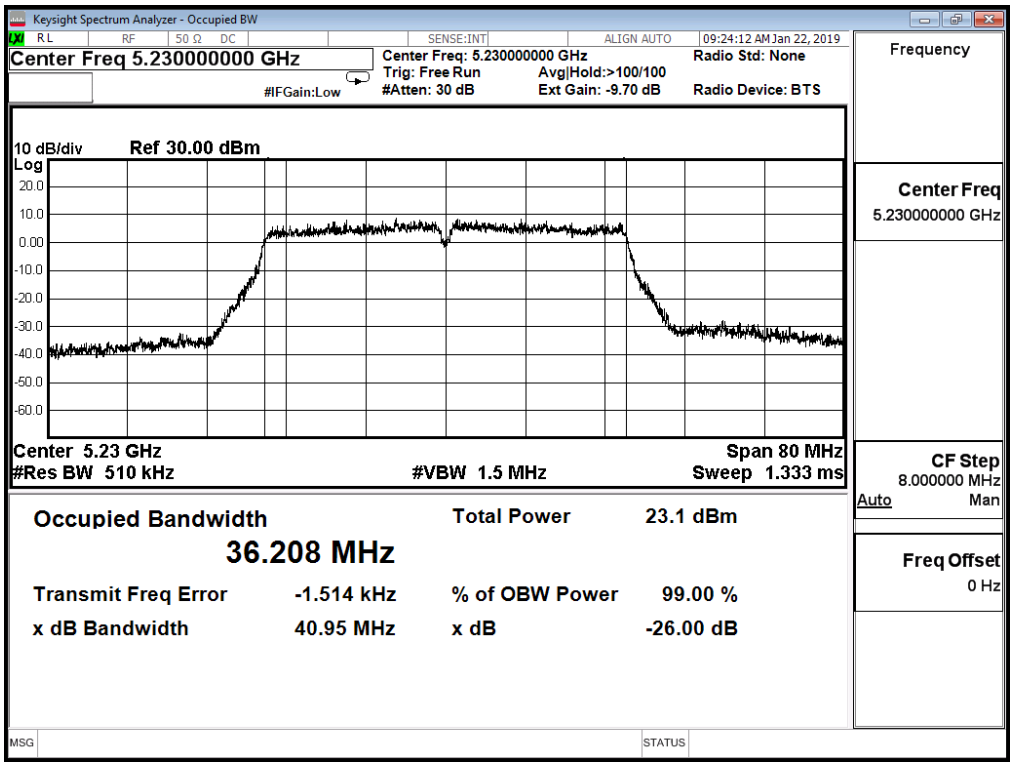
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac_40M(ANT 1)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
38	5190	40.840	36.251	--	Pass
46	5230	40.950	36.208	--	Pass

Channel 38 (5190MHz)



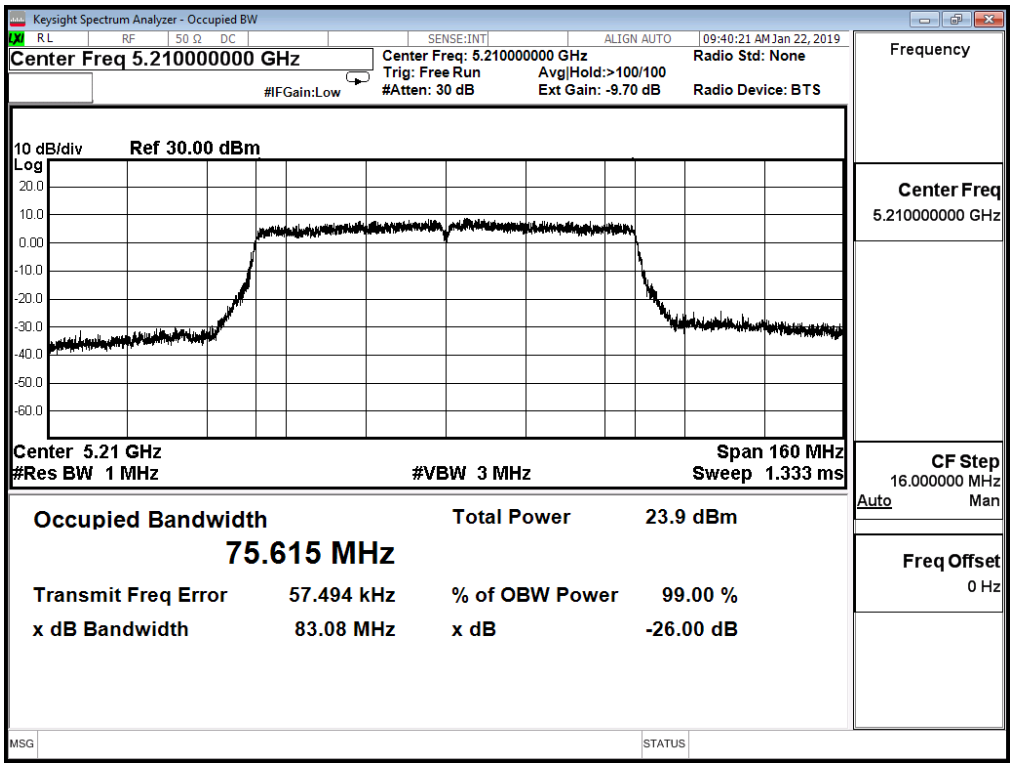
Channel 46 (5230MHz)



Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac_80M(ANT 0)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
42	5210	83.080	75.615	--	Pass

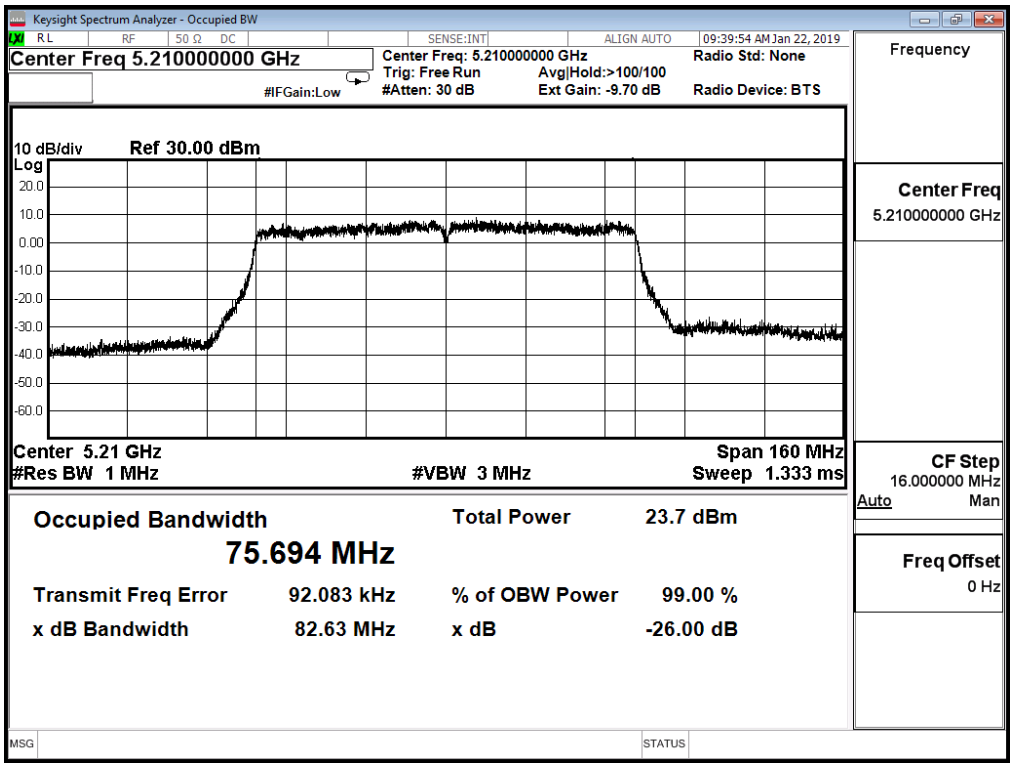
Channel 42 (5210MHz)



Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac_80M(ANT 1)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
42	5210	82.630	75.694	--	Pass

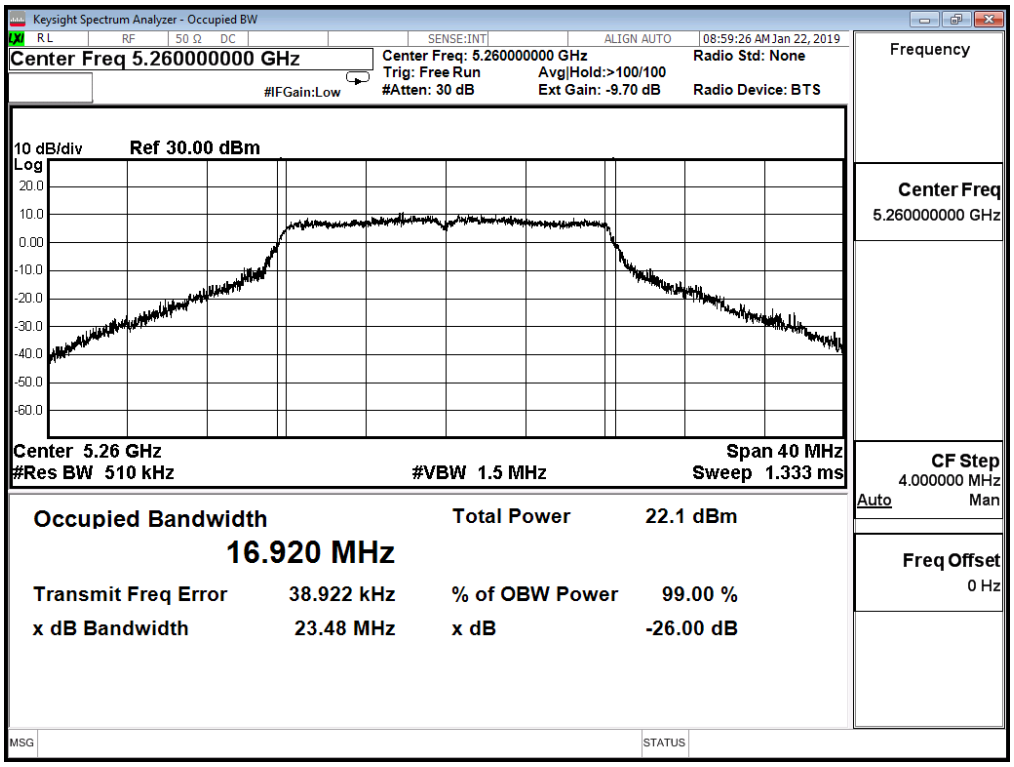
Channel 42 (5210MHz)



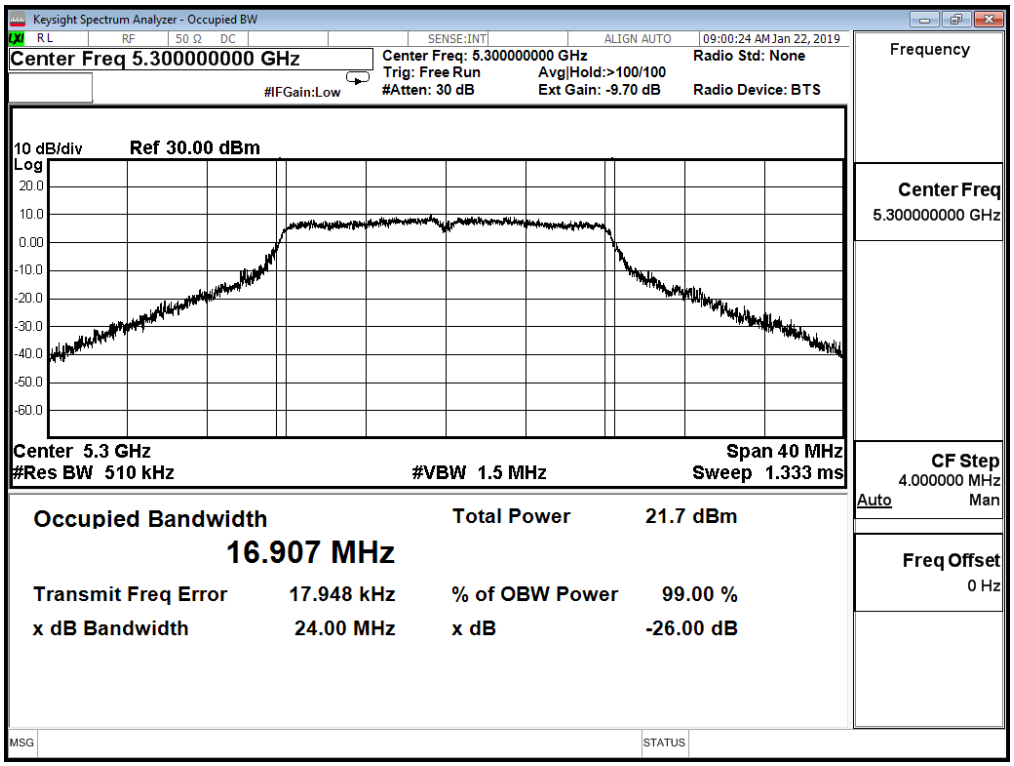
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT0)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
52	5260	23.480	16.920	--	Pass
60	5300	24.000	16.907	--	Pass
64	5320	24.400	16.873	--	Pass

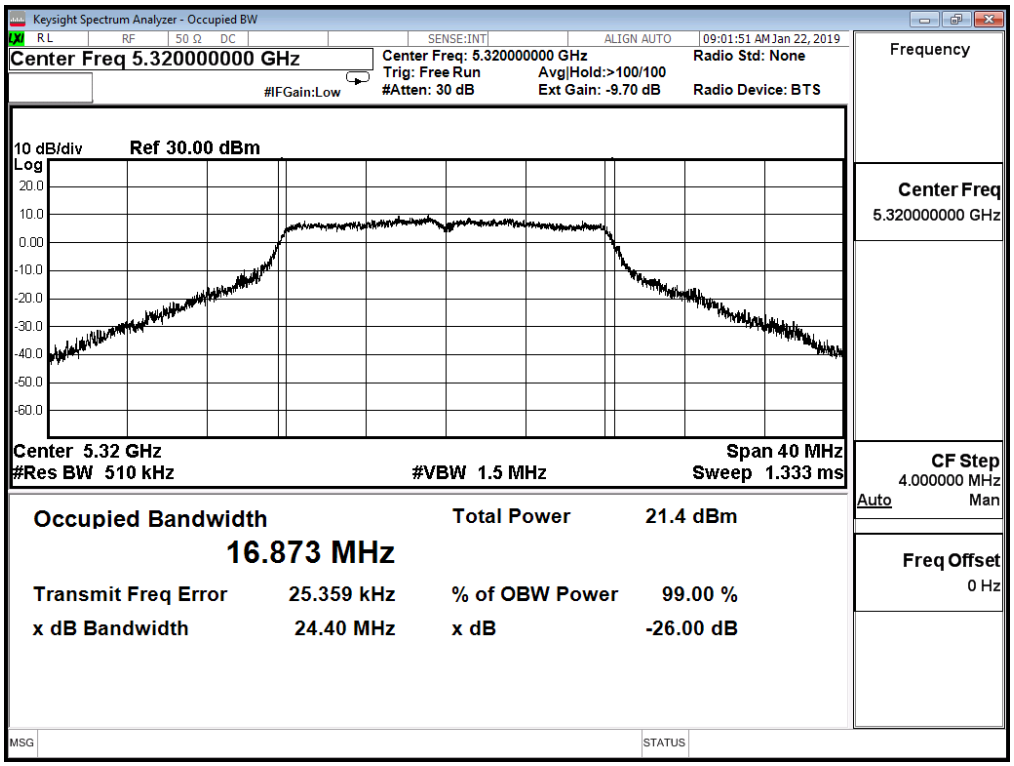
Channel 52 (5260MHz)



Channel 60 (5300MHz)



