

FCC Test Report

Product Name	Mobile Computer
Model No	RS35
FCC ID	Q3N-RS35

Applicant	Cipherlab Co, Ltd.
Address	12F, NO.333, SEC.2, DUNHUA S. RD., TAIPEI, TAIWAN, R.O.C.

Date of Receipt	June 08, 2020
Issued Date	July 02, 2020
Report No.	2060284R-E3032110125
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Report

Issued Date: July 02, 2020

Report No.: 2060284R-E3032110125



Product Name	Mobile Computer
Applicant	Cipherlab Co, Ltd.
Address	12F, NO.333, SEC.2, DUNHUA S. RD., TAIPEI, TAIWAN, R.O.C.
Manufacturer	Cipherlab Co, Ltd.
Model No.	RS35
FCC ID.	Q3N-RS35
EUT Rated Voltage	AC 100-240V, 50-60Hz or DC 5V by USB or DC 3.8V by battery
EUT Test Voltage	AC 120V / 60Hz
Trade Name	CIPHERLAB
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E ANSI C63.4: 2014, ANSI C63.10: 2013 KDB Publication 789033
Test Result	Complied

Documented By :



(Senior Adm. Specialist / Genie Chang)

Tested By :



(Engineer / Yunche Chen)

Approved By :



(Director / Vincent Lin)

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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

Revision History

Report No.	Version	Description	Issued Date
2060284R-E3032110125	V1.0	Initial issue of report.	2020-07-02

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Mobile Computer
Trade Name	CIPHERLAB
FCC ID.	Q3N-RS35
Model No.	RS35
Frequency Range	802.11a/n-20MHz: 5180-5320MHz, 5500-5700MHz, 5745-5825MHz 802.11n-40MHz: 5190-5310, 5510-5670MHz, 5755-5795MHz 802.11ac-80MHz: 5210-5290MHz, 5530-5690MHz, 5775MHz
Number of Channels	802.11a/n-20MHz: 25; 802.11n-40MHz: 12 802.11ac-80MHz: 6
Data Rate	802.11a: 6 - 54Mbps 802.11n: up to 150Mbps 802.11ac-80MHz: up to 433.3MHz
Channel Control	Auto
Type of Modulation	802.11a/n/ac: OFDM, BPSK, QPSK, 16QAM, 64QAM, 256QAM
Antenna Type	PIFA Antenna
Antenna Gain	Refer to the table "Antenna List"
USB to Type-C Cable	Shielded, 1m
USB Docking Cable	Shielded, 1.5m, with one ferrite core boned.
Power Adapter	MFR: SUNNY, M/N: SYS1561-1005 Input: AC 100-240V, 50-60Hz Output: 5V ---2A

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Auden	RS35	PIFA Antenna	1.9dBi for 5.150-5.250 GHz 3.0dBi for 5.250-5.350 GHz 3.6dBi for 5.470-5.725 GHz 2.7dBi For 5.725~5.825GHz

Note: The antenna of EUT is conform to FCC 15.203.

802.11a/n-20MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 36:	5180 MHz	Channel 40:	5200 MHz	Channel 44:	5220 MHz	Channel 48:	5240 MHz
Channel 52:	5260 MHz	Channel 56:	5280 MHz	Channel 60:	5300 MHz	Channel 64:	5320 MHz
Channel 100:	5500 MHz	Channel 104:	5520 MHz	Channel 108:	5540 MHz	Channel 112:	5560 MHz
Channel 116:	5580 MHz	Channel 120:	5600 MHz	Channel 124:	5620 MHz	Channel 128:	5640 MHz
Channel 132:	5660 MHz	Channel 136:	5680 MHz	Channel 140:	5700 MHz	Channel 144:	5720 MHz
Channel 149:	5745 MHz	Channel 153:	5765 MHz	Channel 157:	5785 MHz	Channel 161:	5805 MHz
Channel 165:	5825 MHz						

802.11n-40MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 38:	5190 MHz	Channel 46:	5230 MHz	Channel 54:	5270 MHz	Channel 62:	5310 MHz
Channel 102:	5510 MHz	Channel 110:	5550 MHz	Channel 118:	5590 MHz	Channel 126:	5630 MHz
Channel 134:	5670 MHz	Channel 142:	5710 MHz	Channel 151:	5755 MHz	Channel 159:	5795 MHz

802.11ac-80MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 42:	5210 MHz	Channel 58:	5290 MHz	Channel 106:	5530 MHz	Channel 122:	5610 MHz
Channel 138:	5690 MHz	Channel 155:	5775 MHz				

Note:

1. This device is a Mobile Computer with a built-in 2.4 GHz and 5 GHz WLAN and Bluetooth V4.0, V3.0, V2.1+EDR transceiver , this report for 5GHz WLAN
2. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report.
5. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart E for Unlicensed National Information Infrastructure devices.

Test Mode	Mode 1: Transmit (802.11a-6Mbps) Mode 2: Transmit (802.11n-20BW 7.2Mbps) Mode 3: Transmit (802.11n-40BW 15Mbps) Mode 4: Transmit (802.11ac-80BW 32.5Mbps)
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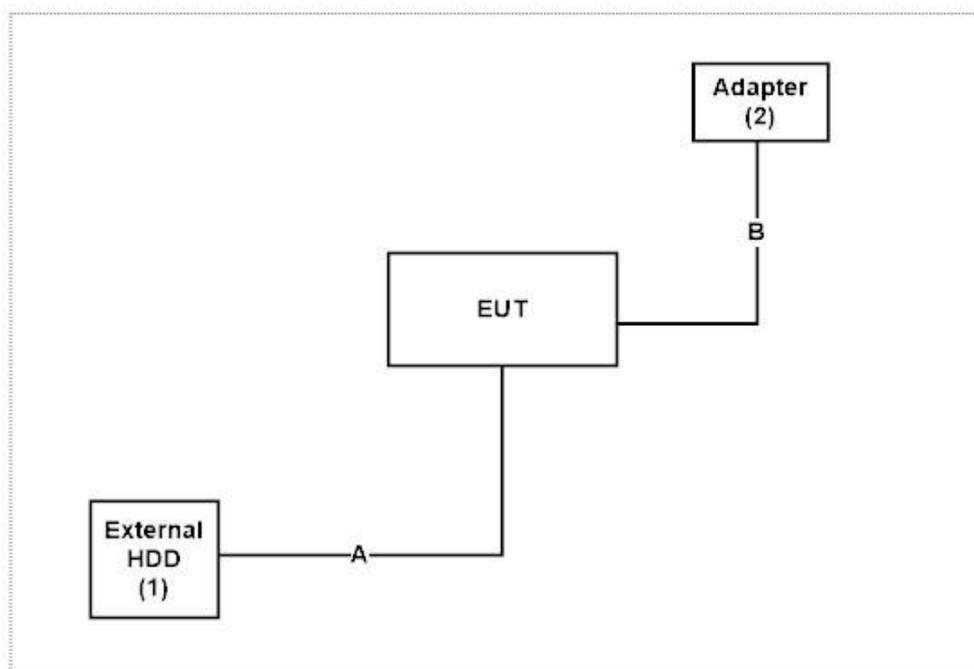
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	Power Cord
1	External HDD	Transcend	TS1TSJ25H3B	F21786-0125	N/A
2	Adapter	SUNNY	SYS1561-1005	N/A	N/A

Signal Cable Type	Signal cable Description
A	USB to Type-C Cable Shielded, 1m
B	USB Docking Cable Shielded, 1.5m, with one ferrite core boned.

1.4. Configuration of tested System



1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software “QRCT v3.0.271.0” on the EUT.
3. Configure the test mode, the test channel, and the data rate.
4. Press “OK” to start the continuous Transmit.
5. Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	26.1 °C
	Humidity (%RH)	10~90 %	45 %
Radiated Emission	Temperature (°C)	10~40 °C	25.8 °C
	Humidity (%RH)	10~90 %	73 %
Conductive	Temperature (°C)	10~40 °C	23.4 °C
	Humidity (%RH)	10~90 %	71.9 %

USA : FCC Registration Number: TW3023

Canada : IC Registration Number: 4075A

Site Description: Accredited by TAF
Accredited Number: 3023

Test Laboratory: DEKRA Testing and Certification Co., Ltd
Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451,
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Phone number: 886-2-8601-3788

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Email address: info.tw@dekra.com

Website: <http://www.dekra.com.tw>

1.7. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2020/04/06	2021/04/05
X	Spectrum Analyzer	Agilent	N9010A	MY53470892	2019/09/25	2020/09/24
X	Peak Power Analyzer	Keysight	8990B	MY51000410	2019/07/30	2020/07/29
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2019/07/30	2020/07/29
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2019/07/30	2020/07/29
X	EMI Test Receiver	R&S	ESCS 30	100369	2019/11/27	2020/11/26
X	LISN	R&S	ENV216	101105	2020/04/27	2021/04/26
X	LISN	R&S	ESH3-Z5	836679/014	2020/04/26	2021/04/25
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2020/06/19	2021/06/18

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : DEKRA Conduction Test SystemV9.0.5.

For Radiated measurements /Site3/CB8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Test Receiver	R&S	ESR7	101602	2019/12/16	2020/12/15
X	Signal Analyzer	R&S	FSV40	101869	2019/07/04	2020/07/03
X	Loop Antenna	Teseq	HLA6121	37133	2019/10/15	2021/10/14
X	Bilog Antenna	Schaffner Chase	CBL6112B	2916	2020/01/20	2021/01/19
X	Coaxial Cable	DEKRA	L1907-001C	280280.F141.1000D	2019/07/10	2020/07/09
X	Amplifier	EMCI	EMC001330	980254	2019/08/22	2020/08/21
X	Horn Antenna	ETS-LINDGREN	3117	00228113	2020/05/28	2021/05/27
X	Coaxial Cable	DEKRA	L1907-002C	280280.F141.1000D	2019/07/10	2020/07/09
X	Amplifier	EMCI	EMC05820SE	980362	2020/06/30	2021/06/29
X	Amplifier	EMCI	EMC051845SE	980632	2019/08/08	2020/08/07
X	Horn Antenna	Com-Power	AH-1840	101101	2019/10/31	2020/10/30
X	Amplifier + Cable	EMCI	EMC184045SE	980369	2020/04/23	2021/04/22
	Bilog Antenna	Schaffner Chase	CBL6112B	2925	2020/02/20	2021/02/19
	Coaxial Cable	DEKRA	L1907-003C	00100A1B3A120M	2019/07/10	2020/07/09
	Amplifier	EMCI	EMC001330	980255	2020/03/17	2021/03/16
X	Filter	MICRO-TRONICS	BRM50702	G270	2019/08/08	2020/08/07
X	Filter	MICRO-TRONICS	BRM50716	G196	2019/08/08	2020/08/07

Note:

1. Loop Antenna is calibrated every two years, the other equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : DEKRA Test SystemV1.1.

1.8. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document, and is described in each test chapter of this report.

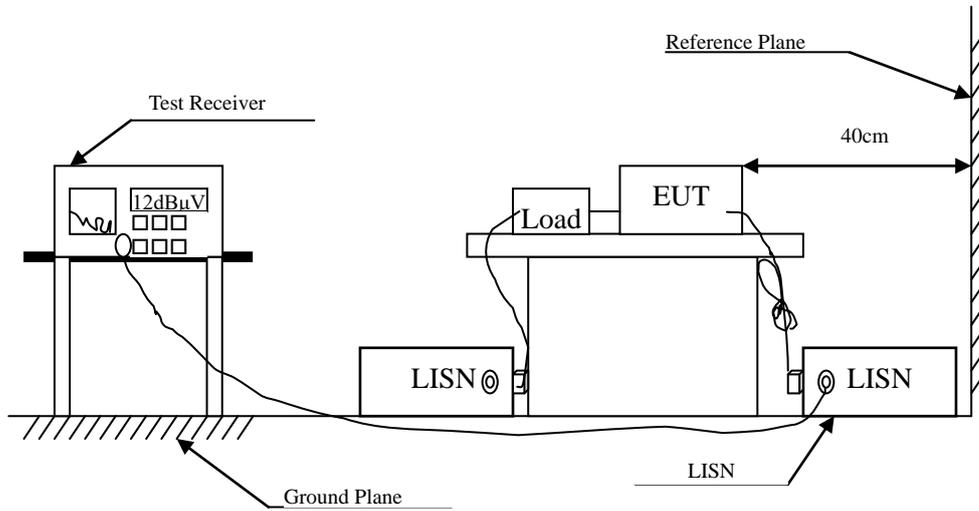
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test item	Uncertainty	
Conducted Emission	±3.42 dB	
Maximun conducted output power	Power Meter ±0.89dB	Spectrum Analyzer ±2.06dB
Power Density	±2.06dB	
Radiated Emission	9kHz~30MHz: ±3.88dB 30MHz~1GHz: ±4.06dB 1GHz~18GHz: ±3.71dB 18GHz~40GHz: ±3.73dB 40GHz~50GHz: ±3.75dB 50GHz~325GHz: ±4.39dB	
Band Edge	9kHz~30MHz: ±3.88dB 30MHz~1GHz: ±4.06dB 1GHz~18GHz: ±3.71dB 18GHz~40GHz: ±3.73dB 40GHz~50GHz: ±3.75dB 50GHz~325GHz: ±4.39dB	
Occupied Bandwidth	±1544.74Hz	
Duty Cycle	±2.31msec	

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dB μ V) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

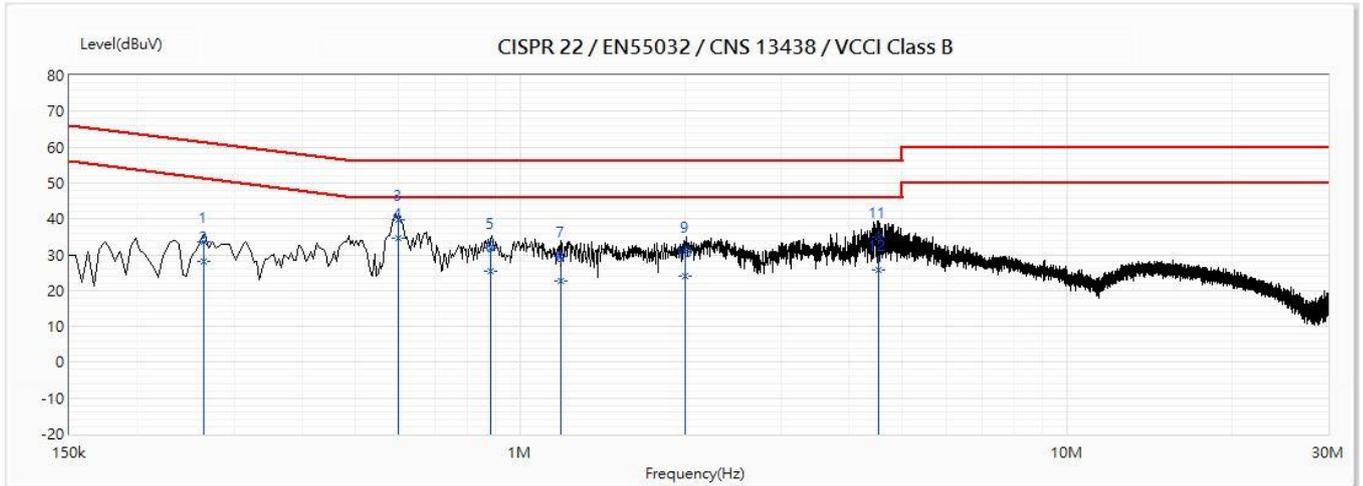
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4:2014 on conducted measurement.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.4. Test Result of Conducted Emission

Product : Mobile Computer
 Test Item : Conducted Emission Test
 Test Mode : Mode 4: Transmit (802.11ac-80BW 32.5Mbps) (5210MHz)
 Test Date : 2020/06/29

Line1



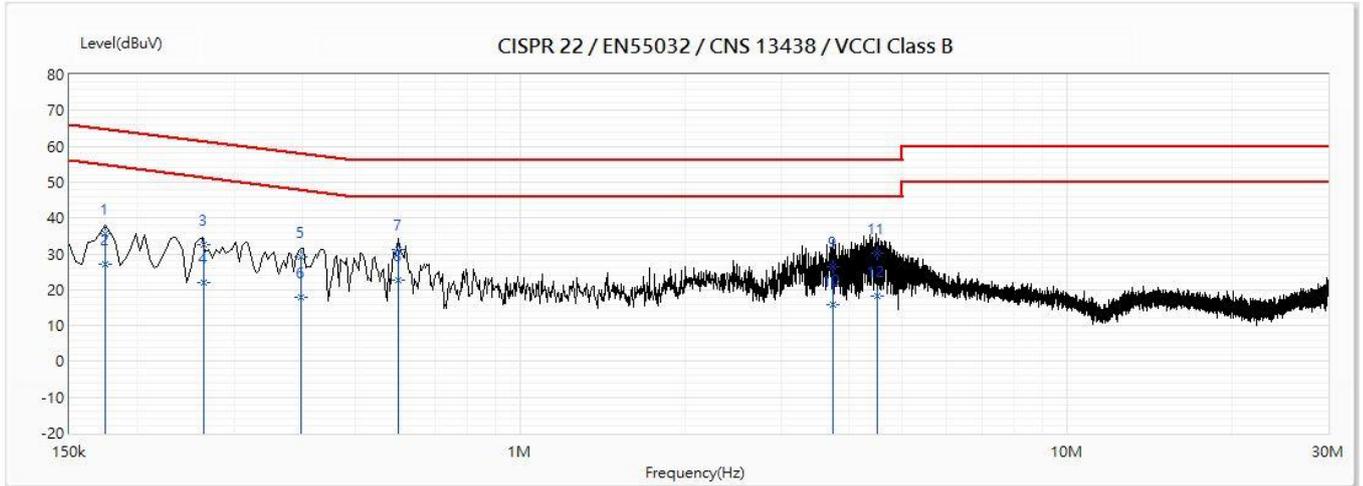
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.263	33.74	61.32	-27.58	23.94	9.80	QP
2	0.263	28.06	51.32	-23.26	18.26	9.80	AV
3	0.598	39.69	56.00	-16.31	29.89	9.80	QP
*4	0.598	34.48	46.00	-11.52	24.68	9.80	AV
5	0.883	31.72	56.00	-24.28	21.92	9.80	QP
6	0.883	25.43	46.00	-20.57	15.63	9.80	AV
7	1.185	29.50	56.00	-26.50	19.69	9.81	QP
8	1.185	22.52	46.00	-23.48	12.71	9.81	AV
9	2.007	30.80	56.00	-25.20	20.95	9.85	QP
10	2.007	23.90	46.00	-22.10	14.05	9.85	AV
11	4.526	34.88	56.00	-21.12	24.94	9.93	QP
12	4.526	25.58	46.00	-20.42	15.65	9.93	AV

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level-Limit

Product : Mobile Computer
 Test Item : Conducted Emission Test
 Test Mode : Mode 4: Transmit (802.11ac-80BW 32.5Mbps) (5210MHz)
 Test Date : 2020/06/29

N



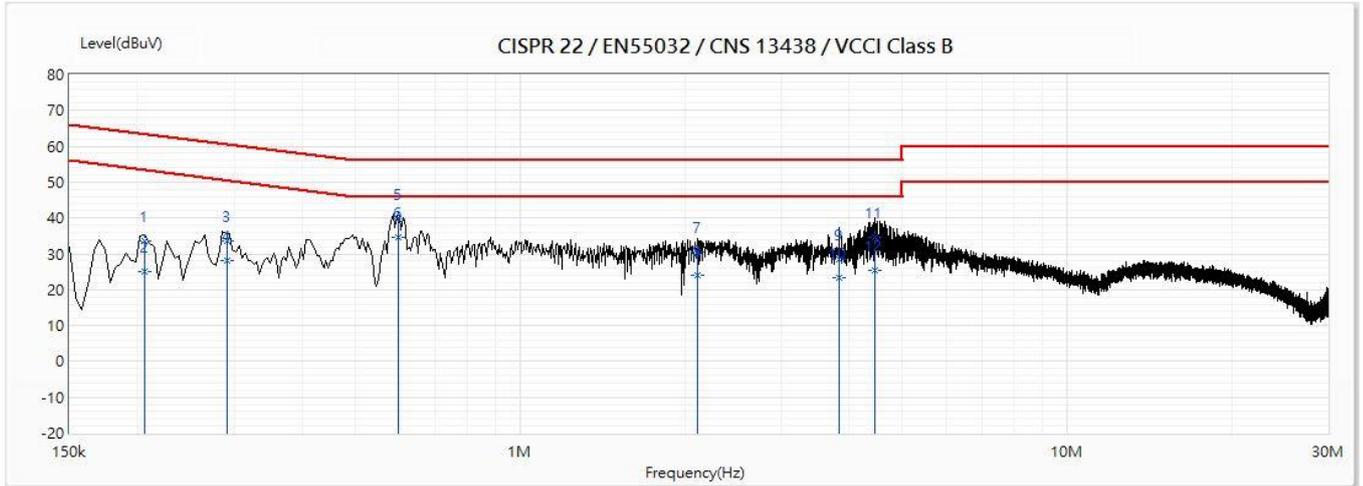
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.174	35.65	64.76	-29.11	25.86	9.79	QP
2	0.174	26.94	54.76	-27.82	17.15	9.79	AV
3	0.264	32.53	61.30	-28.77	22.75	9.78	QP
4	0.264	22.14	51.30	-29.16	12.36	9.78	AV
5	0.398	29.30	57.90	-28.60	19.51	9.79	QP
6	0.398	17.91	47.90	-29.99	8.12	9.79	AV
7	0.6	31.08	56.00	-24.92	21.29	9.79	QP
*8	0.6	22.55	46.00	-23.45	12.76	9.79	AV
9	3.727	26.34	56.00	-29.66	16.45	9.89	QP
10	3.727	15.78	46.00	-30.22	5.89	9.89	AV
11	4.487	30.13	56.00	-25.87	20.21	9.92	QP
12	4.487	18.37	46.00	-27.63	8.46	9.92	AV

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level-Limit

Product : Mobile Computer
 Test Item : Conducted Emission Test
 Test Mode : Mode 4: Transmit (802.11ac-80BW 32.5Mbps) (5290MHz)
 Test Date : 2020/06/29

Line1



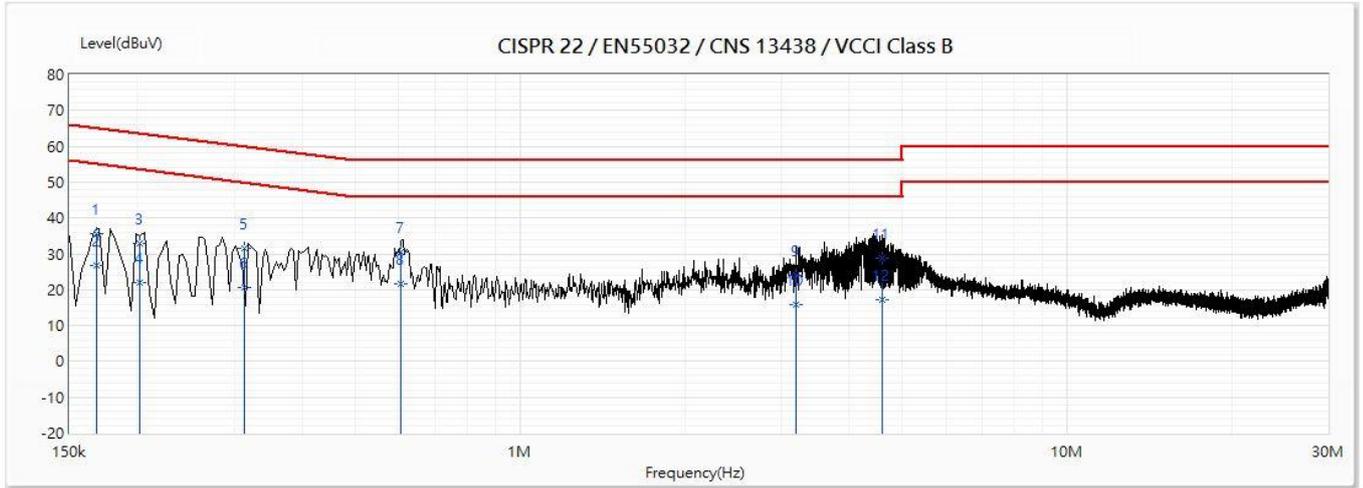
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.205	33.65	63.39	-29.74	23.85	9.80	QP
2	0.205	25.13	53.39	-28.26	15.33	9.80	AV
3	0.292	33.75	60.48	-26.73	23.95	9.80	QP
4	0.292	28.16	50.48	-22.32	18.36	9.80	AV
5	0.599	39.64	56.00	-16.36	29.84	9.80	QP
*6	0.599	34.53	46.00	-11.47	24.73	9.80	AV
7	2.111	30.42	56.00	-25.58	20.57	9.85	QP
8	2.111	24.04	46.00	-21.96	14.19	9.85	AV
9	3.831	28.52	56.00	-27.48	18.61	9.91	QP
10	3.831	23.20	46.00	-22.80	13.29	9.91	AV
11	4.458	34.53	56.00	-21.47	24.60	9.93	QP
12	4.458	25.36	46.00	-20.64	15.43	9.93	AV

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level-Limit

Product : Mobile Computer
 Test Item : Conducted Emission Test
 Test Mode : Mode 4: Transmit (802.11ac-80BW 32.5Mbps) (5290MHz)
 Test Date : 2020/06/29

N



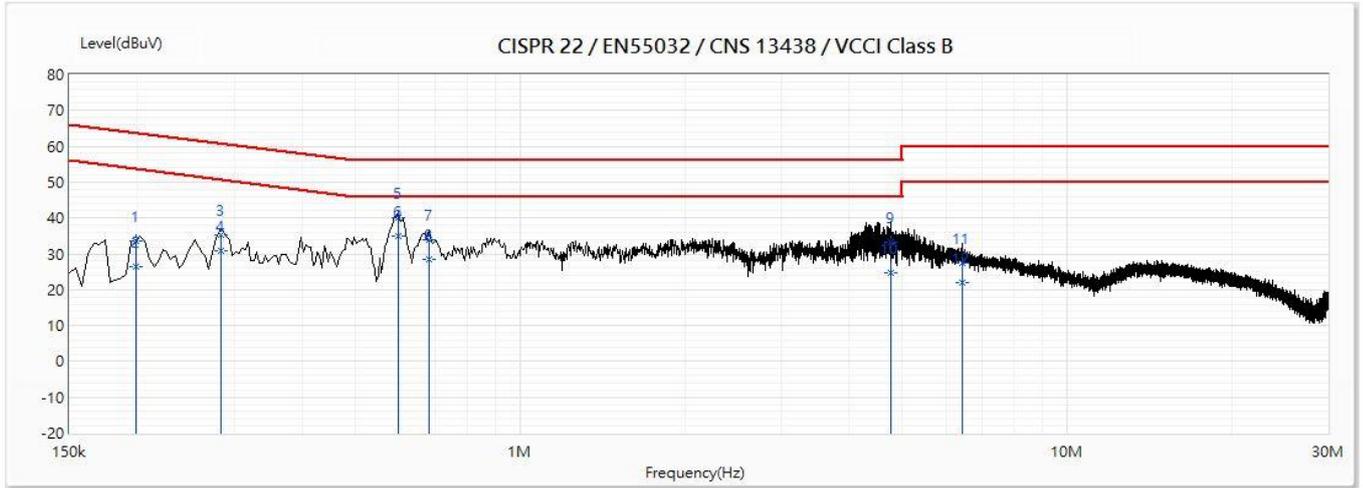
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.168	35.71	65.04	-29.34	25.92	9.79	QP
2	0.168	26.77	55.04	-28.27	16.98	9.79	AV
3	0.201	32.76	63.56	-30.80	22.98	9.78	QP
4	0.201	22.09	53.56	-31.47	12.30	9.78	AV
5	0.314	31.38	59.87	-28.49	21.60	9.78	QP
6	0.314	20.75	49.87	-29.12	10.97	9.78	AV
7	0.605	30.36	56.00	-25.64	20.57	9.79	QP
*8	0.605	21.78	46.00	-24.22	11.99	9.79	AV
9	3.19	23.91	56.00	-32.09	14.04	9.88	QP
10	3.19	15.67	46.00	-30.33	5.80	9.88	AV
11	4.584	28.94	56.00	-27.06	19.02	9.92	QP
12	4.584	17.23	46.00	-28.77	7.31	9.92	AV

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level-Limit

Product : Mobile Computer
 Test Item : Conducted Emission Test
 Test Mode : Mode 4: Transmit (802.11ac-80BW 32.5Mbps) (5530MHz)
 Test Date : 2020/06/29

Line1



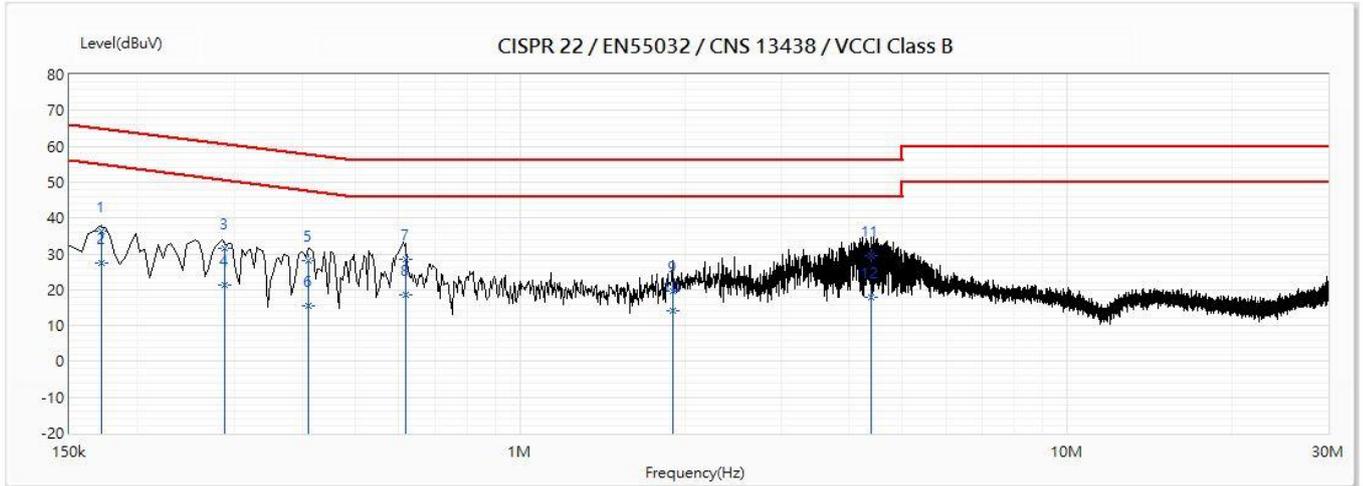
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.199	33.42	63.66	-30.25	23.62	9.80	QP
2	0.199	26.39	53.66	-27.27	16.59	9.80	AV
3	0.284	35.14	60.69	-25.55	25.34	9.80	QP
4	0.284	30.76	50.69	-19.93	20.96	9.80	AV
5	0.597	39.93	56.00	-16.07	30.13	9.80	QP
*6	0.597	35.01	46.00	-10.99	25.21	9.80	AV
7	0.683	34.02	56.00	-21.98	24.22	9.80	QP
8	0.683	28.42	46.00	-17.58	18.62	9.80	AV
9	4.757	33.37	56.00	-22.63	23.43	9.93	QP
10	4.757	24.66	46.00	-21.34	14.73	9.93	AV
11	6.439	27.37	60.00	-32.63	17.39	9.98	QP
12	6.439	22.02	50.00	-27.98	12.04	9.98	AV

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level-Limit

Product : Mobile Computer
 Test Item : Conducted Emission Test
 Test Mode : Mode 4: Transmit (802.11ac-80BW 32.5Mbps) (5530MHz)
 Test Date : 2020/06/29

