

FCC Test Report

Product Name	Key programming device
Model No	KeyReader Plus
FCC ID	QLXKRP

Applicant	TeraTron GmbH
Address	Bunsenstr. 10, 51647 Gummersbach, Germany

Date of Receipt	Aug. 02, 2016
Issued Date	Jan. 06, 2017
Report No.	1680089R-RFUSP08V00
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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Test Report

Issued Date: Jan. 06, 2017

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Product Name	Key programming device
Applicant	TeraTron GmbH
Address	Bunsenstr. 10, 51647 Gummersbach, Germany
Manufacturer	TeraTron GmbH
Model No.	KeyReader Plus
FCC ID.	QLXKRP
EUT Rated Voltage	DC 3.6V (Power by Battery)
EUT Test Voltage	DC 3.6V (Power by Battery)
Trade Name	TeraTron
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E: 2015 ANSI C63.4: 2014, ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01r03
Test Result	Complied

Documented By :



(Senior Adm. Specialist / Leven Huang)

Tested By :



(Engineer / Ken Chen)

Approved By :



(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Key programming device
Trade Name	TeraTron
Model No.	KeyReader Plus
FCC ID.	QLXKRP
Frequency Range	802.11a/n-20MHz: 5180-5320MHz, 5500-5700MHz, 5745-5825MHz
Number of Channels	802.11a/n-20MHz: 24
Data Rate	802.11a: 6 - 54Mbps 802.11n: up to 72.2Mbps
Type of Modulation	802.11a/n: OFDM, BPSK, QPSK, 16QAM, 64QAM
Antenna type	Printed on PCB Antenna
Antenna Gain	Refer to the table "Antenna List"
Channel Control	Auto
USB Cable	Shielded, 2m
Contain Module	u-blox / ODIN-W160

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	PROANT AB	432	Printed on PCB Antenna	3.0dBi For 5.15~5.25GHz 3.0dBi For 5.25~5.35GHz 3.0dBi For 5.47~5.725GHz 3.0dBi 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 149:	5745 MHz
Channel 153:	5765 MHz	Channel 157:	5785 MHz	Channel 161:	5805 MHz	Channel 165:	5825 MHz

Note:

1. This device is a Key programming device with a built-in 802.11a/n WLAN transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. At result of pretests, module supports dual-channel transmission, only the worst case is shown in the report.
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)

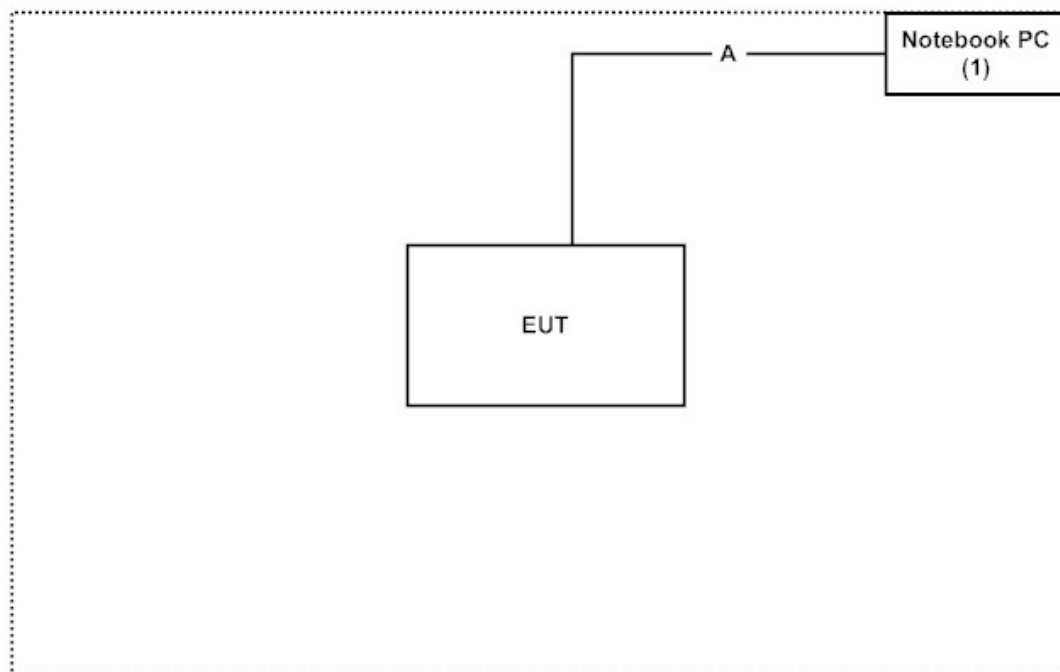
1.3. Tested System Details

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	Notebook PC	ASUS	X206H	X206HA	Non-Shielded, 1.8m

Signal Cable Type		Signal cable Description
A	USB Cable	Shielded, 2m

1.4. Configuration of tested System



1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software “Firefox for keyReaderPlus.lnk (Ver2015.08.1-21C /01.25)” 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:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

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/chinese/about/certificates.aspx?bval=5>

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FCC Accreditation Number: TW1014

1.7. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2016/10/1	2017/9/29
X	Spectrum Analyzer	Agilent	N9010A	MY48030495	2016/7/22	2017/7/21
X	Power Meter	Anritsu	ML2495A	6K00003357	2016/6/23	2017/6/22
X	Pulse power sensor	Anritsu	MA2411B	0846193	2016/6/23	2017/6/22
X	EMI Test Receiver	R&S	ESCS 30	100369	2016/10/13	2017/10/12
X	LISN	R&S	ESH3-Z5	836679/017	2017/1/7	2018/1/6
X	LISN	R&S	ENV216	100097	2017/1/7	2018/1/6
X	Coaxial Cable	QTK(Arnist)	RG 400	LC018-RG	2016/6/25	2017/6/24