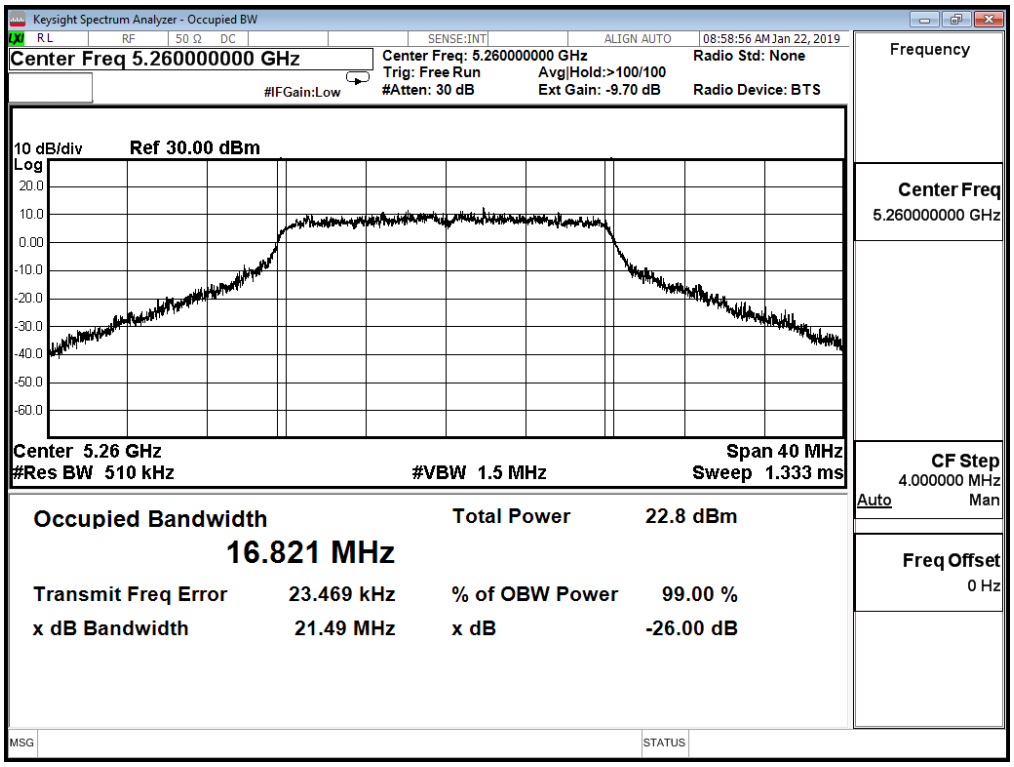
Channel 64 (5320MHz)



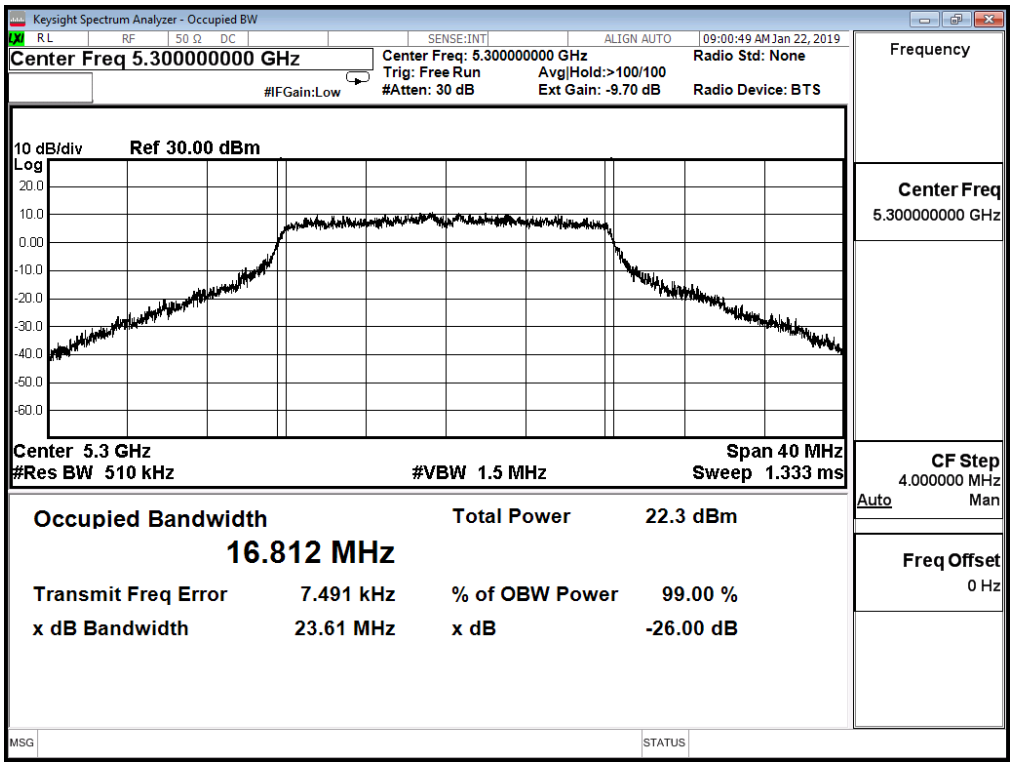
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT1)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
52	5260	21.490	16.821	--	Pass
60	5300	23.610	16.812	--	Pass
64	5320	23.000	16.824	--	Pass

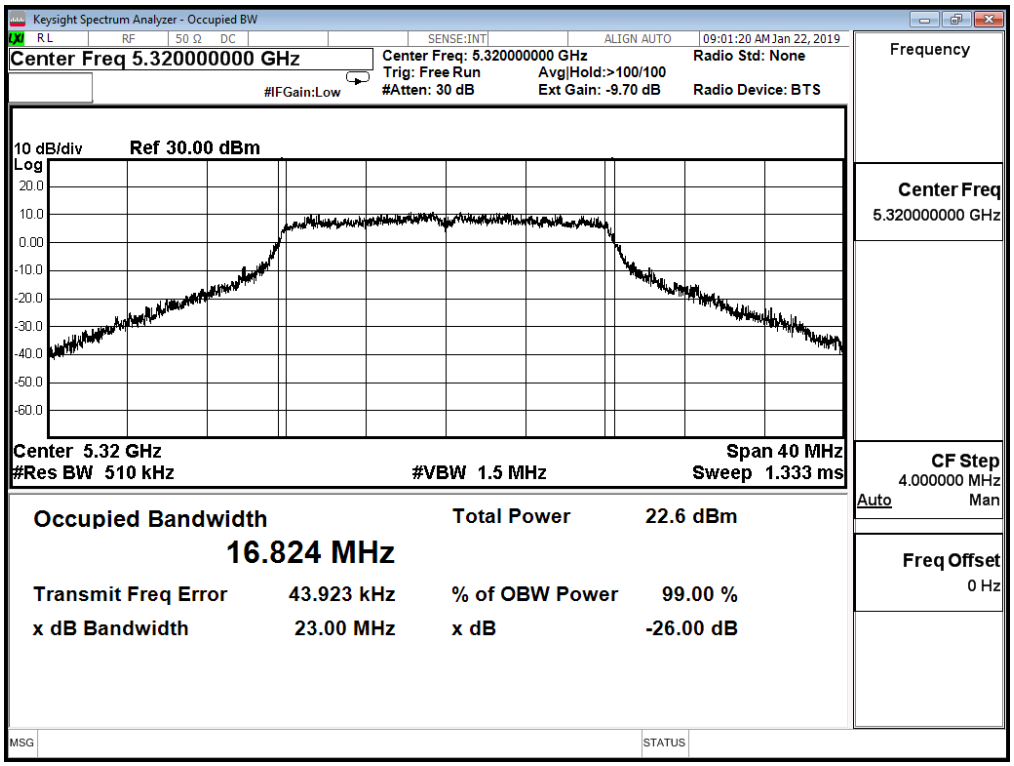
Channel 52 (5260MHz)



Channel 60 (5300MHz)



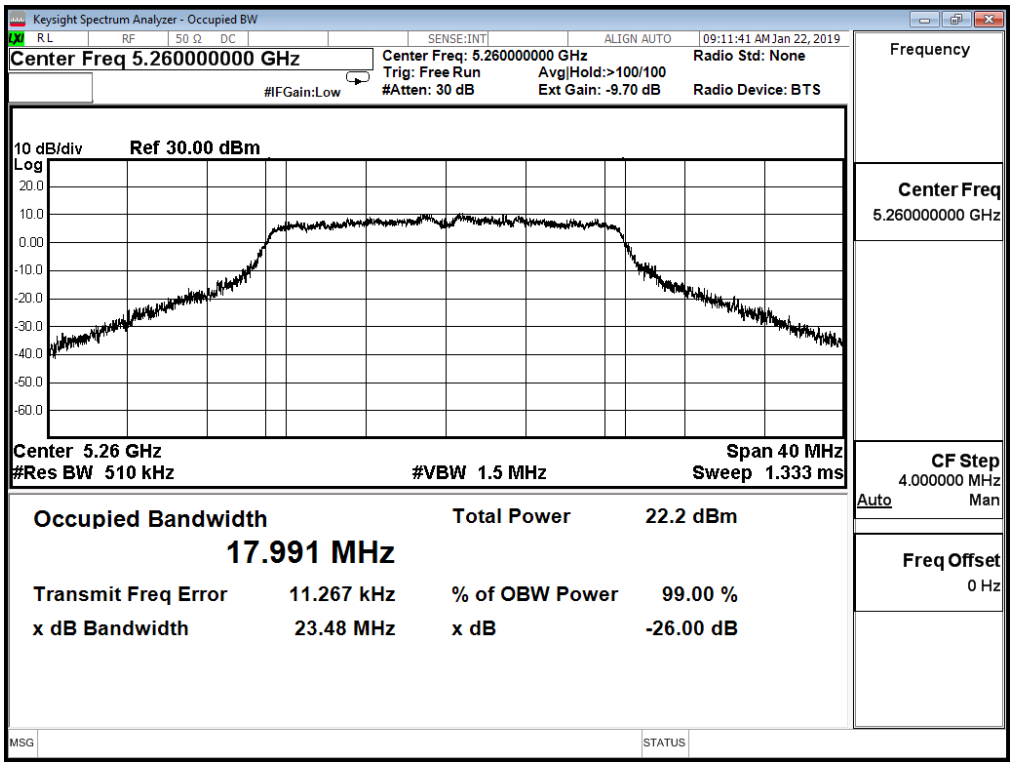
Channel 64 (5320MHz)



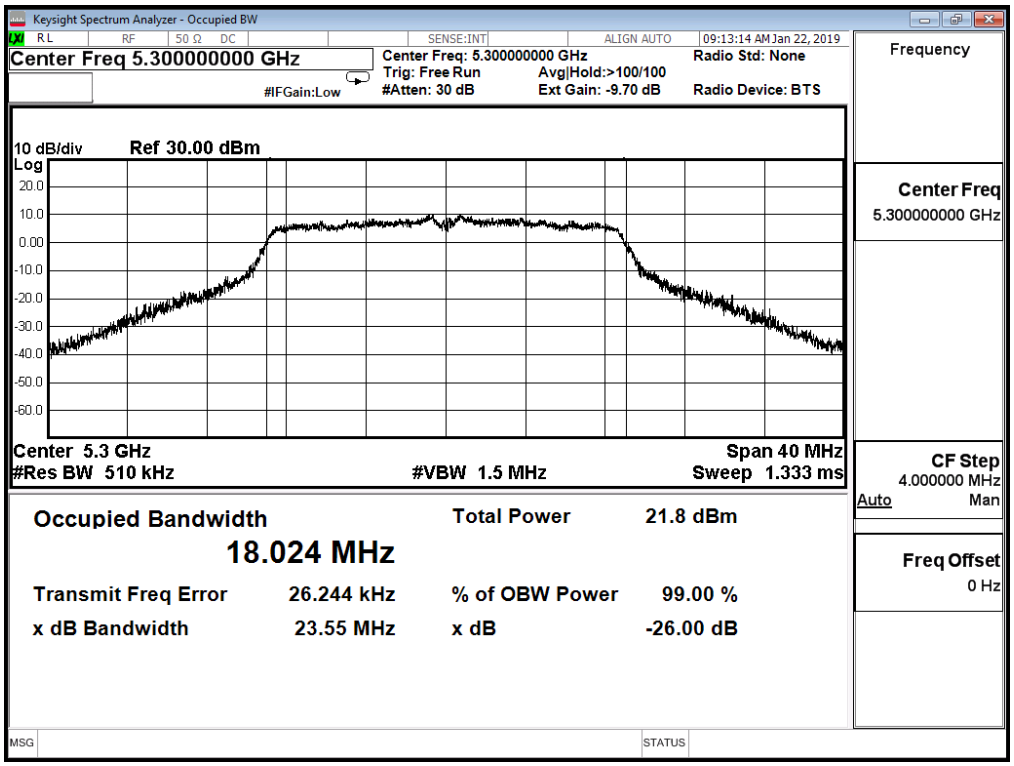
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac_20M (ANT0)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
52	5260	23.480	17.991	--	Pass
60	5300	23.550	18.024	--	Pass
64	5320	23.220	18.041	--	Pass

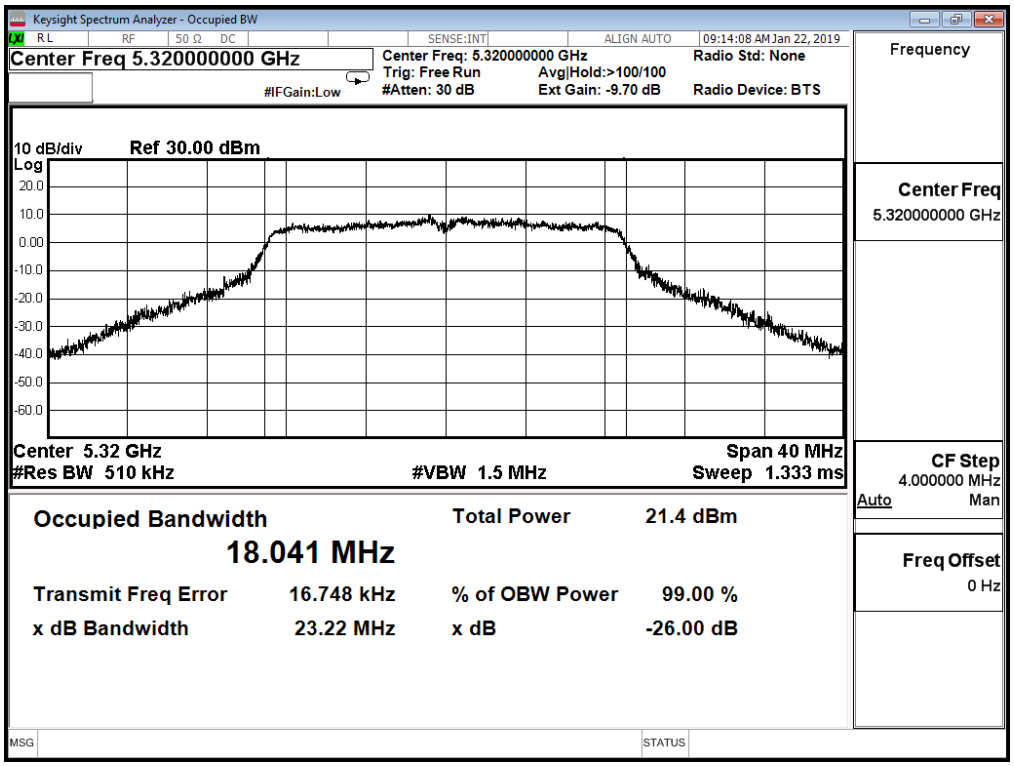
Channel 52 (5260MHz)



Channel 60 (5300MHz)