N



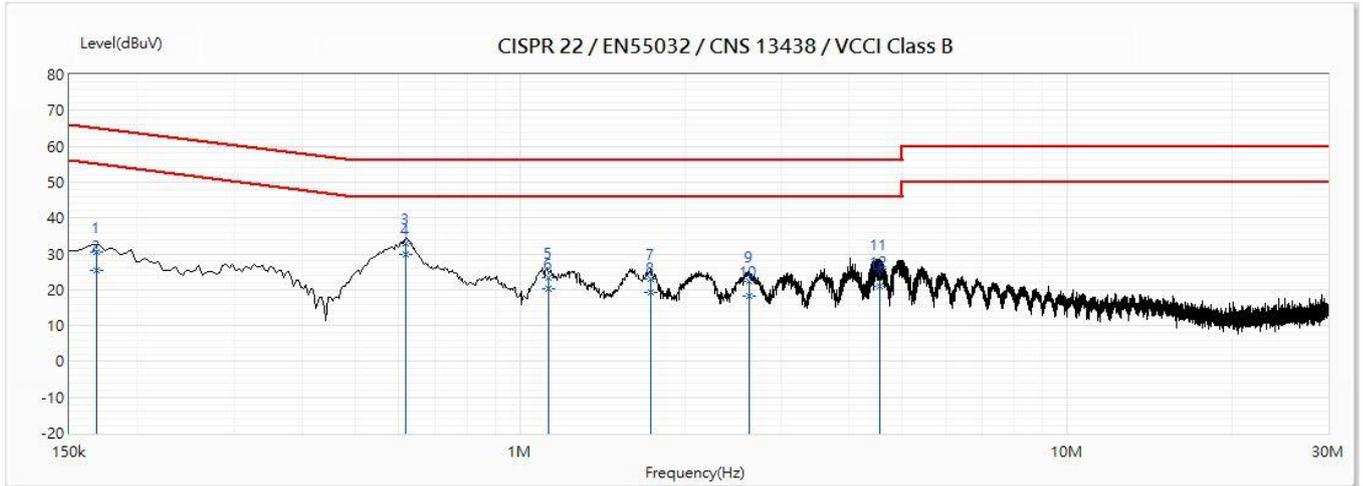
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.171	36.42	64.89	-28.47	26.63	9.79	QP
2	0.171	27.49	54.89	-27.40	17.70	9.79	AV
3	0.288	31.62	60.57	-28.95	21.84	9.78	QP
4	0.288	21.42	50.57	-29.15	11.63	9.78	AV
5	0.411	27.97	57.63	-29.66	18.18	9.79	QP
6	0.411	15.35	47.63	-32.28	5.56	9.79	AV
7	0.618	28.41	56.00	-27.59	18.62	9.79	QP
8	0.618	18.61	46.00	-27.39	8.82	9.79	AV
9	1.9	19.64	56.00	-36.36	9.81	9.84	QP
10	1.9	14.26	46.00	-31.74	4.42	9.84	AV
*11	4.381	29.46	56.00	-26.54	19.55	9.91	QP
12	4.381	17.94	46.00	-28.06	8.03	9.91	AV

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level-Limit

Product : Mobile Computer
 Test Item : Conducted Emission Test
 Test Mode : Mode 4: Transmit (802.11ac-80BW 32.5Mbps) (5775MHz)
 Test Date : 2020/06/29

Line1



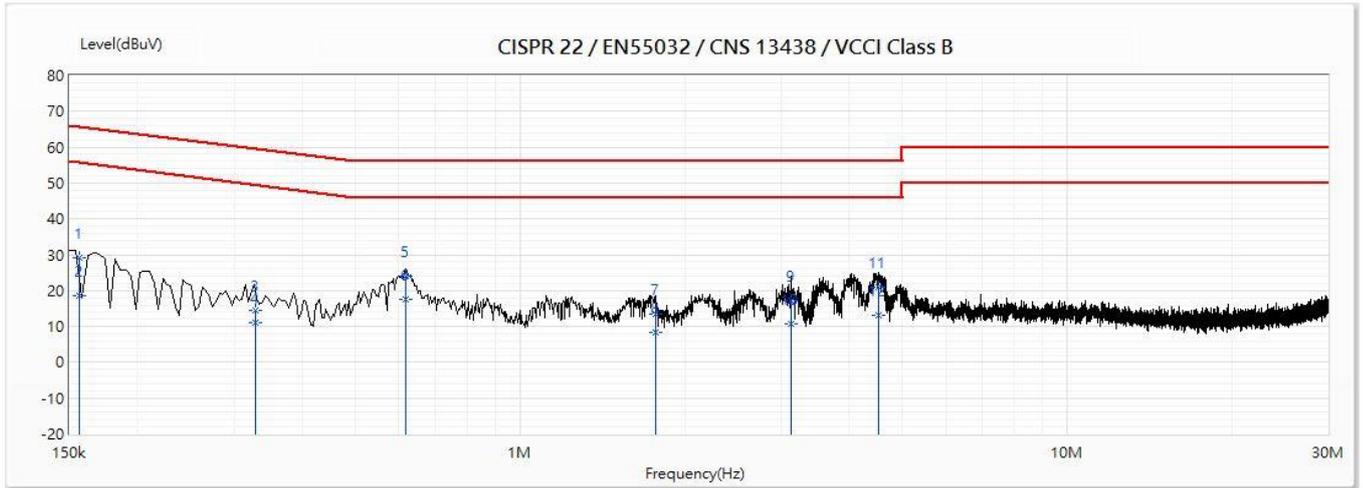
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.168	30.61	65.04	-34.43	20.80	9.81	QP
2	0.168	25.29	55.04	-29.75	15.48	9.81	AV
3	0.618	32.90	56.00	-23.10	23.10	9.80	QP
*4	0.618	29.77	46.00	-16.23	19.97	9.80	AV
5	1.127	23.50	56.00	-32.50	13.69	9.81	QP
6	1.127	20.32	46.00	-25.68	10.52	9.81	AV
7	1.73	22.97	56.00	-33.03	13.13	9.84	QP
8	1.73	19.32	46.00	-26.68	9.49	9.84	AV
9	2.621	22.16	56.00	-33.84	12.29	9.87	QP
10	2.621	18.23	46.00	-27.77	8.36	9.87	AV
11	4.552	25.70	56.00	-30.30	15.77	9.93	QP
12	4.552	20.79	46.00	-25.21	10.85	9.93	AV

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level-Limit

Product : Mobile Computer
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 4: Transmit (802.11ac-80BW 32.5Mbps) (5775MHz)
 Test Date : 2020/06/29

N



No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.156	29.17	65.66	-36.50	19.38	9.79	QP
2	0.156	18.60	55.66	-37.06	8.81	9.79	AV
3	0.327	14.63	59.52	-44.89	4.84	9.79	QP
4	0.327	11.21	49.52	-38.31	1.42	9.79	AV
5	0.619	24.11	56.00	-31.89	14.32	9.79	QP
*6	0.619	17.64	46.00	-28.36	7.85	9.79	AV
7	1.765	13.52	56.00	-42.48	3.69	9.83	QP
8	1.765	8.34	46.00	-37.66	-1.48	9.83	AV
9	3.133	17.20	56.00	-38.80	7.32	9.88	QP
10	3.133	10.71	46.00	-35.29	0.84	9.88	AV
11	4.516	21.03	56.00	-34.97	11.12	9.92	QP
12	4.516	13.27	46.00	-32.73	3.36	9.92	AV

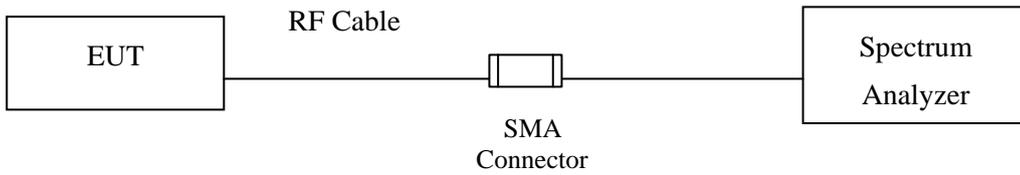
Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. Emission Level=Reading Level + Correct Factor(Correct Factor=LISN Factor+Cable Loss).
3. Margin=Emission Level-Limit

3. Maximun conducted output power

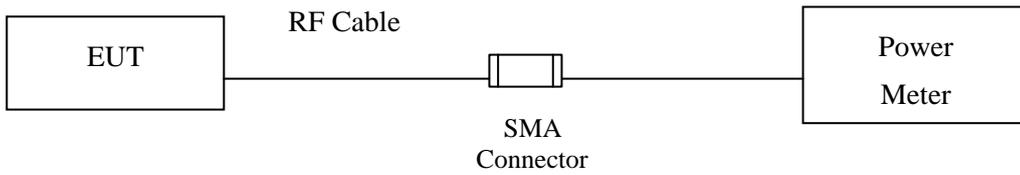
3.1. Test Setup

99% Occupied Bandwidth

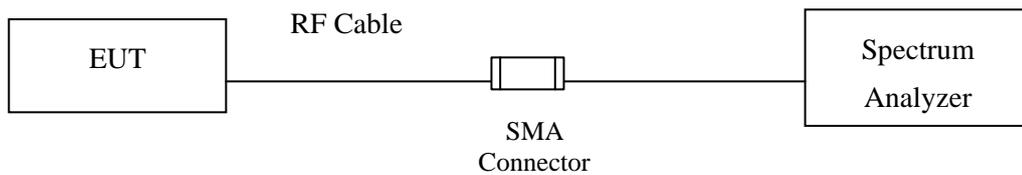


Conduction Power Measurement

Conduction Power Measurement (for 802.11an)



Conduction Power Measurement (for 802.11ac)



3.2. Limits

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. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power 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, if transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power 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. 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. 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 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 mobile and portable 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, if transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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 $11 \text{ dBm} + 10 \log B$, where B is the 99% emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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, if transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point UNII 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

As an alternative to FCC KDB-789033, the EUT maximum conducted output power was measured with an average power meter employing a video bandwidth greater than the 6dB BW of the emission under test. Maximum conducted output power was read directly from the meter across all data rates, and across three channels within each sub-band. Special care was used to make sure that the EUT was transmitting in continuous mode. This method exceeds the limitations of FCC KDB-789033, and provides more accurate measurements.

802.11an (BW \leq 40MHz) Maximum conducted output power using KDB 789033 section E)3)b) Method PM-G (Measurement using a gated RF average power meter)

Note: the power meter have a video bandwidth that is greater than or equal to the measurement bandwidth, (Anritsu/ MA2411B video bandwidth: 65MHz)

802.11ac (BW=80MHz) Maximum conducted output power using KDB 789033 section E)2)b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep).

When transmitted signals consist of two or more non-contiguous spectrum segments (e.g., 80+80 MHz mode) or when a single spectrum segment of a transmission crosses the boundary between two adjacent U-NII bands, KDB 644545 D03 section D) procedure is used for measurements.

3.4. Test Result of Maximum conducted output power

Product : Mobile Computer
 Test Item : Maximum conducted output power
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)
 Test Date : 2020/06/11

Cable loss=1dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
		Measurement Level (dBm)							
36	5180	17.38	--	--	--	--	--	--	--
44	5220	17.5	17.41	17.38	17.37	17.36	17.34	17.29	17.26
48	5240	17.32	--	--	--	--	--	--	--
52	5260	17.2	--	--	--	--	--	--	--
60	5300	17.13	17.04	17.01	16.91	16.87	16.8	16.76	16.68
64	5320	17.07	--	--	--	--	--	--	--
100	5500	17.49	--	--	--	--	--	--	--
116	5580	17.31	17.25	17.21	17.21	17.15	17.08	17.06	17.04
140	5700	10.60	--	--	--	--	--	--	--
149	5745	17.49	--	--	--	--	--	--	--
157	5785	17.36	17.33	17.31	17.31	17.24	17.2	17.18	17.17
165	5825	17.32	--	--	--	--	--	--	--

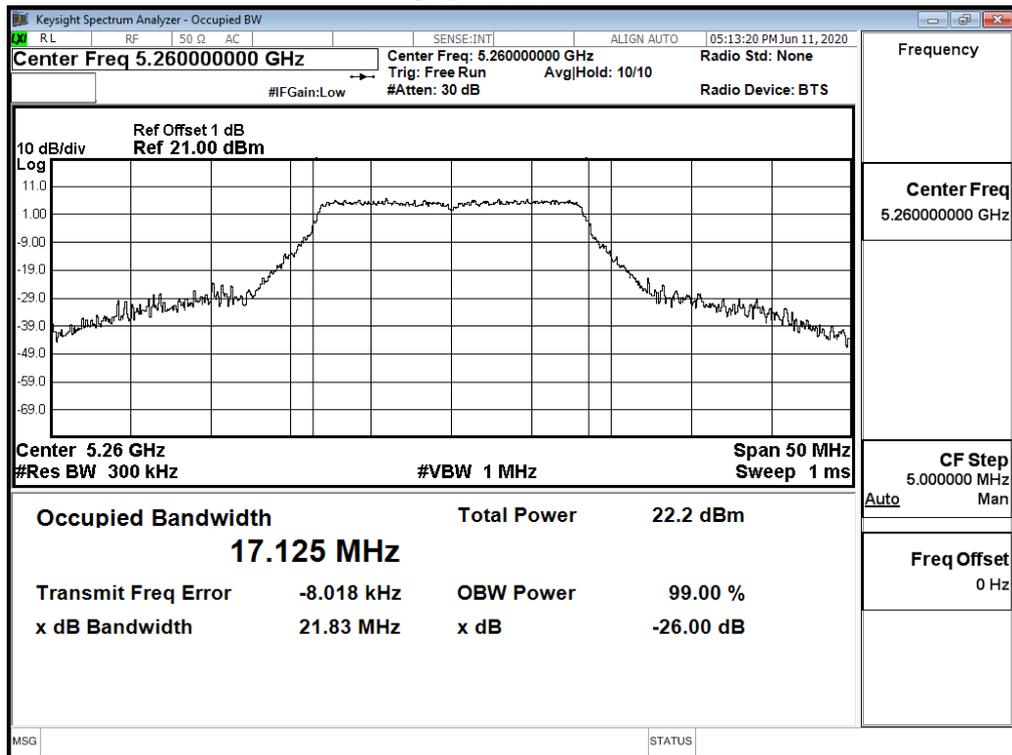
Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

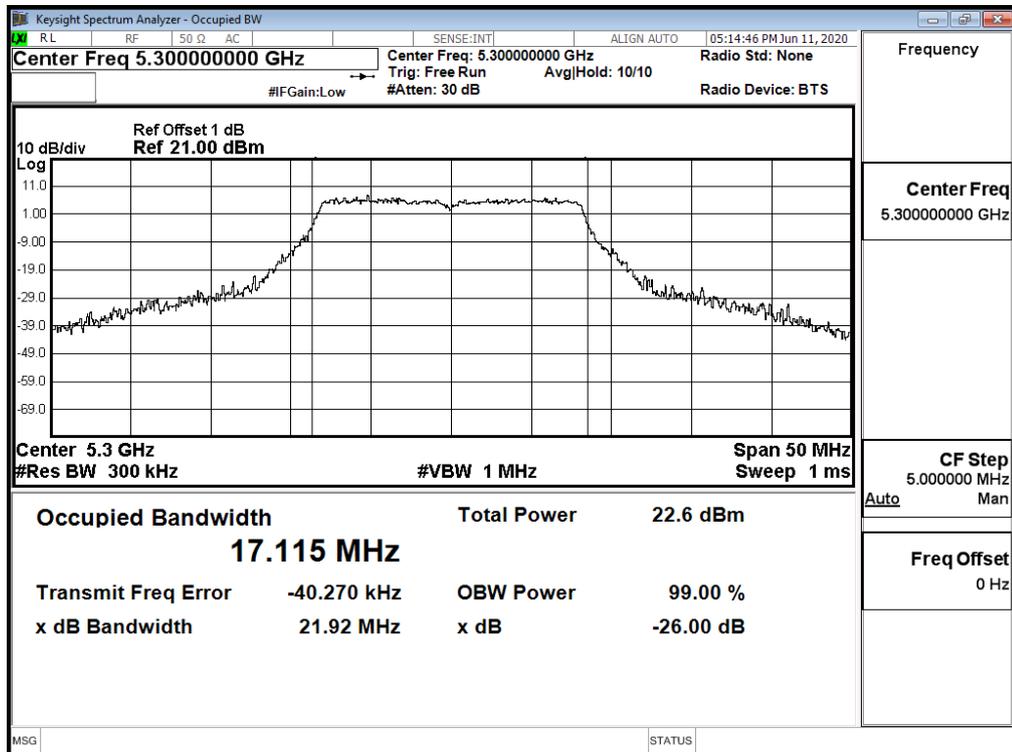
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit	
				(dBm)	dBm+10log(BW)
36	5180	--	17.38	24	--
44	5220	--	17.5	24	--
48	5240	--	17.32	24	--
52	5260	21.830	17.2	24	24.39
60	5300	21.920	17.13	24	24.41
64	5320	21.920	17.07	24	24.41
100	5500	22.030	17.49	24	24.43
116	5580	22.020	17.31	24	24.43
140	5700	22.470	10.6	24	24.52
149	5745	--	17.49	30	--
157	5785	--	17.36	30	--
165	5825	--	17.32	30	--

Note: Power Output Value =Reading value on average power meter + cable loss

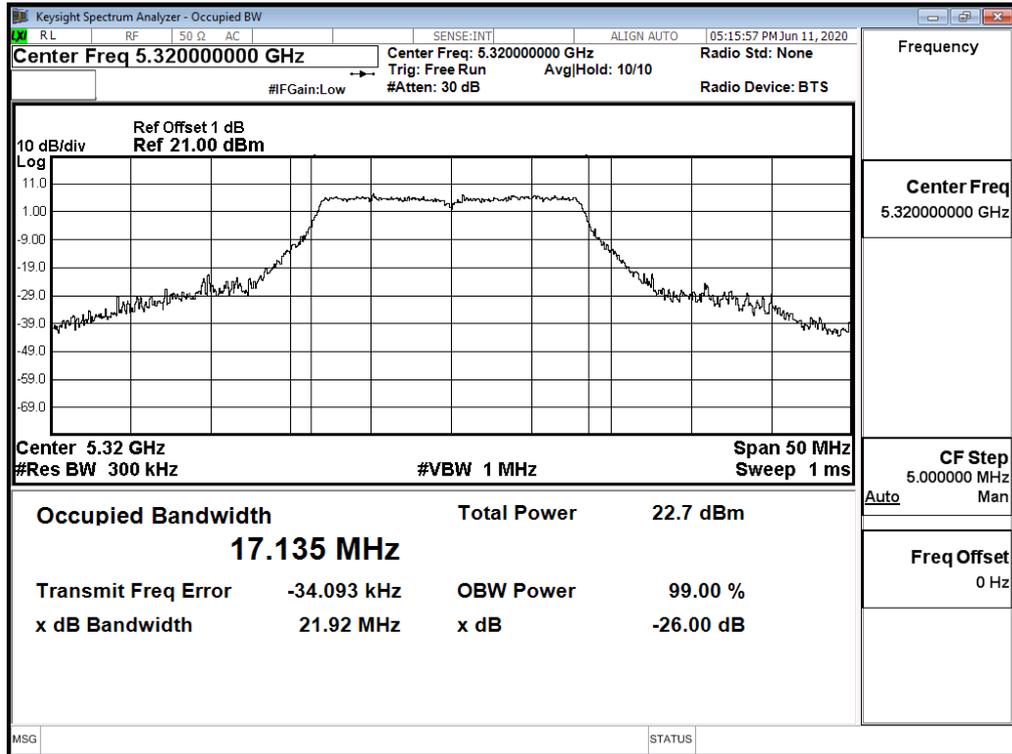
26dB Occupied Bandwidth: Channel 52:



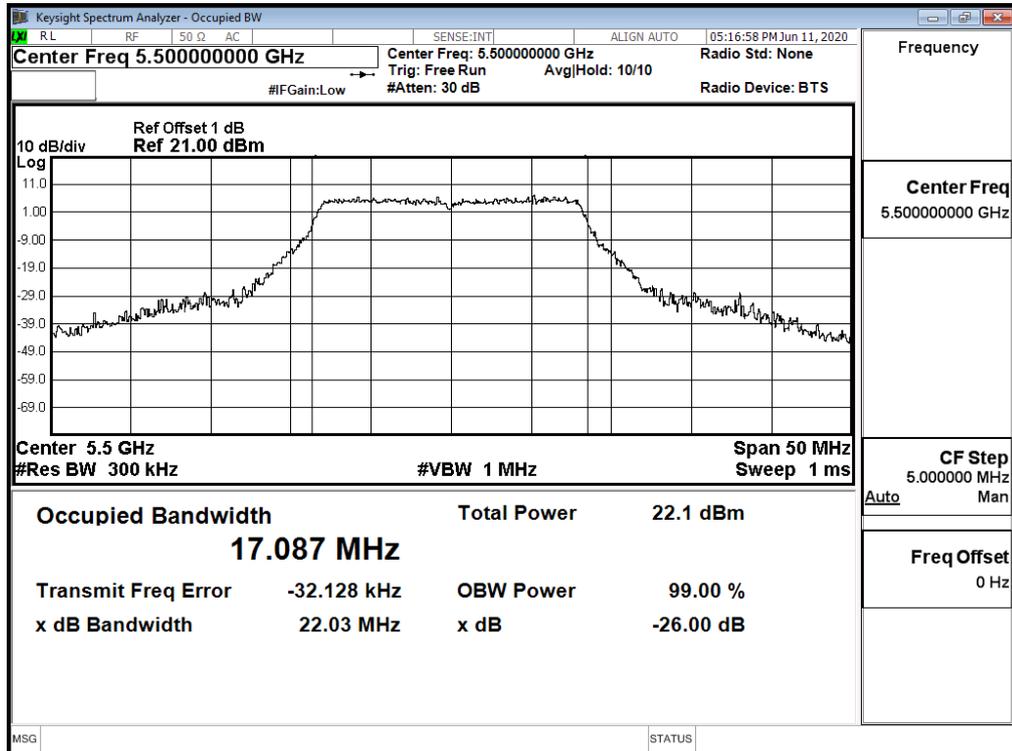
Channel 60:



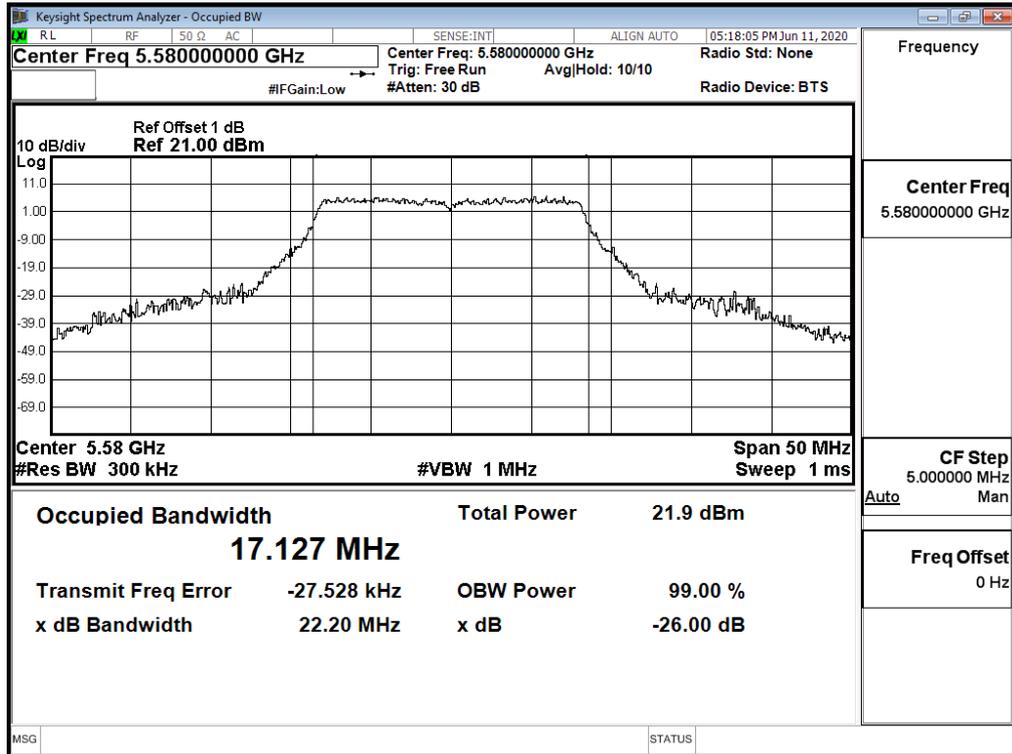
Channel 64:



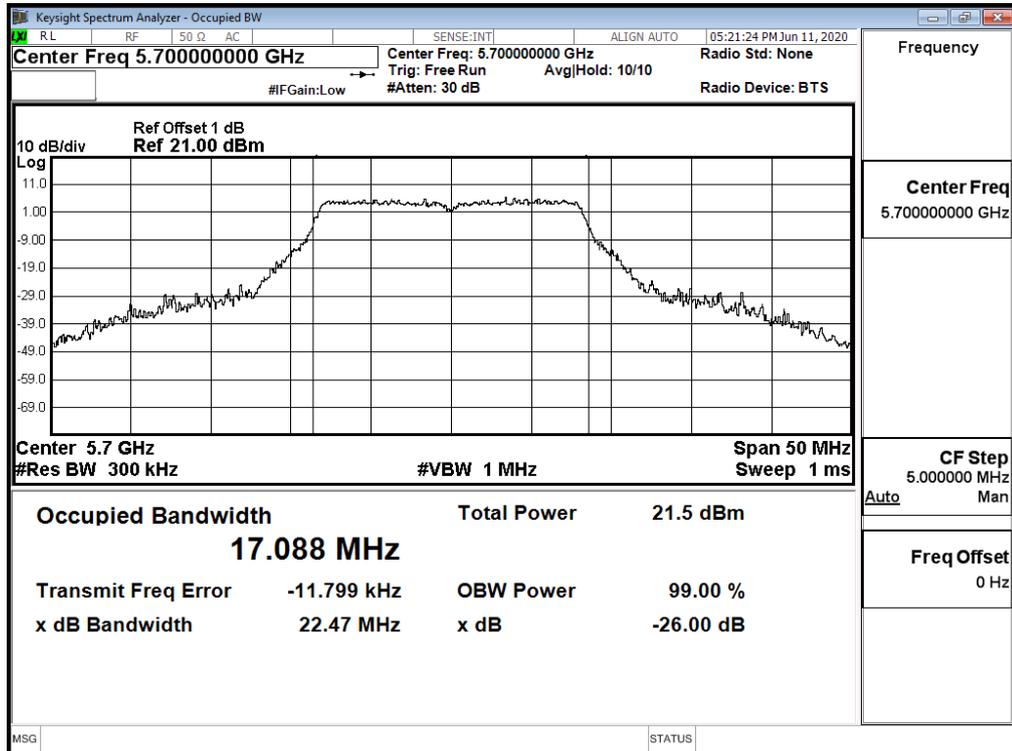
Channel 100:



Channel 116:



Channel 140:



Product : Mobile Computer
 Test Item : Maximum conducted output power
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps)
 Test Date : 2020/06/11

Cable loss=1dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		7.2	14.4	21.7	28.9	43.3	57.8	65	72.2
		Measurement Level (dBm)							
36	5180	16.74	--	--	--	--	--	--	--
44	5220	16.61	16.58	16.52	16.47	16.43	16.39	16.35	16.33
48	5240	16.95	--	--	--	--	--	--	--
52	5260	16.77	--	--	--	--	--	--	--
60	5300	16.69	16.60	16.50	16.40	16.32	16.22	16.16	16.06
64	5320	16.60	--	--	--	--	--	--	--
100	5500	16.66	--	--	--	--	--	--	--
116	5580	16.92	16.82	16.75	16.68	16.65	16.62	16.58	16.55
140	5700	10.47	--	--	--	--	--	--	--
144(Band3)	5720	15.70	15.56	15.50	15.45	15.36	15.27	15.23	15.17
144(Band4)	5720	10.26	10.10	10.08	10.02	9.98	9.95	9.90	9.82
149	5745	16.55	--	--	--	--	--	--	--
157	5785	16.99	16.77	16.70	16.60	16.50	16.44	16.36	16.26
165	5825	16.90	--	--	--	--	--	--	--

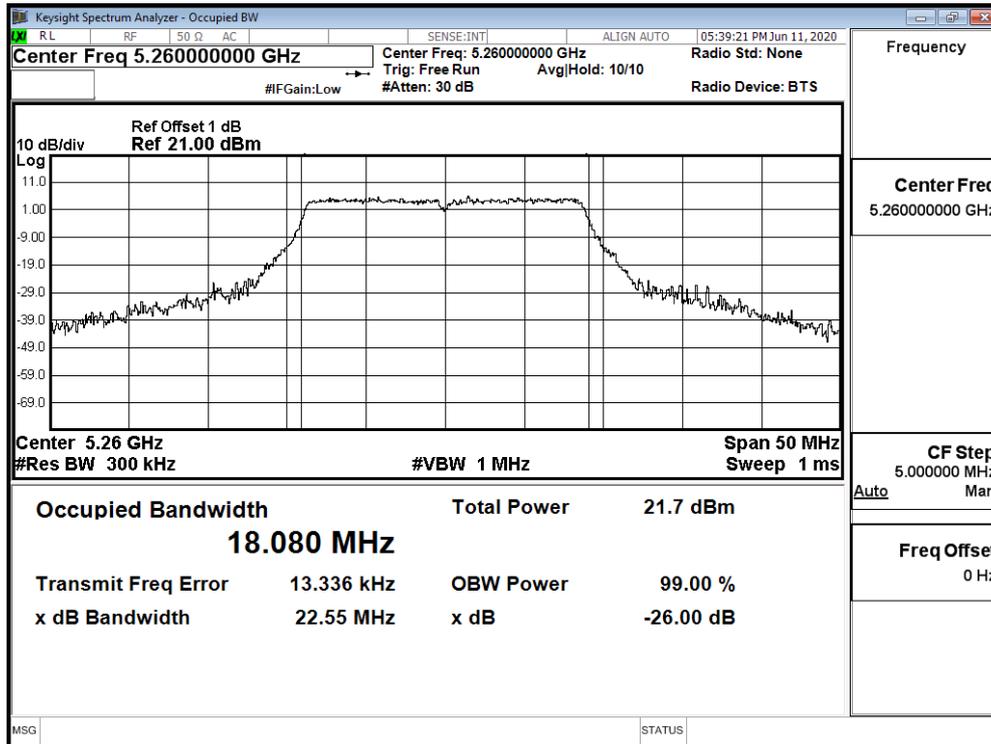
Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

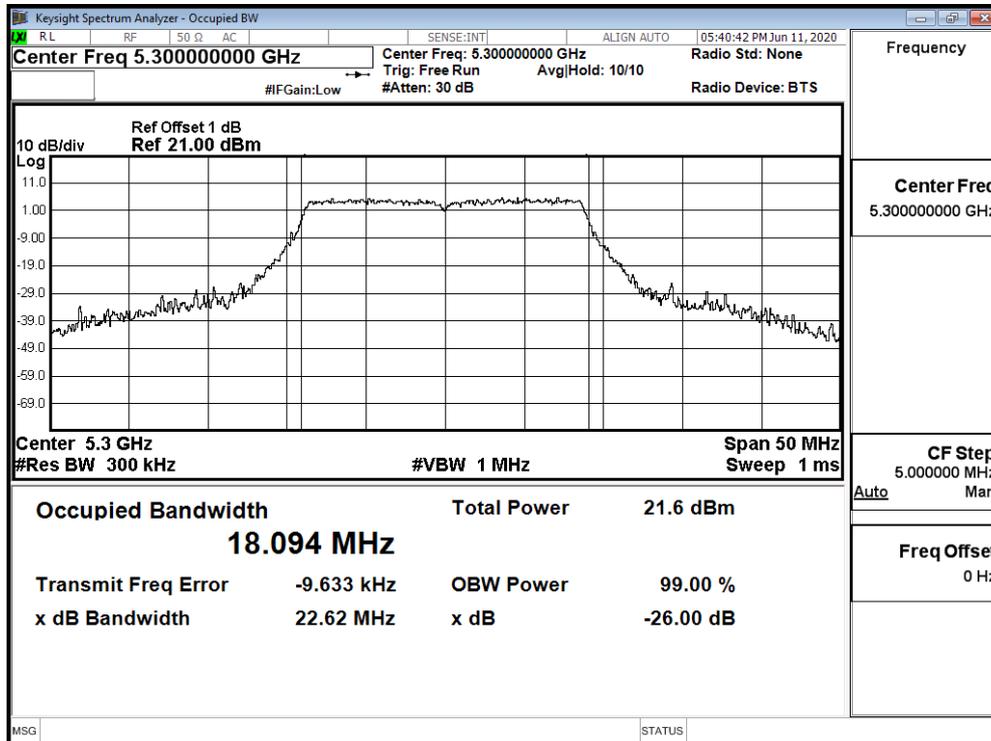
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit	
				(dBm)	dBm+10log(BW)
36	5180	--	16.74	24	--
44	5220	--	16.61	24	--
48	5240	--	16.95	24	--
52	5260	22.550	16.77	24	24.53
60	5300	22.620	16.69	24	24.54
64	5320	22.290	16.60	24	24.48
100	5500	22.440	16.66	24	24.51
116	5580	22.290	16.92	24	24.48
140	5700	22.740	10.47	24	24.57
144(Band3)	5720	16.050	15.70	24	23.05
144(Band4)	5720	--	10.26	30	--
149	5745	--	16.55	30	--
157	5785	--	16.99	30	--
165	5825	--	16.90	30	--