For Radiated measurements /Site3/CB8

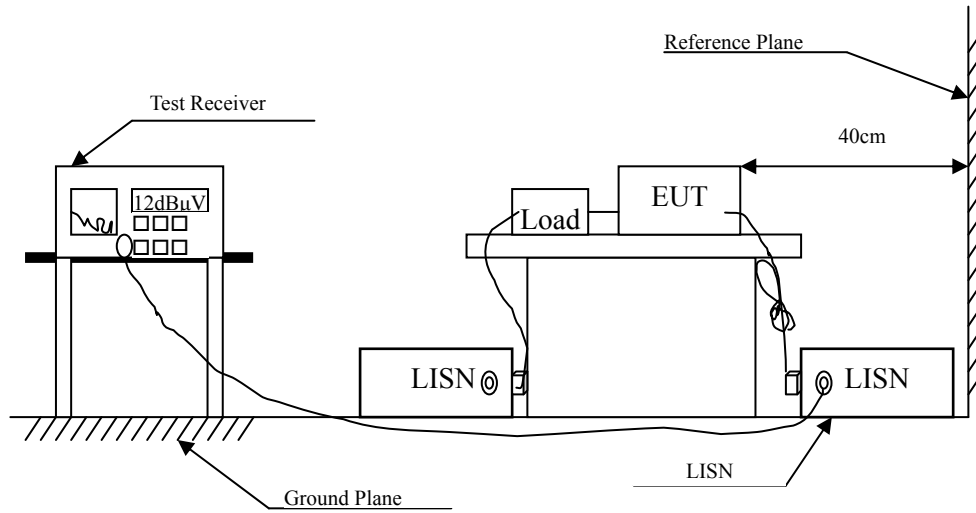
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Spectrum Analyzer	R&S	FSP40	100170	2017/1/5	2018/1/4
	Loop Antenna	Teseq	HLA6121	37133	2016/3/18	2017/3/17
X	Bi-Log Antenna	Schaffner Chase	CBL6112B	2707	2016/6/11	2017/6/10
X	<u>Horn Antenna</u>	ETS-Lindgren	3117	00135205	2016/4/6	2017/4/5
X	<u>Horn Antenna</u>	Schwarzbeck	BBHA9170	9170430	2016/1/11	2017/1/10
X	<u>Pre-Amplifier</u>	QTK	AP/0100A	CHM/0901069	2016/6/23	2017/6/22
X	<u>Pre-Amplifier</u>	EMCI	EMC012630SE	980210	2016/1/26	2017/1/24
X	<u>Pre-Amplifier</u>	NARDA WE	DBL-1840N506	013	2016/9/30	2017/9/29
X	Filter	MicroTRON	BRM50701	019	2016/11/2	2017/11/1
X	Filter	Microwave Circuits	N0257881	36681	2016/12/7	2017/12/6
X	EMI Test Receiver	R&S	ESR26	101385	2016/9/29	2017/9/28
X	Coaxial Cable	QTK(Arnist)	SUCOFLEX 106	L1606-015C	2016/6/23	2017/6/22
X	EMI Test Receiver	R&S	ESCS 30	838251/001	2016/7/21	2017/7/20
X	Coaxial Cable	QTK(Arnist)	RG 214	LC003-RG	2016/6/16	2017/6/15
X	Coaxial signal switch	Anritsu	MP59B	6201415889	2016/6/16	2017/6/15

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 : QuieTek EMI 2.0 V2.1.113.

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBμV) 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 C63.10:2013 on conducted measurement.

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

The EUT was setup to ANSI C63.10, 2014; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