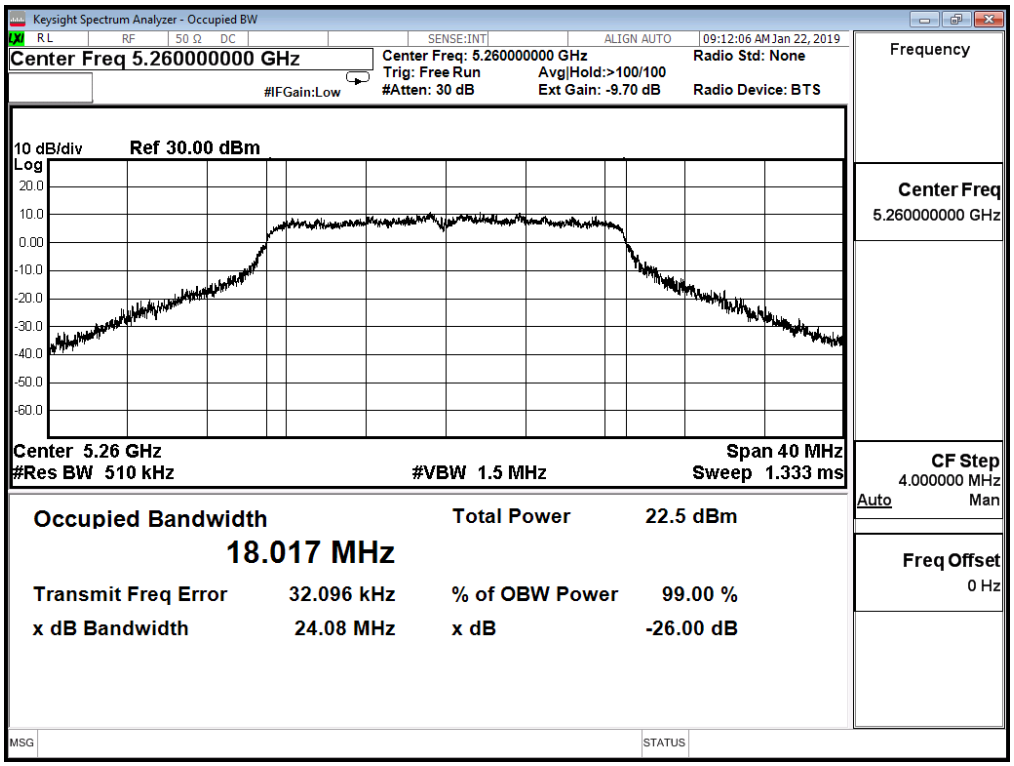
Channel 64 (5320MHz)



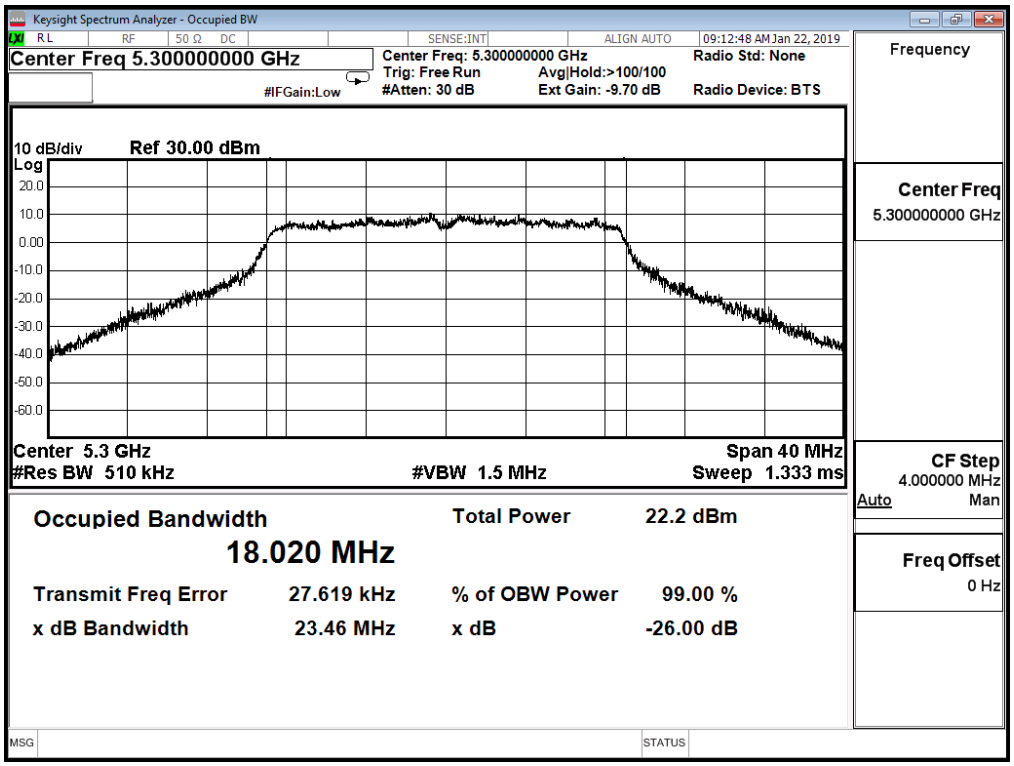
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac_20M (ANT1)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
52	5260	24.080	18.017	--	Pass
60	5300	23.460	18.020	--	Pass
64	5320	23.780	18.005	--	Pass

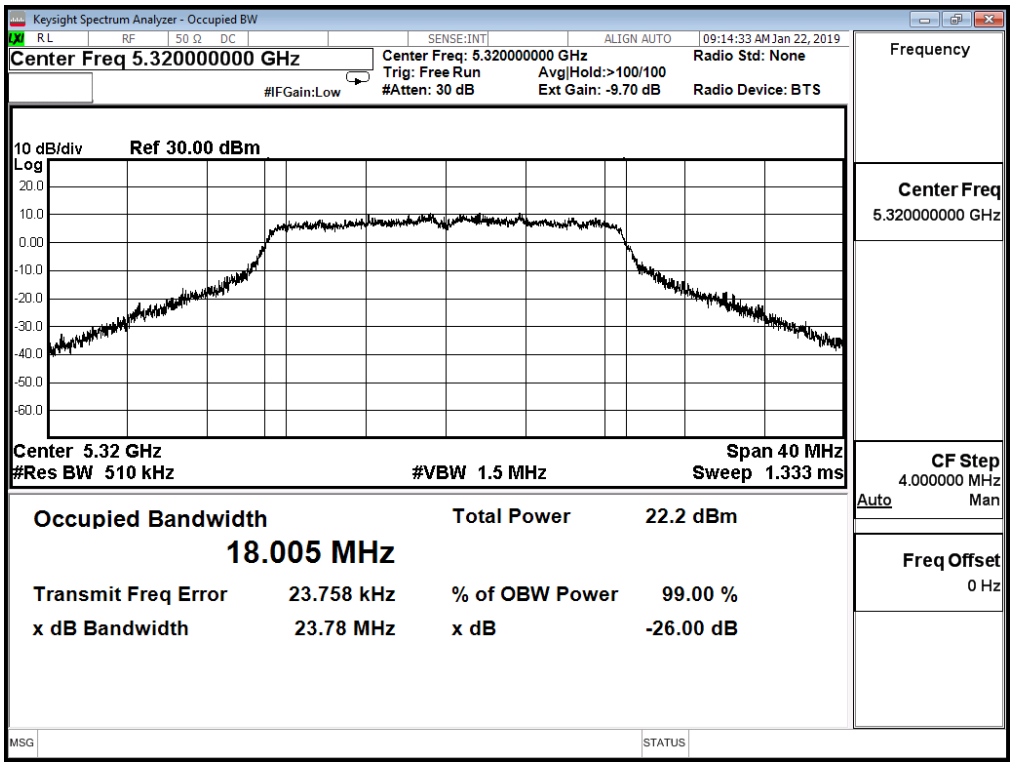
Channel 52 (5260MHz)



Channel 60 (5300MHz)



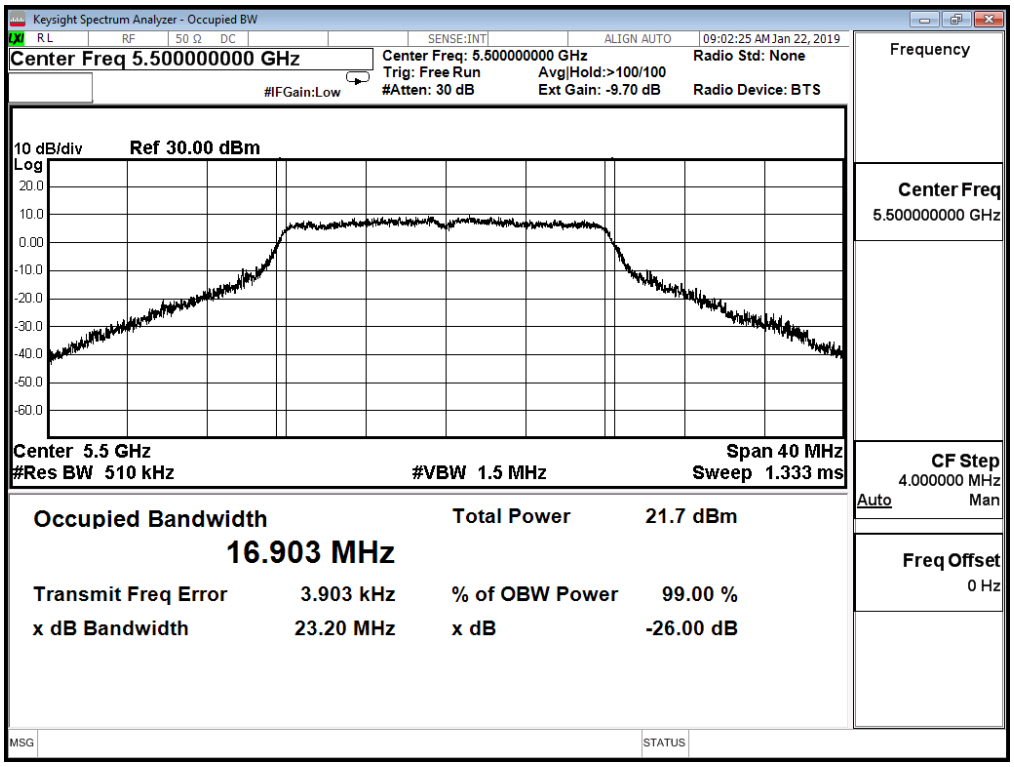
Channel 64 (5320MHz)



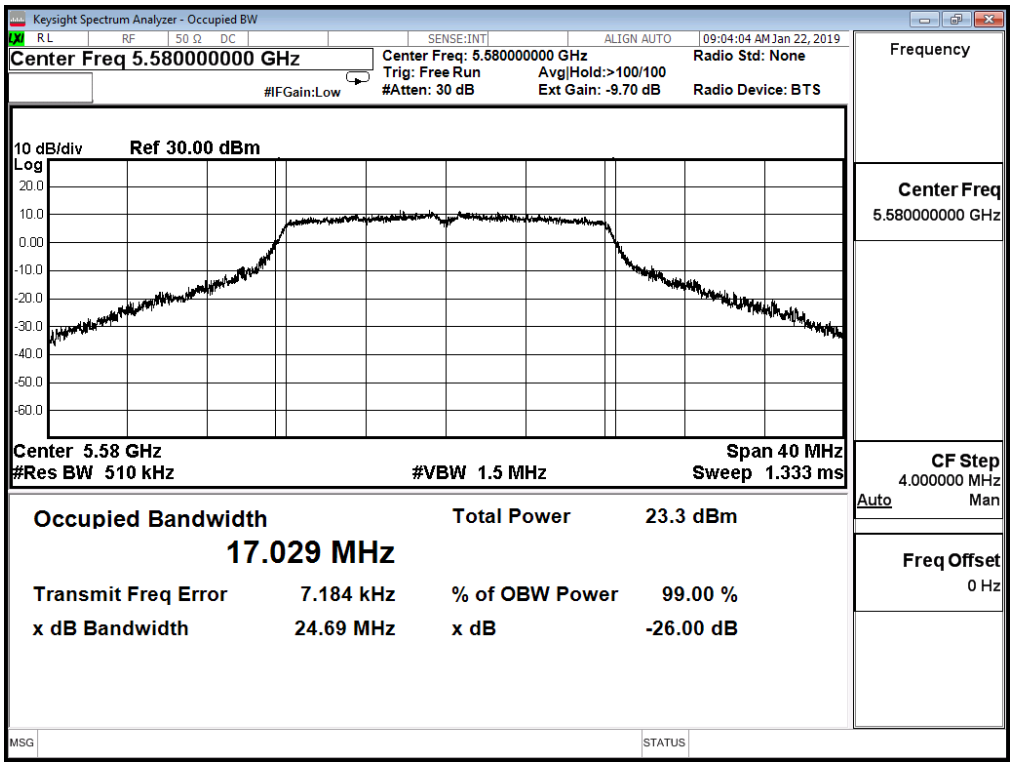
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT0)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
100	5500	23.200	16.903	--	Pass
116	5580	24.690	17.029	--	Pass
140	5700	24.950	17.036	--	Pass

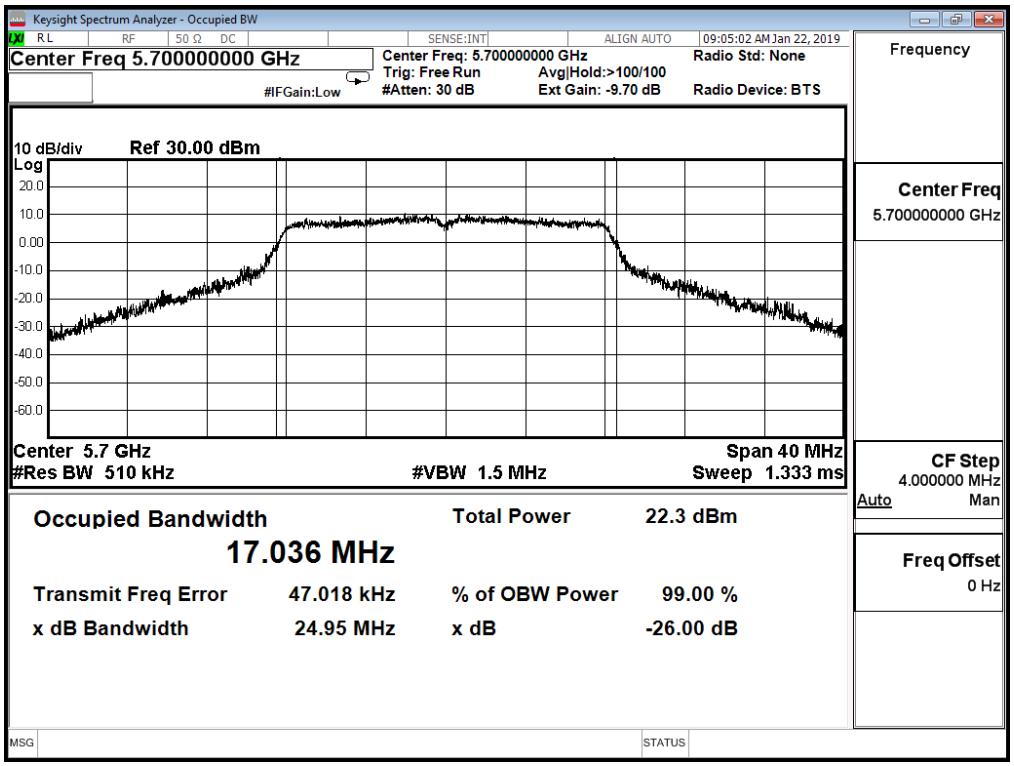
Channel 100 (5500MHz)



Channel 116 (5580MHz)