Note: Power Output Value =Reading value on average power meter + cable loss

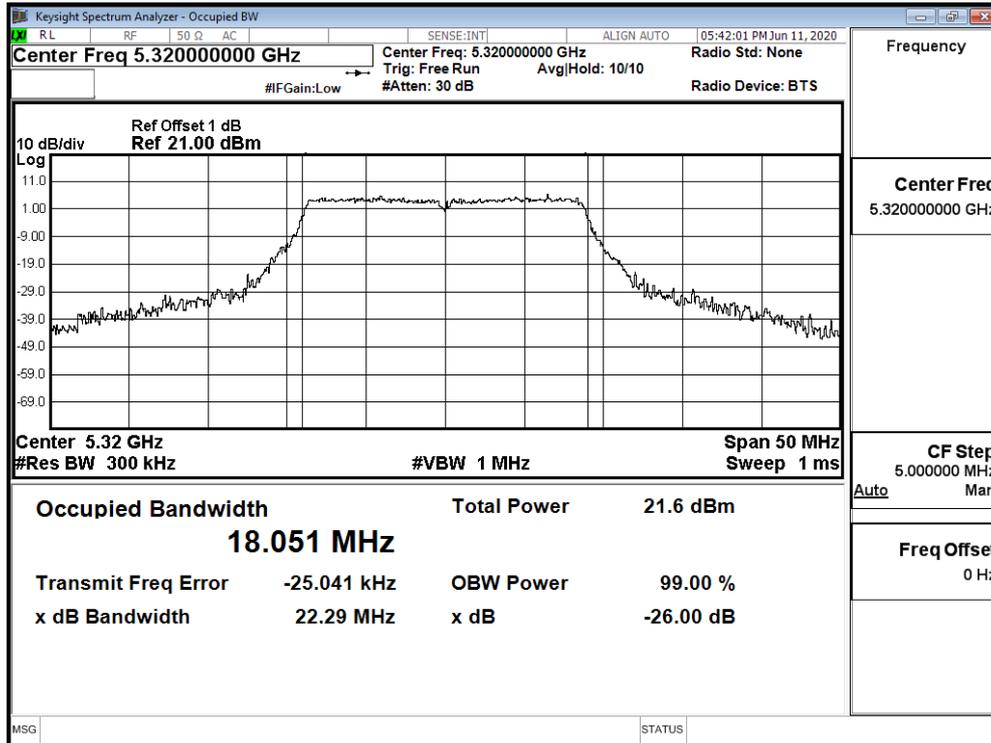
26dB Occupied Bandwidth: Channel 52



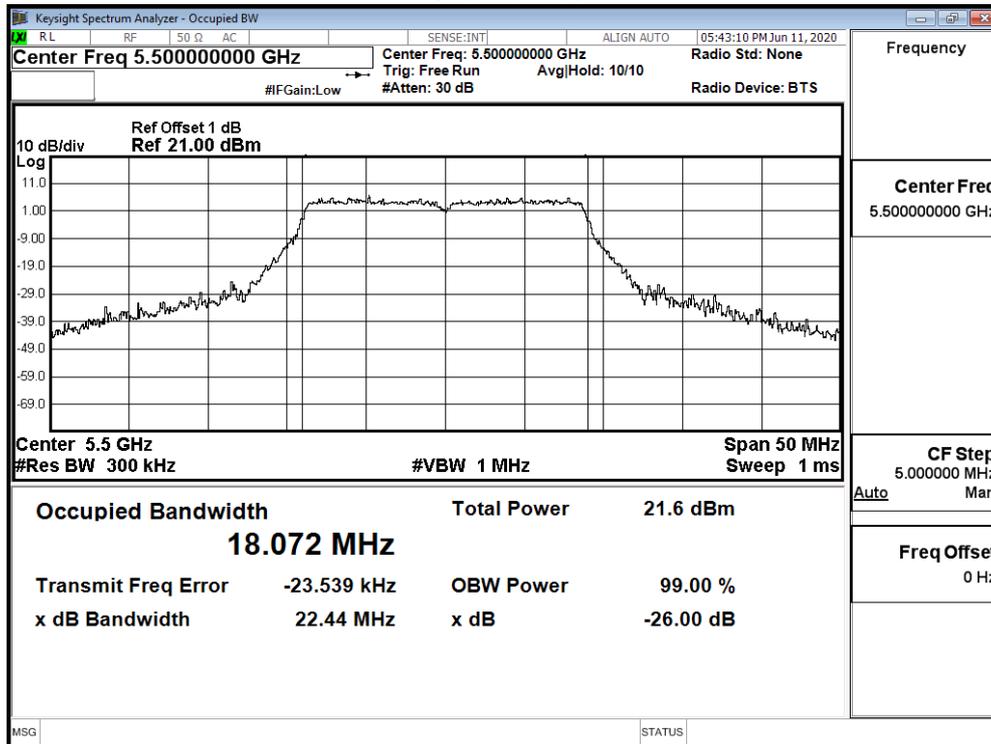
Channel 60



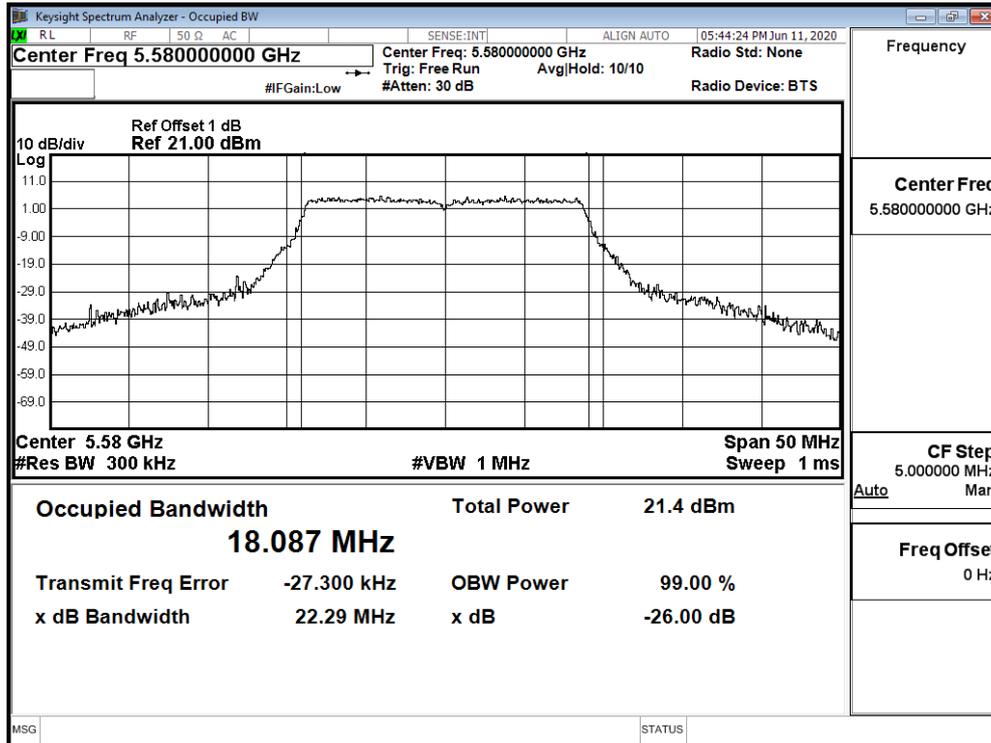
Channel 64



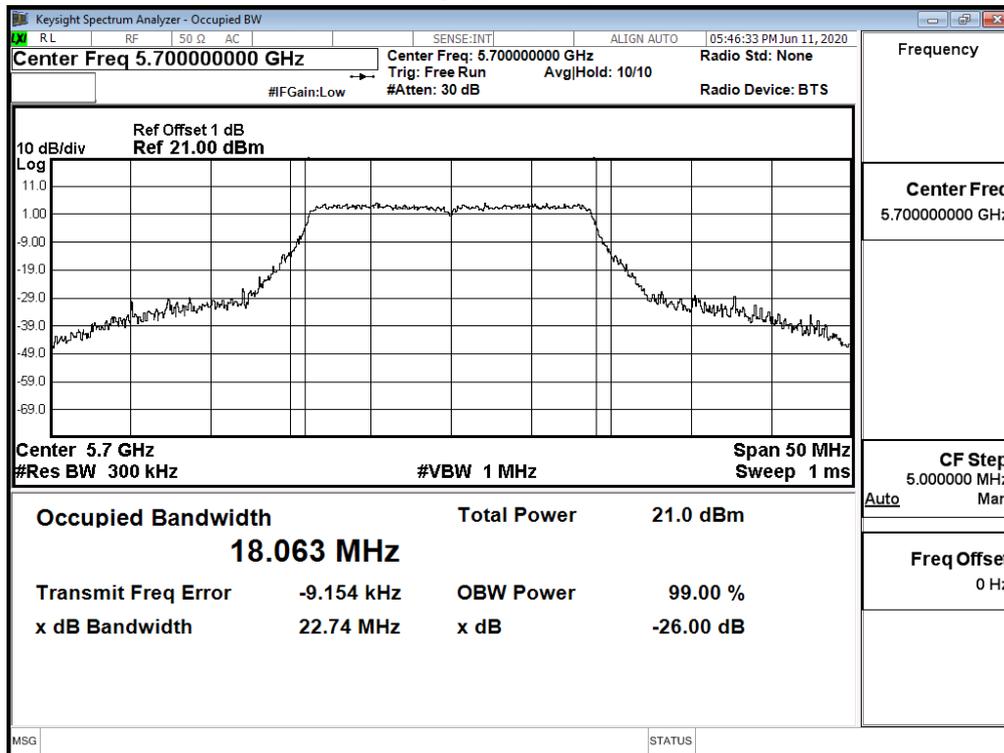
Channel 100



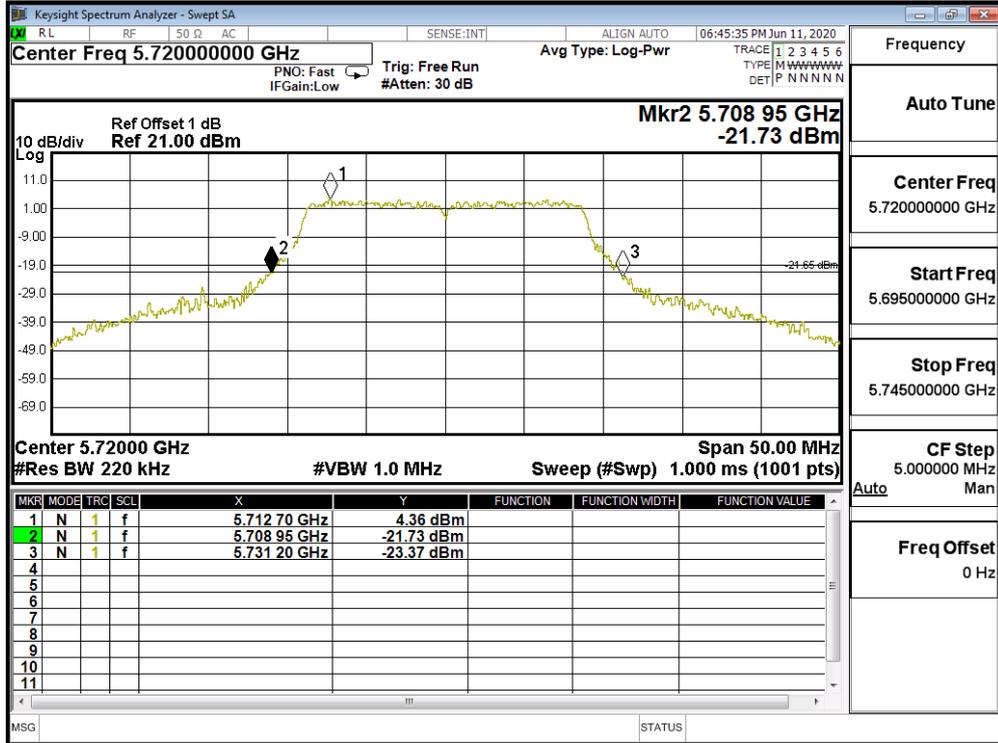
Channel 116



Channel 140

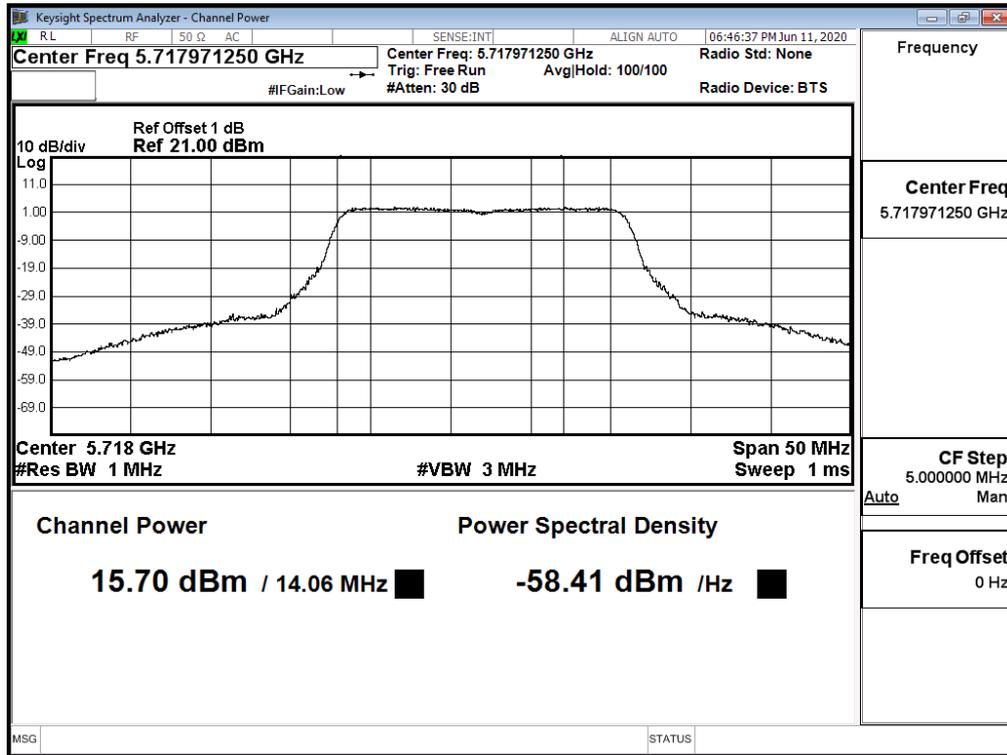


Channel 144

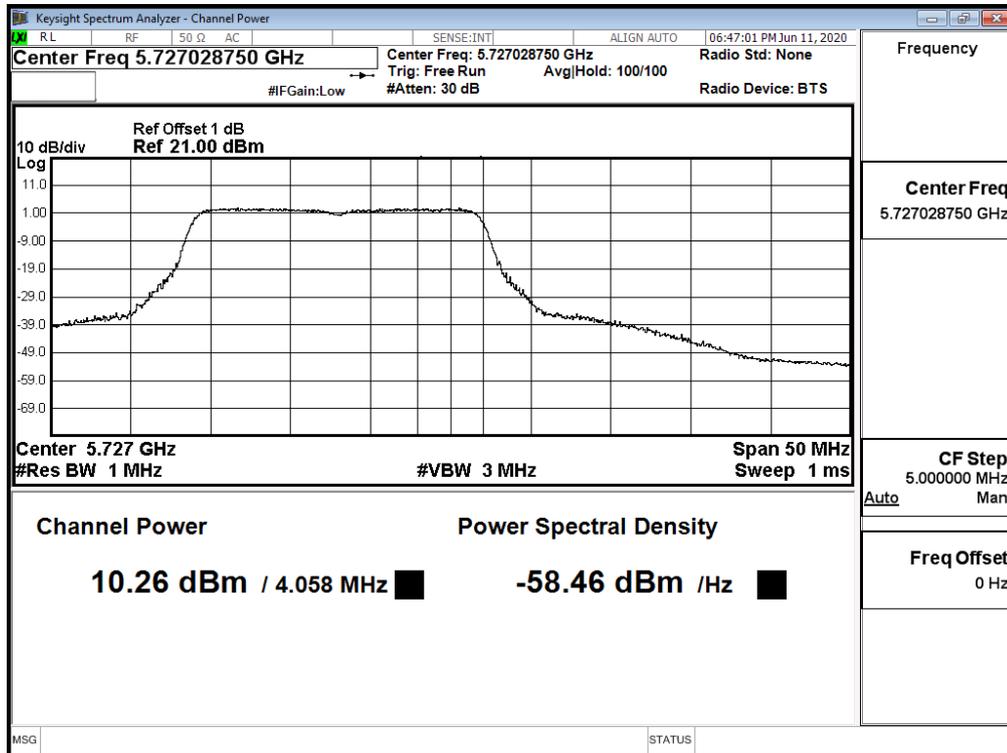


Maximum conducted output power:

Channel 144



Channel 144



Product : Mobile Computer
 Test Item : Maximum conducted output power
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps)
 Test Date : 2020/06/11

Cable loss=1dB		Maximum conducted output power							
Channel No.	Frequency (MHz)	Data Rate (Mbps)							
		15	30	45	60	90	120	135	150
		Measurement Level (dBm)							
38	5190	13.41	--	--	--	--	--	--	--
46	5230	16.95	16.93	16.92	16.91	16.87	16.82	16.73	16.71
54	5270	16.62	--	--	--	--	--	--	--
62	5310	13.55	13.53	13.45	13.45	13.36	13.33	13.26	13.19
102	5510	11.67	--	--	--	--	--	--	--
110	5550	16.91	16.90	16.83	16.74	16.69	16.61	16.53	16.43
134	5670	16.80	--	--	--	--	--	--	--
142F(Band3)	5710	16.48	16.41	16.32	16.28	16.28	16.26	16.25	16.19
142F(Band4)	5710	5.00	4.92	4.82	4.77	4.67	4.67	4.57	4.47
151	5755	16.76	--	--	--	--	--	--	--
159	5795	16.68	16.61	16.59	16.54	16.54	16.49	16.43	16.43

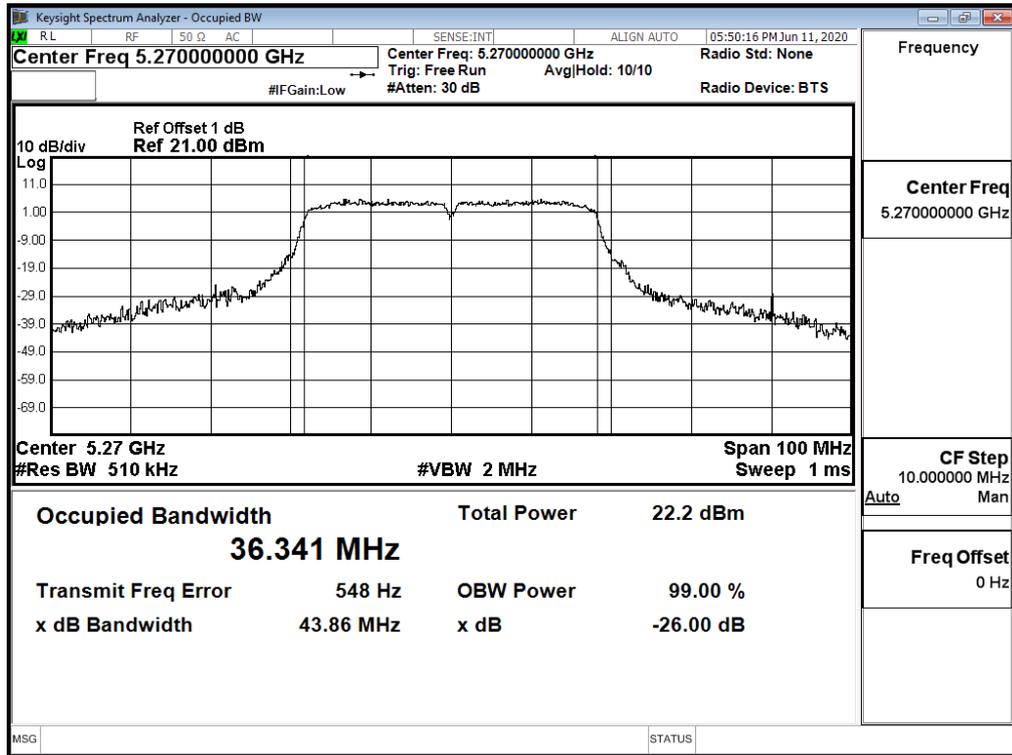
Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

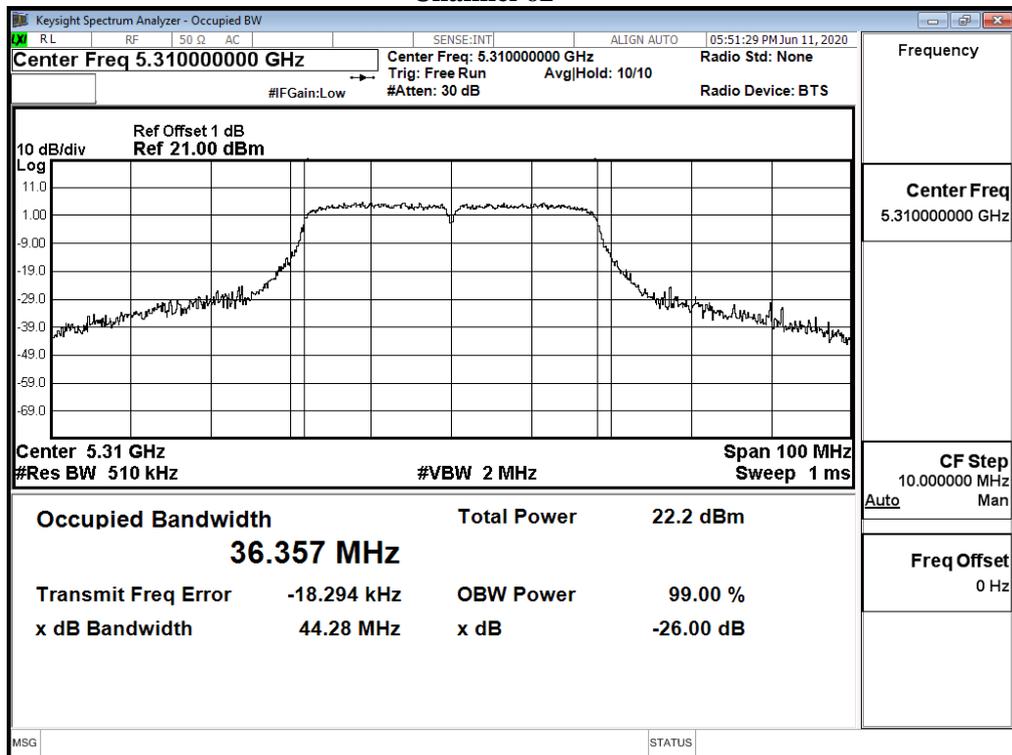
Channel No	Frequency Range (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Output Power Limit	
				(dBm)	dBm+10log(BW)
38	5190	--	13.41	24	--
46	5230	--	16.95	24	--
54	5270	43.860	16.62	24	27.42
62	5310	44.280	13.55	24	27.46
102	5510	43.710	11.67	24	27.41
110	5550	43.040	16.91	24	27.34
134	5670	43.900	16.80	24	27.42
142F(Band3)	5710	37.100	16.48	24	26.69
142F(Band4)	5710	--	5.00	30	--
151	5755	--	16.76	30	--
159	5795	--	16.68	30	--

Note: Power Output Value =Reading value on average power meter + cable loss

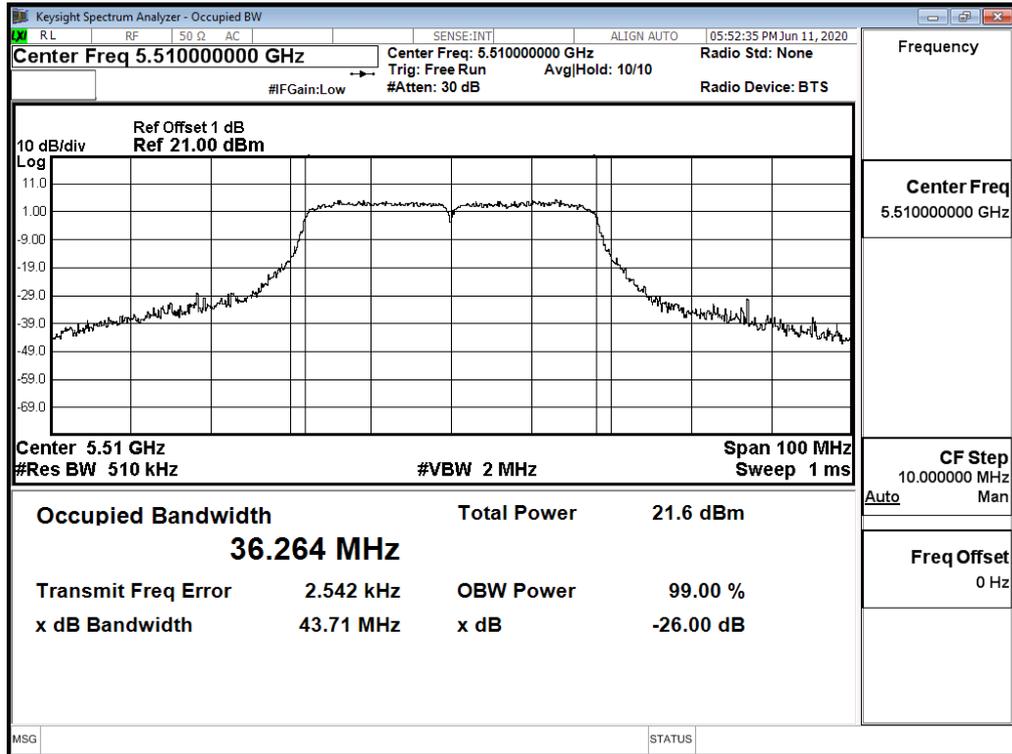
26dB Occupied Bandwidth: Channel 54



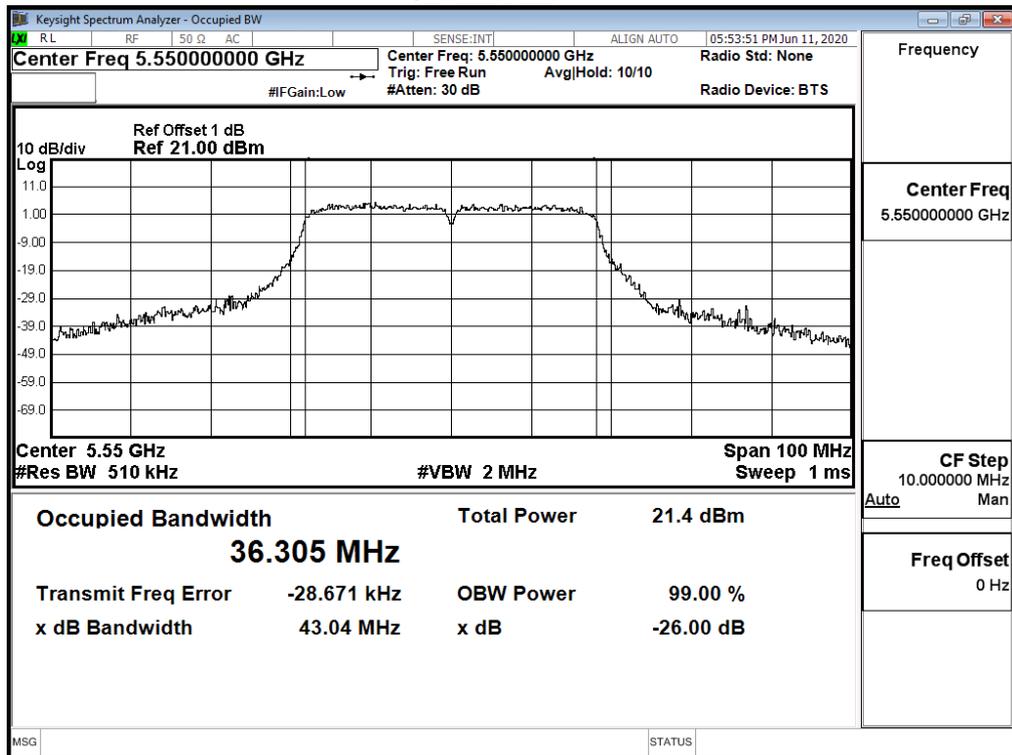
Channel 62



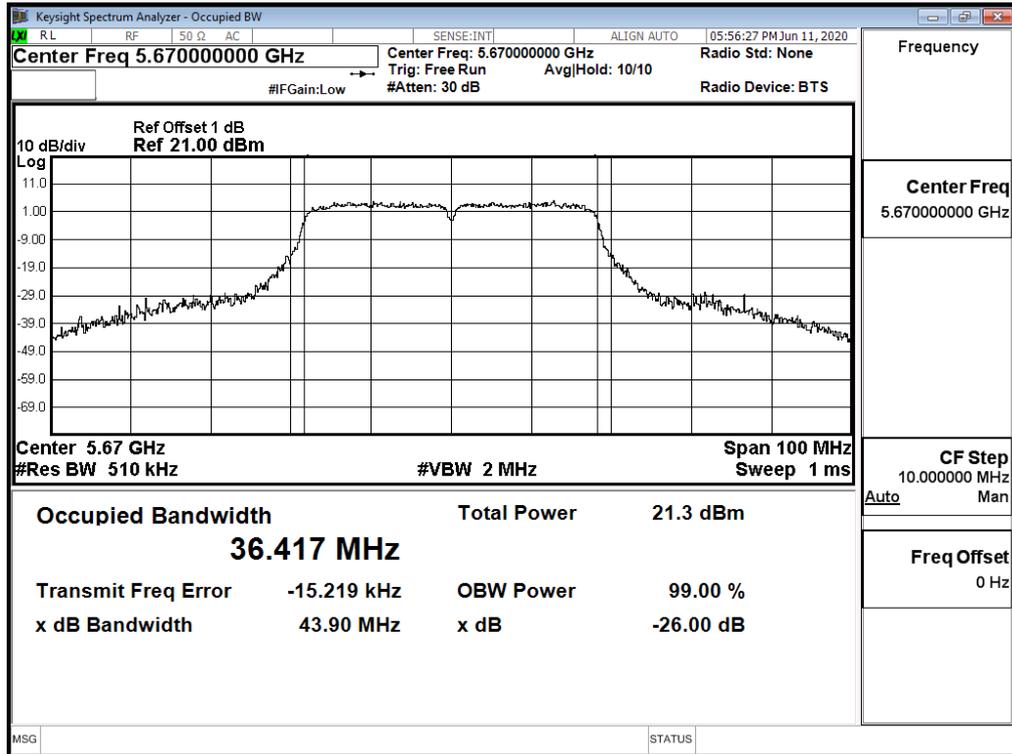
Channel 102



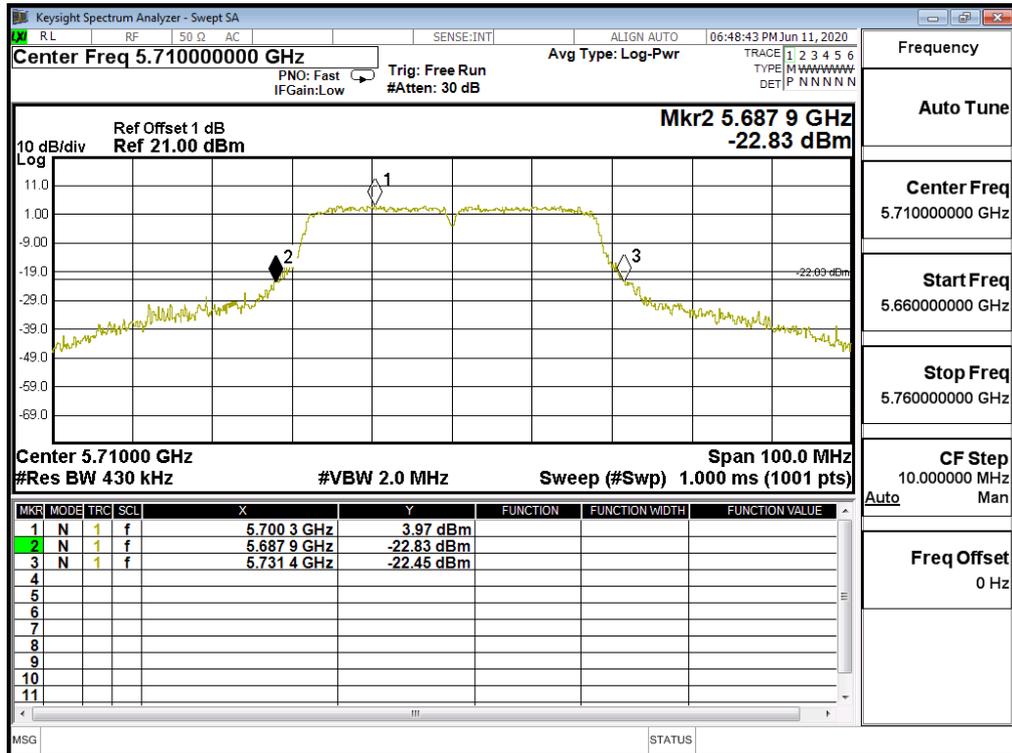
Channel 110



Channel 134

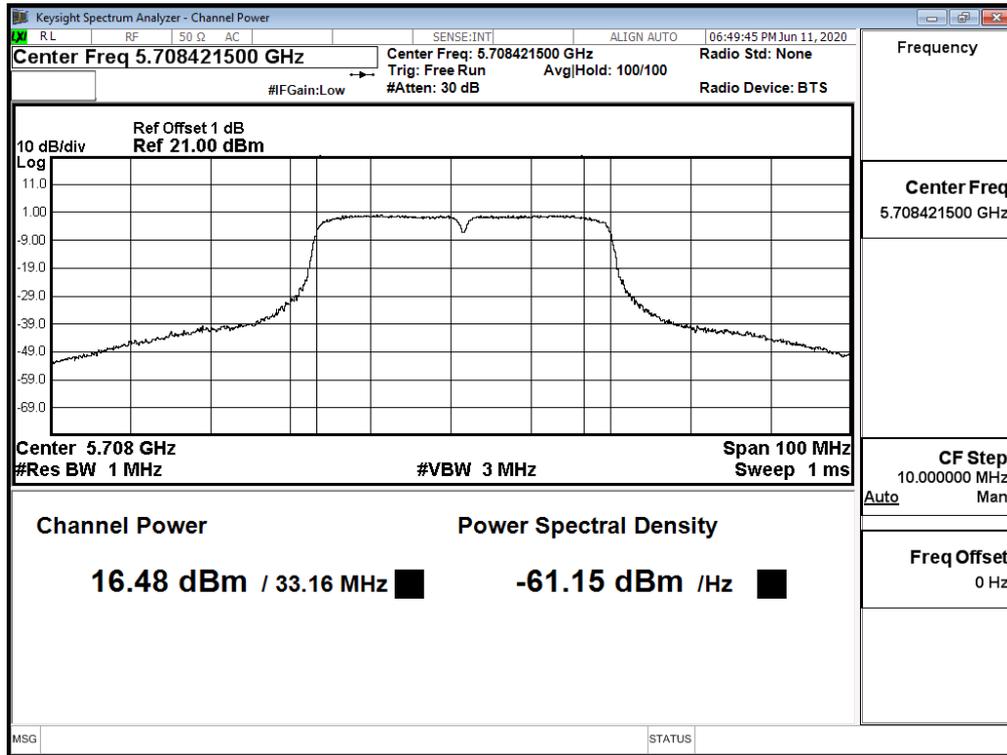


Channel 142

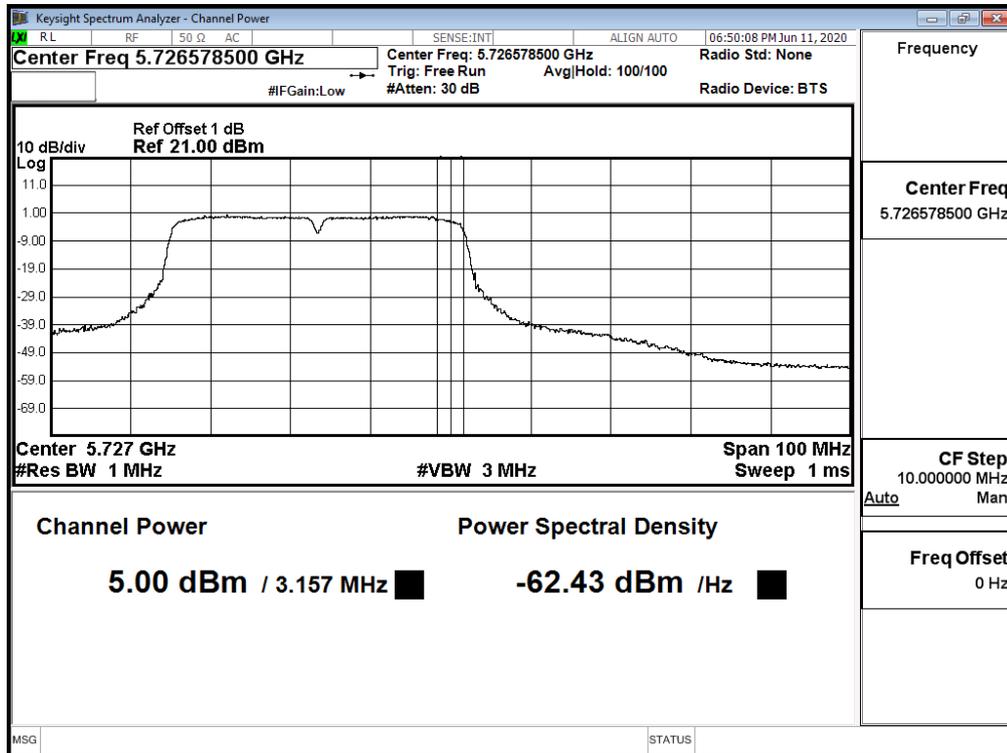


Maximum conducted output power:

Channel 142



Channel 142



Product : Mobile Computer
 Test Item : Maximum conducted output power
 Test Mode : Mode 4: Transmit (802.11ac-80BW 32.5Mbps)
 Test Date : 2020/06/11

Cable loss=1dB		Maximum conducted output power									
Channel No	Frequency (MHz)	Data Rate (Mbps)									
		VTH0	VTH1	VTH2	VTH3	VTH4	VTH5	VTH6	VTH7	VTH8	VTH9
42	5210	12.60	12.51	12.46	12.46	12.39	12.34	12.27	12.18	12.14	12.11
58	5290	14.51	14.45	14.38	14.30	14.28	14.27	14.23	14.20	14.20	14.13
106	5530	11.83	11.80	11.73	11.73	11.70	11.66	11.56	11.56	11.46	11.42
122	5610	14.73	14.70	14.65	14.63	14.59	14.53	14.50	14.45	14.37	14.35
138(Band3)	5690	14.63	14.55	14.51	14.50	14.43	14.41	14.39	14.37	14.36	14.26
138(Band4)	5690	-3.48	-3.53	-3.62	-3.66	-3.67	-3.70	-3.72	-3.72	-3.78	-3.87
155	5775	14.62	14.61	14.52	14.44	14.40	14.30	14.24	14.18	14.13	14.10

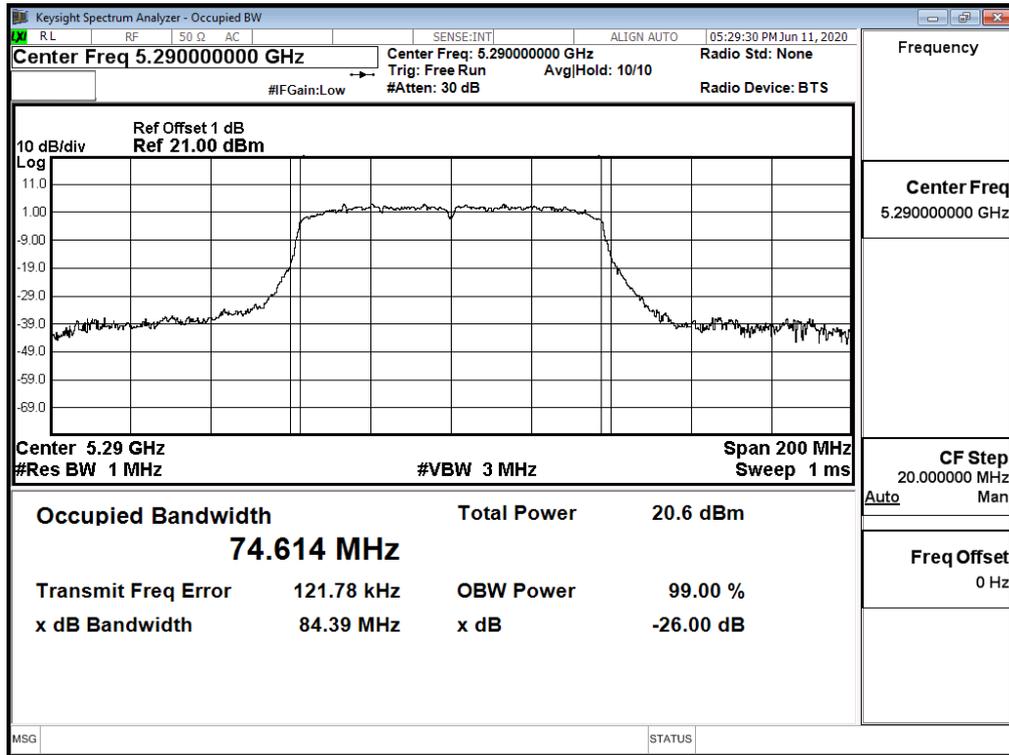
Note: Maximum conducted output power Value =Reading value on Spectrum Analyzer + cable loss

Maximum conducted output power Measurement

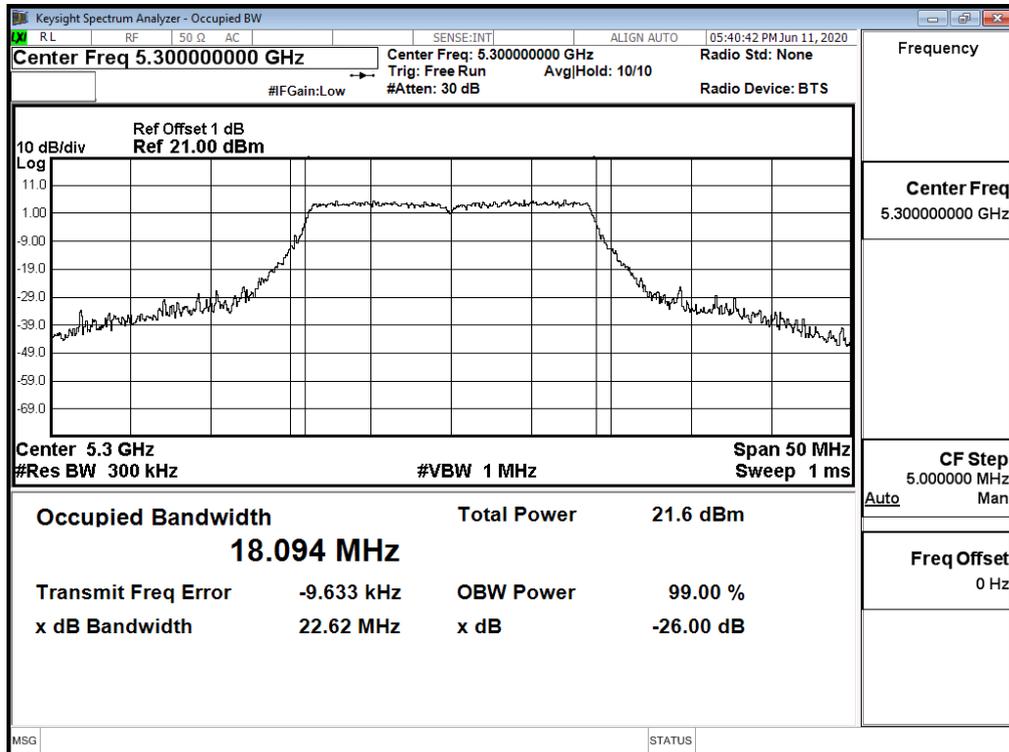
Channel No	Frequency Range	26dB Bandwidth	Output Power	Output Power Limit		Result
	(MHz)	(MHz)	(dBm)	(dBm)	dBm+10log(BW)	
42	5210	--	12.60	24	--	Pass
58	5290	84.390	14.51	24	30.26	Pass
106	5530	84.690	11.83	24	30.28	Pass
122	5610	84.290	14.73	24	30.26	Pass
138(Band3)	5690	76.600	14.63	24	29.84	Pass
138(Band4)	5690	--	-3.48	30	--	Pass
155	5775	--	14.62	30	--	Pass

Note: Power Output Value = Reading value on Spectrum Analyzer + cable loss

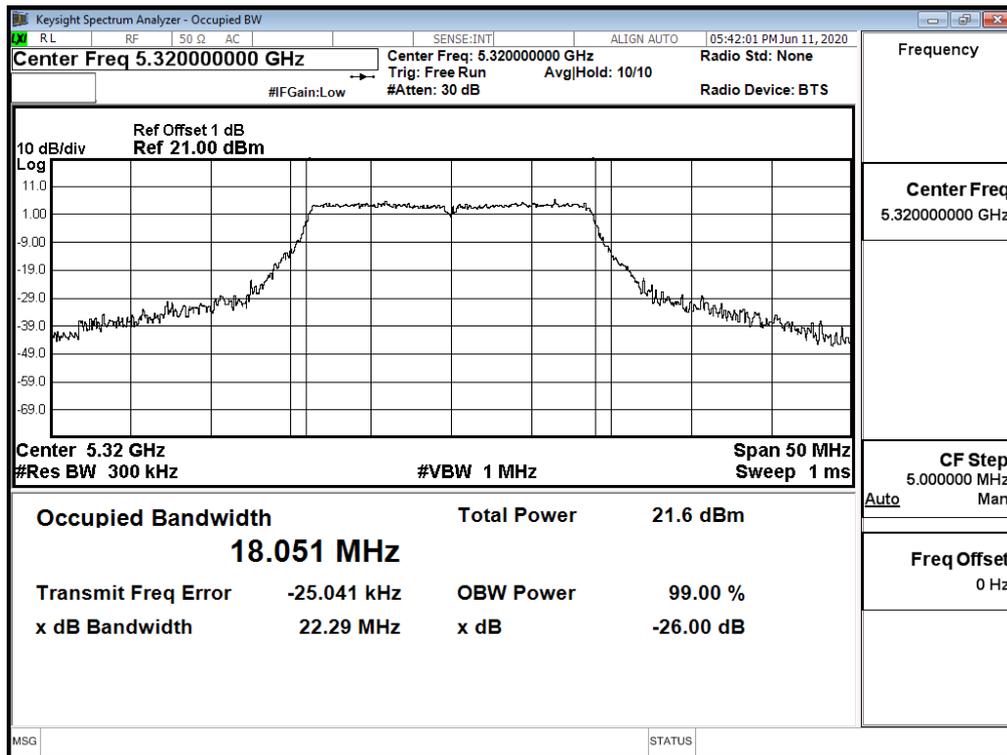
26dB Occupied Bandwidth: Channel 58



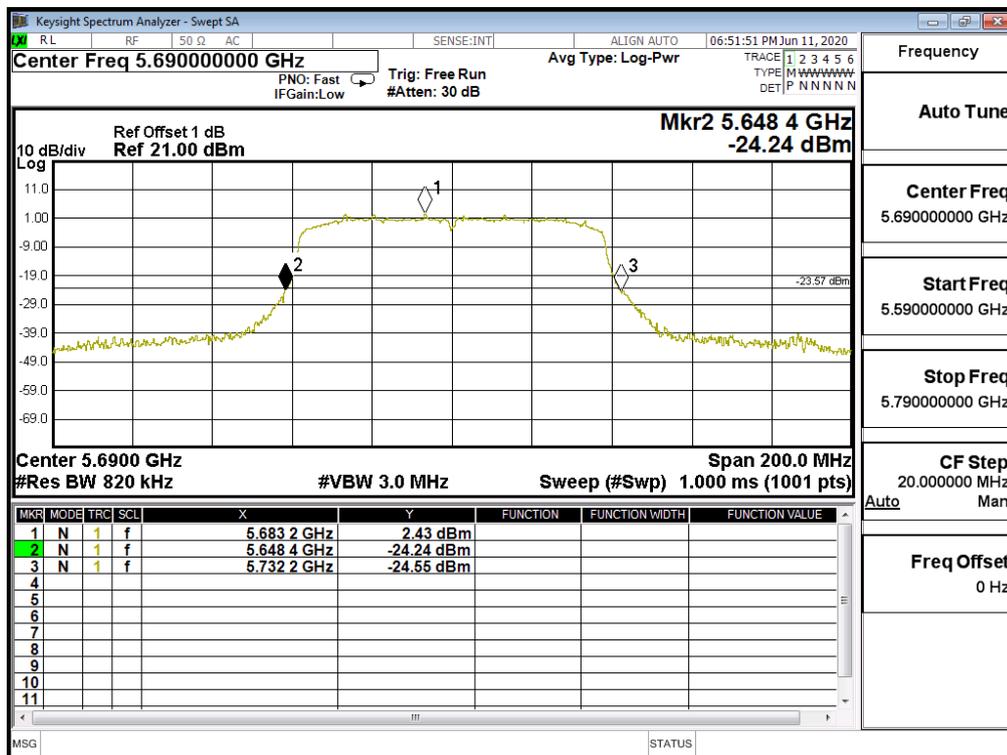
Channel 106



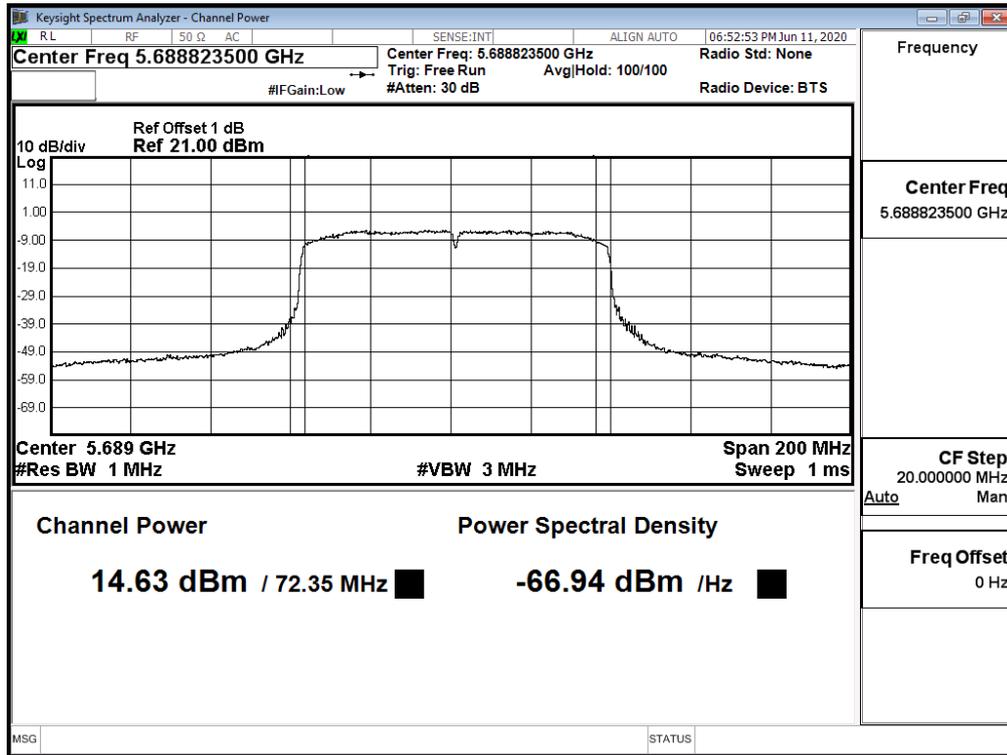
Channel 122



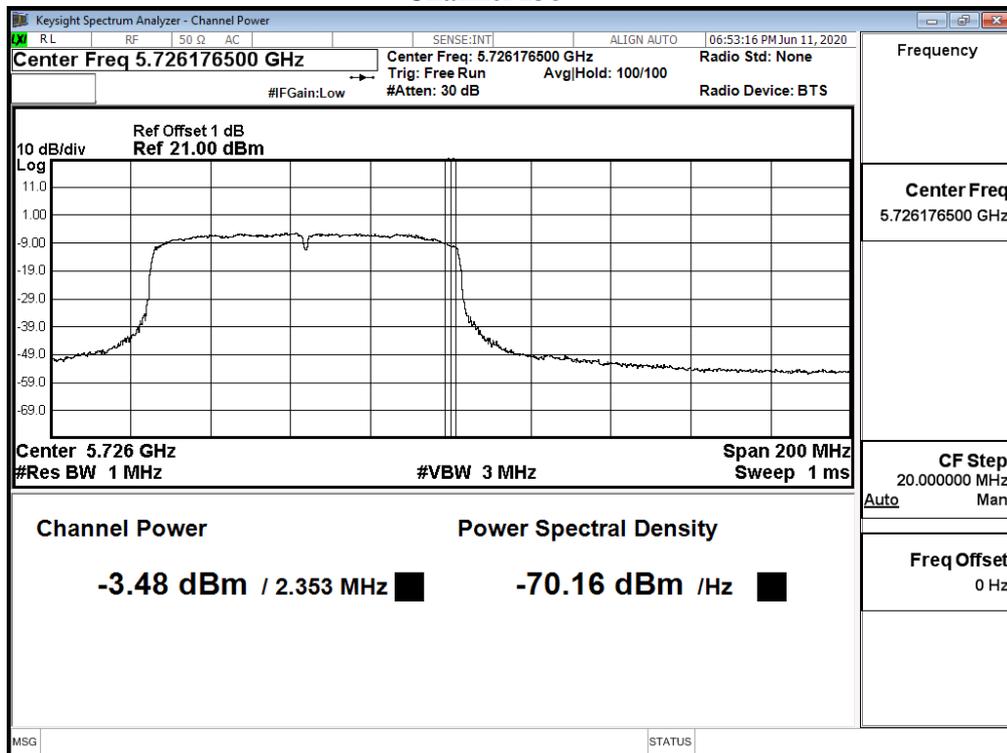
Channel 138



**Maximum conducted output power:
Channel 138**

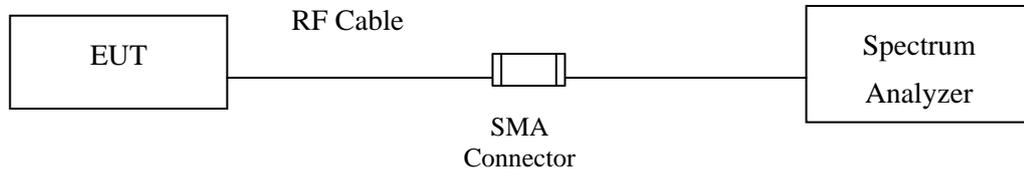


Channel 138



4. Peak Power Spectral Density

4.1. Test Setup



4.2. Limits

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 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, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, 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, 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. 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 mobile and portable 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, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.+

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, 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, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, 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, 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 UNII 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.

4.3. Test Procedure

The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

The Peak Power Spectral Density using KDB 789033 section F) procedure, Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer.

SA-1 method is selected to run the test.

For the band 5.725-5.85 GHz, Scale the observed power level to an equivalent value in 500 kHz by adjusting (increase) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500\text{ kHz}/100\text{ kHz}) = 6.98\text{ dB}$.

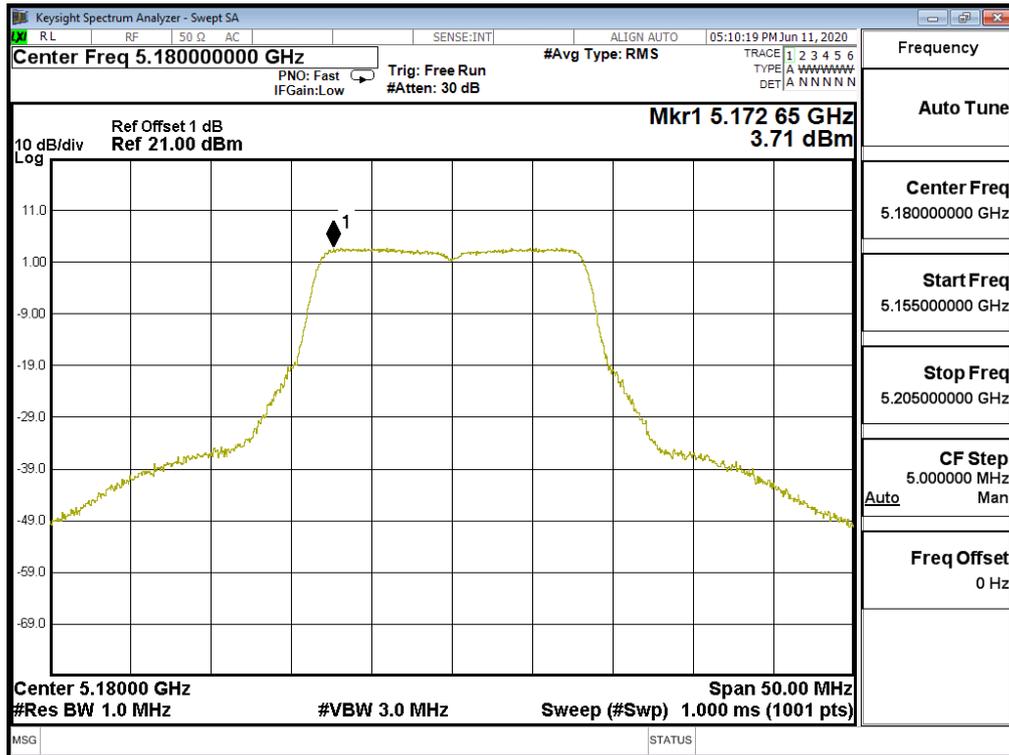
4.4. Test Result of Peak Power Spectral Density

Product : Mobile Computer
 Test Item : Peak Power Spectral Density
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)
 Test Date : 2020/06/11

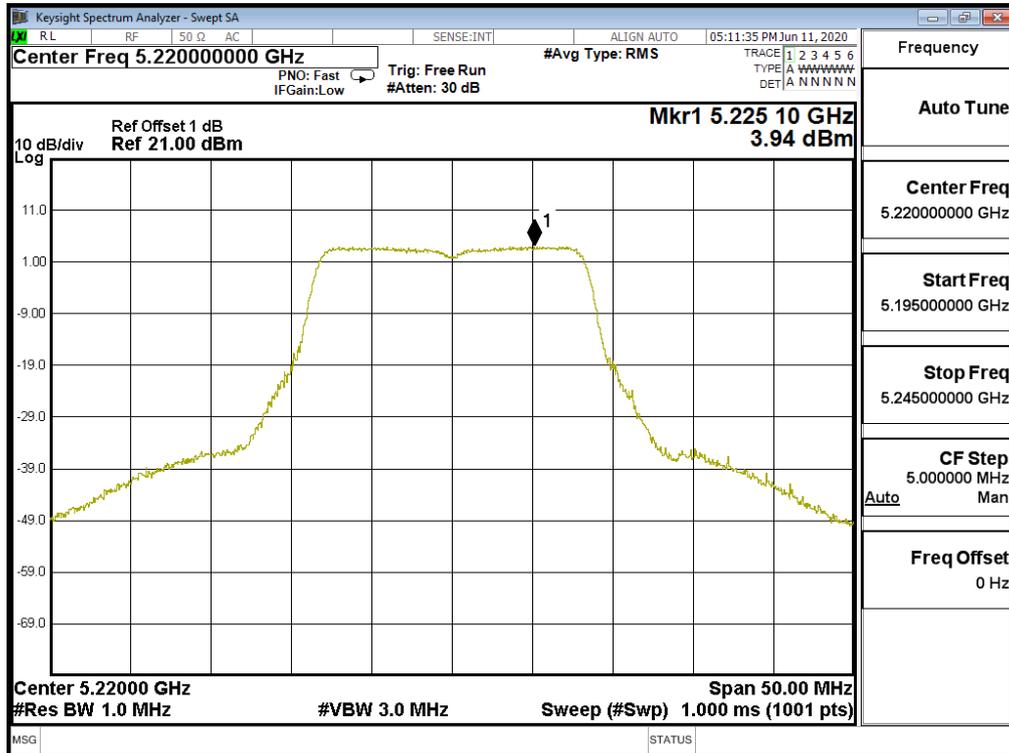
Channel Number	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dBm)	Required Limit (dBm)	Result
36	5180	6	3.71	<11	Pass
44	5220	6	3.94	<11	Pass
48	5240	6	4.14	<11	Pass
52	5260	6	3.98	<11	Pass
60	5300	6	4.41	<11	Pass
64	5320	6	4.59	<11	Pass
100	5500	6	3.96	<11	Pass
116	5580	6	3.63	<11	Pass
140	5700	6	3.30	<11	Pass

Channel Number	Frequency (MHz)	Data Rate (Mbps)	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm)	Required Limit (dBm)	Result
149	5745	6	-5.34	6.99	1.65	<30	Pass
157	5785	6	-5.37	6.99	1.62	<30	Pass
165	5825	6	-5.28	6.99	1.71	<30	Pass

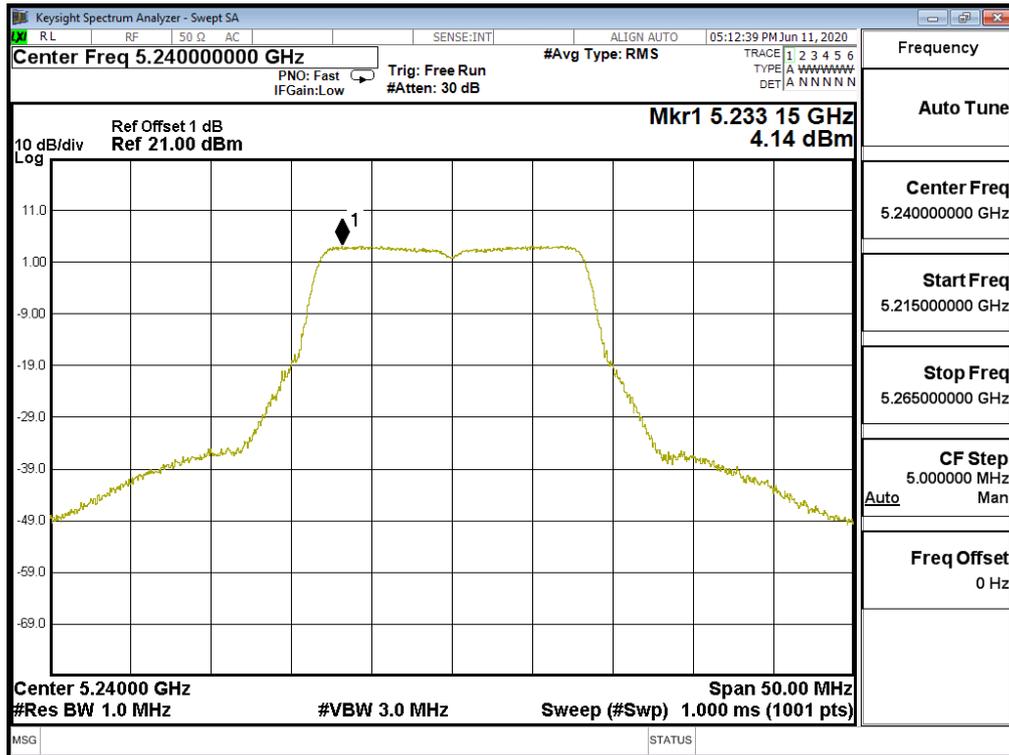
Channel 36:



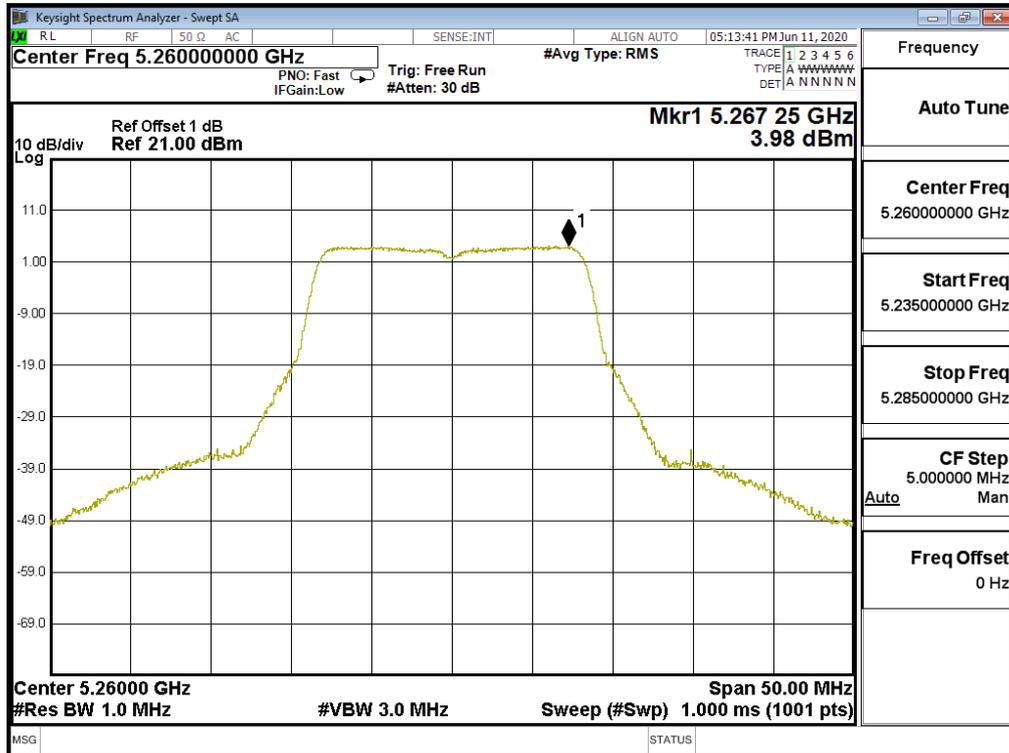
Channel 44:



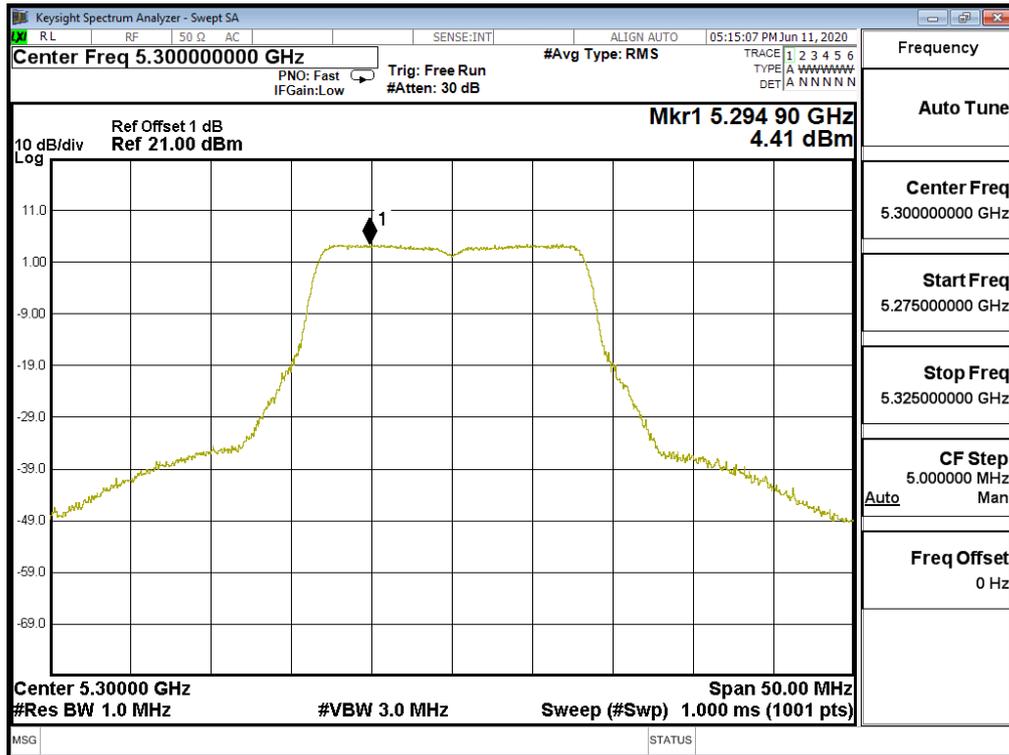
Channel 48:



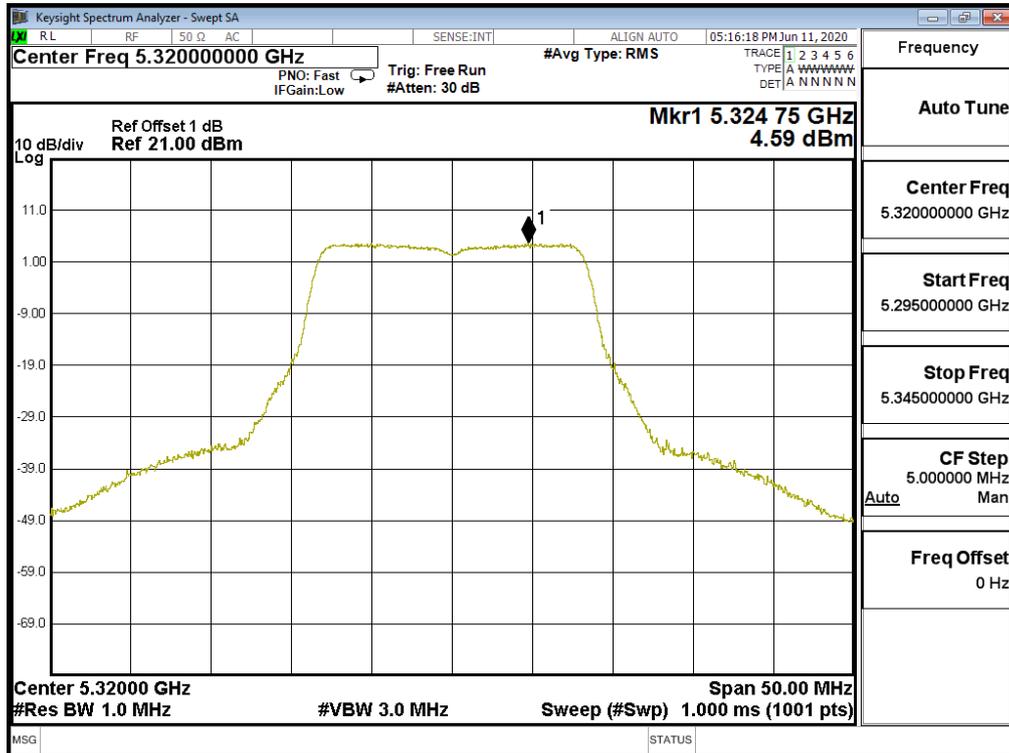
Channel 52:



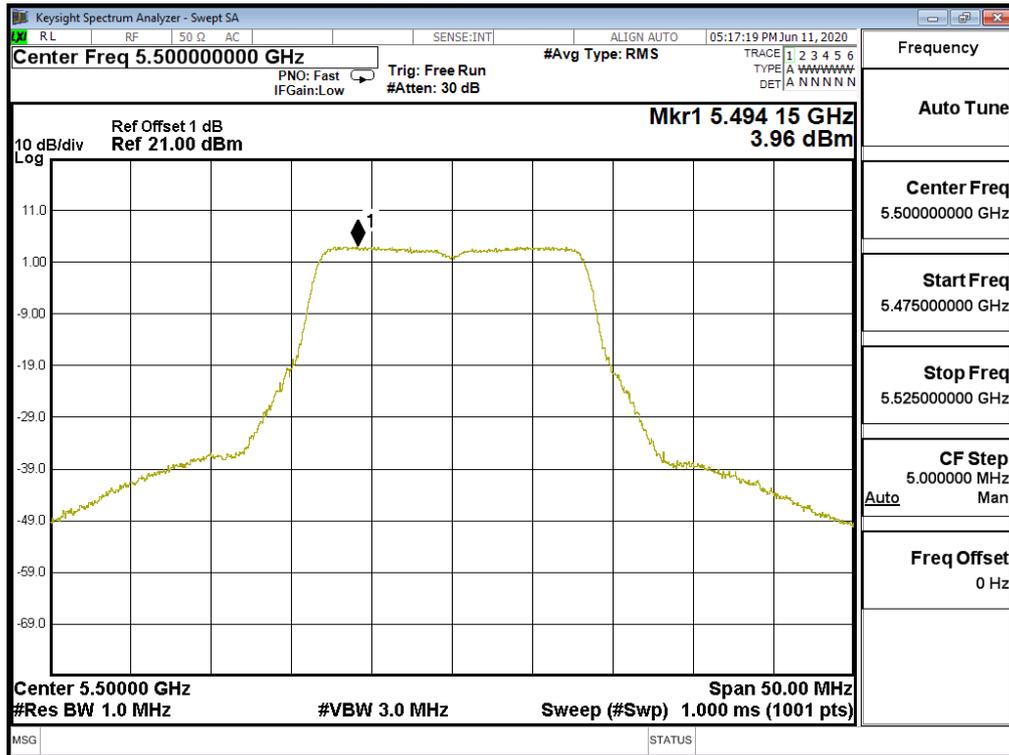
Channel 60:



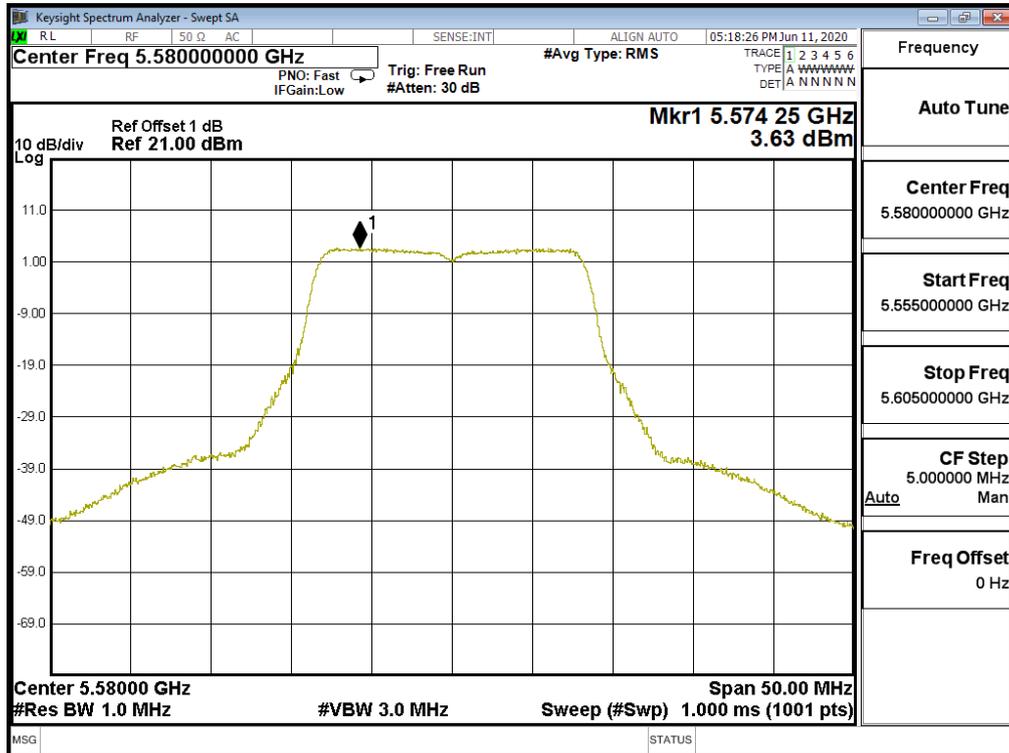
Channel 64:



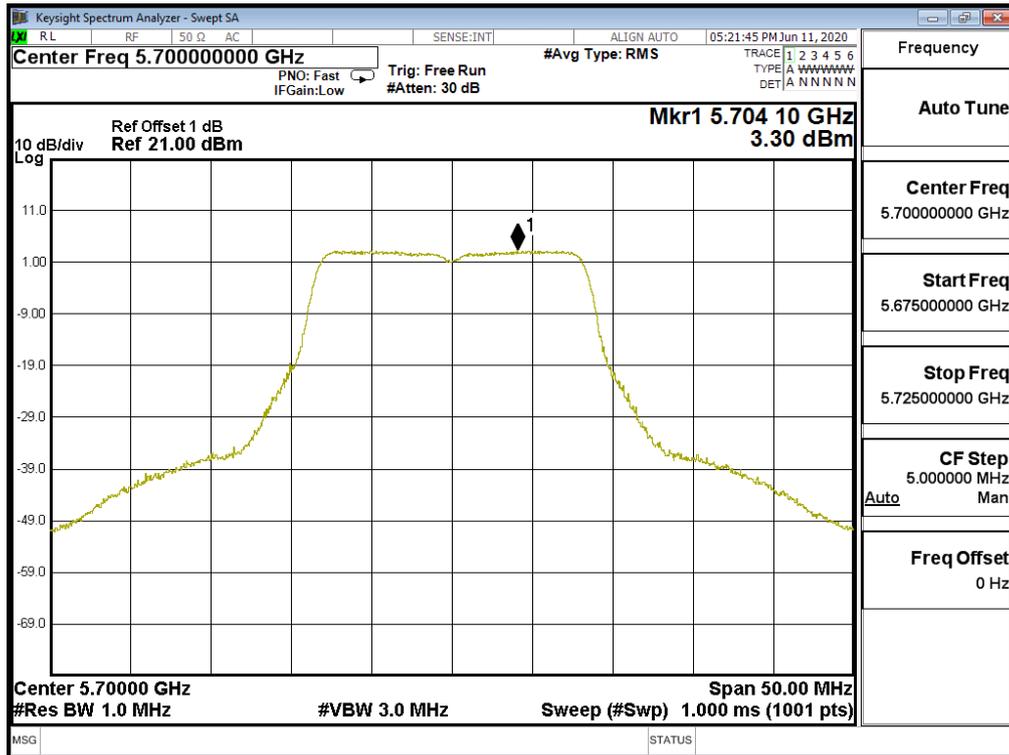
Channel 100:



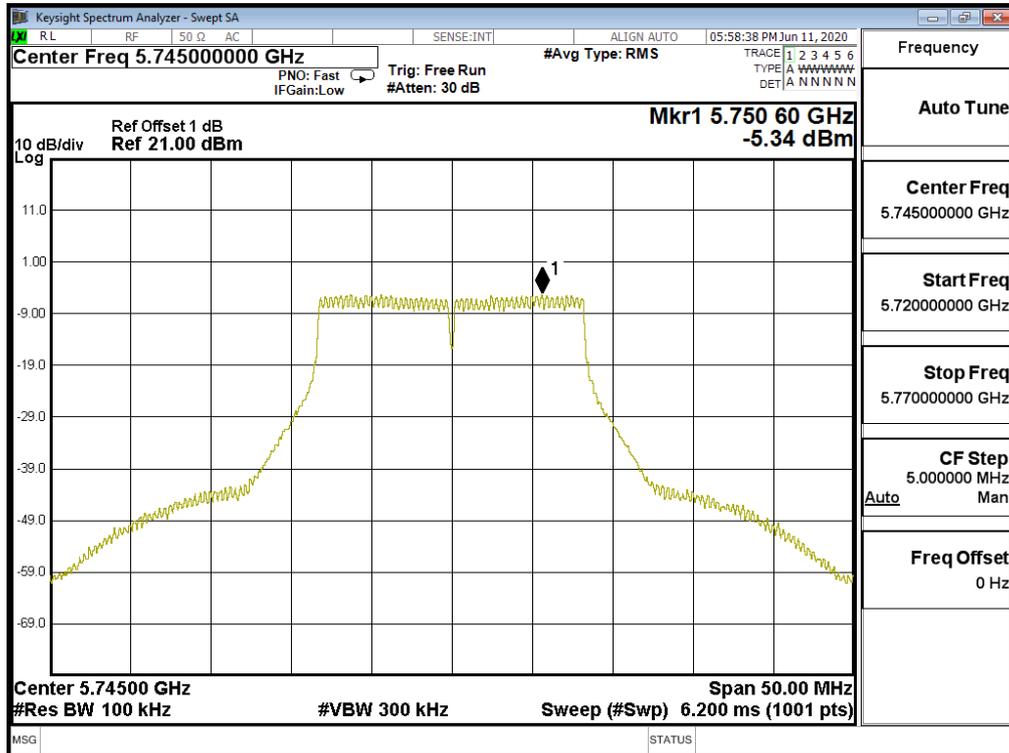
Channel 116:



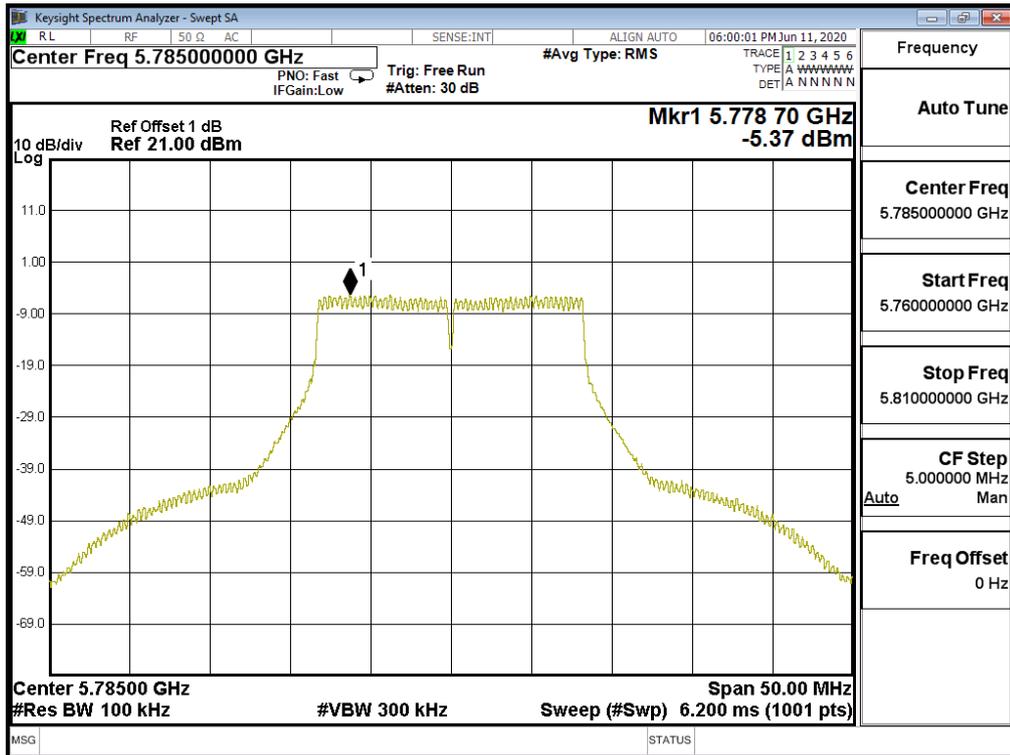
Channel 140:



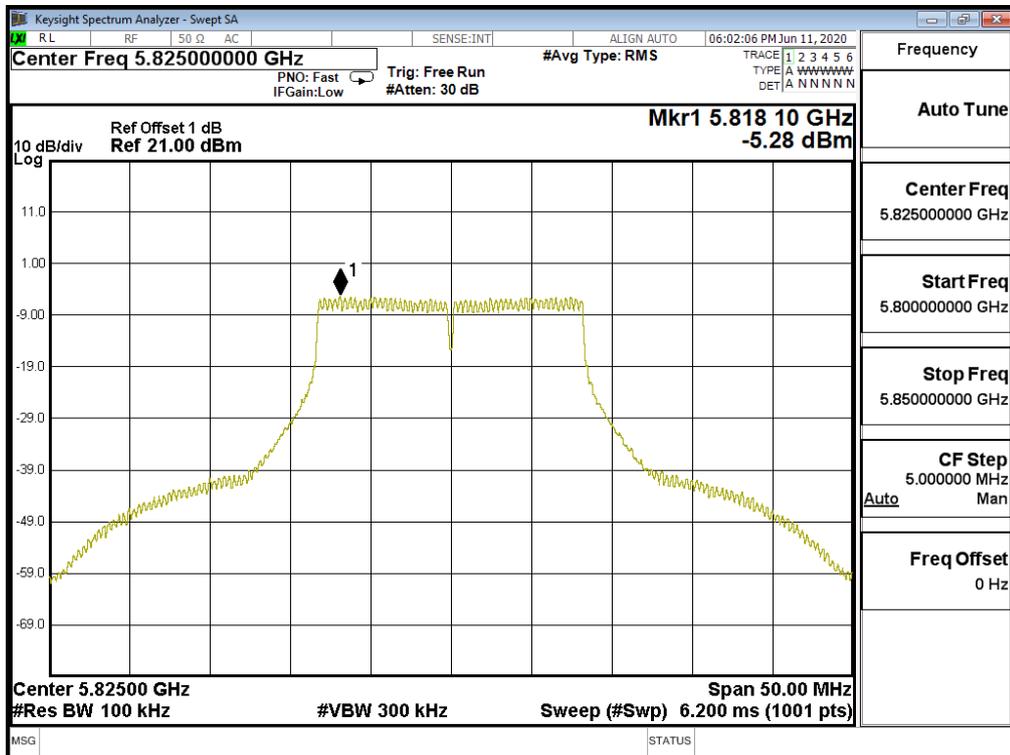
Channel 149



Channel 157



Channel 165

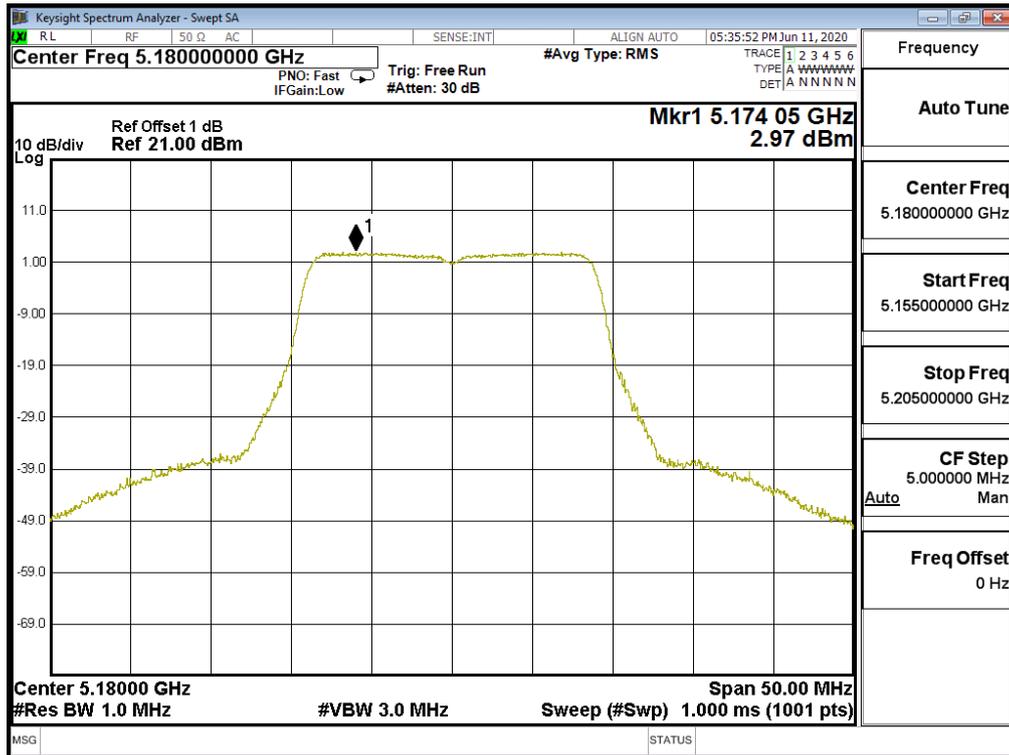


Product : Mobile Computer
 Test Item : Peak Power Spectral Density
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps)
 Test Date : 2020/06/29

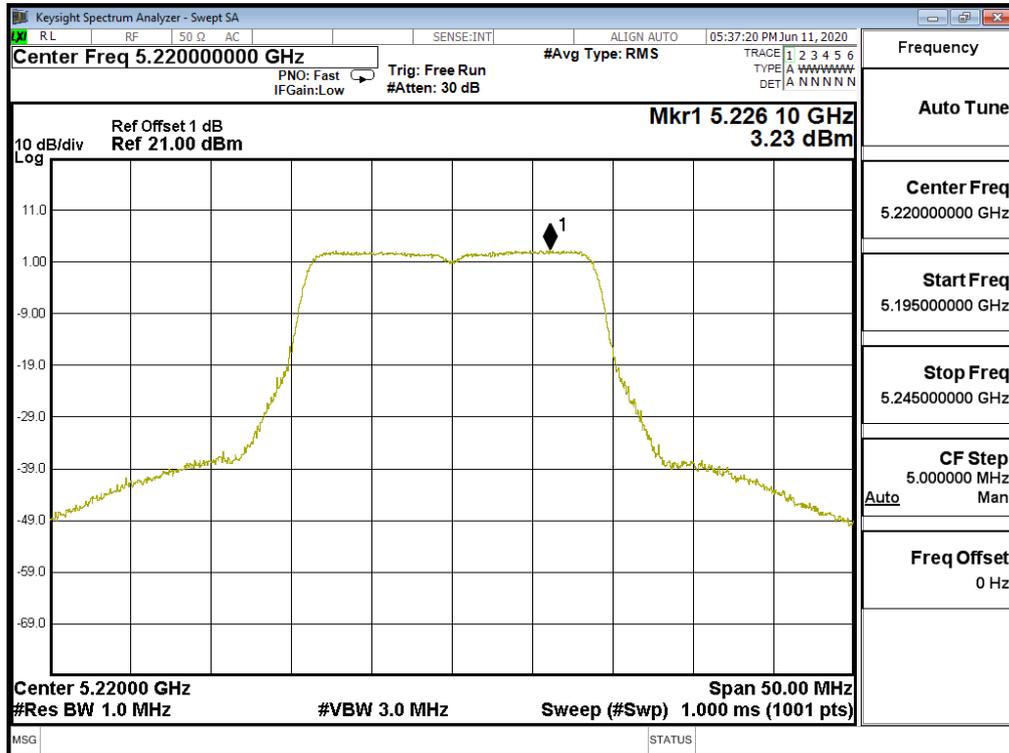
Channel Number	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dBm)	Required Limit (dBm)	Result
36	5180	7.2	2.97	11	Pass
44	5220	7.2	3.23	11	Pass
48	5240	7.2	3.24	11	Pass
52	5260	7.2	3.25	11	Pass
60	5300	7.2	2.94	11	Pass
64	5320	7.2	3.05	11	Pass
100	5500	7.2	3.06	11	Pass
116	5580	7.2	2.92	11	Pass
140	5700	7.2	2.55	11	Pass
144(Band3)	5720	7.2	2.57	11	Pass

Channel Number	Frequency (MHz)	Data Rate (Mbps)	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm)	Required Limit (dBm)	Result
144(Band4)	5720	7.2	-6.70	6.99	0.29	<30	Pass
149	5745	7.2	-6.44	6.99	0.55	<30	Pass
157	5785	7.2	-6.17	6.99	0.82	<30	Pass
165	5825	7.2	-6.29	6.99	0.70	<30	Pass

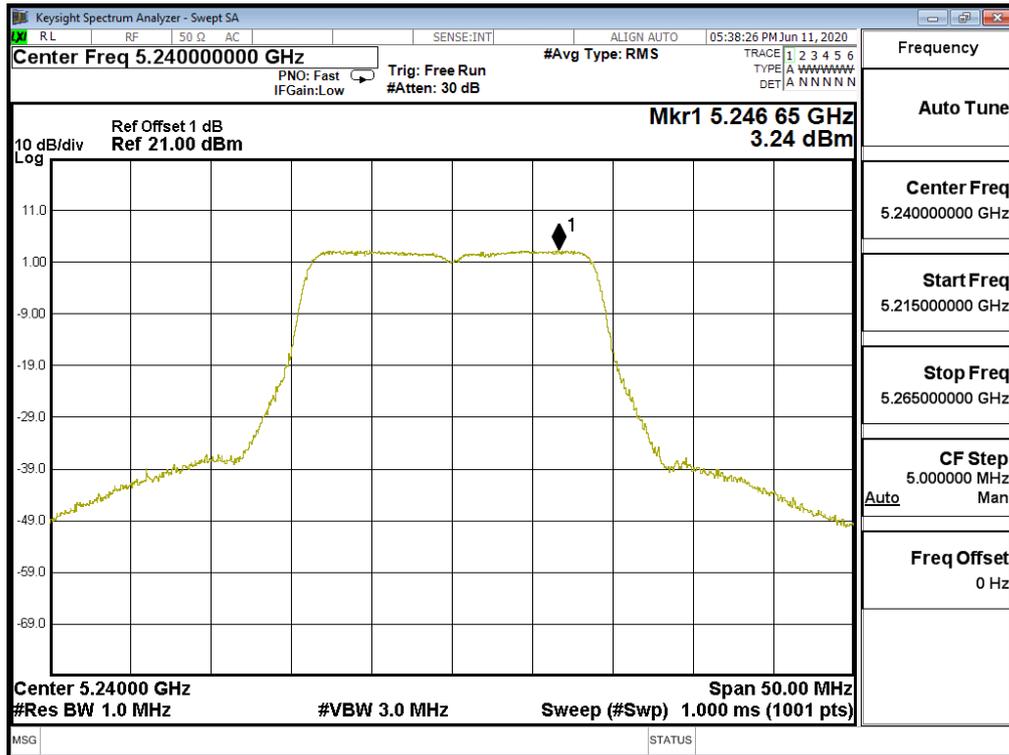
Channel 36:



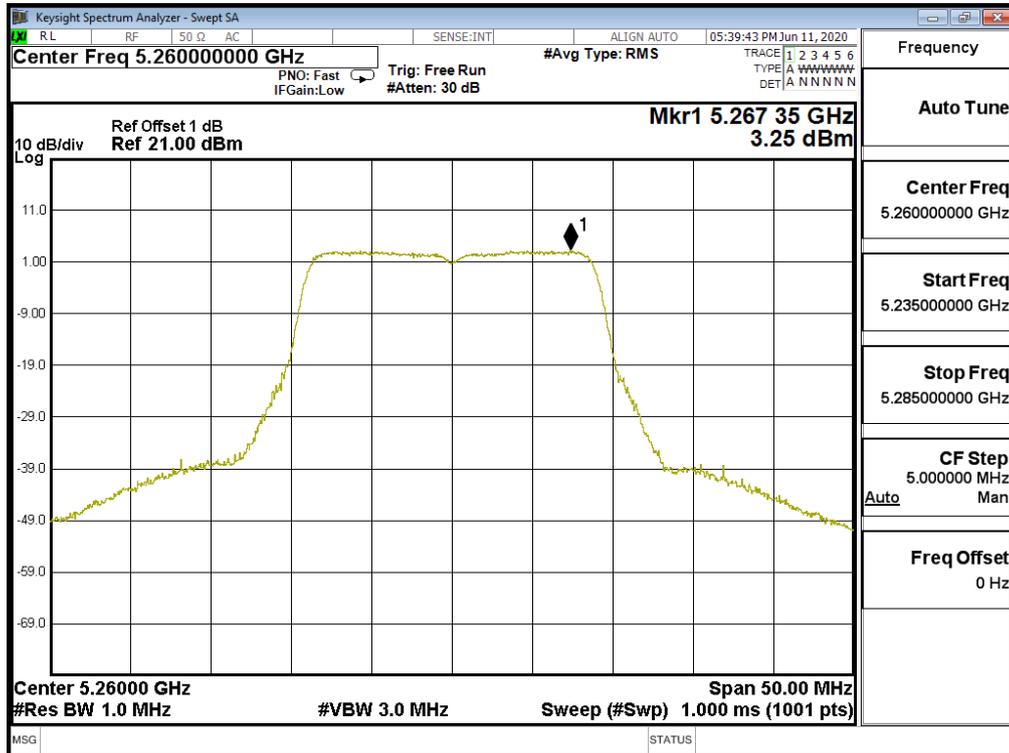
Channel 44:



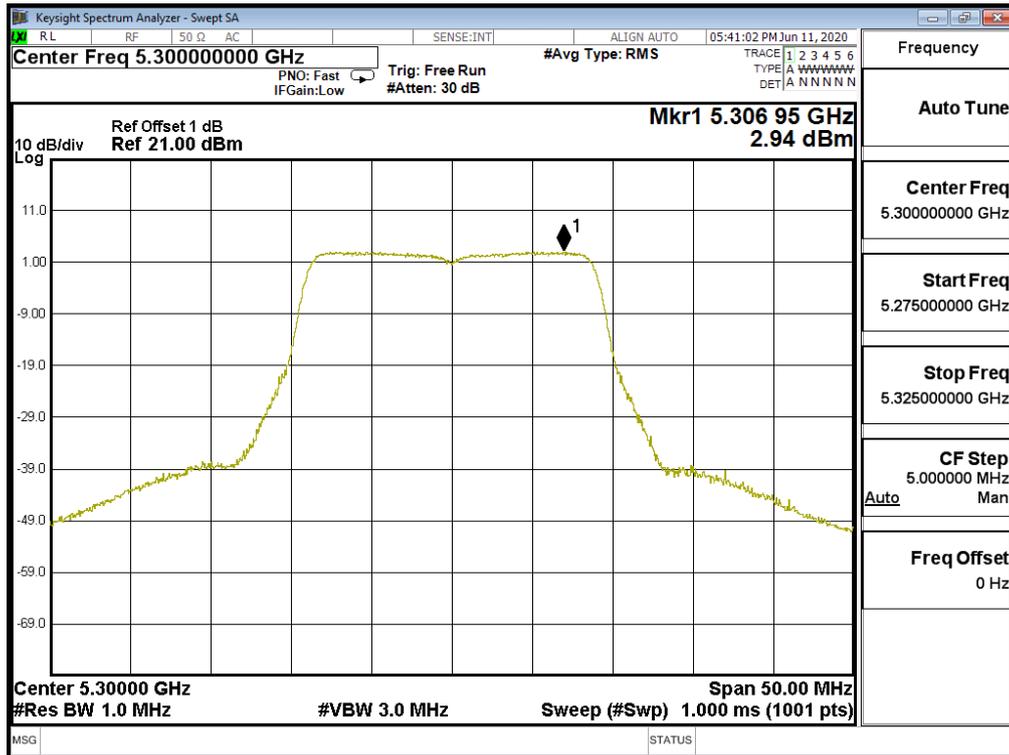
Channel 48:



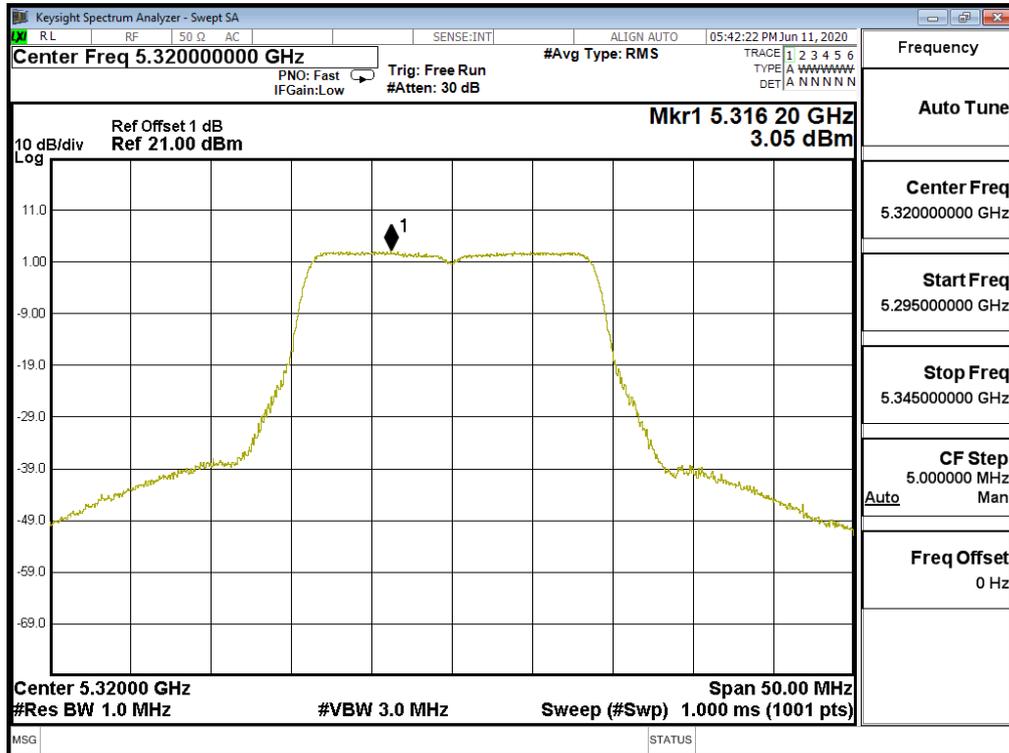
Channel 52:



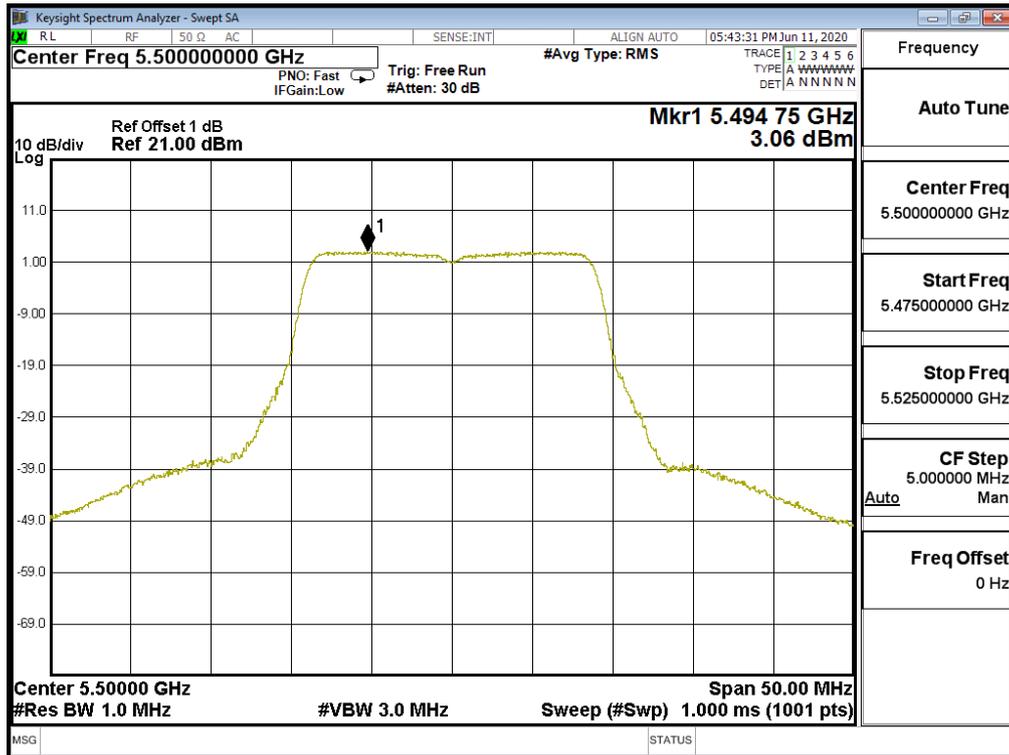
Channel 60:



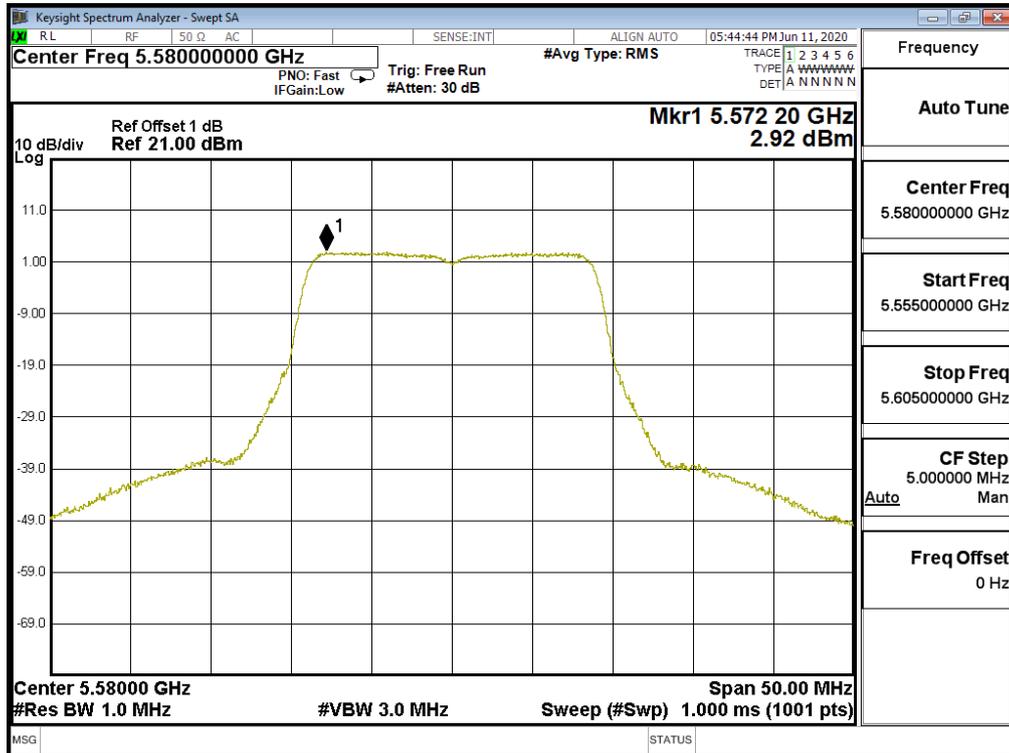
Channel 64:



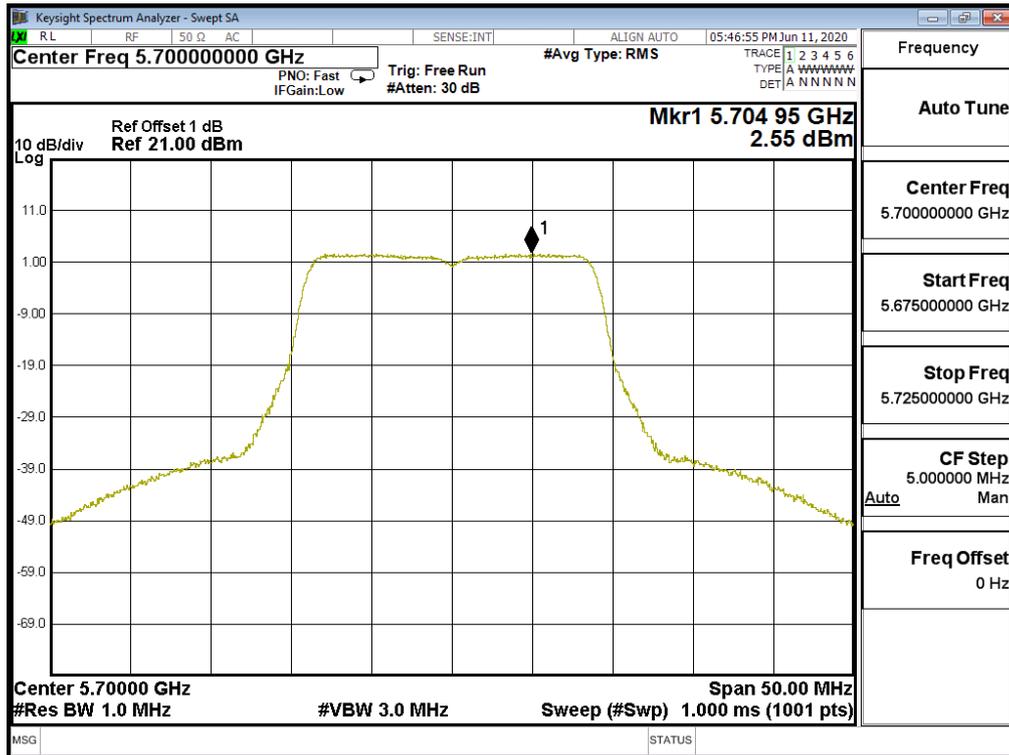
Channel 100:



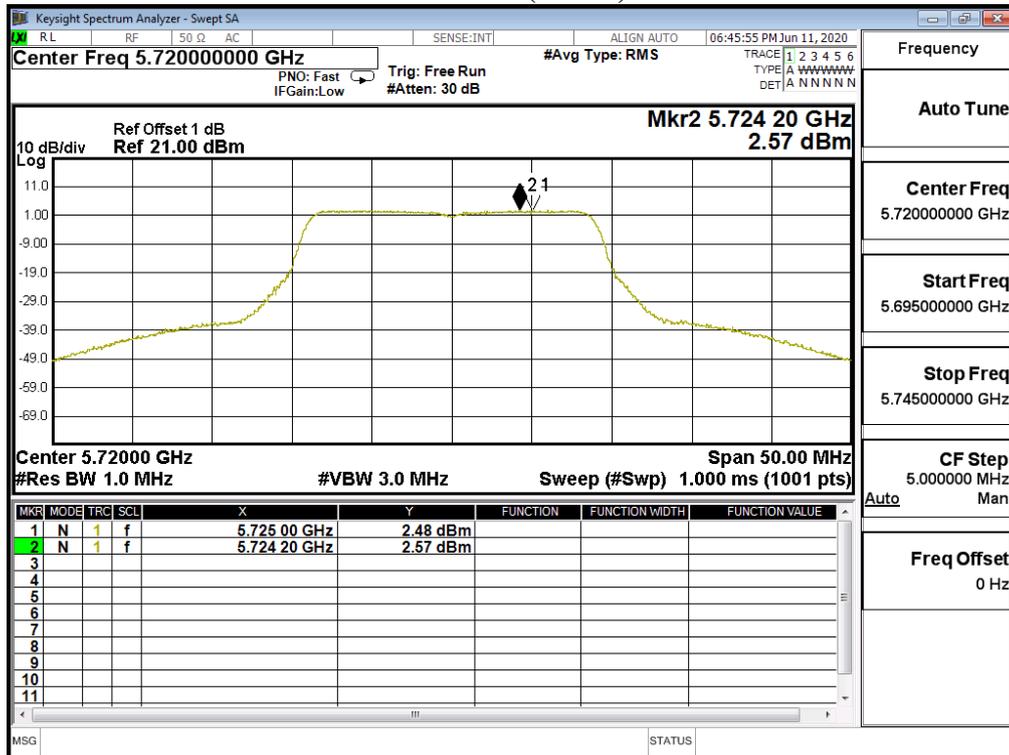
Channel 116:



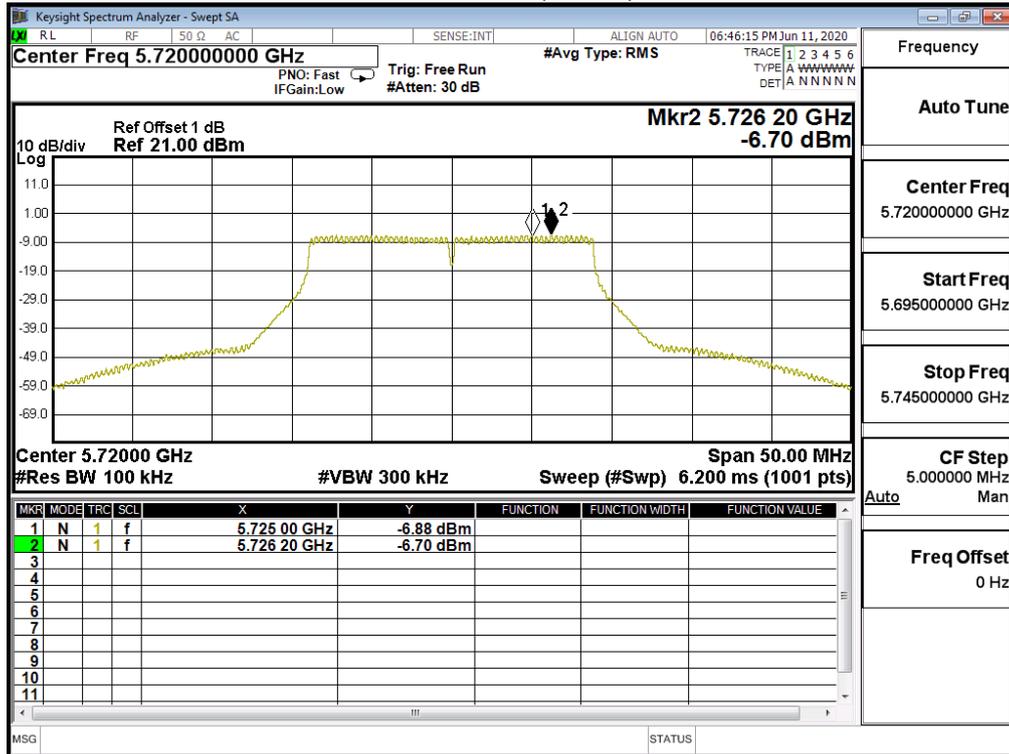
Channel 140:



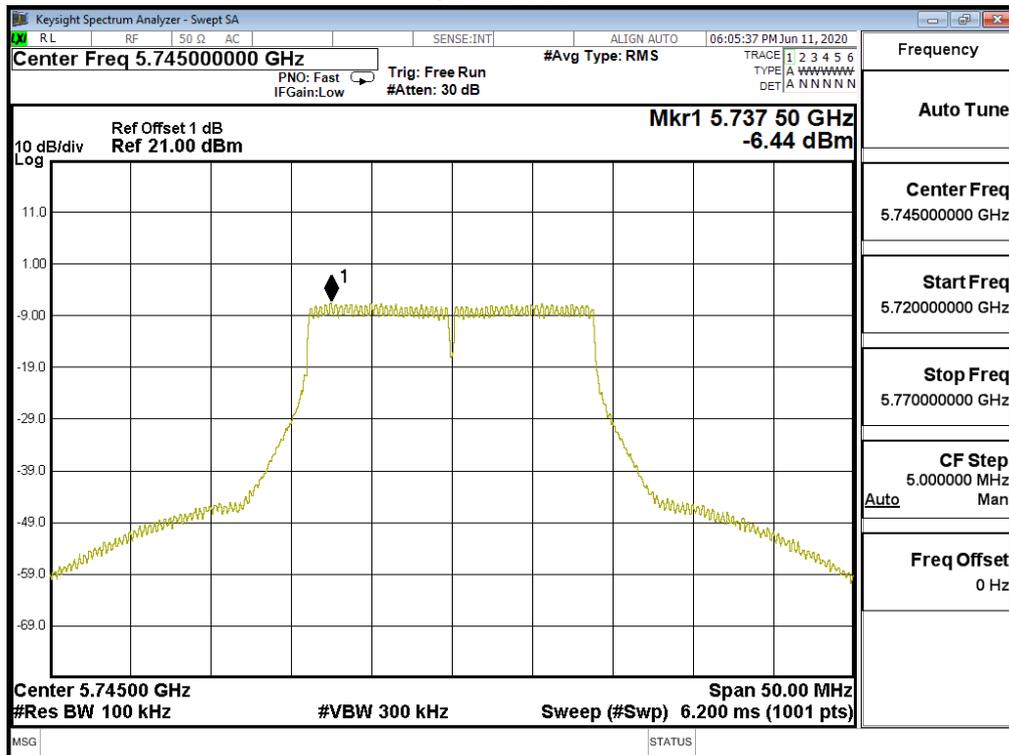
Channel 144(Band3):



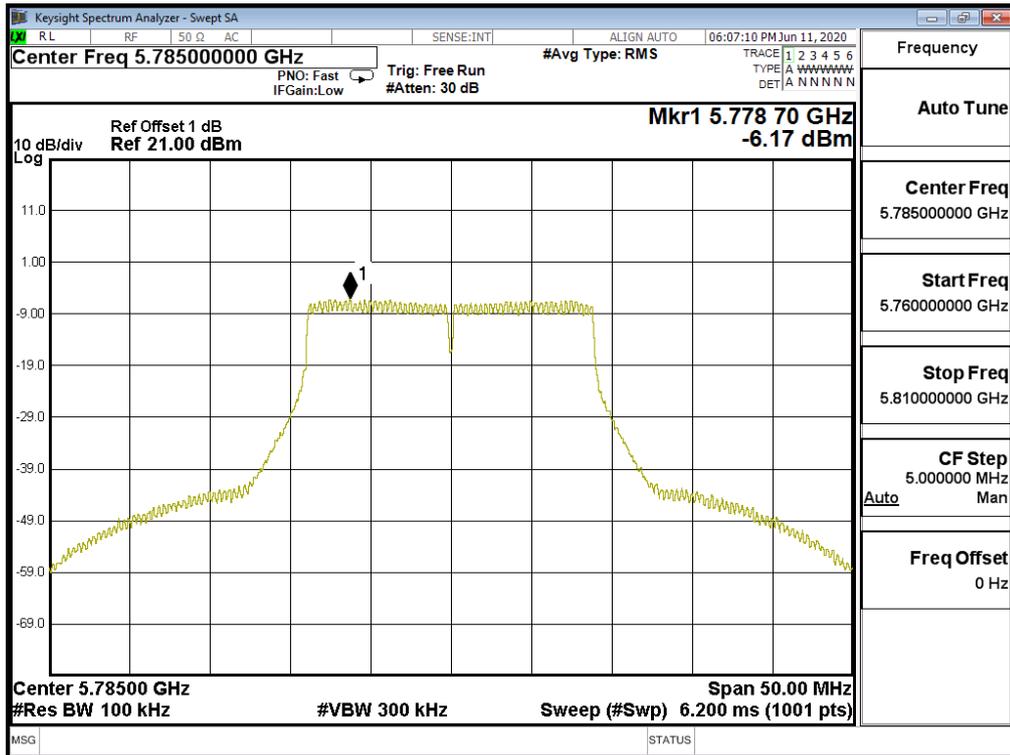
Channel 144(Band4):



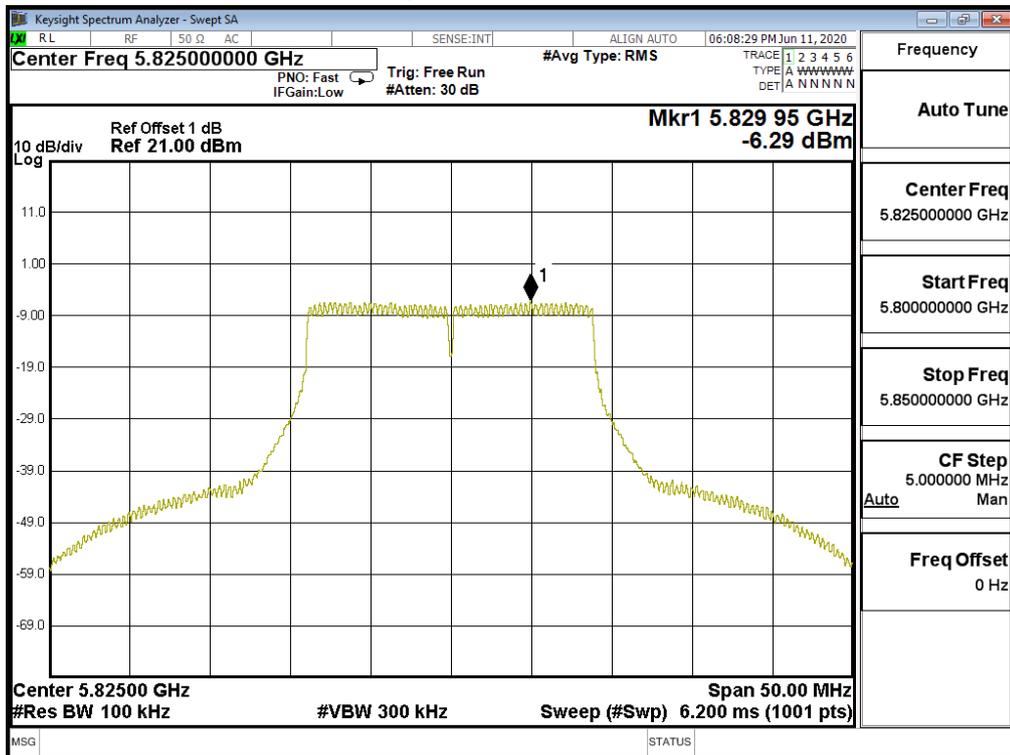
Channel 149:



Channel 157:



Channel 165:

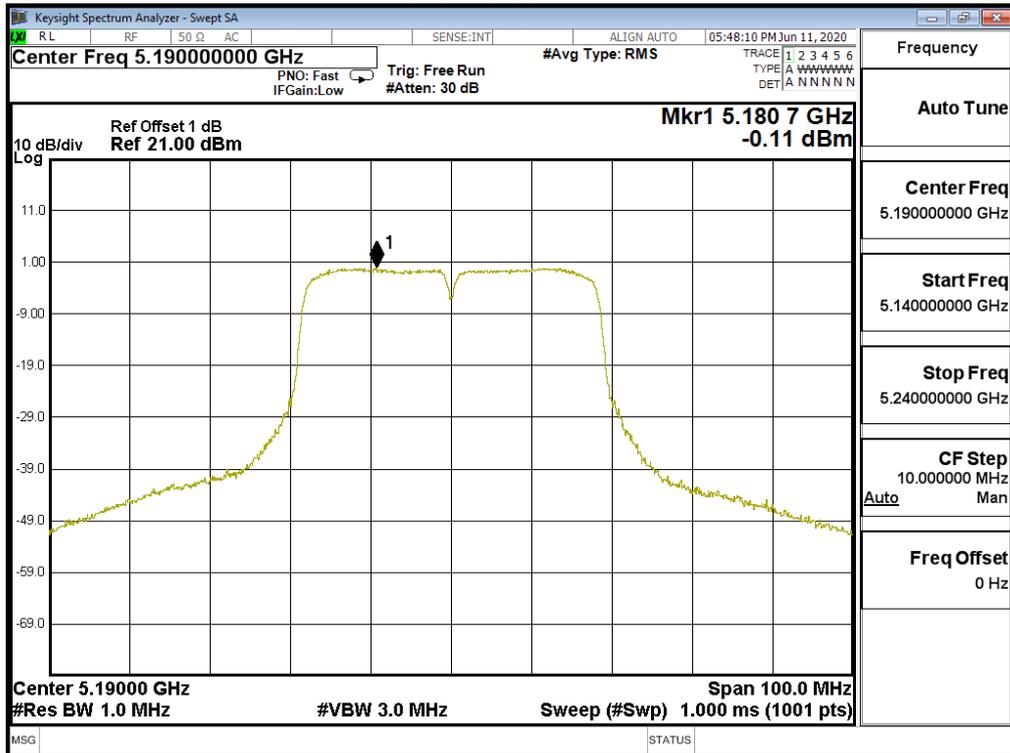


Product : Mobile Computer
 Test Item : Peak Power Spectral Density
 Test Mode : Mode 3: Transmit (802.11n-40BW 15Mbps)
 Test Date : 2020/06/11

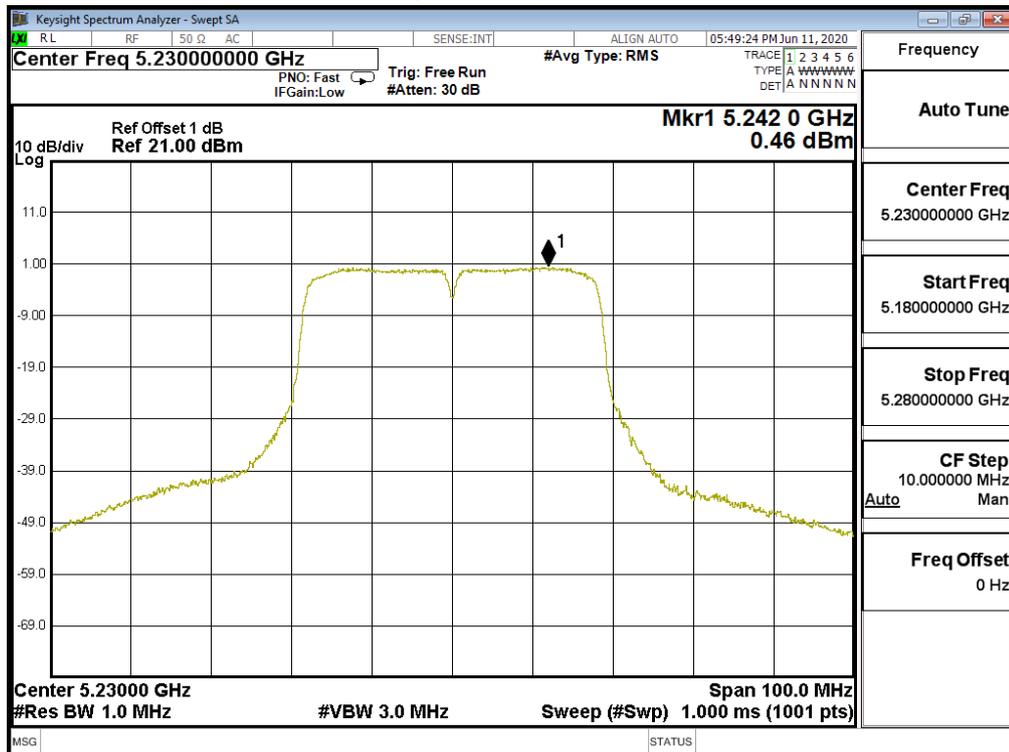
Channel Number	Frequency (MHz)	Data Rata (Mbps)	Measurement Level (dBm)	Required Limit (dBm)	Result
38	5190	15	-0.11	11	Pass
46	5230	15	0.46	11	Pass
54	5270	15	0.70	11	Pass
62	5310	15	0.79	11	Pass
102	5510	15	0.12	11	Pass
110	5550	15	-0.15	11	Pass
134	5670	15	-0.14	11	Pass
142(Band3)	5710	15	-0.06	11	Pass

Channel Number	Frequency (MHz)	Data Rata (Mbps)	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm)	Required Limit (dBm)	Result
142(Band4)	5710	15	-10.53	6.99	-3.54	<30	Pass
151	5755	15	-9.10	6.99	-2.11	<30	Pass
159	5795	15	-9.23	6.99	-2.24	<30	Pass