2.4. Uncertainty

± 2.26 dB

2.5. Test Result of Conducted Emission

Product : Key programming device
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Date : 2016/12/21
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5220MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV	dB	dBμV
LINE 1					
Quasi-Peak					
0.154	9.783	36.880	46.663	-19.223	65.886
0.205	9.775	23.370	33.145	-31.284	64.429
0.455	9.784	20.760	30.544	-26.742	57.286
1.150	9.848	17.710	27.558	-28.442	56.000
2.923	9.953	9.710	19.663	-36.337	56.000
15.302	10.159	21.310	31.469	-28.531	60.000
Average					
0.154	9.783	22.660	32.443	-23.443	55.886
0.205	9.775	6.690	16.465	-37.964	54.429
0.455	9.784	12.300	22.084	-25.202	47.286
1.150	9.848	11.130	20.978	-25.022	46.000
2.923	9.953	-0.590	9.363	-36.637	46.000
15.302	10.159	12.640	22.799	-27.201	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Key programming device
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Date : 2016/12/21
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5220MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV	Margin dB	Limit dBμV
LINE 2					
Quasi-Peak					
0.201	9.835	22.680	32.515	-32.028	64.543
0.255	9.839	23.800	33.639	-29.361	63.000
0.451	9.854	21.250	31.104	-26.296	57.400
1.060	9.901	15.160	25.061	-30.939	56.000
2.787	10.021	10.190	20.211	-35.789	56.000
16.298	10.318	16.340	26.658	-33.342	60.000
Average					
0.201	9.835	8.190	18.025	-36.518	54.543
0.255	9.839	8.660	18.499	-34.501	53.000
0.451	9.854	13.620	23.474	-23.926	47.400
1.060	9.901	8.410	18.311	-27.689	46.000
2.787	10.021	1.180	11.201	-34.799	46.000
16.298	10.318	6.960	17.278	-32.722	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Key programming device
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Date : 2016/12/21
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5300MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV	dB	dBμV
LINE 1					
Quasi-Peak					
0.150	9.784	36.390	46.174	-19.826	66.000
0.193	9.774	31.420	41.194	-23.577	64.771
0.244	9.778	25.020	34.798	-28.516	63.314
0.509	9.789	18.210	27.999	-28.001	56.000
1.150	9.848	17.870	27.718	-28.282	56.000
15.384	10.160	21.810	31.970	-28.030	60.000
Average					
0.150	9.784	19.210	28.994	-27.006	56.000
0.193	9.774	15.520	25.294	-29.477	54.771
0.244	9.778	11.260	21.038	-32.276	53.314
0.509	9.789	10.240	20.029	-25.971	46.000
1.150	9.848	11.330	21.178	-24.822	46.000
15.384	10.160	13.020	23.180	-26.820	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Key programming device
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Date : 2016/12/21
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5300MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV	dB	dBμV
LINE 2					
Quasi-Peak					
0.154	9.831	42.760	52.591	-13.295	65.886
0.212	9.836	28.270	38.106	-26.123	64.229
0.287	9.841	20.280	30.121	-31.965	62.086
0.463	9.855	19.100	28.955	-28.102	57.057
1.162	9.909	16.080	25.989	-30.011	56.000
16.873	10.323	13.770	24.093	-35.907	60.000
Average					
0.154	9.831	21.680	31.511	-24.375	55.886
0.212	9.836	10.710	20.546	-33.683	54.229
0.287	9.841	8.890	18.731	-33.355	52.086
0.463	9.855	10.260	20.115	-26.942	47.057
1.162	9.909	9.370	19.279	-26.721	46.000
16.873	10.323	7.230	17.553	-32.447	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Key programming device
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Date : 2016/12/21
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5580MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV	dB	dBμV
LINE 1					
Quasi-Peak					
0.162	9.781	35.620	45.401	-20.256	65.657
0.224	9.777	27.420	37.197	-26.689	63.886
0.560	9.793	13.810	23.603	-32.397	56.000
1.138	9.847	17.630	27.477	-28.523	56.000
2.193	9.939	8.080	18.019	-37.981	56.000
15.306	10.159	21.370	31.529	-28.471	60.000
Average					
0.162	9.781	19.290	29.071	-26.586	55.657
0.224	9.777	13.420	23.197	-30.689	53.886
0.560	9.793	4.610	14.403	-31.597	46.000
1.138	9.847	11.180	21.027	-24.973	46.000
2.193	9.939	-0.100	9.839	-36.161	46.000
15.306	10.159	12.900	23.059	-26.941	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Key programming device
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Date : 2016/12/21
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5580MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV	dB	dBμV
LINE 2					
Quasi-Peak					
0.154	9.831	36.100	45.931	-19.955	65.886
0.193	9.834	31.160	40.994	-23.777	64.771
0.459	9.855	20.080	29.935	-27.236	57.171
0.974	9.895	15.900	25.795	-30.205	56.000
2.451	10.004	9.560	19.564	-36.436	56.000
16.271	10.318	16.340	26.658	-33.342	60.000
Average					
0.154	9.831	22.010	31.841	-24.045	55.886
0.193	9.834	15.810	25.644	-29.127	54.771
0.459	9.855	11.970	21.825	-25.346	47.171
0.974	9.895	7.330	17.225	-28.775	46.000
2.451	10.004	2.030	12.034	-33.966	46.000
16.271	10.318	6.800	17.118	-32.882	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Key programming device
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Date : 2016/12/21
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5785MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV	dB	dBμV
LINE 1					
Quasi-Peak					
0.150	9.784	36.000	45.784	-20.216	66.000
0.185	9.775	31.870	41.645	-23.355	65.000
0.220	9.776	27.720	37.496	-26.504	64.000
0.455	9.784	21.030	30.814	-26.472	57.286
1.154	9.848	17.710	27.558	-28.442	56.000
15.283	10.158	21.480	31.638	-28.362	60.000
Average					
0.150	9.784	18.970	28.754	-27.246	56.000
0.185	9.775	17.090	26.865	-28.135	55.000
0.220	9.776	13.660	23.436	-30.564	54.000
0.455	9.784	12.390	22.174	-25.112	47.286
1.154	9.848	11.280	21.128	-24.872	46.000
15.283	10.158	12.800	22.958	-27.042	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Key programming device
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Date : 2016/12/21
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV	Margin dB	Limit dBμV
LINE 2					
Quasi-Peak					
0.162	9.832	35.340	45.172	-20.485	65.657
0.193	9.834	31.020	40.854	-23.917	64.771
0.451	9.854	21.510	31.364	-26.036	57.400
1.158	9.909	16.590	26.499	-29.501	56.000
2.181	9.998	9.220	19.218	-36.782	56.000
15.310	10.299	15.680	25.979	-34.021	60.000
Average					
0.162	9.832	19.290	29.122	-26.535	55.657
0.193	9.834	15.760	25.594	-29.177	54.771
0.451	9.854	13.620	23.474	-23.926	47.400
1.158	9.909	9.890	19.799	-26.201	46.000
2.181	9.998	2.370	12.368	-33.632	46.000
15.310	10.299	7.500	17.799	-32.201	50.000

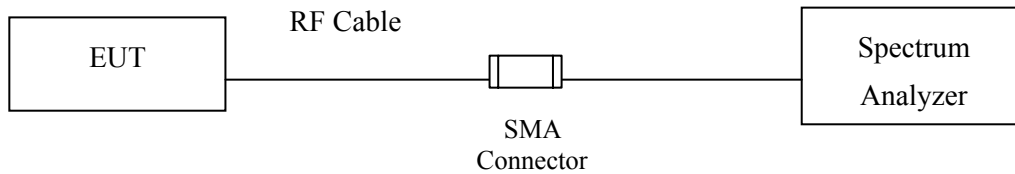
Note:

1. All Reading Levels are Quasi-Peak and average value.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

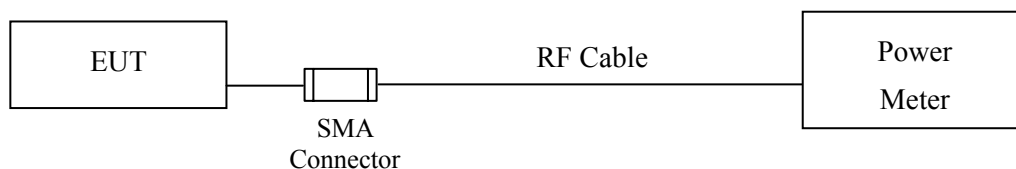
3. Maximun conducted output power

3.1. Test Setup

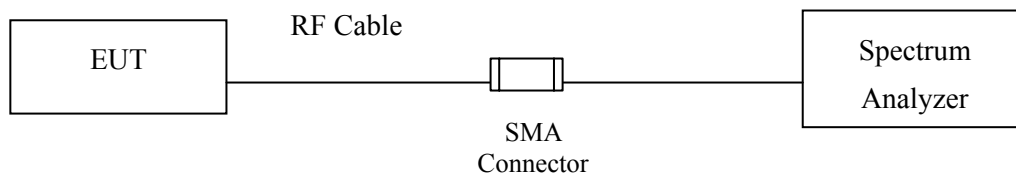
99& Occupied Bandwidth



Conduction Power Measurement (for 802.11an)



Conduction Power Measurement (for 802.11ac)



3.2. Limits

3.2.1. 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. 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.

3.2.2. 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 $11 \text{ dBm} + 10 \log B$, where B is the 26 dB 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.

3.2.3. 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. 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 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 ($BW \leq 40\text{MHz}$) 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 ($BW=80\text{MHz}$) 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 D01 section F) procedure is used for measurements.

3.4. Uncertainty

$\pm 1.62 \text{ dB}$

3.5. Test Result of Maximum conducted output power

Product : Key programming device
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)

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	8.95	--	--	--	--	--	--	--
44	5220	9.11	9.02	8.97	8.89	8.82	8.75	8.68	8.61
48	5240	9.08	--	--	--	--	--	--	--
52	5260	8.85	--	--	--	--	--	--	--
60	5300	9.02	8.96	8.91	8.85	8.80	8.74	8.69	8.63
64	5320	9.05	--	--	--	--	--	--	--
100	5500	9.48	--	--	--	--	--	--	--
116	5580	9.22	9.13	9.05	8.96	8.88	8.79	8.71	8.62
140	5700	9.47	--	--	--	--	--	--	--
149	5745	9.39	--	--	--	--	--	--	--
157	5785	9.43	9.37	9.31	9.25	9.19	9.13	9.07	9.01
165	5825	9.49	--	--	--	--	--	--	--

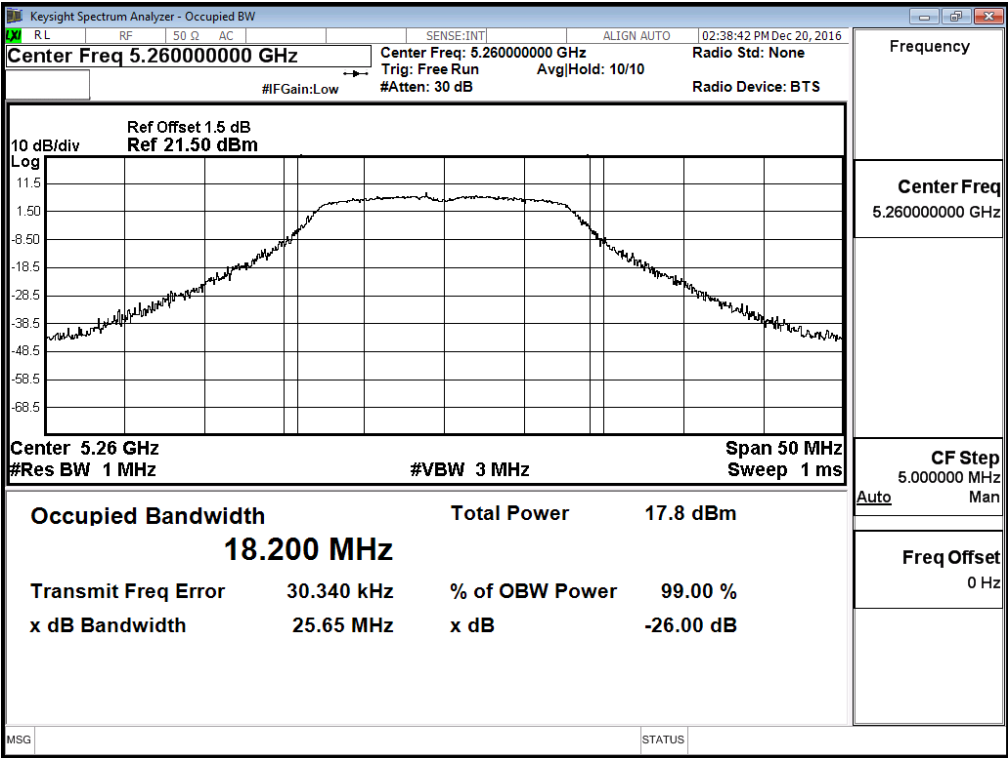
Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