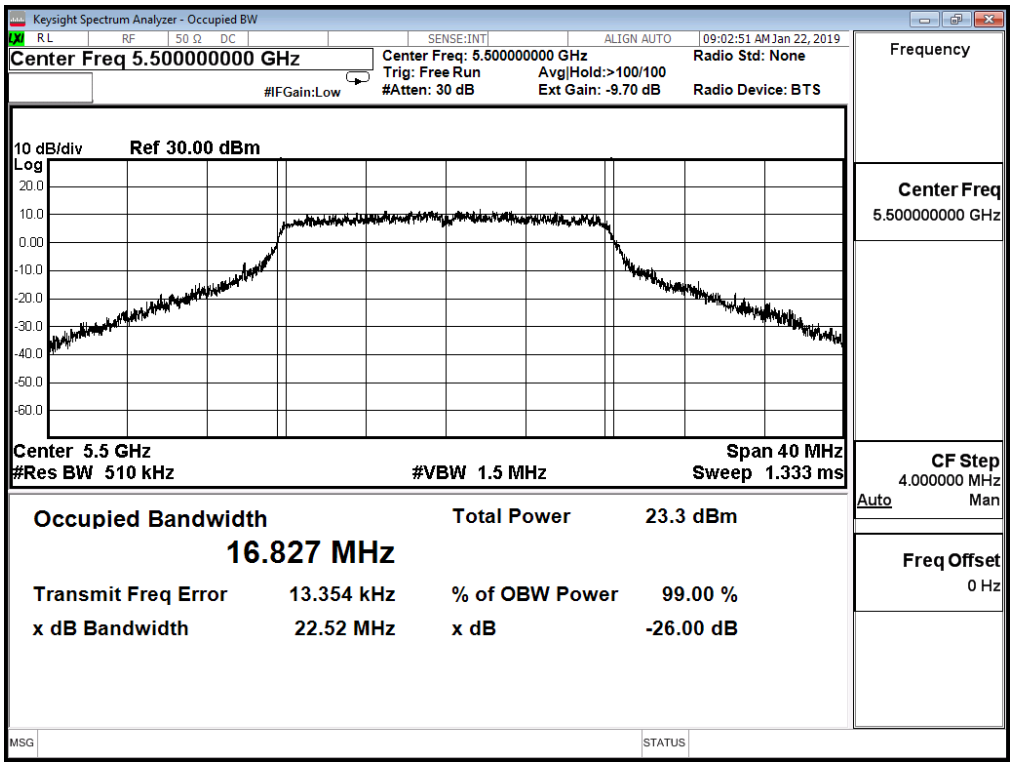
Channel 140 (5700MHz)



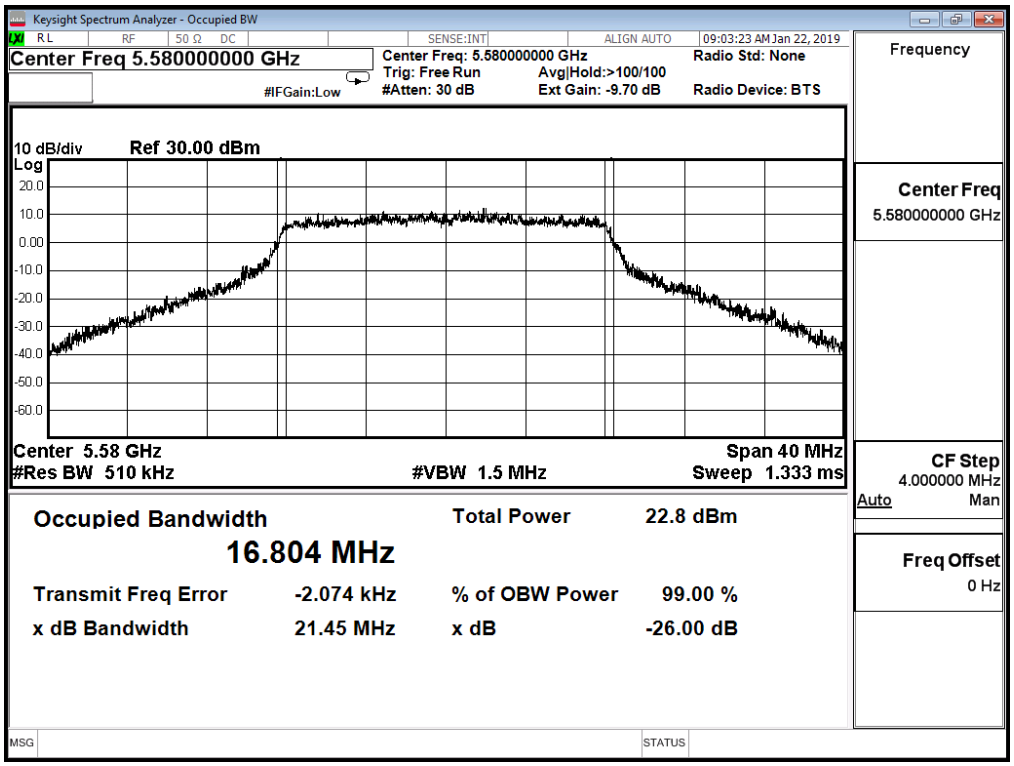
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT1)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
100	5500	22.520	16.827	--	Pass
116	5580	21.450	16.804	--	Pass
140	5700	22.550	16.855	--	Pass

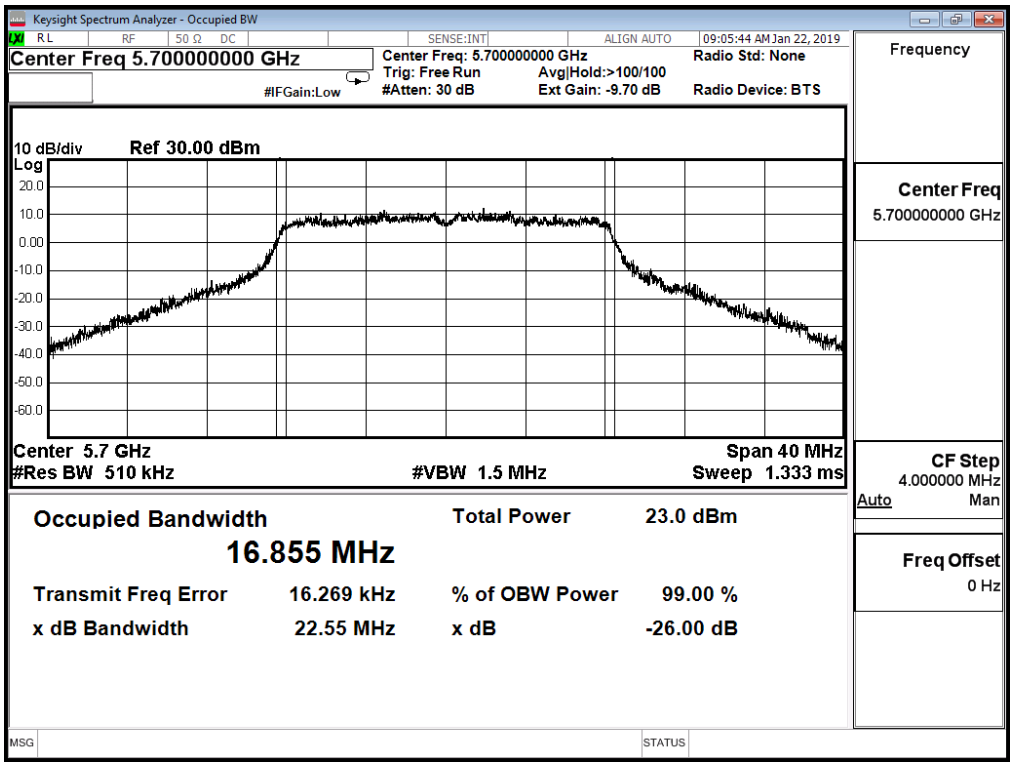
Channel 100 (5500MHz)



Channel 116 (5580MHz)



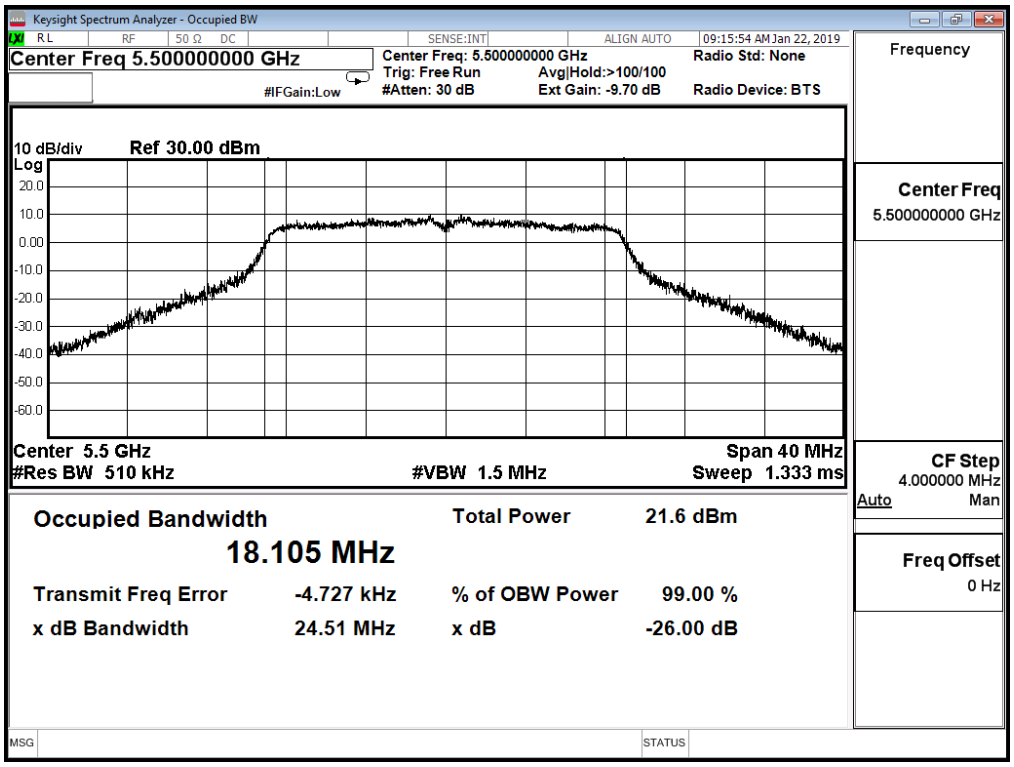
Channel 140 (5700MHz)



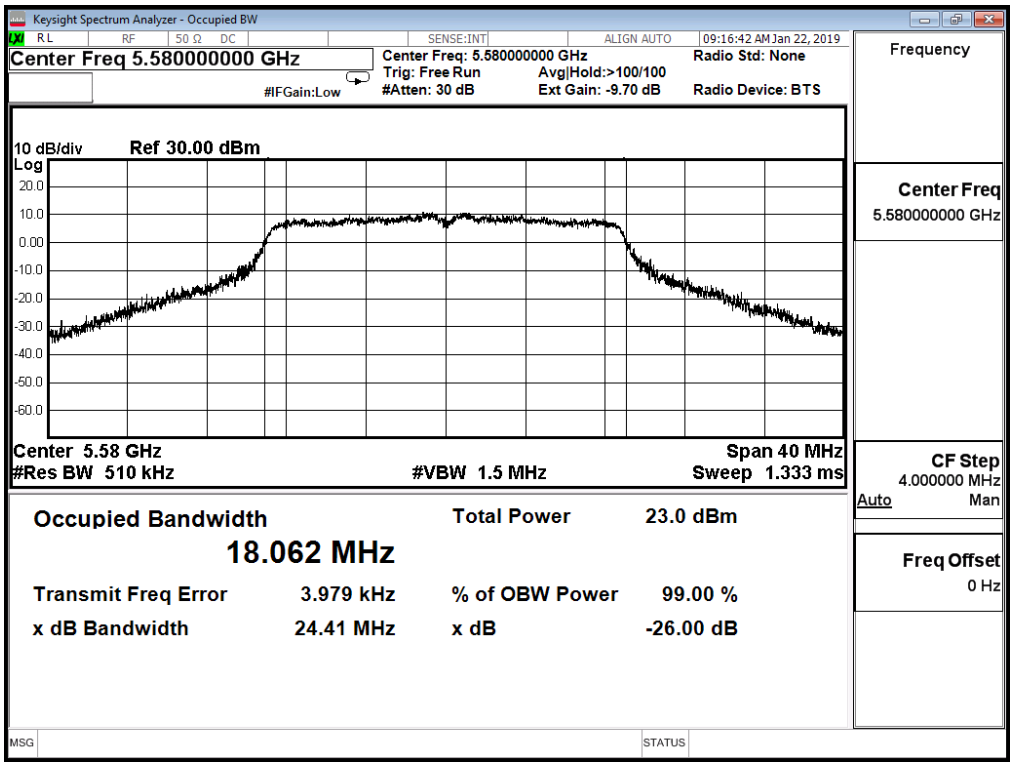
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac_20M (ANT0)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
100	5500	24.510	18.105	--	Pass
116	5580	24.410	18.062	--	Pass
140	5700	26.350	18.263	--	Pass

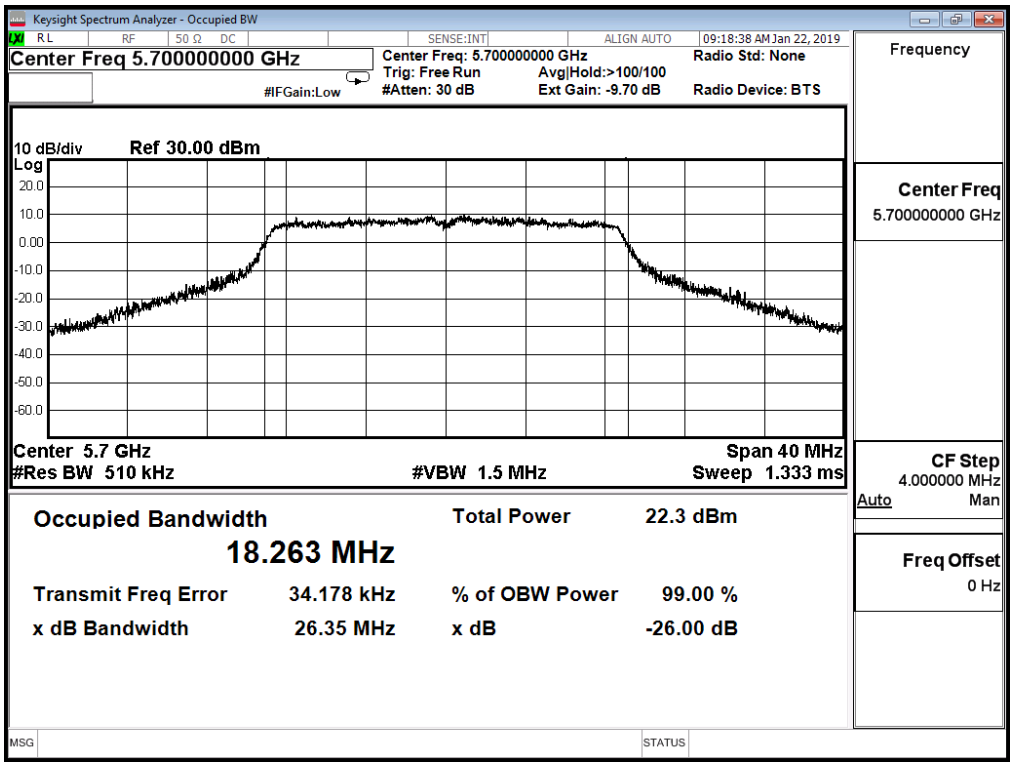
Channel 100 (5500MHz)



Channel 116 (5580MHz)



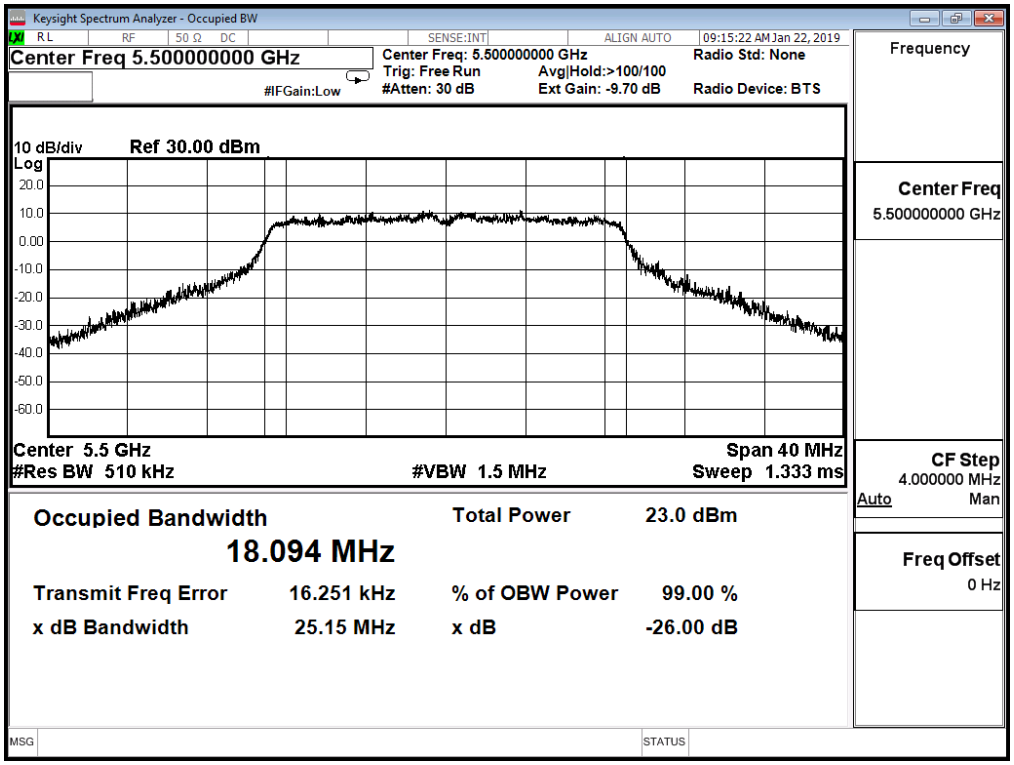
Channel 140 (5700MHz)