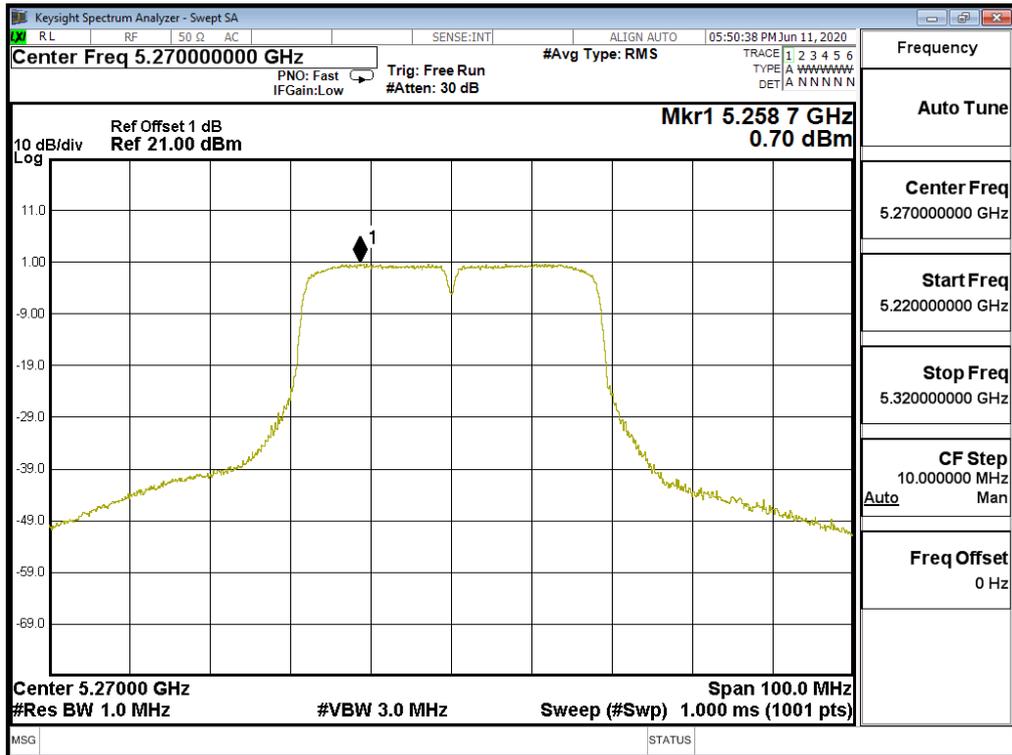
Channel 38



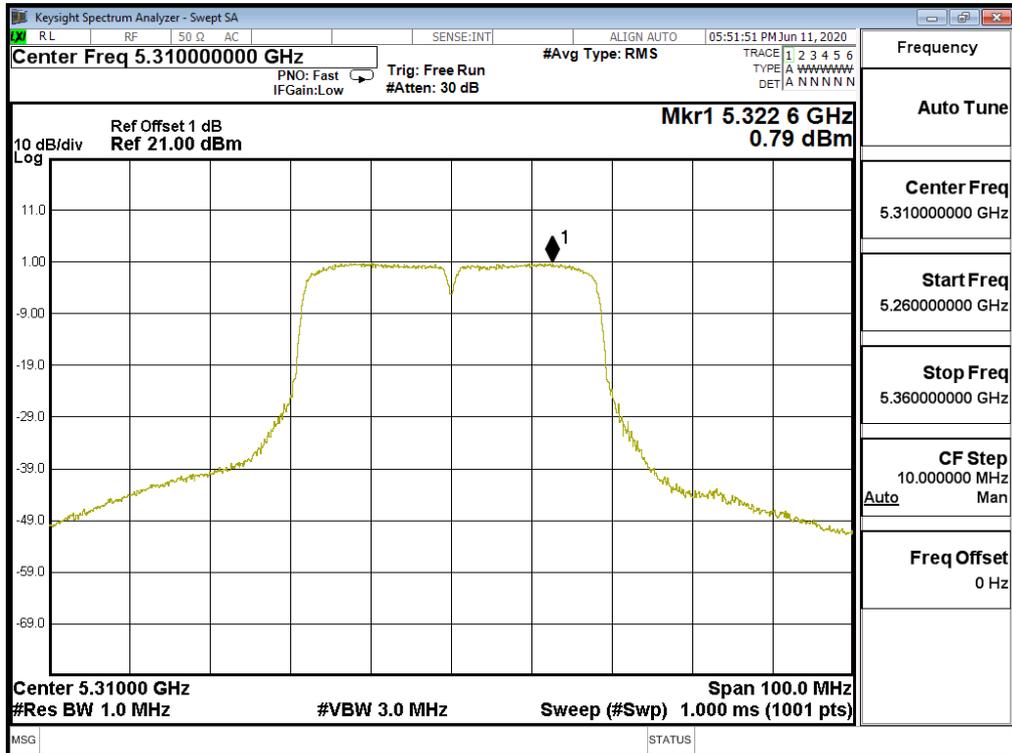
Channel 46



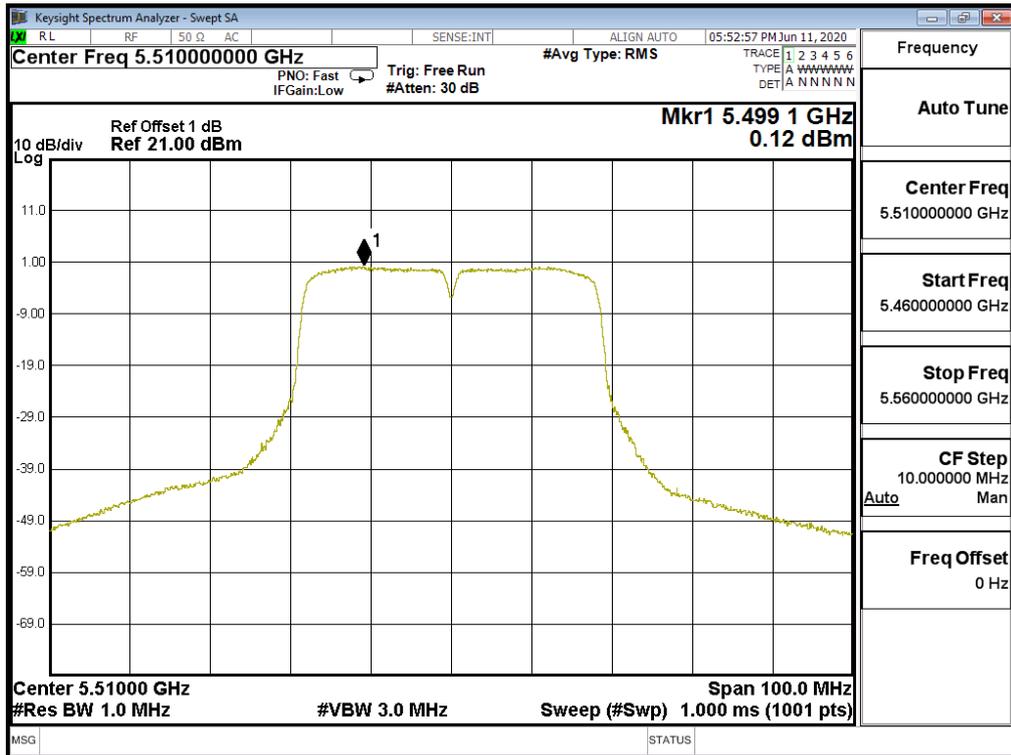
Channel 54



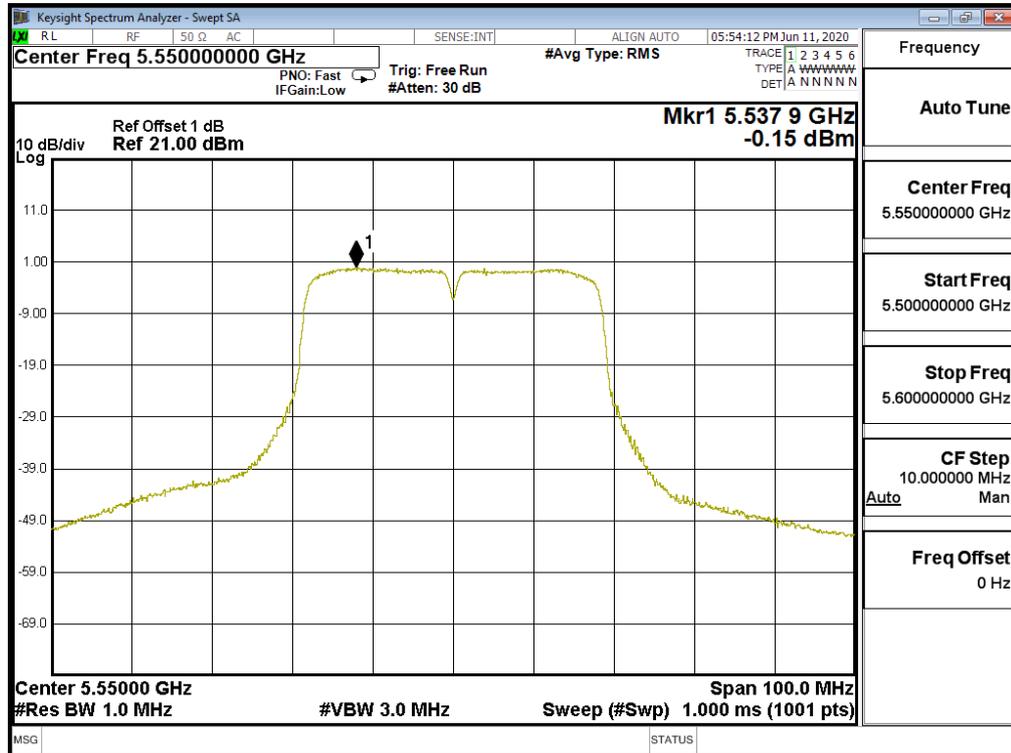
Channel 62



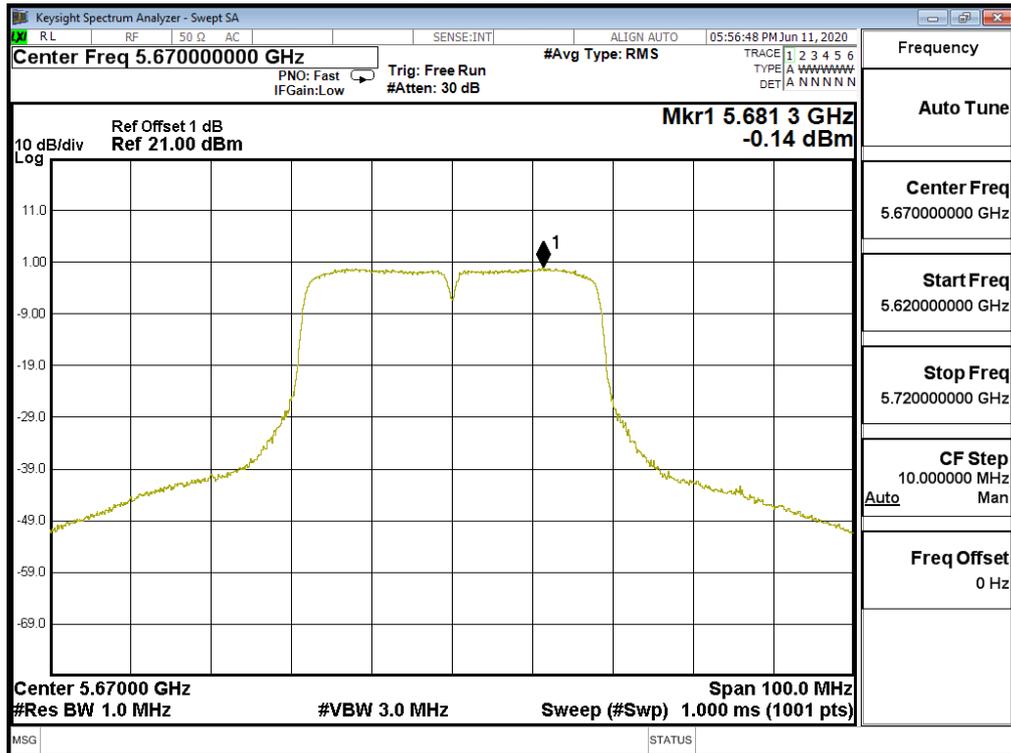
Channel 102



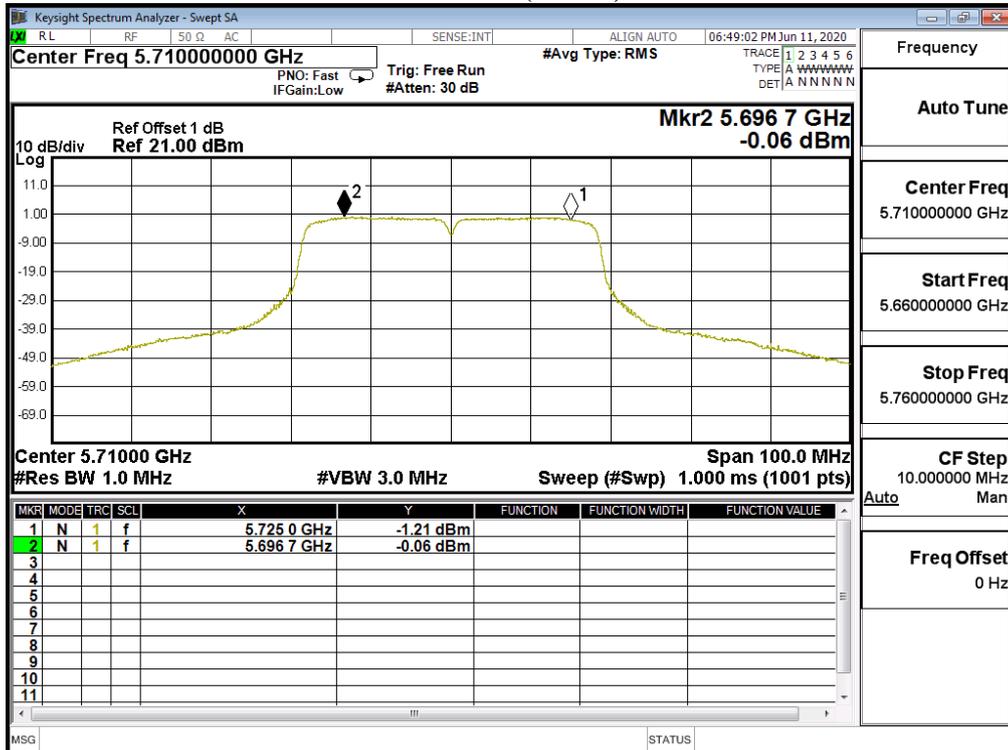
Channel 110



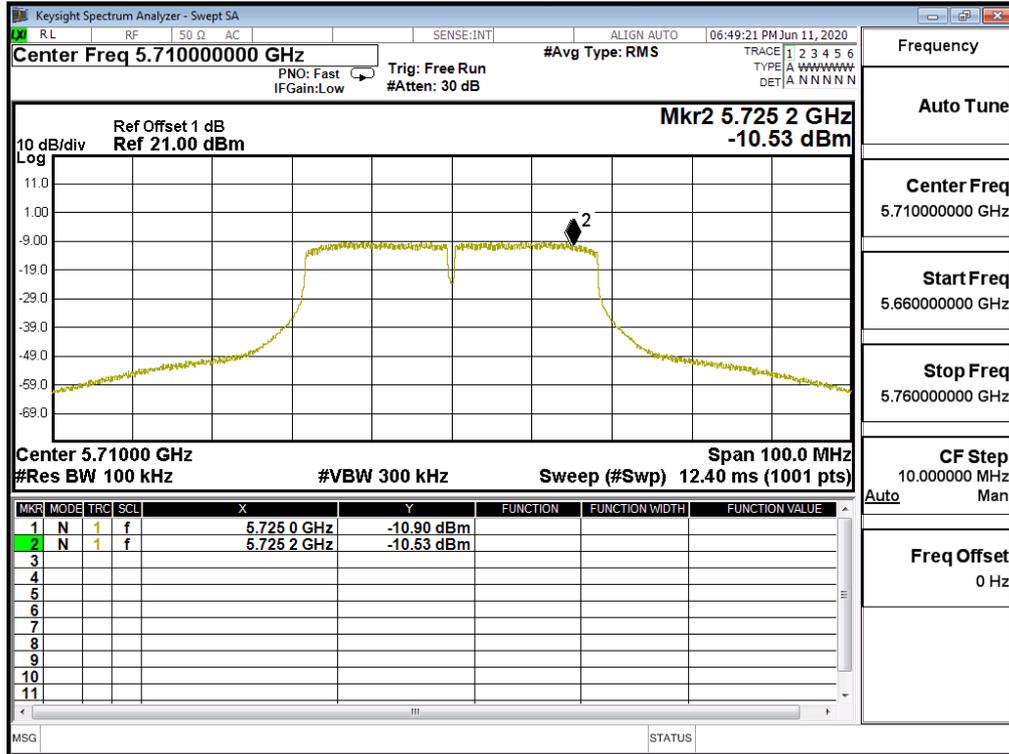
Channel 134



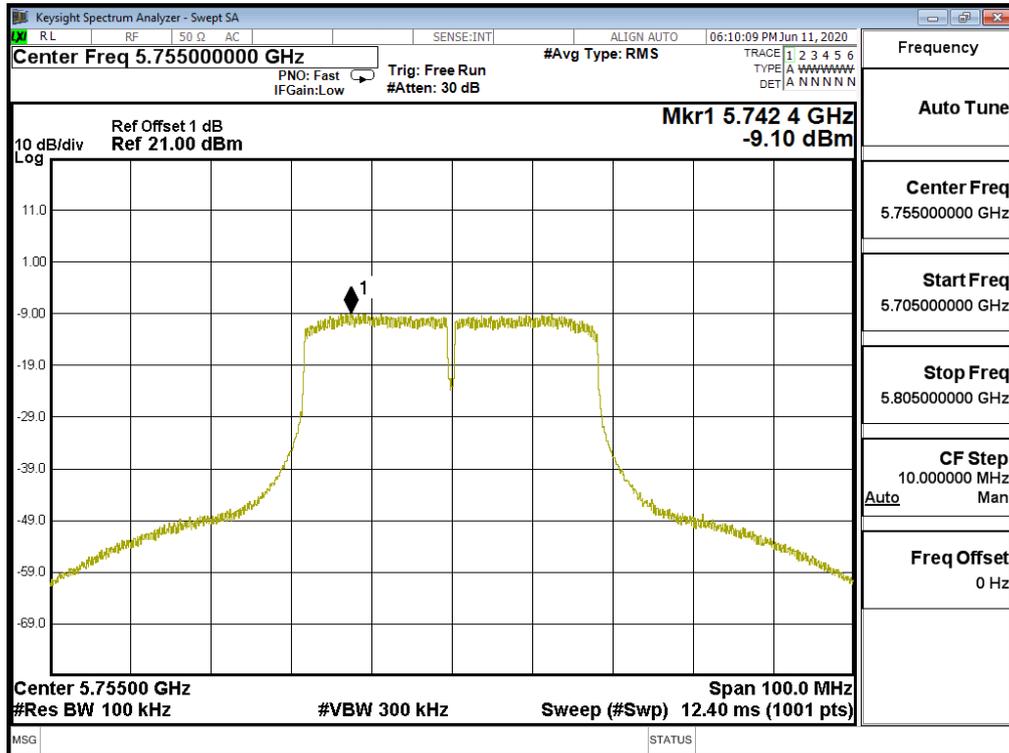
Channel 142(Band3)



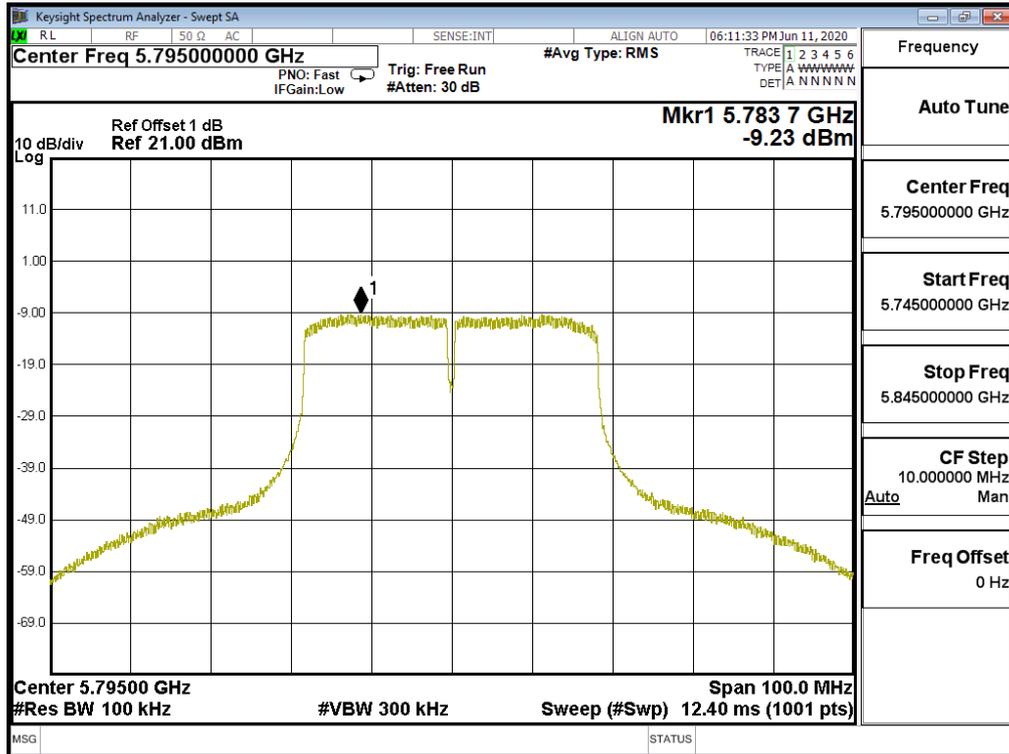
Channel 142(Band4)



Channel 151



Channel 159

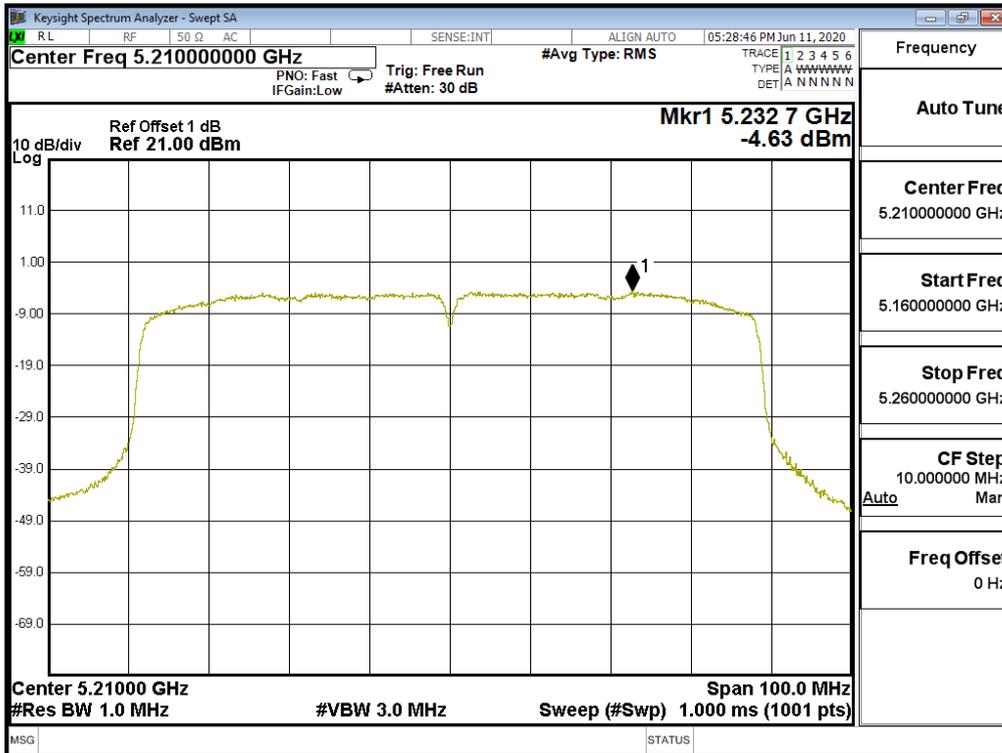


Product : Mobile Computer
 Test Item : Peak Power Spectral Density
 Test Mode : Mode 4: Transmit (802.11ac-80BW 32.5Mbps)
 Test Date : 2020/06/11

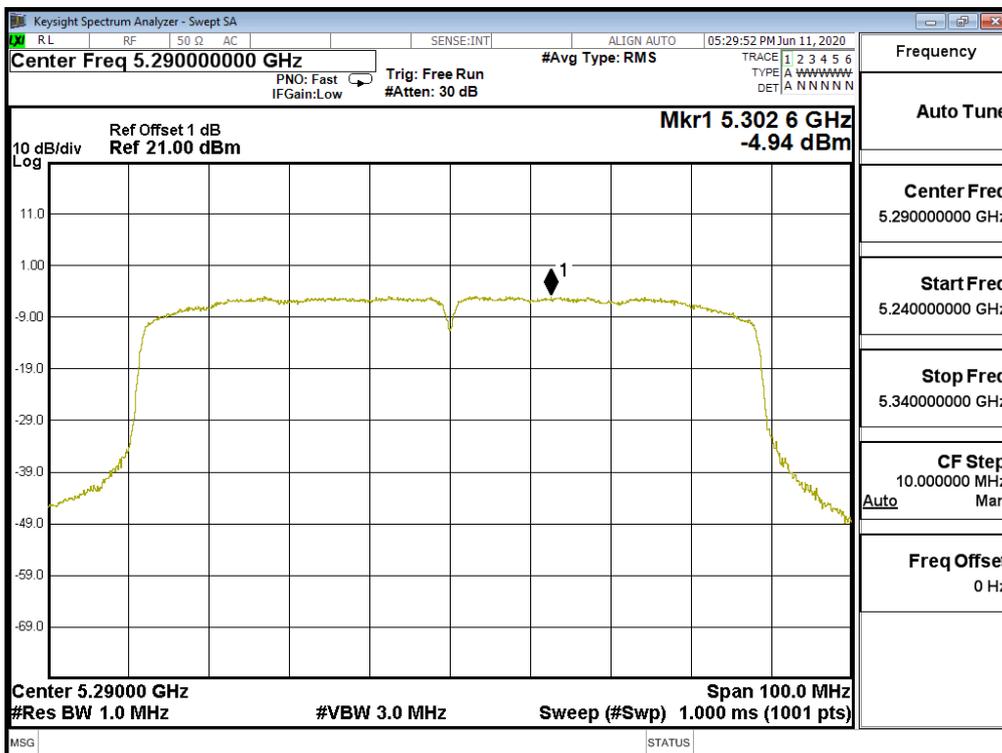
Channel Number	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dBm)	Required Limit (dBm)	Result
42	5210	32.5	-4.63	11	Pass
58	5290	32.5	-4.94	11	Pass
106	5530	32.5	-4.63	11	Pass
122	5610	32.5	-5.60	11	Pass
138(Band3)	5690	32.5	-5.60	11	Pass

Channel Number	Frequency (MHz)	Data Rate (Mbps)	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm)	Required Limit (dBm)	Result
138ac80(Band4)	5690	32.5	-18.57	6.99	-11.58	<30	Pass
155ac80	5775	32.5	-13.67	6.99	-6.68	<30	Pass

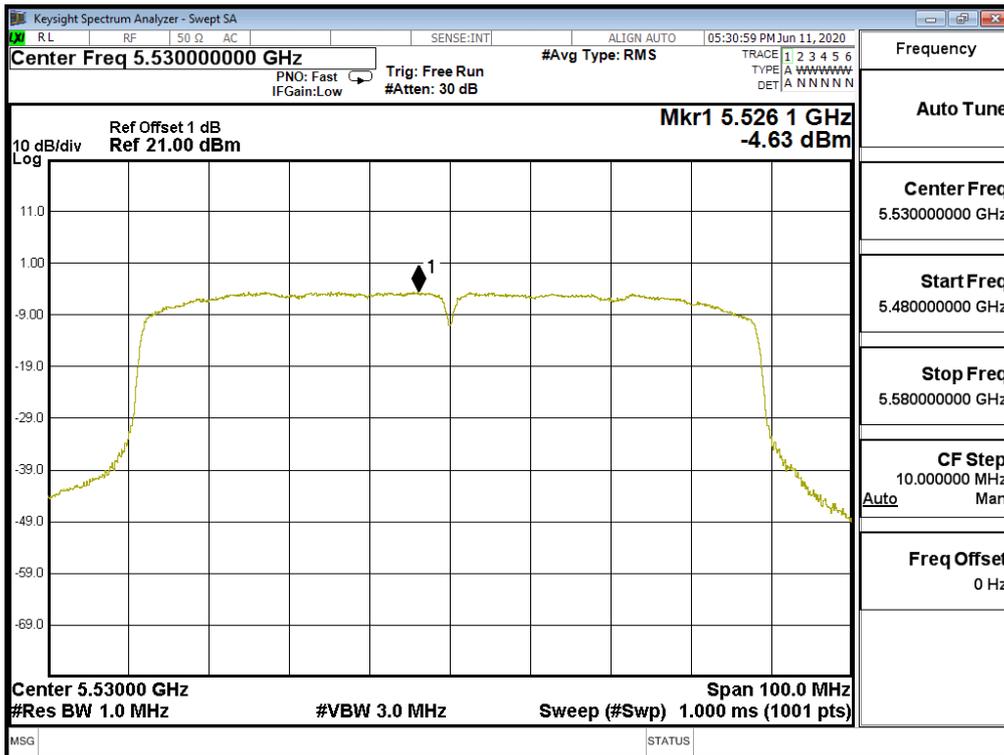
Channel 42



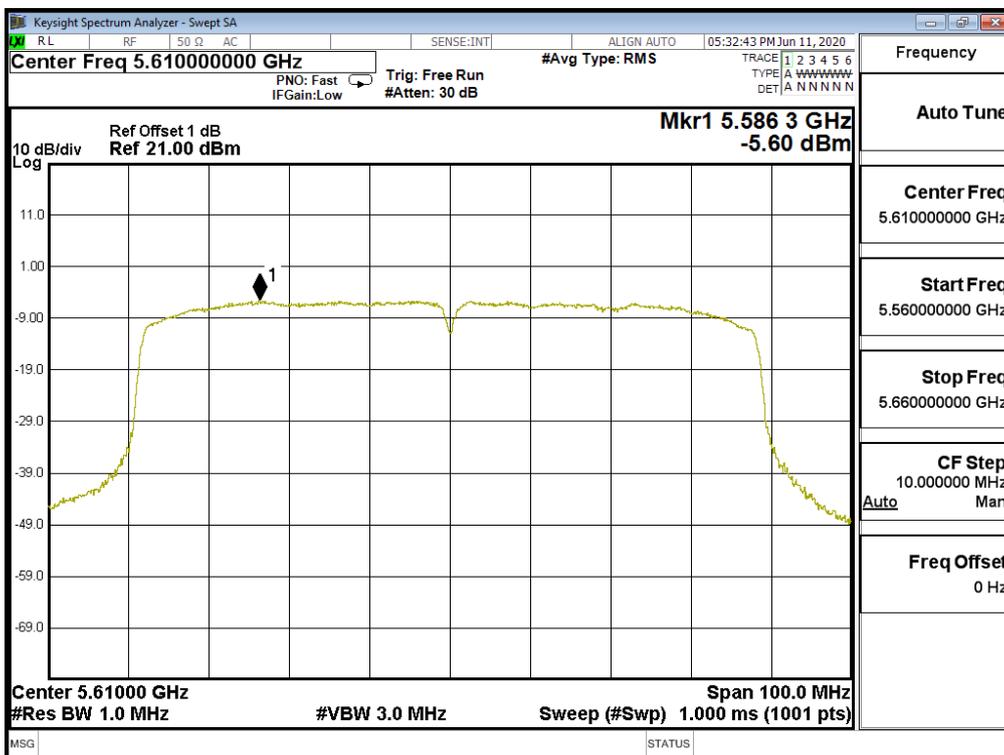
Channel 58



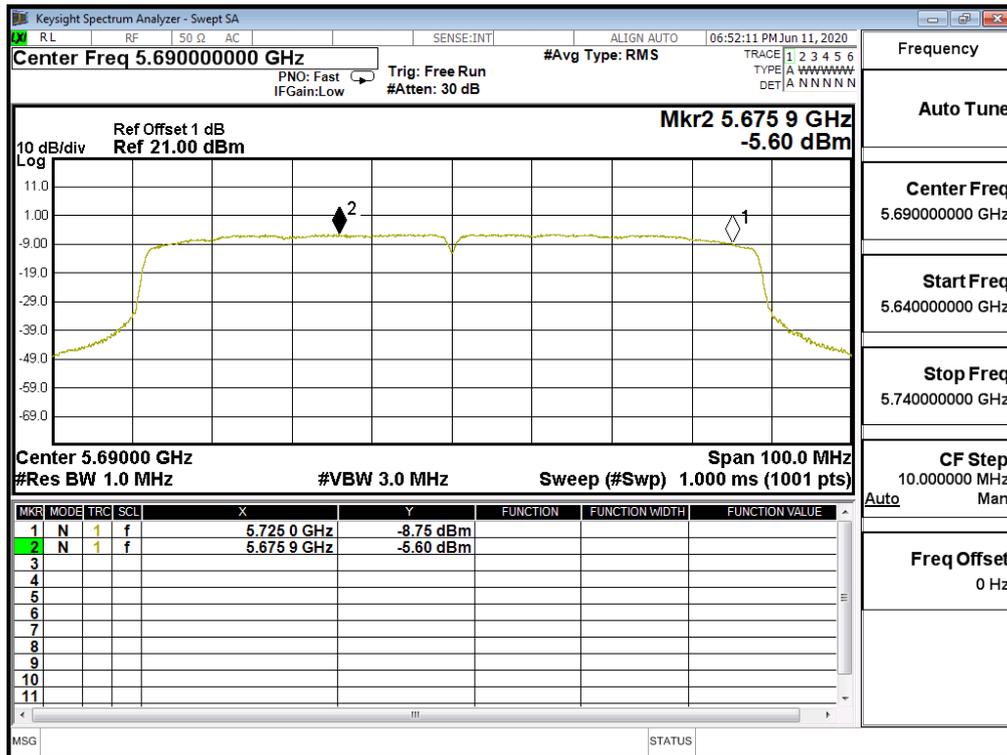
Channel 106



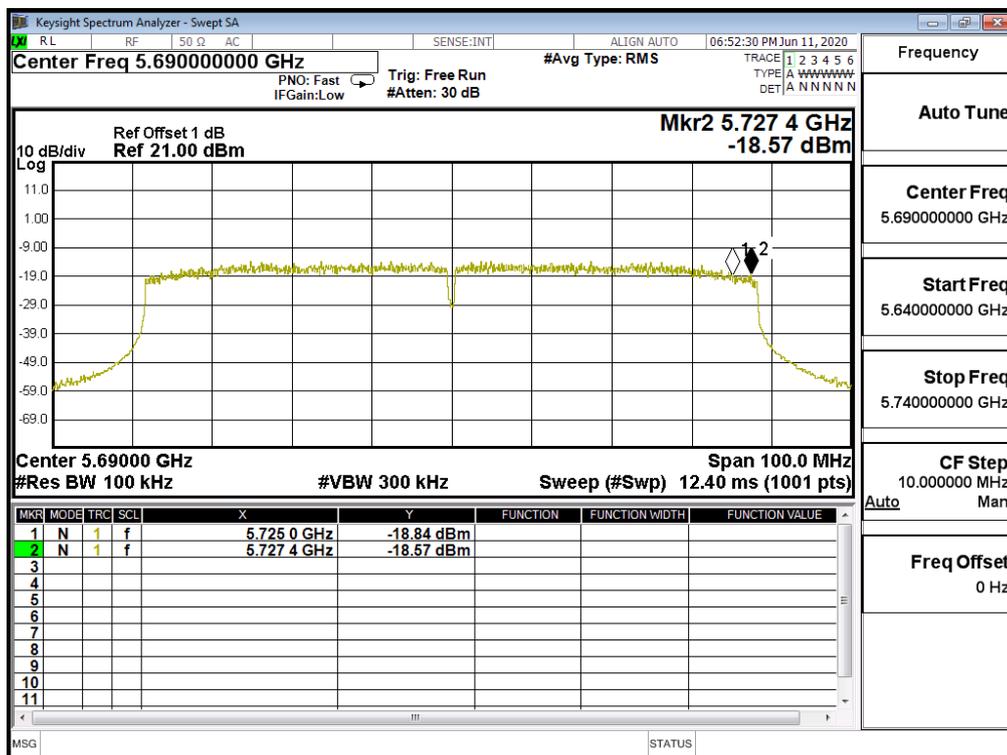
Channel 122



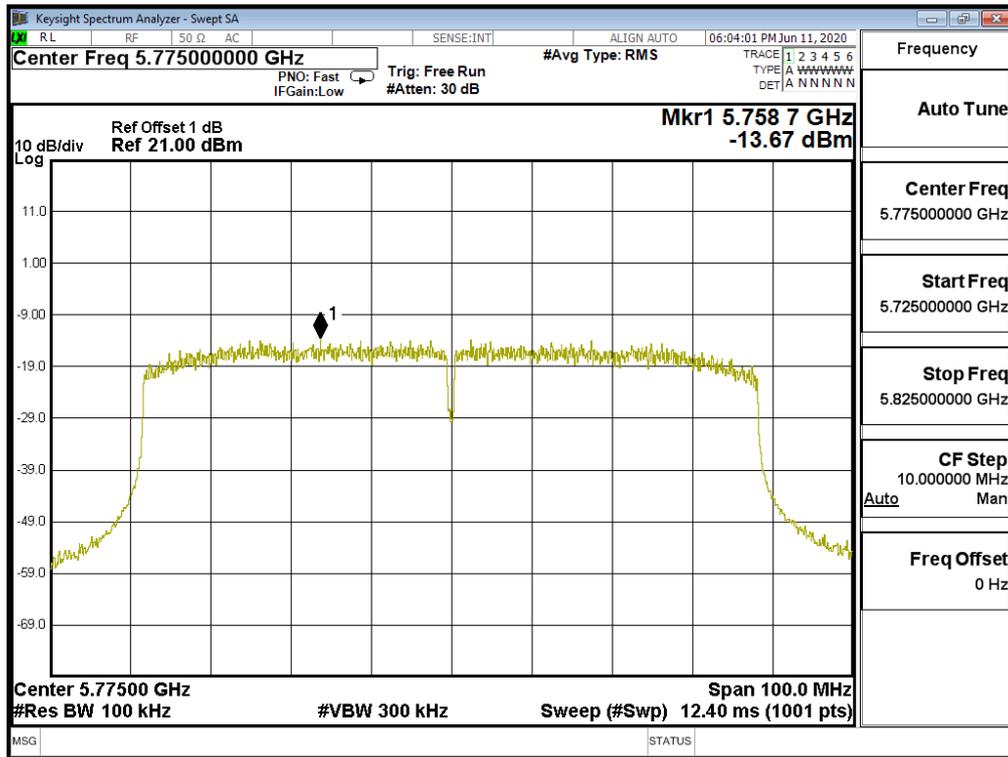
Channel 138



Channel 138



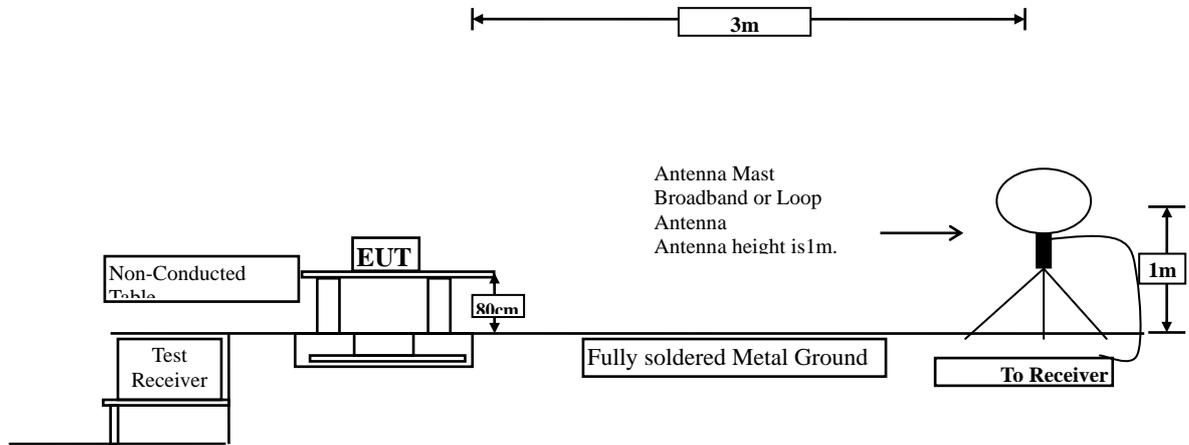
Channel 155



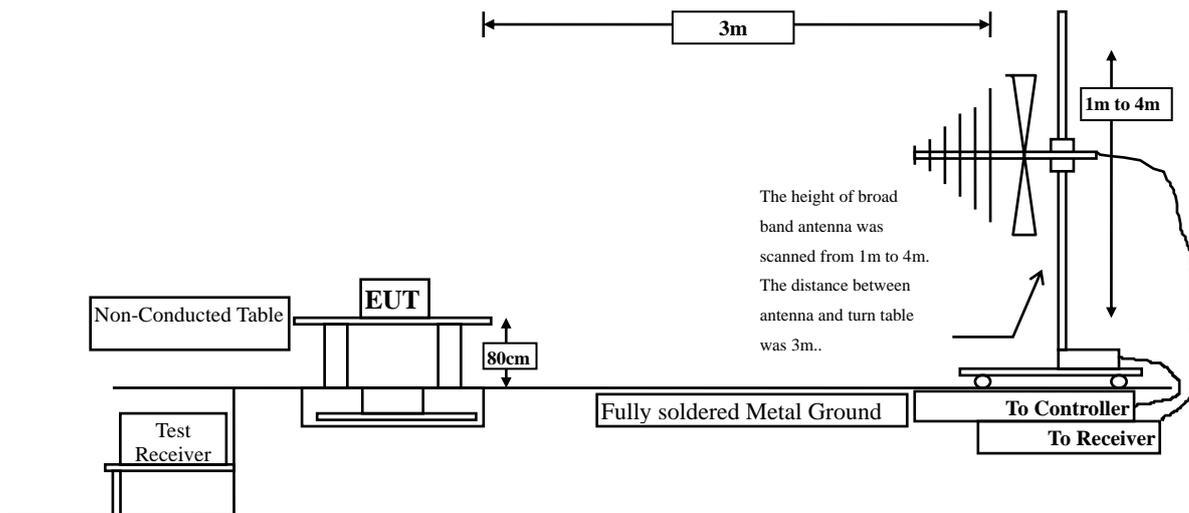
5. Radiated Emission

5.1. Test Setup

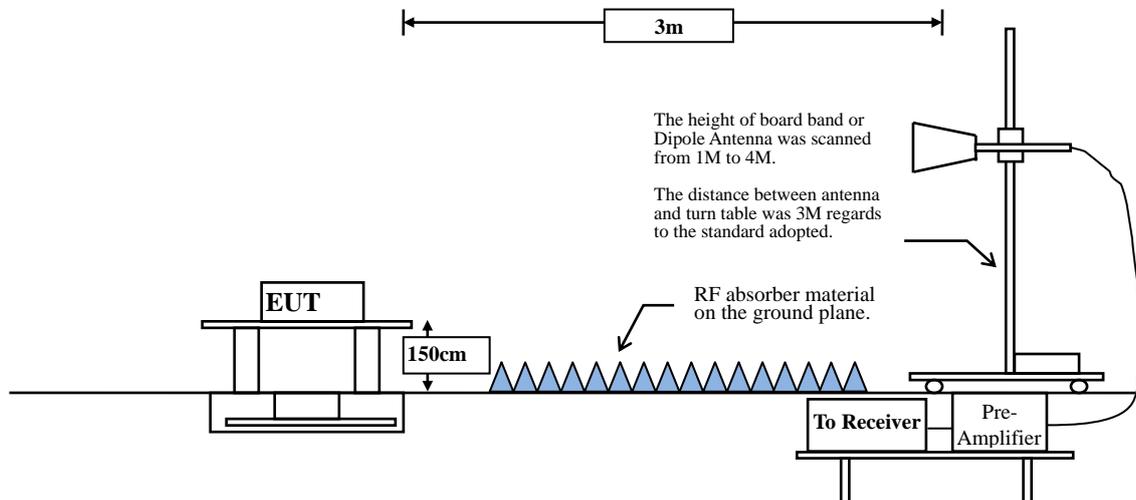
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