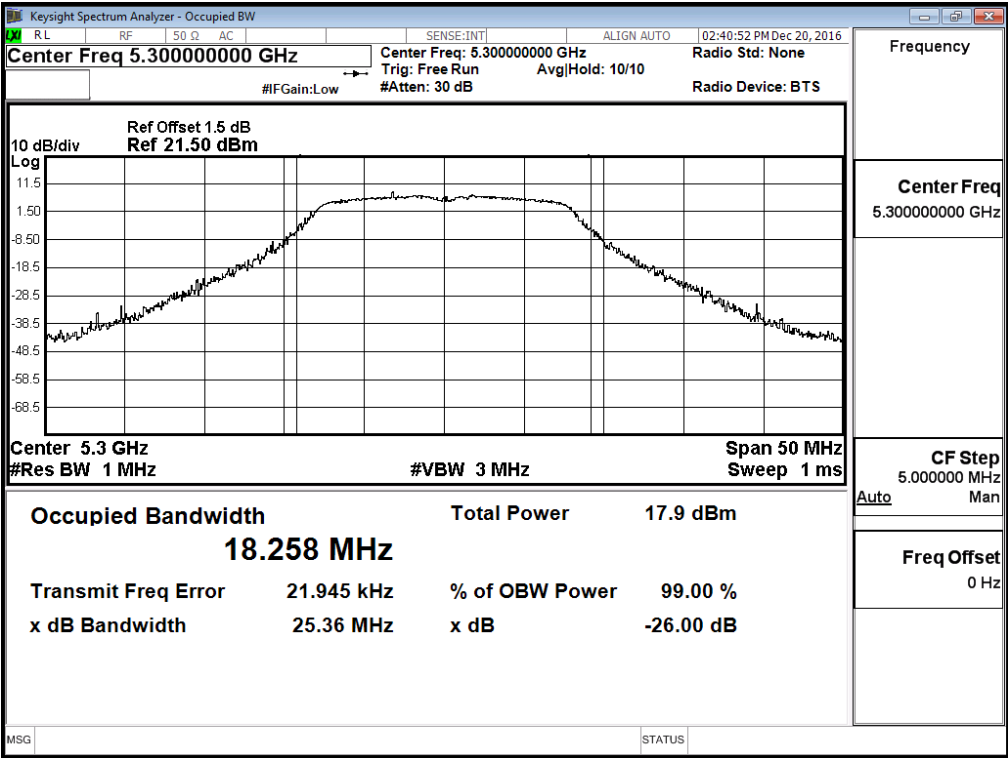
Channel No	Frequency Range (MHz)	99% Bandwidth (MHz)	Output Power (dBm)	Output Power Limit	
				(dBm)	dBm+10log(BW)
36	5180	--	8.95	24	--
44	5220	--	9.11	24	--
48	5240	--	9.08	24	--
52	5260	18.200	8.85	24	23.60
60	5300	18.258	9.02	24	23.61
64	5320	18.178	9.05	24	23.60
100	5500	18.120	9.48	24	23.58
116	5580	18.269	9.22	24	23.62
140	5700	18.165	9.47	24	23.59
149	5745	--	9.39	30	--
157	5785	--	9.43	30	--
165	5825	--	9.49	30	--

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

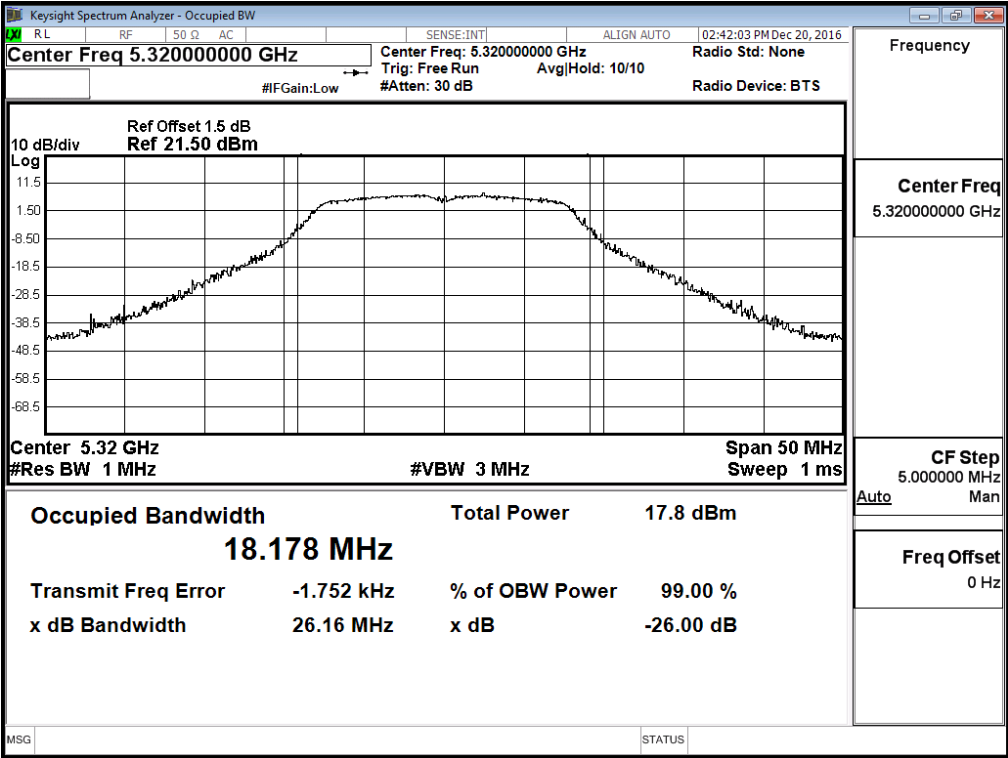
99% Occupied Bandwidth:
Channel 52:



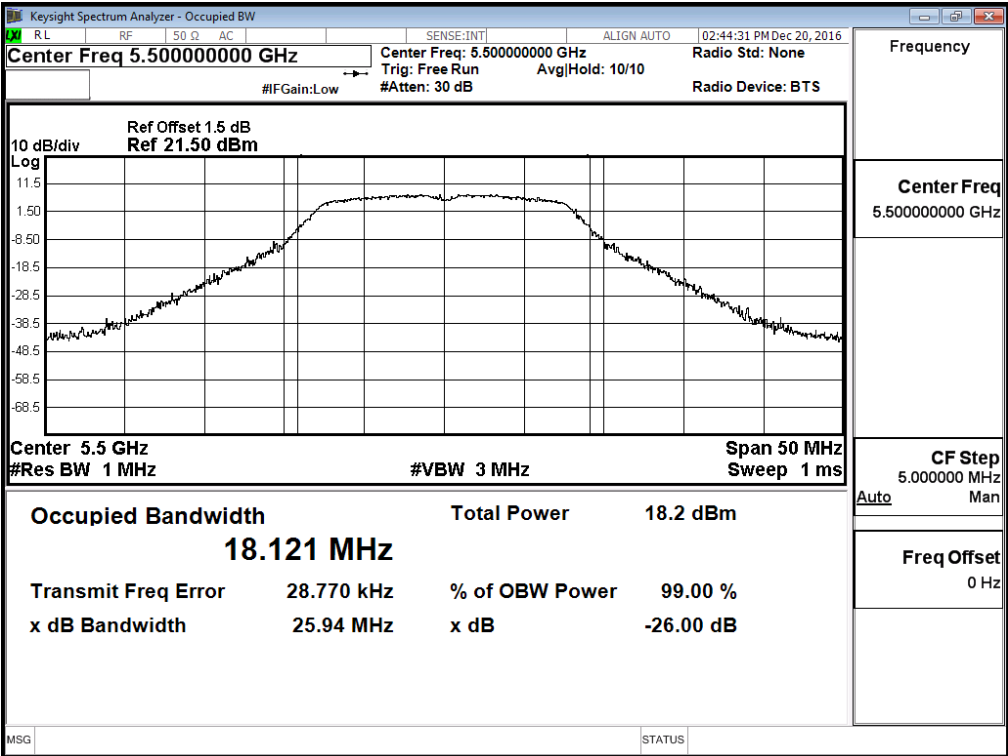
Channel 60:



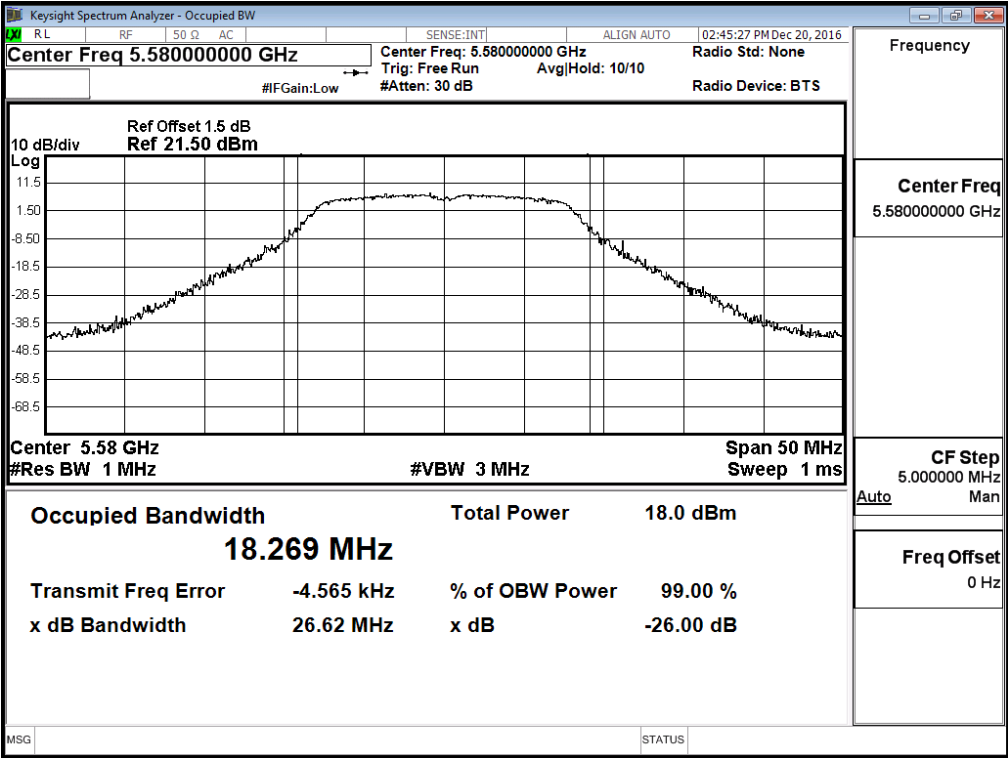
Channel 64:



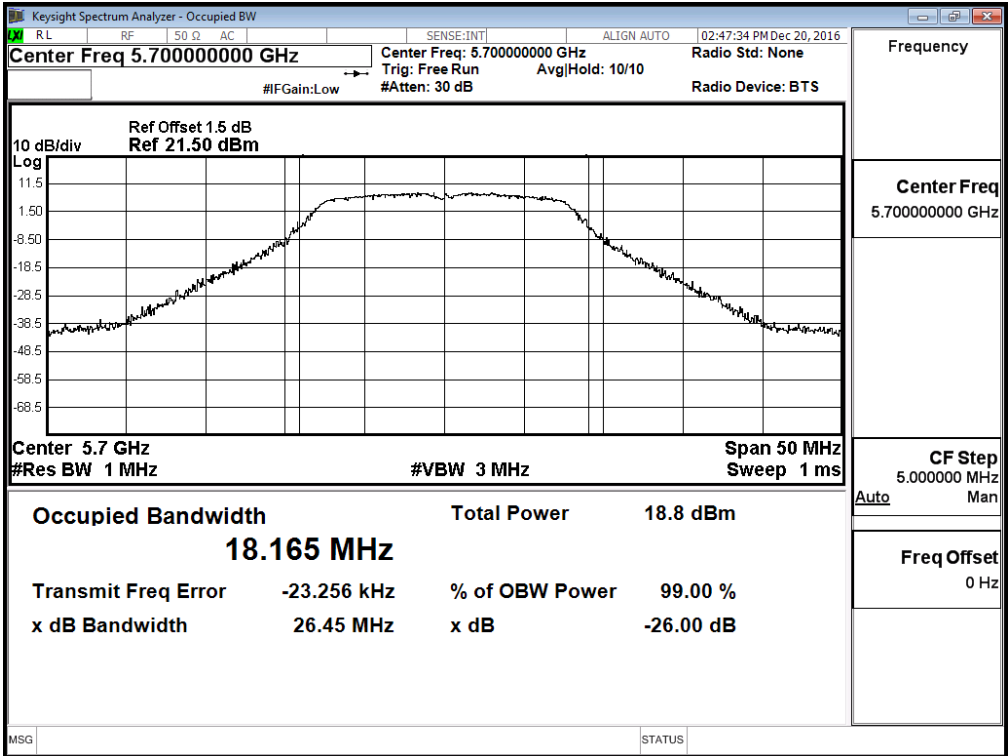
Channel 100:



Channel 116:



Channel 140:



Product : Key programming device
 Test Item : Maximum conducted output power
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps)

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	9.17	--	--	--	--	--	--	--
44	5220	9.49	9.43	9.38	9.32	9.27	9.21	9.16	9.10
48	5240	9.49	--	--	--	--	--	--	--
52	5260	9.35	--	--	--	--	--	--	--
60	5300	9.28	9.23	9.17	9.12	9.06	9.01	8.95	8.90
64	5320	9.21	--	--	--	--	--	--	--
100	5500	9.43	--	--	--	--	--	--	--
116	5580	9.46	9.42	9.37	9.33	9.28	9.24	9.19	9.15
140	5700	9.38	--	--	--	--	--	--	--
149	5745	9.40	--	--	--	--	--	--	--
157	5785	9.26	9.21	9.16	9.11	9.06	9.01	8.96	8.91
165	5825	9.16	--	--	--	--	--	--	--

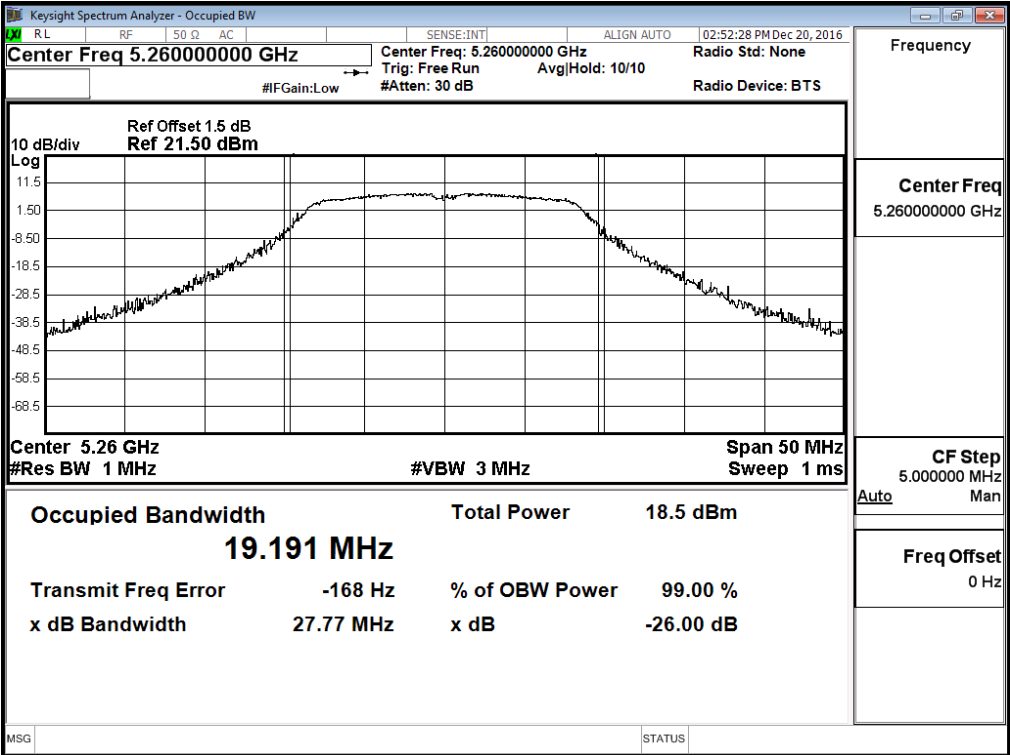
Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

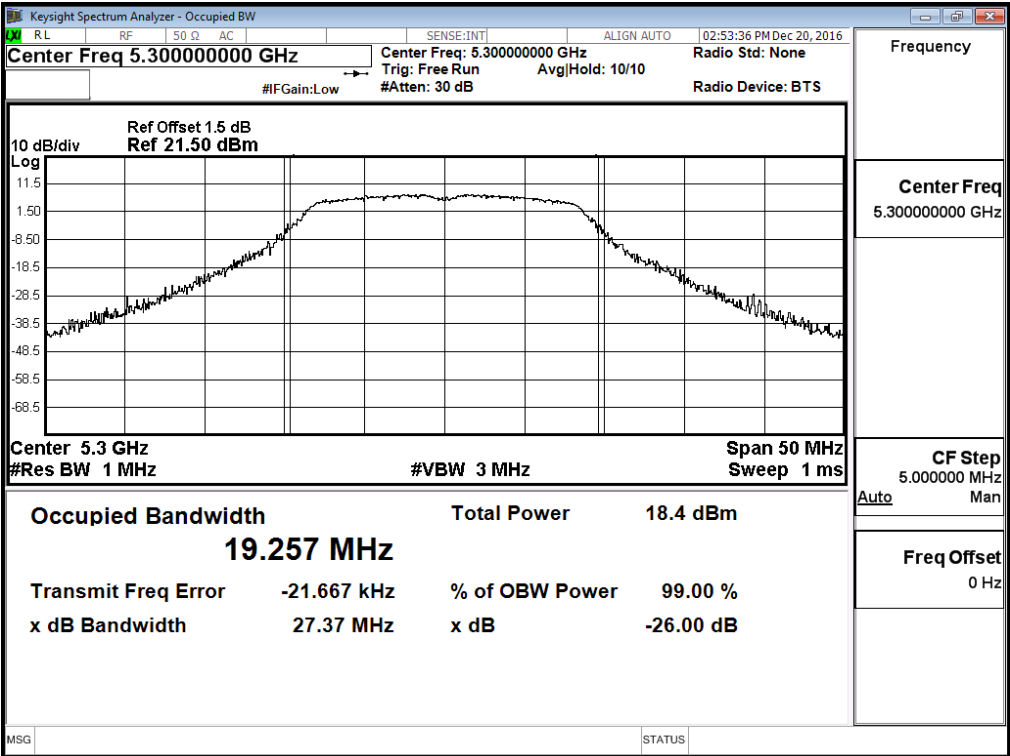
Channel No	Frequency Range (MHz)	99% Bandwidth (MHz)	Output Power (dBm)	Output Power Limit	
				(dBm)	dBm+10log(BW)
36	5180	--	9.17	24	--
44	5220	--	9.49	24	--
48	5240	--	9.49	24	--
52	5260	19.191	9.35	24	23.83
60	5300	19.257	9.28	24	23.85
64	5320	19.150	9.21	24	23.82
100	5500	19.109	9.43	24	23.81
116	5580	19.209	9.46	24	23.84
140	5700	19.285	9.38	24	23.85
149	5745	--	9.4	30	--
157	5785	--	9.26	30	--
165	5825	--	9.16	30	--