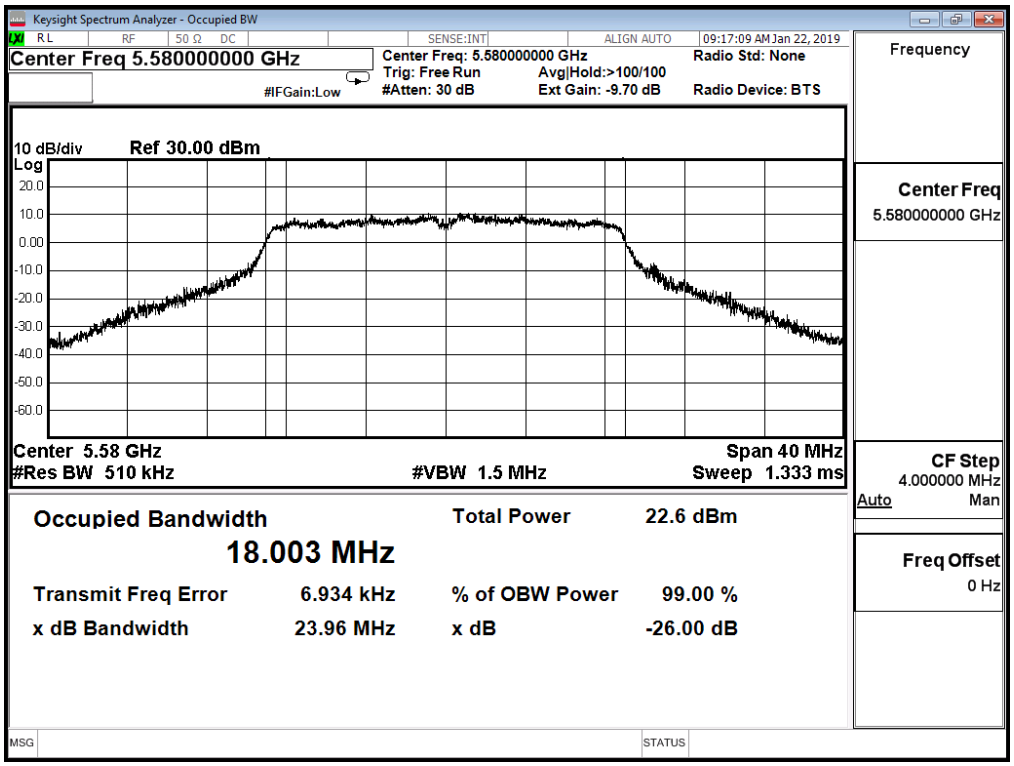
Product	Secure Smartphone		
Test Item	26dB & 99% Bandwidth		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac_20M (ANT1)					
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Result
100	5500	25.150	18.094	--	Pass
116	5580	23.960	18.003	--	Pass
140	5700	24.130	18.070	--	Pass

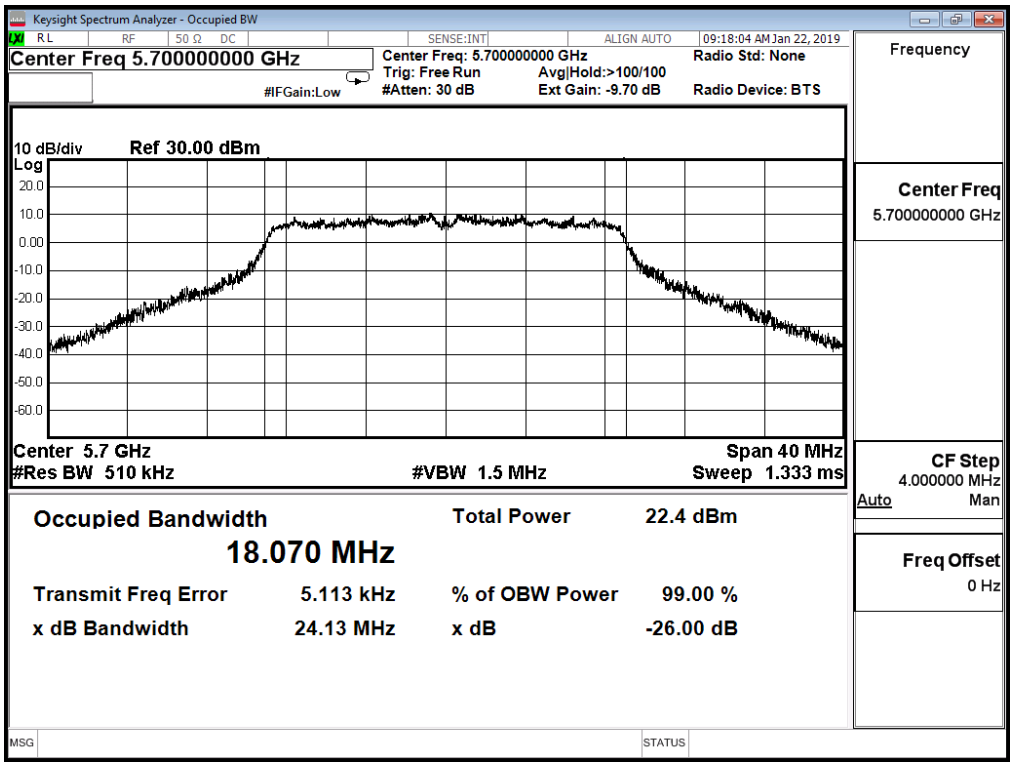
Channel 100 (5500MHz)



Channel 116 (5580MHz)

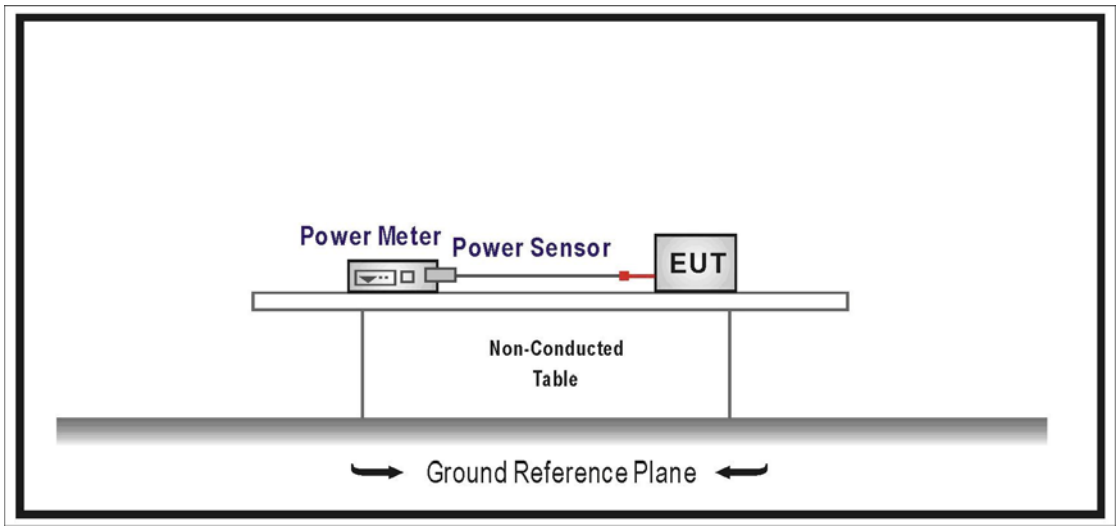


Channel 140 (5700MHz)



3. Maximum conducted output power

3.1. Test Setup



3.2. Limits

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz 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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

3.3. Test Procedure

The EUT was setup to ANSI C63.10: 2013; tested to U-NII test procedure of 789033 D02 v02r01 for compliance to FCC 47CFR Subpart E requirements. The Method SA-1 of the Maximum conducted output power was used.

Set RBW=1MHz, VBW=3MHz with RMS detector and trace average 100 traces in power averaging mode. Set span to encompass the entire emission bandwidth (EBW) of the signal. Compute power by integrating the spectrum across the 26 dB EBW of the signal.

3.4. Test Result

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT 0)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
36	5180	18.630	≦30.000
44	5220	18.770	≦30.000
48	5240	18.620	≦30.000

The worst emission of data rate is 6Mbps

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate (Mbps)							Required Limit (dBm)
		6	12	18	24	36	48	54	
36	5180	18.630	--	--	--	--	--	--	≦30.000
44	5220	18.770	18.640	18.500	18.350	18.220	18.090	17.950	≦30.000
48	5240	18.620	--	--	--	--	--	--	≦30.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT 1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
36	5180	18.880	≦30.000
44	5220	19.140	≦30.000
48	5240	19.020	≦30.000

The worst emission of data rate is 6Mbps

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate (Mbps)							Required Limit (dBm)
		6	12	18	24	36	48	54	
36	5180	18.880	--	--	--	--	--	--	≦30.000
44	5220	19.140	18.990	18.860	18.710	18.560	18.410	18.280	≦30.000
48	5240	19.020	--	--	--	--	--	--	≦30.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT 0+1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
36	5180	21.767	≦30.000
44	5220	21.969	≦30.000
48	5240	21.835	≦30.000

The worst emission of data rate is 6Mbps

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate (Mbps)							Required Limit (dBm)
		6	12	18	24	36	48	54	
36	5180	21.767	--	--	--	--	--	--	≦30.000
44	5220	21.969	21.880	21.750	21.600	21.460	21.320	21.180	≦30.000
48	5240	21.835	--	--	--	--	--	--	≦30.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(20MHz)(ANT 0)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
36	5180	18.650	≦30.000
44	5220	18.840	≦30.000
48	5240	18.570	≦30.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
36	5180	18.650	--	--	--	--	--	--	--	--	--	≦30.000
44	5220	18.840	18.700	18.560	18.430	18.290	18.150	18.020	17.870	17.730	17.590	≦30.000
48	5240	18.570	--	--	--	--	--	--	--	--	--	≦30.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(20MHz)(ANT 1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
36	5180	18.330	≦30.000
44	5220	18.520	≦30.000
48	5240	18.500	≦30.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
36	5180	18.330	--	--	--	--	--	--	--	--	--	≦30.000
44	5220	18.520	18.370	18.230	18.090	17.950	17.820	17.670	17.520	17.380	17.240	≦30.000
48	5240	18.500	--	--	--	--	--	--	--	--	--	≦30.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(20MHz)(ANT 0+1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
36	5180	21.503	≦30.000
44	5220	21.693	≦30.000
48	5240	21.545	≦30.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
36	5180	21.503	--	--	--	--	--	--	--	--	--	≦30.000
44	5220	21.693	21.610	21.470	21.330	21.190	21.060	20.920	20.770	20.630	20.490	≦30.000
48	5240	21.545	--	--	--	--	--	--	--	--	--	≦30.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(40MHz)(ANT 0)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
38	5190	19.310	≦30.000
46	5230	19.450	≦30.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
38	5190	19.310	--	--	--	--	--	--	--	--	--	≦30.000
46	5230	19.450	19.320	19.190	19.050	18.920	18.770	18.640	18.500	18.360	18.210	≦30.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(40MHz)(ANT 1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
38	5190	19.120	≦30.000
46	5230	19.260	≦30.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
38	5190	19.120	--	--	--	--	--	--	--	--	--	≦30.000
46	5230	19.260	19.110	18.980	18.840	18.700	18.570	18.430	18.280	18.130	17.990	≦30.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(40MHz)(ANT 0+1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
38	5190	22.226	≦30.000
46	5230	22.366	≦30.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
38	5190	22.226	--	--	--	--	--	--	--	--	--	≦30.000
46	5230	22.366	22.280	22.150	22.010	21.870	21.730	21.600	21.450	21.310	21.160	≦30.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(80MHz) (ANT 0)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
42	5210	19.040	≦30.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
42	5210	19.040	18.900	18.760	18.620	18.470	18.320	18.190	18.060	17.930	17.790	≦30.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(80MHz) (ANT 1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
42	5210	18.840	≦30.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
42	5210	18.840	18.710	18.580	18.440	18.300	18.160	18.030	17.890	17.760	17.620	≦30.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(80MHz) (ANT 0+1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
42	5210	21.591	≦30.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
42	5210	21.951	21.870	21.740	21.600	21.450	21.310	21.180	21.040	20.910	20.770	≦30.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT 0)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
52	5260	18.460	≦24.000
60	5300	18.040	≦24.000
64	5320	17.940	≦24.000

The worst emission of data rate is 6Mbps

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate (Mbps)							Required Limit (dBm)
		6	12	18	24	36	48	54	
52	5260	18.460	--	--	--	--	--	--	≦24.000
60	5300	18.040	17.910	17.770	17.620	17.470	17.340	17.200	≦24.000
64	5320	17.940	--	--	--	--	--	--	≦24.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT 1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
52	5260	18.950	≦24.000
60	5300	18.790	≦24.000
64	5320	18.620	≦24.000

The worst emission of data rate is 6Mbps

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate (Mbps)							Required Limit (dBm)
		6	12	18	24	36	48	54	
52	5260	18.950	--	--	--	--	--	--	≦24.000
60	5300	18.790	18.650	18.510	18.380	18.240	18.110	17.970	≦24.000
64	5320	18.620	--	--	--	--	--	--	≦24.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT 0+1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
52	5260	21.722	≦24.000
60	5300	21.441	≦24.000
64	5320	21.304	≦24.000

The worst emission of data rate is 6Mbps

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate (Mbps)							Required Limit (dBm)
		6	12	18	24	36	48	54	
52	5260	21.722	--	--	--	--	--	--	≦24.000
60	5300	21.441	21.370	21.230	21.090	20.940	20.810	20.670	≦24.000
64	5320	21.304	--	--	--	--	--	--	≦24.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(20MHz)(ANT 0)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
52	5260	18.380	≦24.000
60	5300	17.960	≦24.000
64	5320	17.850	≦24.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
52	5260	18.380	--	--	--	--	--	--	--	--	--	≦24.000
60	5300	17.960	17.820	17.680	17.540	17.400	17.260	17.130	16.990	16.850	16.720	≦24.000
64	5320	17.850	--	--	--	--	--	--	--	--	--	≦24.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(20MHz)(ANT 1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
52	5260	18.540	≦24.000
60	5300	18.310	≦24.000
64	5320	18.140	≦24.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
52	5260	18.540	--	--	--	--	--	--	--	--	--	≦24.000
60	5300	18.310	18.170	18.020	17.870	17.730	17.590	17.460	17.330	17.190	17.040	≦24.000
64	5320	18.140	--	--	--	--	--	--	--	--	--	≦24.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(20MHz)(ANT 0+1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
52	5260	21.471	≦24.000
60	5300	21.149	≦24.000
64	5320	21.008	≦24.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
52	5260	21.471	--	--	--	--	--	--	--	--	--	≦24.000
60	5300	21.149	21.070	20.930	20.780	20.640	20.500	20.370	20.240	20.100	19.960	≦24.000
64	5320	21.008	--	--	--	--	--	--	--	--	--	≦24.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT 0)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
100	5500	17.610	≦24.000
116	5580	18.190	≦24.000
140	5700	17.570	≦24.000

The worst emission of data rate is 6Mbps

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate (Mbps)							Required Limit (dBm)
		6	12	18	24	36	48	54	
100	5500	17.610	--	--	--	--	--	--	≦24.000
116	5580	18.190	18.050	17.920	17.770	17.620	17.480	17.330	≦24.000
140	5700	17.570	--	--	--	--	--	--	≦24.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT 1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
100	5500	18.730	≦24.000
116	5580	18.220	≦24.000
140	5700	18.660	≦24.000