5.2. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks: E field strength (dB μ V/m) = 20 log E field strength (uV/m)

5.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to FCC KDB-789033 test procedure for compliance to FCC 47CFR 15. 407 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

RBW and VBW Parameter setting:

According to KDB 789033 section II.G.5 Procedure for Unwanted Maximum Emissions Measurements above 1000 MHz.

RBW = 1MHz.

VBW \geq 3MHz.

According to KDB 789033 section II.G.6 Procedures for Average Unwanted Emissions Measurements above 1000 MHz.

RBW = 1MHz.

VBW = 10Hz, when duty cycle \geq 98 %

VBW \geq 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

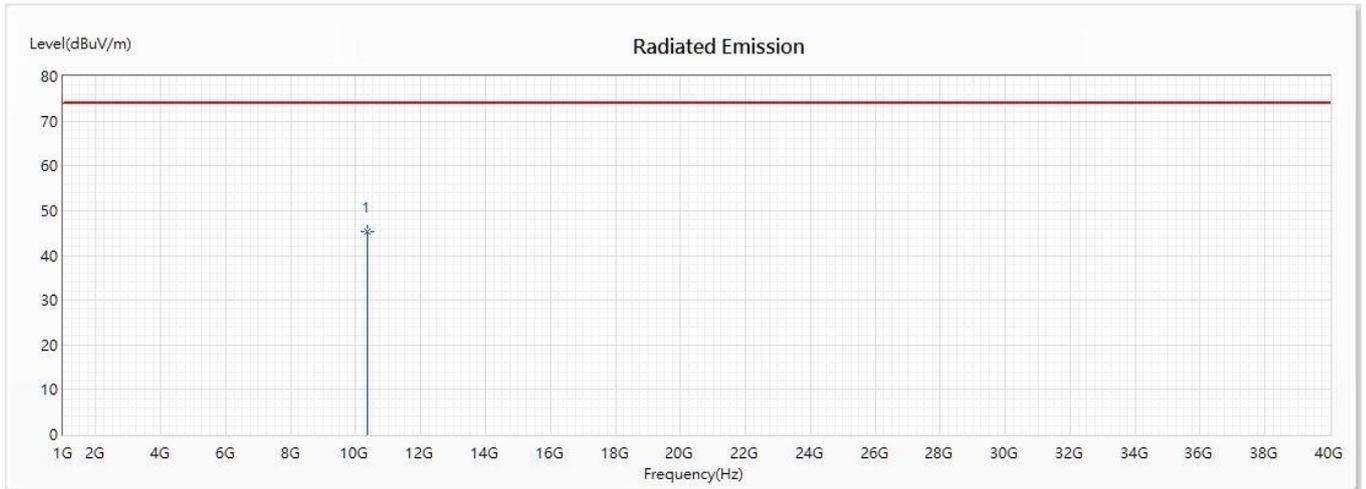
5GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11a	90.32	2.0290	493	500
802.11n20	89.58	1.8696	535	1000
802.11n40	78.49	0.8986	1113	2000
802.11ac80	55.84	0.2493	4012	5000

Note: Duty Cycle Refer to Section 8

5.4. Test Result of Radiated Emission

Product : Mobile Computer
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5180MHz)
 Test Date : 2020/06/12

Horizontal



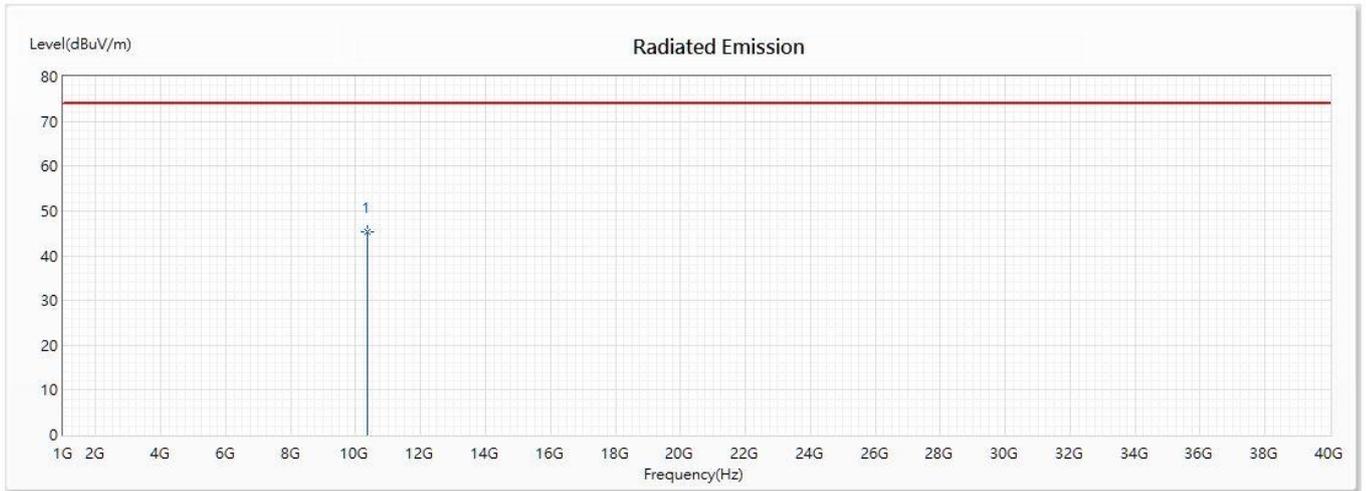
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	10360	45.45	74.00	-28.55	57.05	-11.60	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Computer
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5180MHz)
 Test Date : 2020/06/12

Vertical



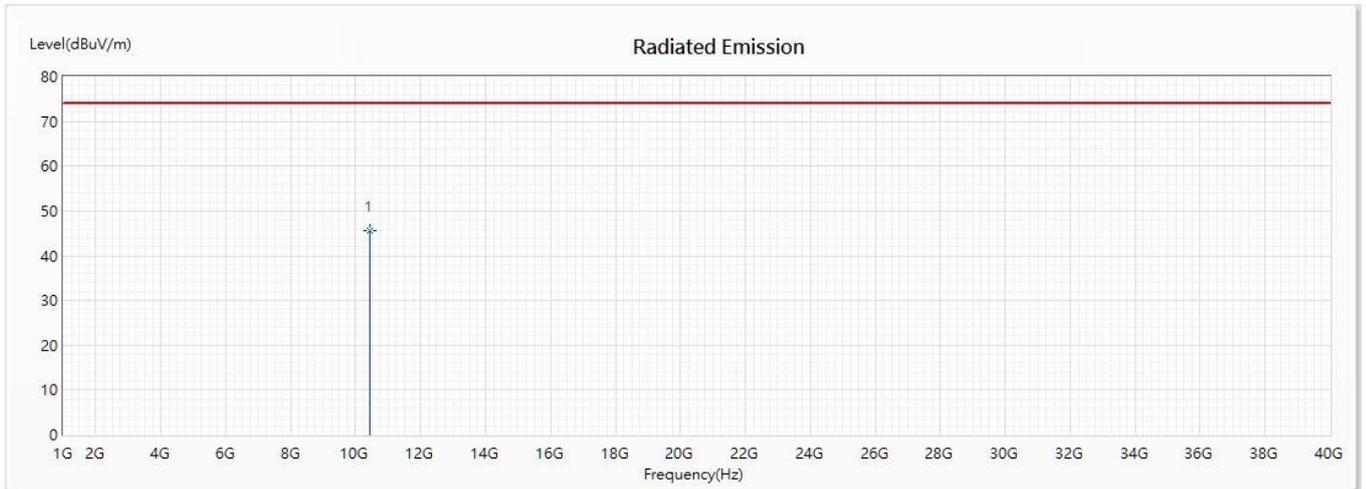
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	10360	45.31	74.00	-28.69	56.91	-11.60	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Computer
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11 a-6Mbps) (5220MHz)
 Test Date : 2020/06/12

Horizontal



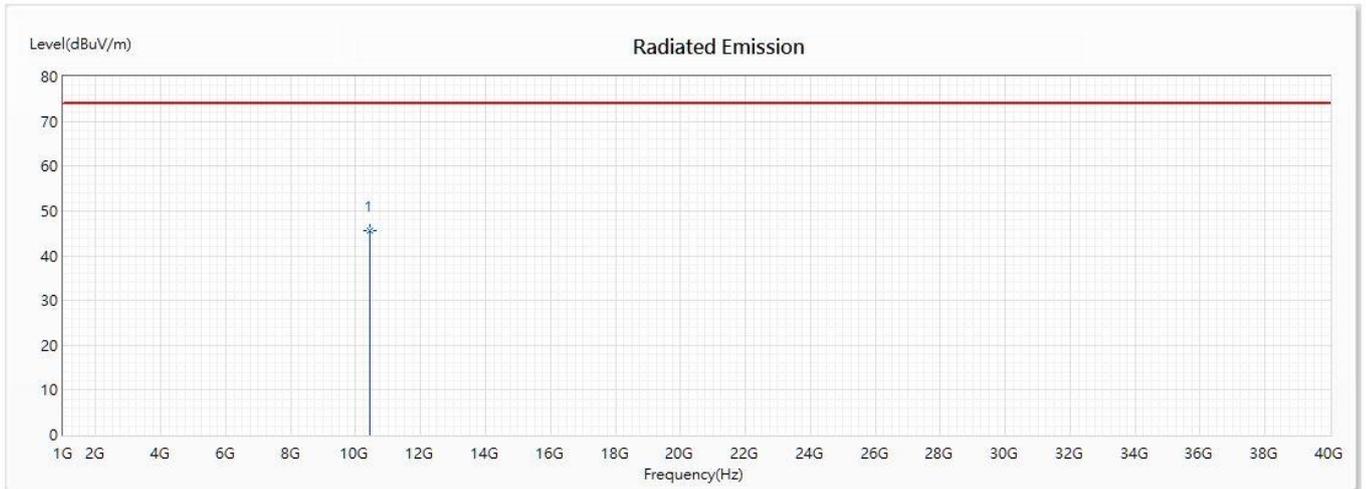
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	10440	45.59	74.00	-28.41	58.00	-12.41	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Computer
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11 a-6Mbps) (5220MHz)
 Test Date : 2020/06/12

Vertical



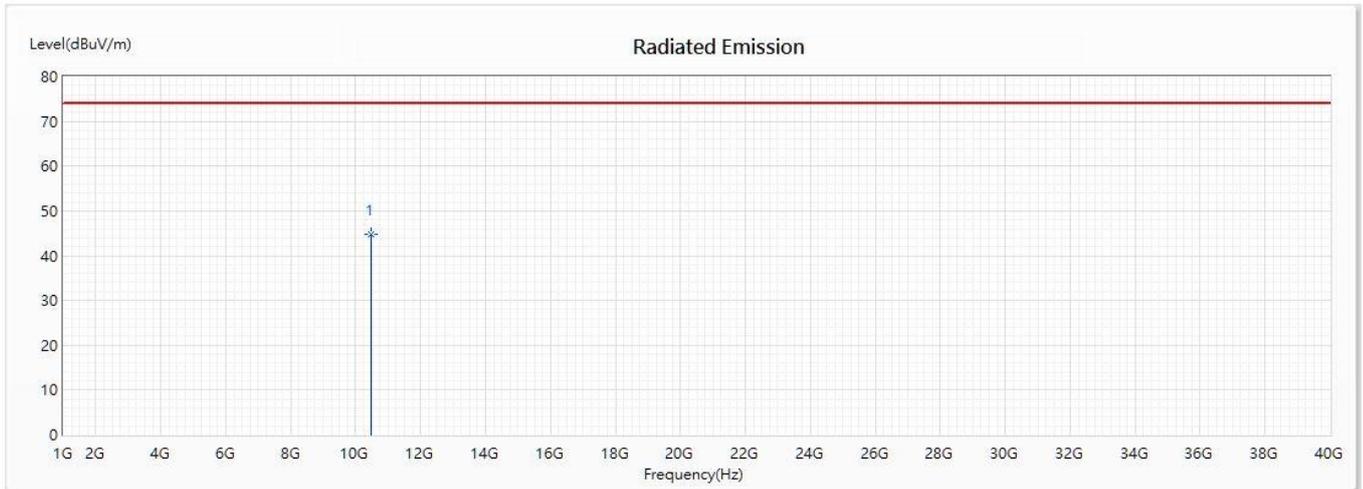
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	10444	45.61	74.00	-28.39	58.05	-12.44	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Computer
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11 a-6Mbps) (5240MHz)
 Test Date : 2020/06/12

Horizontal



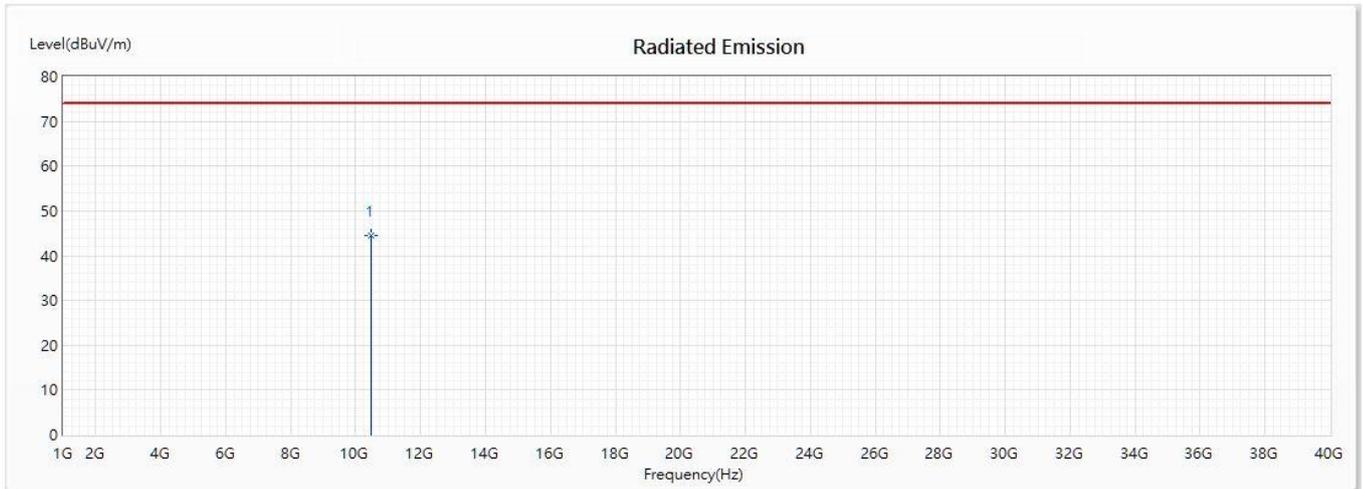
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	10480	44.66	74.00	-29.34	57.41	-12.75	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Computer
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11 a-6Mbps) (5240MHz)
 Test Date : 2020/06/12

Vertical



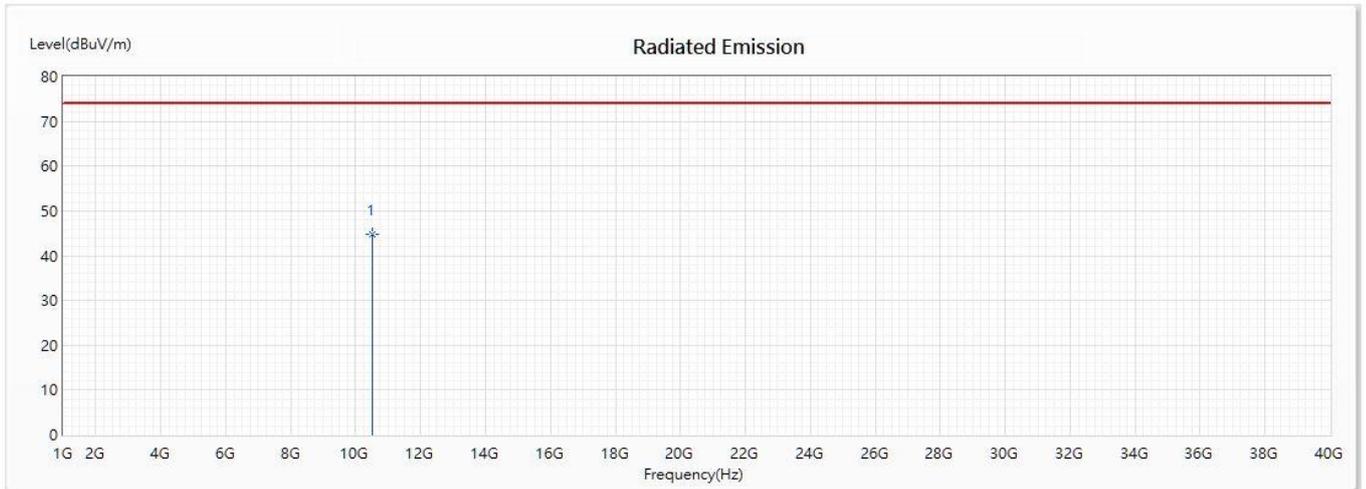
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	10480	44.52	74.00	-29.48	57.27	-12.75	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Computer
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11 a-6Mbps) (5260MHz)
 Test Date : 2020/06/12

Horizontal



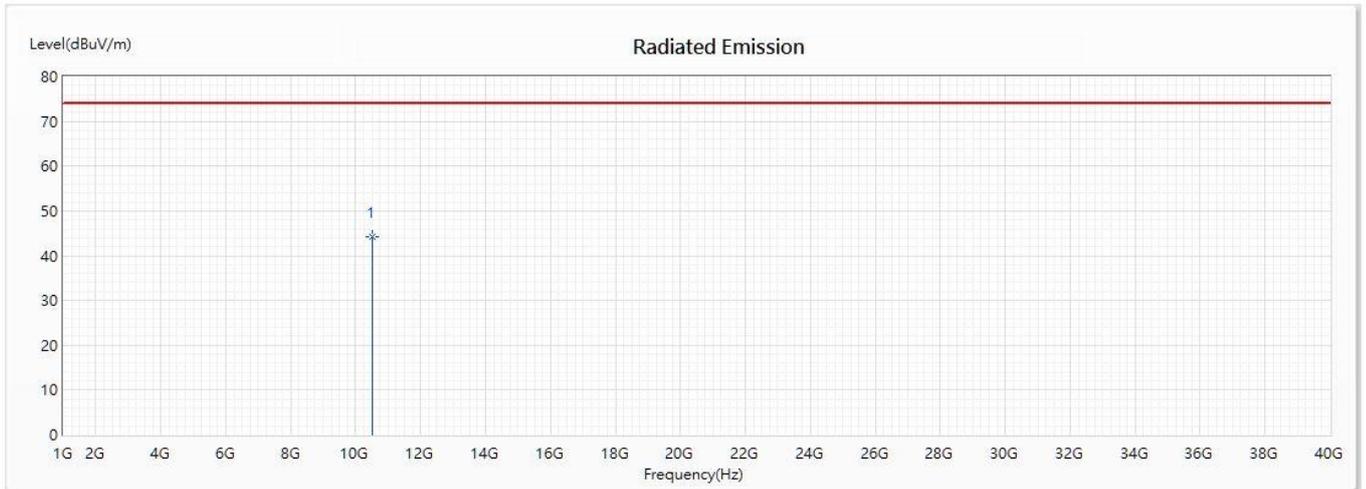
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	10520	44.76	74.00	-29.24	57.86	-13.10	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Computer
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11 a-6Mbps) (5260MHz)
 Test Date : 2020/06/12

Vertical



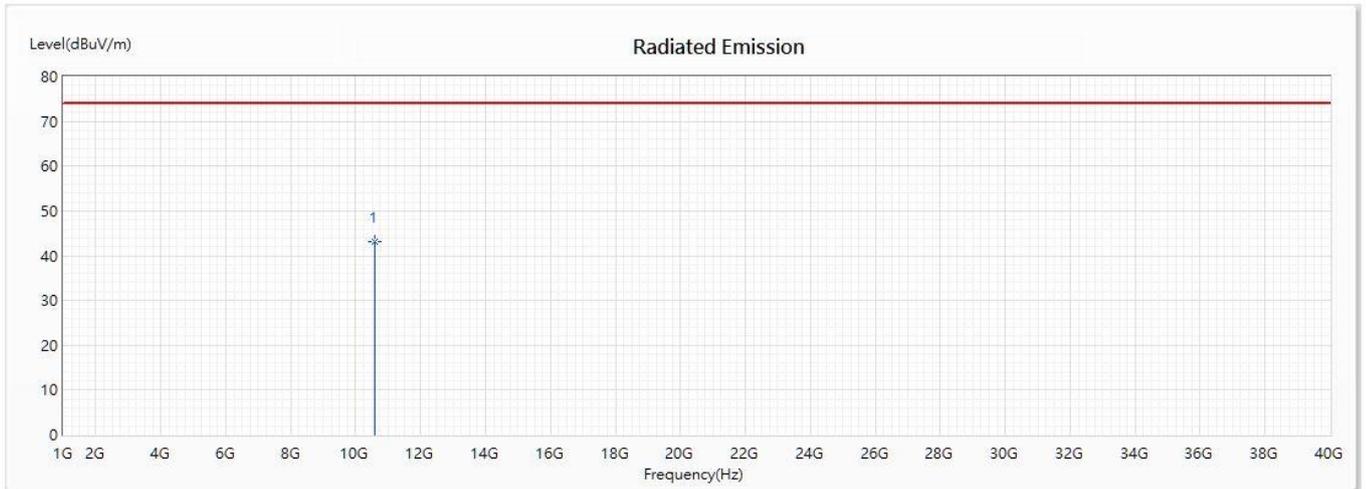
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	10520	44.29	74.00	-29.71	57.39	-13.10	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Computer
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5300MHz)
 Test Date : 2020/06/12

Horizontal



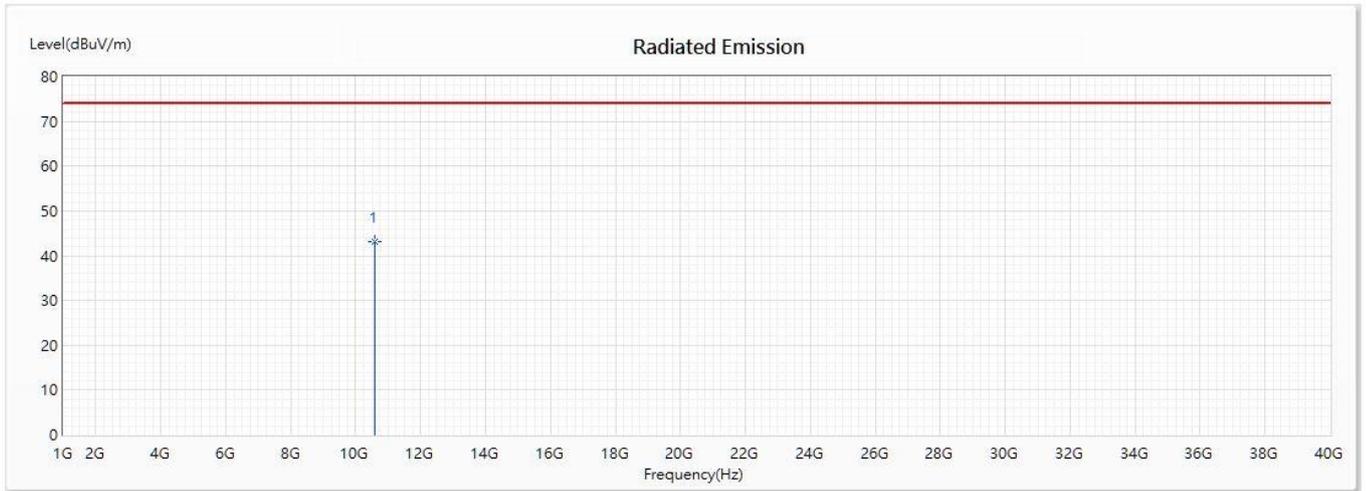
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	10600	43.27	74.00	-30.73	57.12	-13.85	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Computer
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5300MHz)
 Test Date : 2020/06/12

Vertical



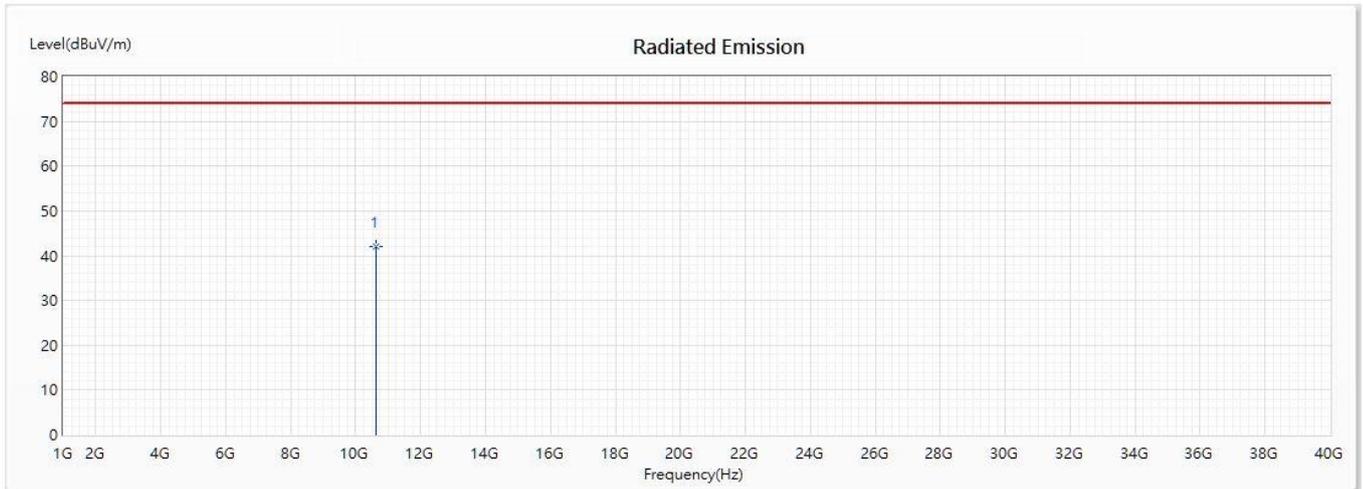
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	10600	43.26	74.00	-30.74	57.11	-13.85	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Computer
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11 a-6Mbps) (5320MHz)
 Test Date : 2020/06/12

Horizontal



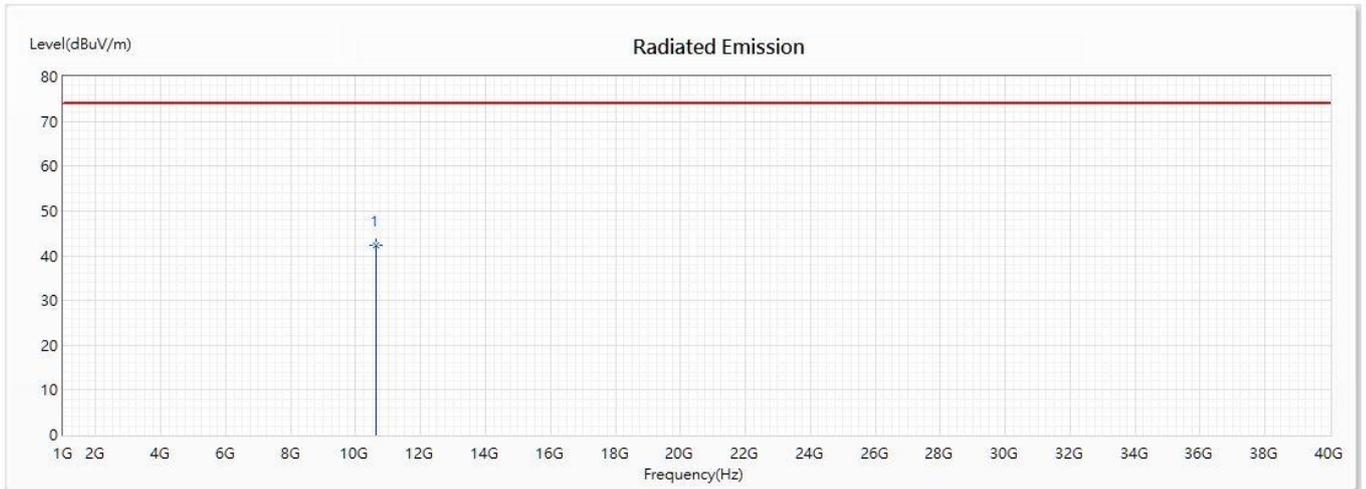
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	10640	41.95	74.00	-32.05	56.06	-14.11	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Mobile Computer
 Test Item : Harmonic Radiated Emission Data
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5320MHz)
 Test Date : 2020/06/12

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	10640	42.35	74.00	-31.65	56.46	-14.11	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.