The worst emission of data rate is 6Mbps

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate (Mbps)							Required Limit (dBm)
		6	12	18	24	36	48	54	
100	5500	18.730	--	--	--	--	--	--	≦24.000
116	5580	18.220	18.080	17.950	17.800	17.660	17.520	17.370	≦24.000
140	5700	18.660	--	--	--	--	--	--	≦24.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT 0+1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
100	5500	21.216	≦24.000
116	5580	21.215	≦24.000
140	5700	21.159	≦24.000

The worst emission of data rate is 6Mbps

Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate (Mbps)							Required Limit (dBm)
		6	12	18	24	36	48	54	
100	5500	21.216	--	--	--	--	--	--	≦24.000
116	5580	21.215	21.140	21.010	20.860	20.720	20.580	20.430	≦24.000
140	5700	21.159	--	--	--	--	--	--	≦24.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac 20MHz (ANT 0)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
100	5500	17.630	≦24.000
116	5580	18.120	≦24.000
140	5700	17.710	≦24.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
100	5500	17.630	--	--	--	--	--	--	--	--	--	≦24.000
116	5580	18.120	17.970	17.820	17.690	17.550	17.410	17.260	17.110	16.980	16.840	≦24.000
140	5700	17.710	--	--	--	--	--	--	--	--	--	≦24.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac 20MHz (ANT 1)

Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
100	5500	18.410	≦24.000
116	5580	18.240	≦24.000
140	5700	18.510	≦24.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
100	5500	18.410	--	--	--	--	--	--	--	--	--	≦24.000
116	5580	18.240	18.090	17.960	17.820	17.670	17.520	17.370	17.230	17.090	16.960	≦24.000
140	5700	18.510	--	--	--	--	--	--	--	--	--	≦24.000

Product	Secure Smartphone		
Test Item	Maximum conducted output power		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac 20MHz (ANT 0+1)

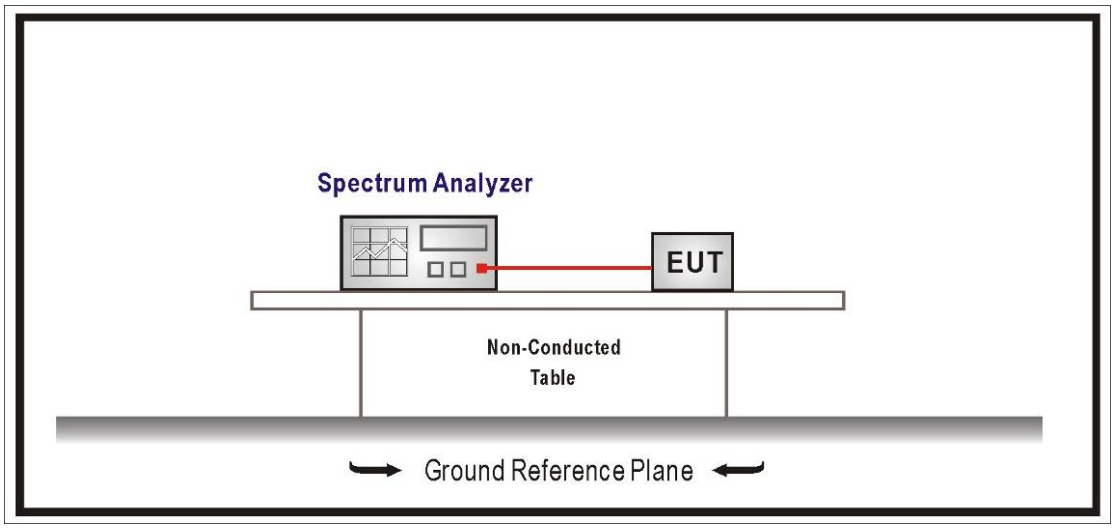
Channel No.	Frequency (MHz)	Output Power (dBm)	Required Limit (dBm)
100	5500	21.048	≦24.000
116	5580	21.191	≦24.000
140	5700	21.139	≦24.000

The worst emission of data rate is MCS 0

Channel No	Frequency (MHz)	MCS Index										Required Limit (dBm)
		0	1	2	3	4	5	6	7	8	9	
100	5500	21.048	--	--	--	--	--	--	--	--	--	≦24.000
116	5580	21.191	21.110	20.970	20.830	20.690	20.540	20.390	20.250	20.110	19.980	≦24.000
140	5700	21.139	--	--	--	--	--	--	--	--	--	≦24.000

4. Maximum power spectral density

4.1. Test Setup



4.2. Limits

1. For the band 5.15-5.25 GHz, the Maximum 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 Maximum 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 Maximum 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 Maximum 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 Maximum 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 Maximum power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi..

4.3. Test Procedure

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

For Band1 : Set RBW=1MHz, VBW=3MHz with RMS detector. The PPSD is the highest level found across the emission in any 1-MHz band after 100 sweeps of averaging.

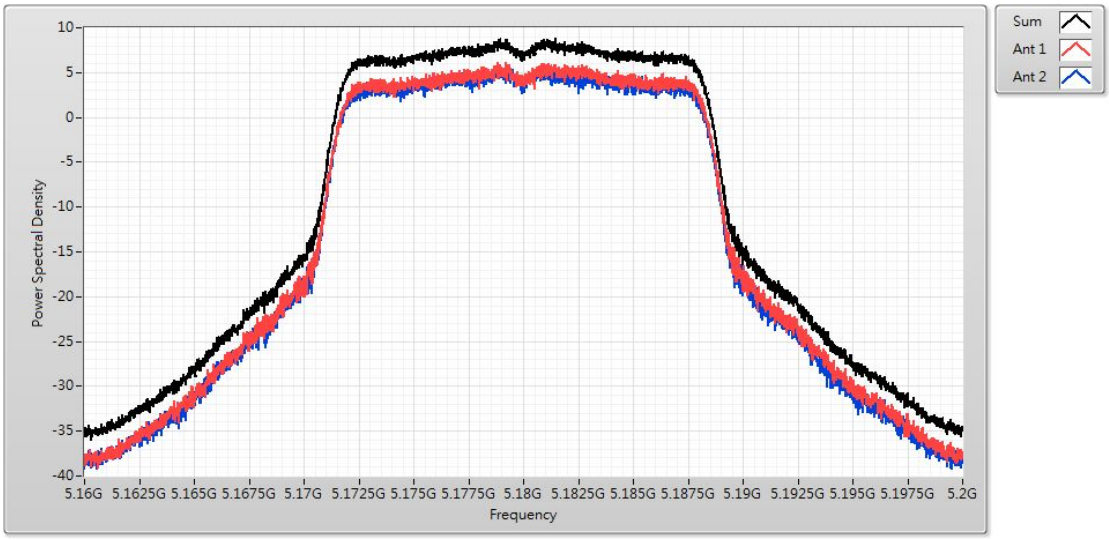
For Band4 : Set RBW=500KHz, VBW=1.5MHz with RMS detector. The PPSD is the highest level found across the emission in any 500KHz band after 100 sweeps of averaging.

4.4. Test Result

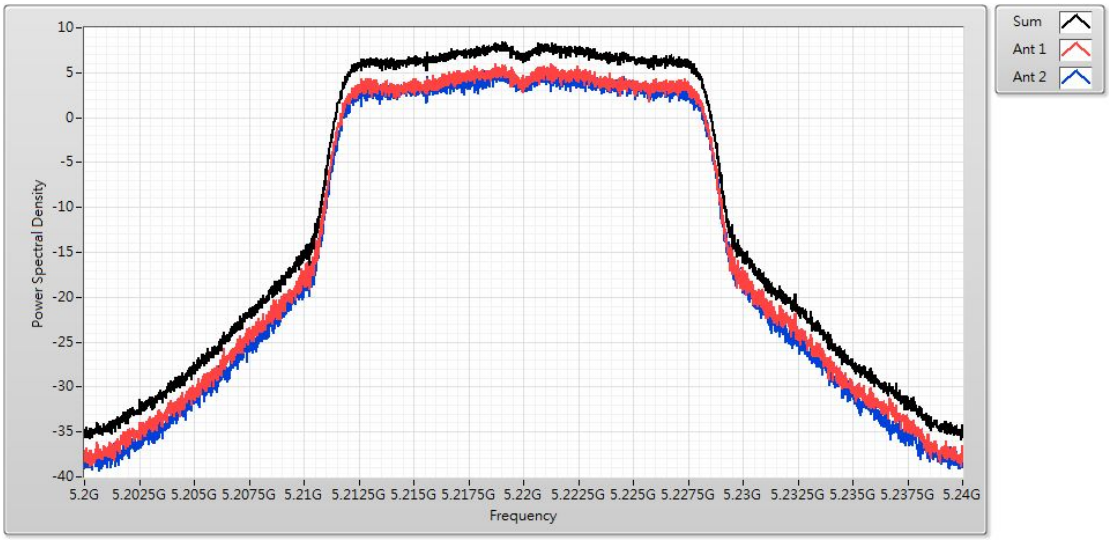
Product	Secure Smartphone		
Test Item	Maximum power spectral density		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT0+1)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
36	5180	8.800	17.000	Pass
44	5220	8.390	17.000	Pass
48	5240	7.870	17.000	Pass

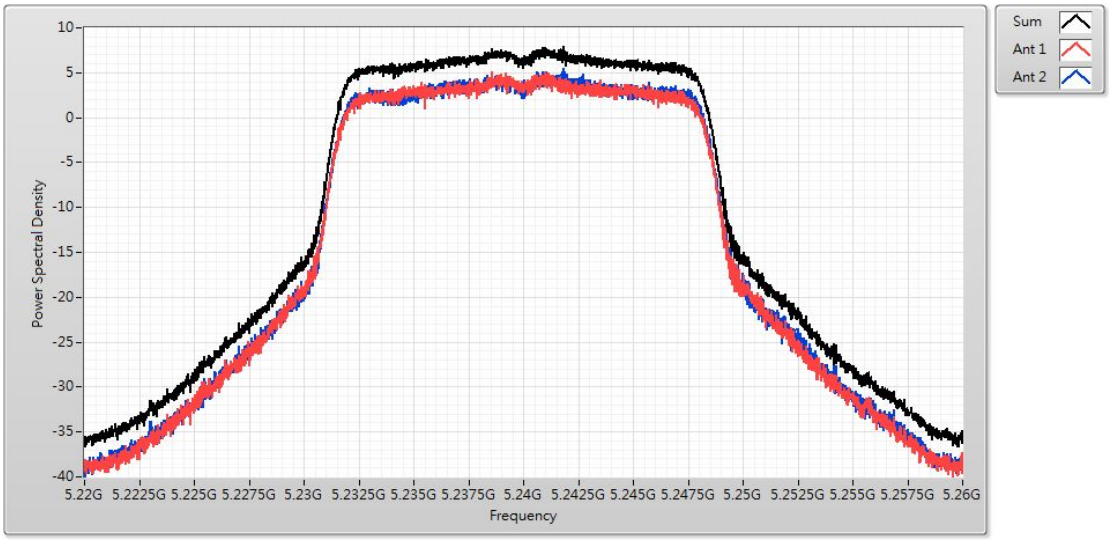
Channel 36



Channel 44



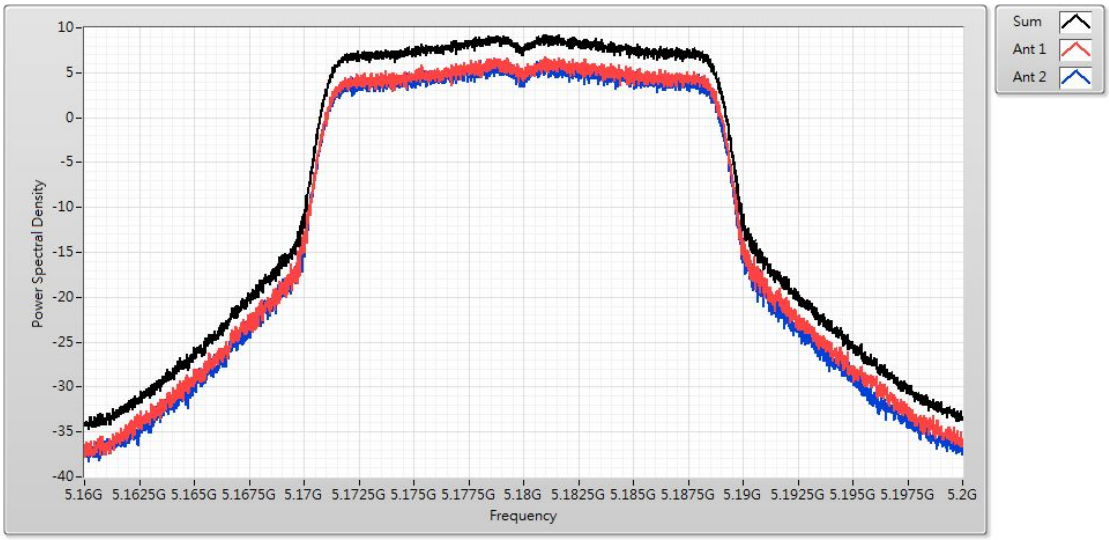
Channel 48



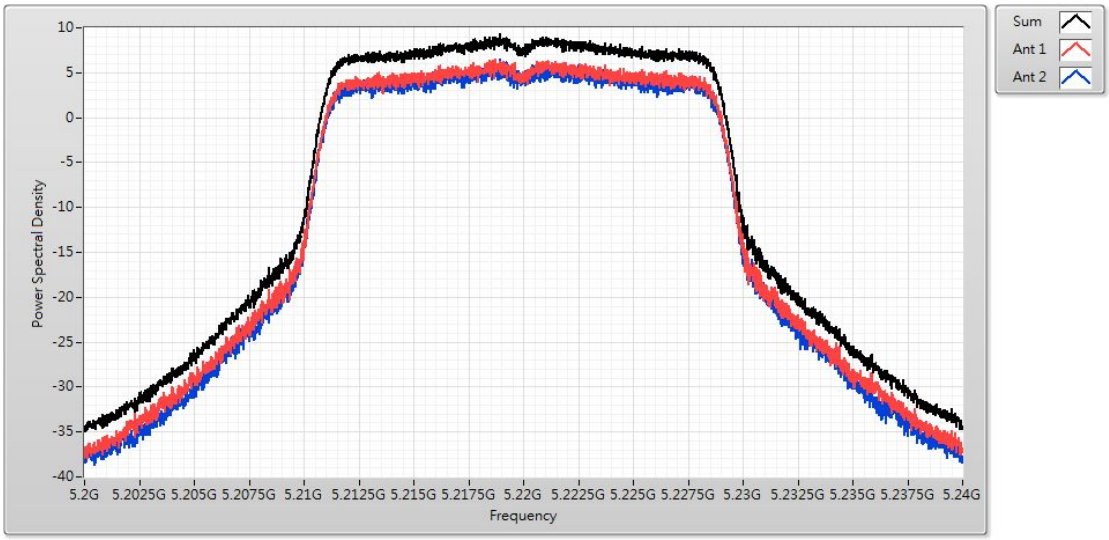
Product	Secure Smartphone		
Test Item	Maximum power spectral density		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(20MHz)(ANT0+1)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
36	5180	9.220	17.000	Pass
44	5220	9.370	17.000	Pass
48	5240	8.760	17.000	Pass

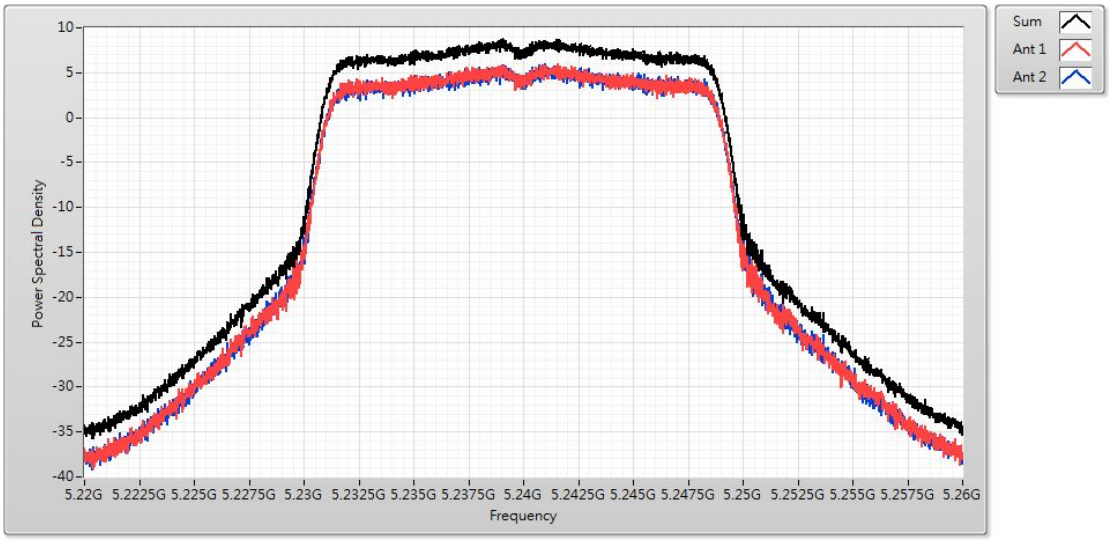
Channel 36



Channel 44



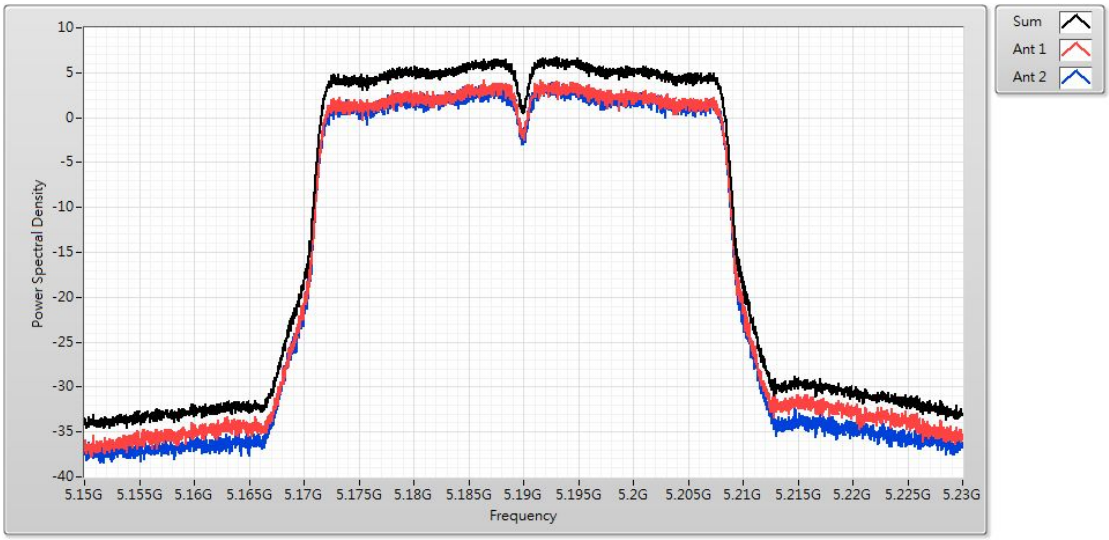
Channel 48



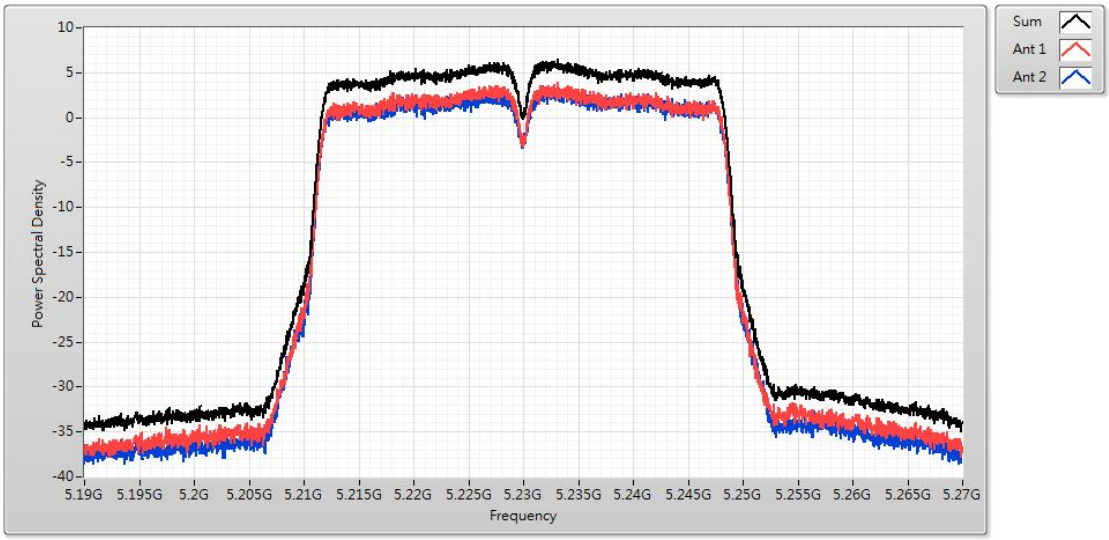
Product	Secure Smartphone		
Test Item	Maximum power spectral density		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(40MHz)(ANT0+1)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
38	5190	6.720	17.000	Pass
46	5230	6.470	17.000	Pass

Channel 38



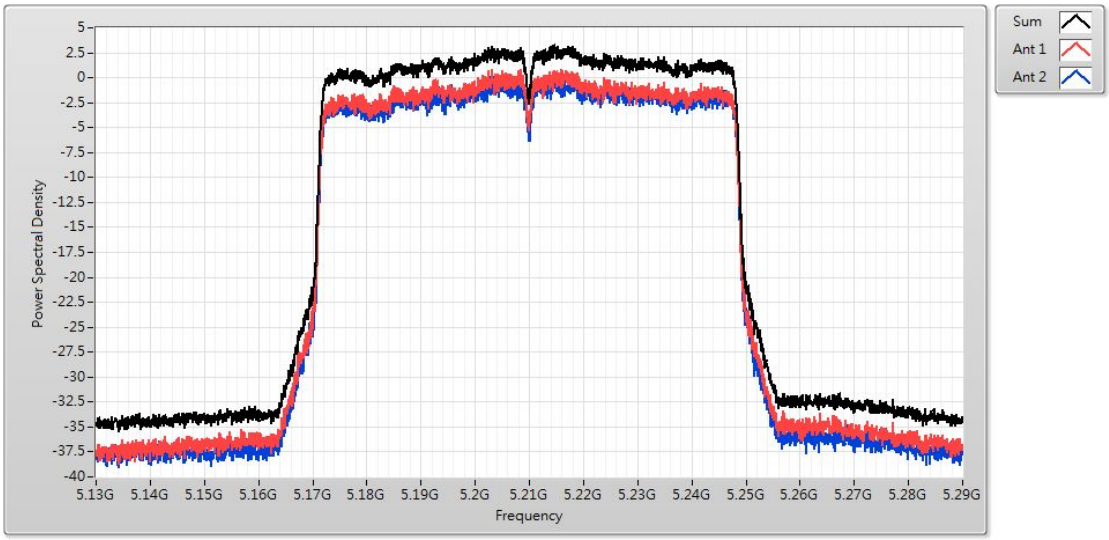
Channel 46


Sum
Ant 1
Ant 2
Power Spectral Density
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
5.19G
5.195G
5.2G
5.205G
5.21G
5.215G
5.22G
5.225G
5.23G
5.235G
5.24G
5.245G
5.25G
5.255G
5.26G
5.265G
5.27G
Frequency

Product	Secure Smartphone		
Test Item	Maximum power spectral density		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(80MHz)(ANT0+1)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
42	5210	3.270	17.000	Pass

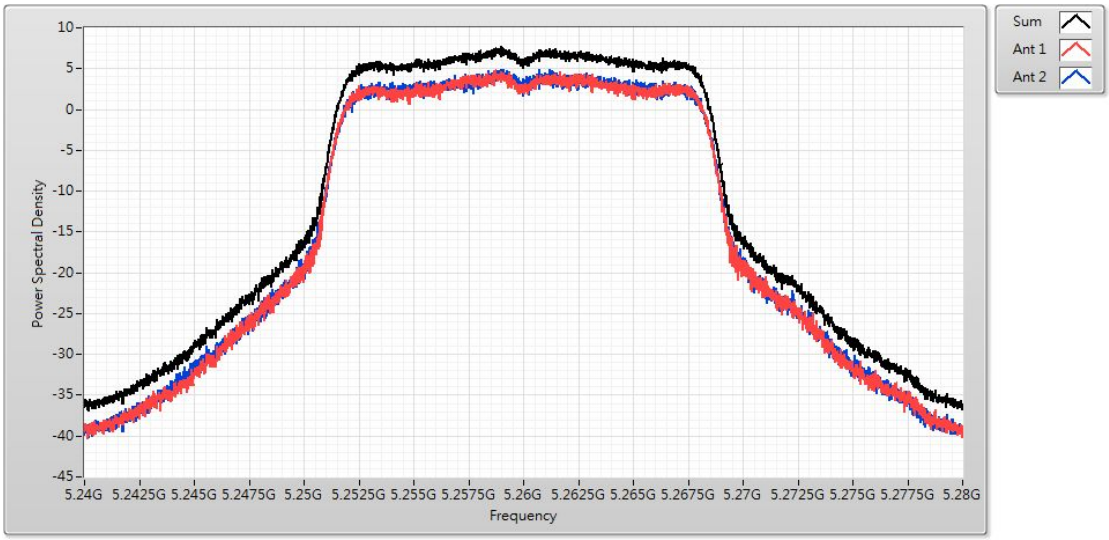
Channel 42



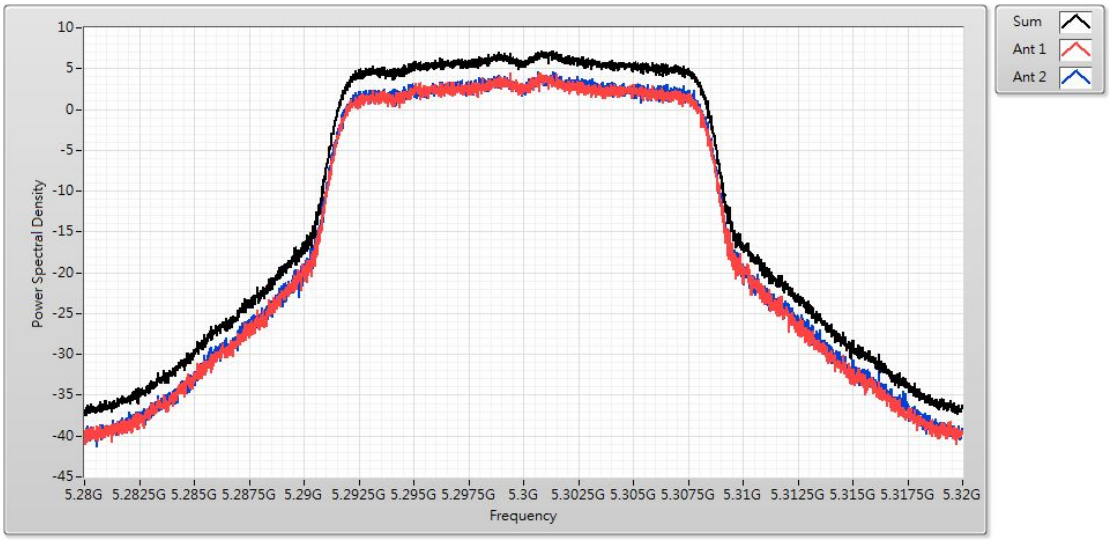
Product	Secure Smartphone		
Test Item	Maximum power spectral density		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT0+1)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
52	5260	7.790	11.000	Pass
60	5300	7.200	11.000	Pass
64	5320	7.220	11.000	Pass

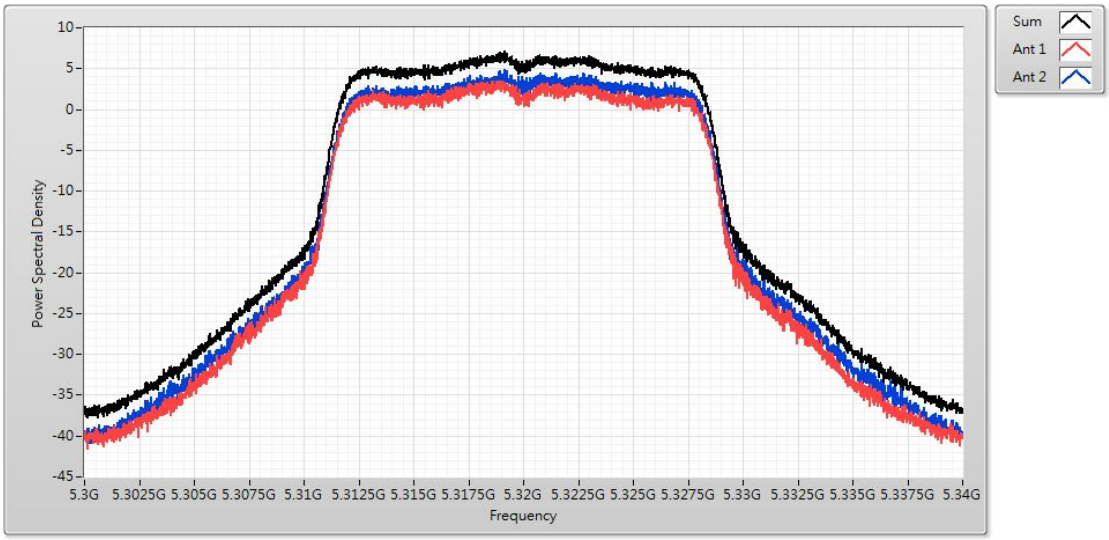
Channel 52



Channel 60



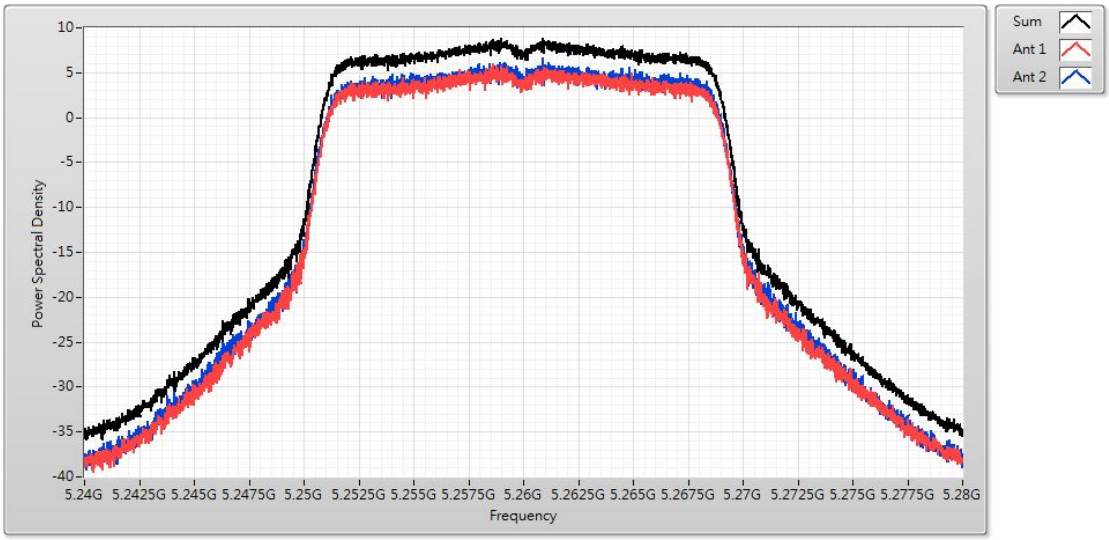
Channel 64



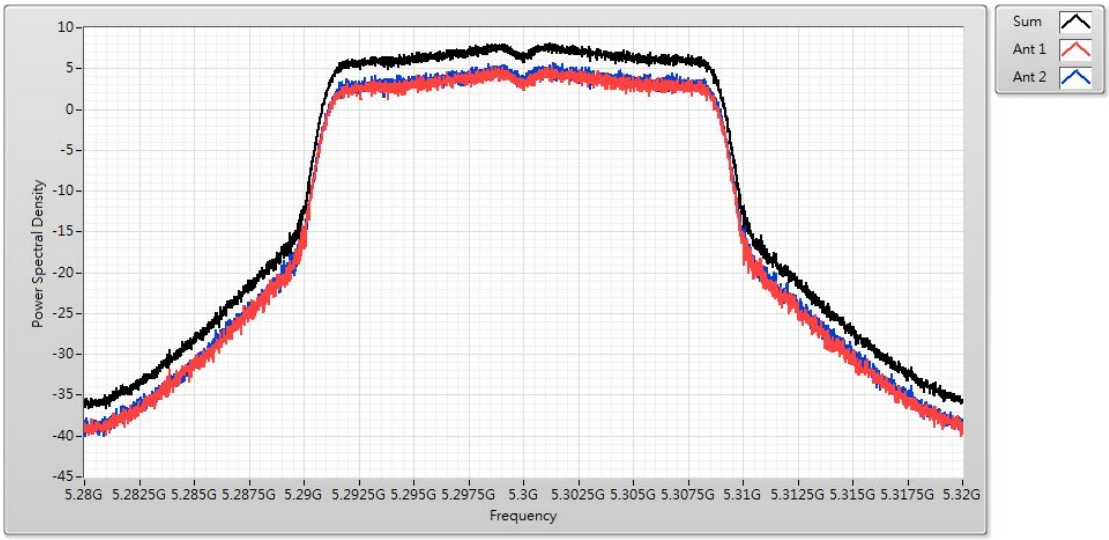
Product	Secure Smartphone		
Test Item	Maximum power spectral density		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(20MHz)(ANT0+1)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
52	5260	8.810	11.000	Pass
60	5300	8.160	11.000	Pass
64	5320	8.020	11.000	Pass

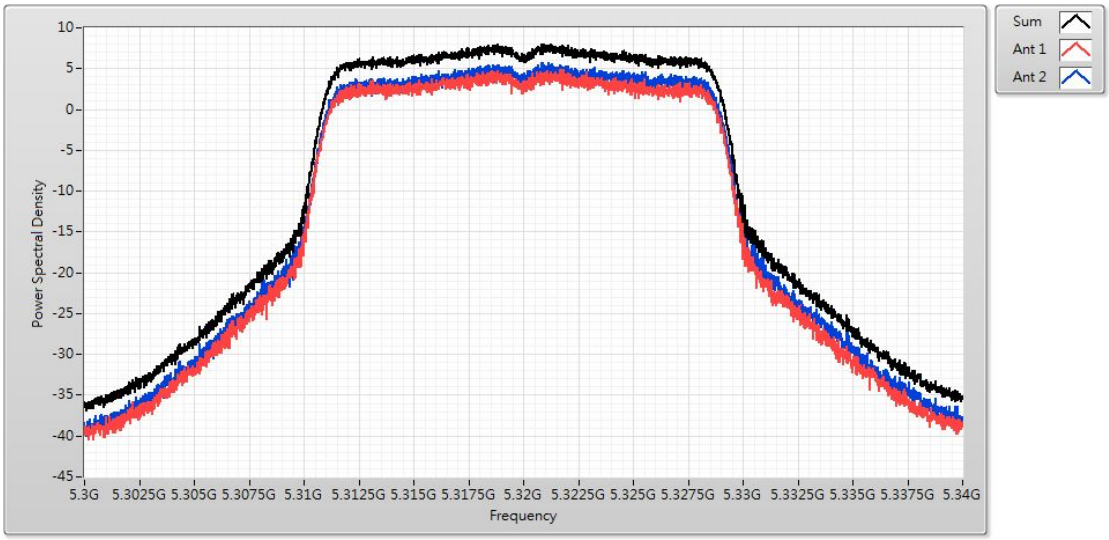
Channel 52



Channel 60



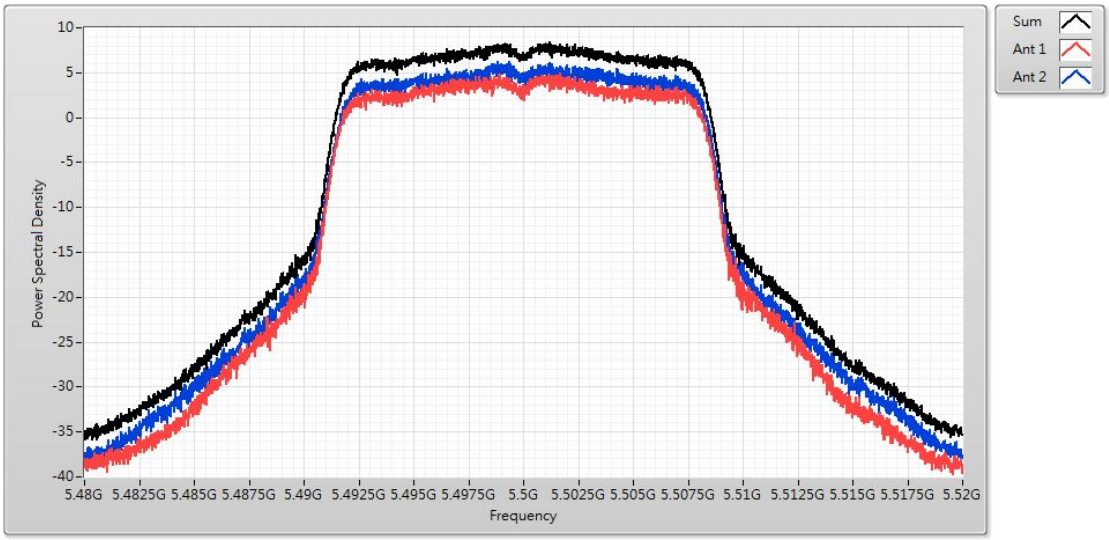
Channel 64



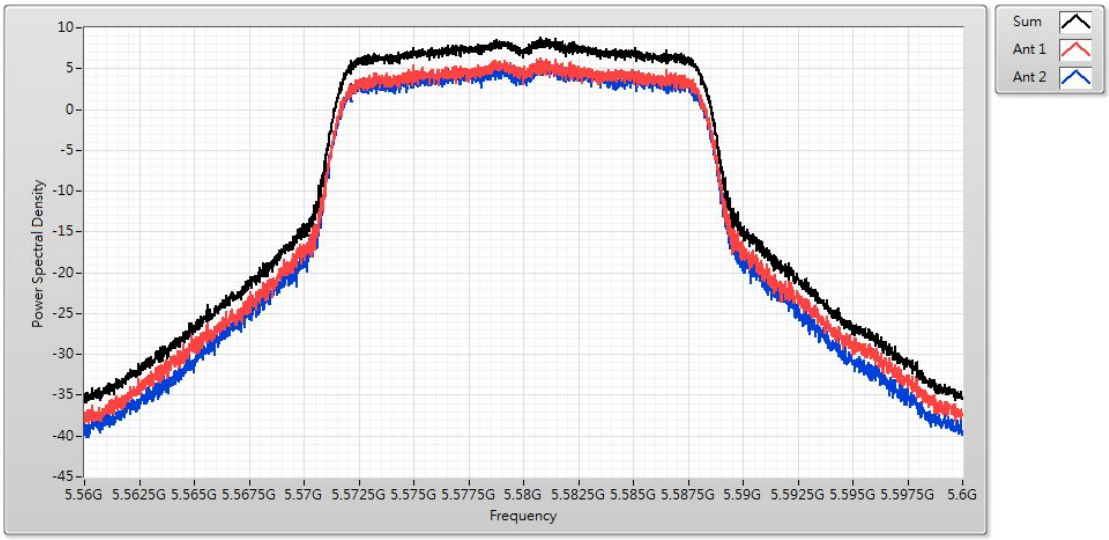
Product	Secure Smartphone		
Test Item	Maximum power spectral density		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11a (ANT0+1)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
100	5500	8.420	11.000	Pass
116	5580	8.800	11.000	Pass
140	5700	7.690	11.000	Pass

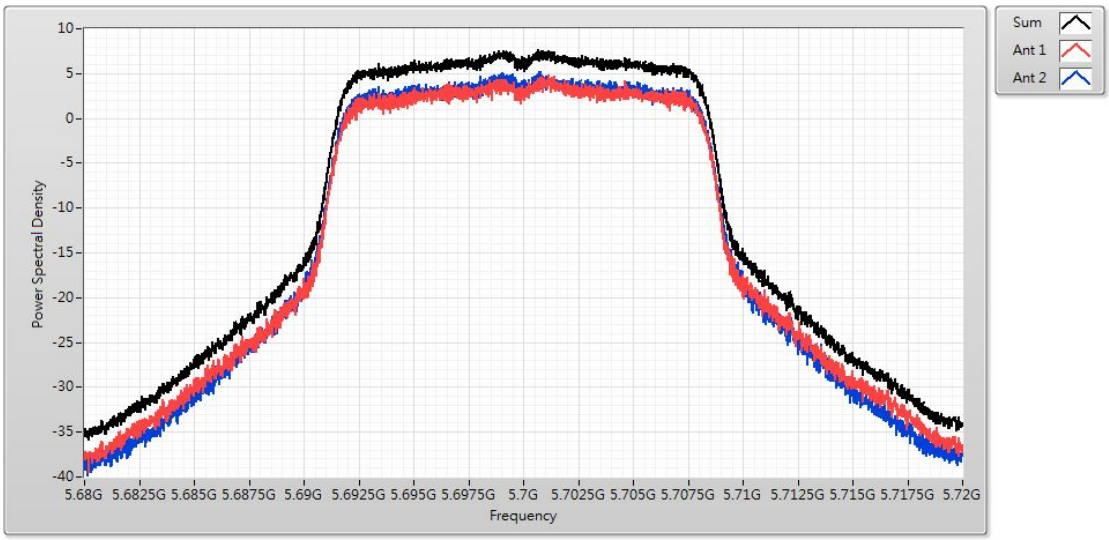
Channel 100



Channel 116



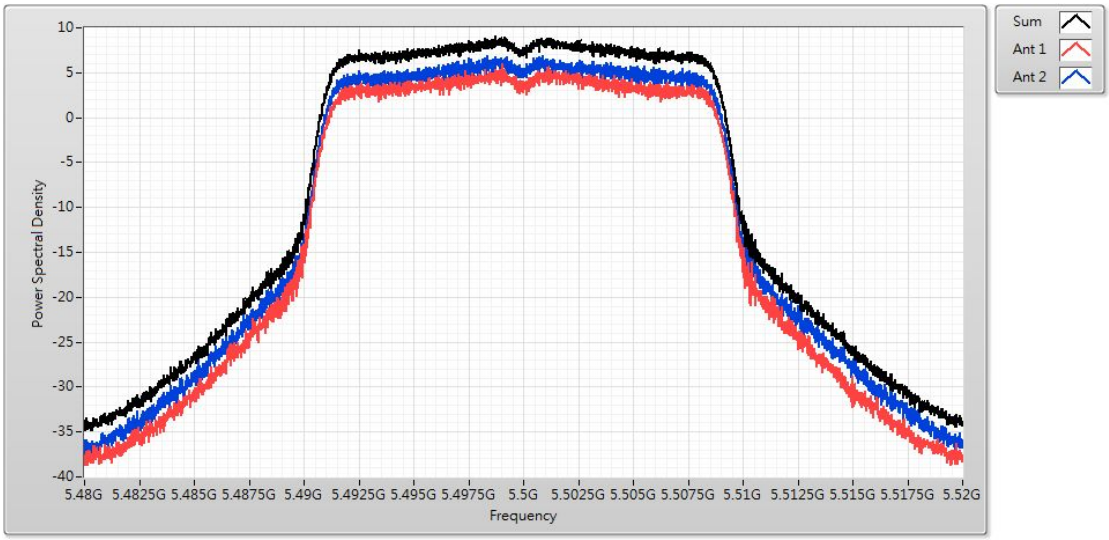
Channel 140



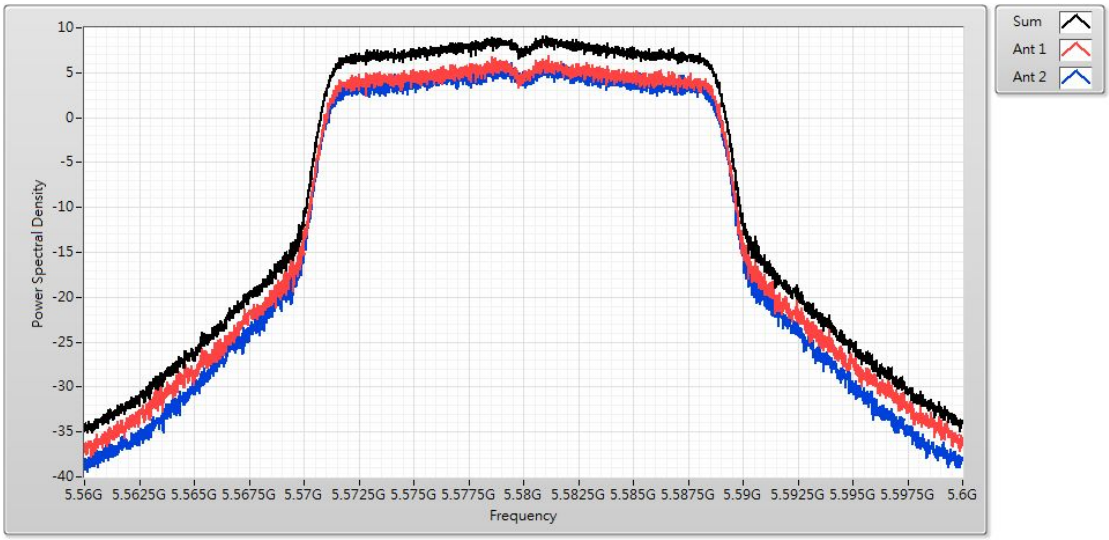
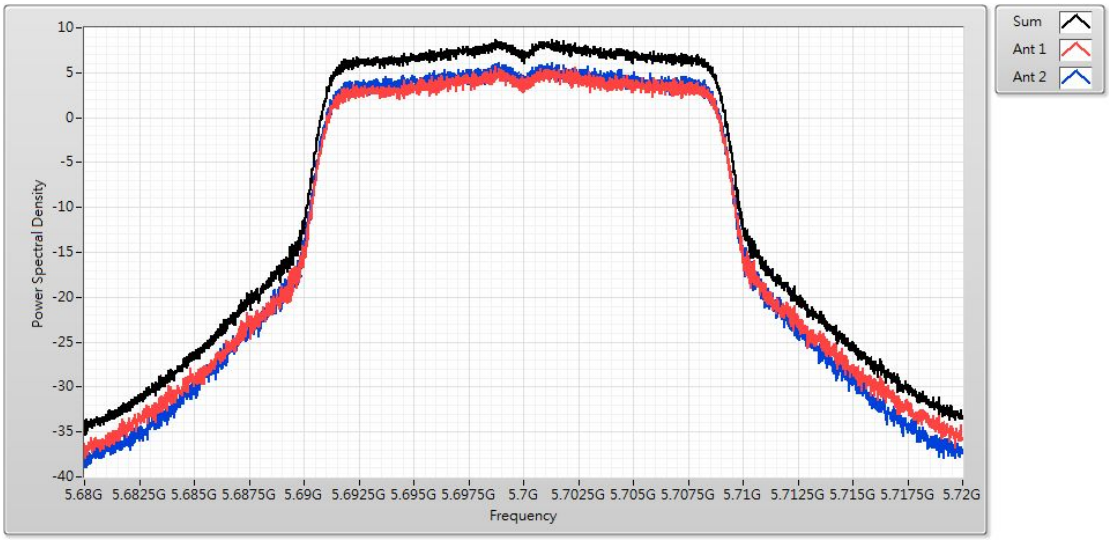
Product	Secure Smartphone		
Test Item	Maximum power spectral density		
Test Mode	Mode 1: Transmit Mode		
Date of Test	2019/01/22	Test Site	SR10-H

IEEE 802.11ac(20MHz)(ANT0+1)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
100	5500	9.110	11.000	Pass
116	5580	9.140	11.000	Pass
140	5700	8.710	11.000	Pass

Channel 100



Channel 116



Channel 140