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

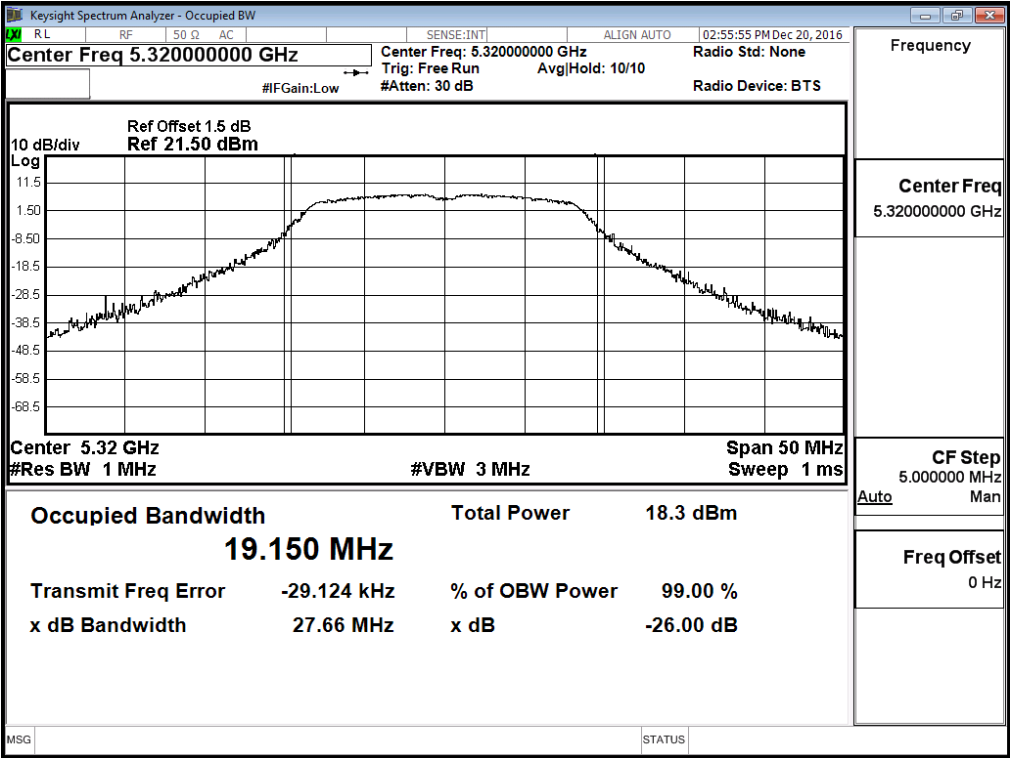
99% Occupied Bandwidth:
Channel 52



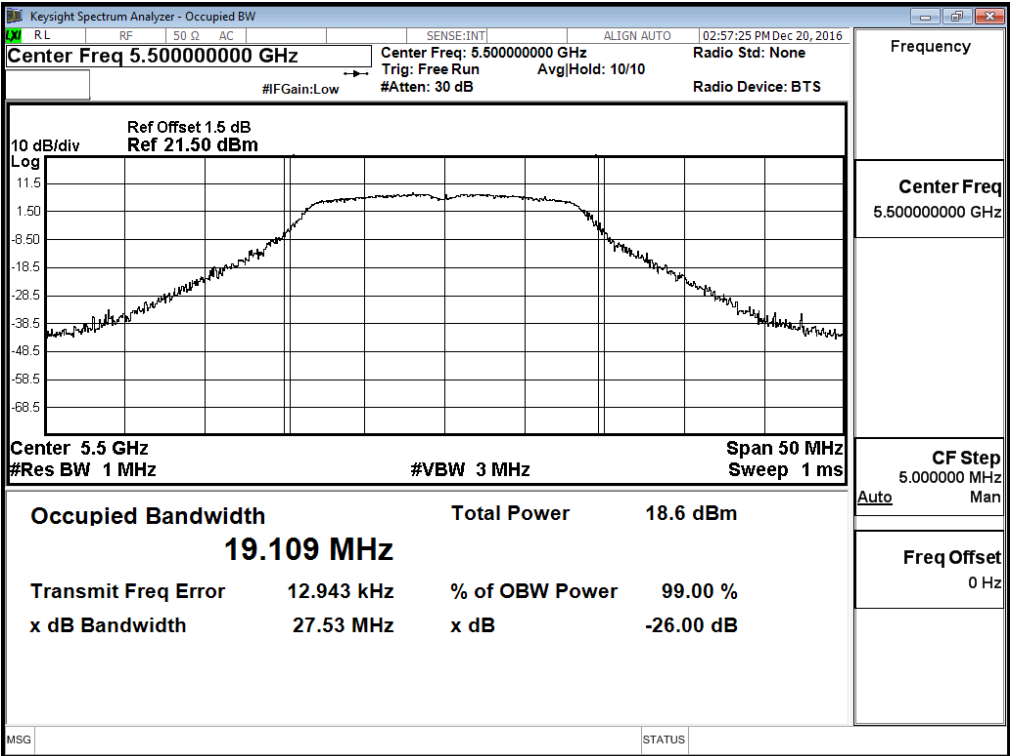
Channel 60



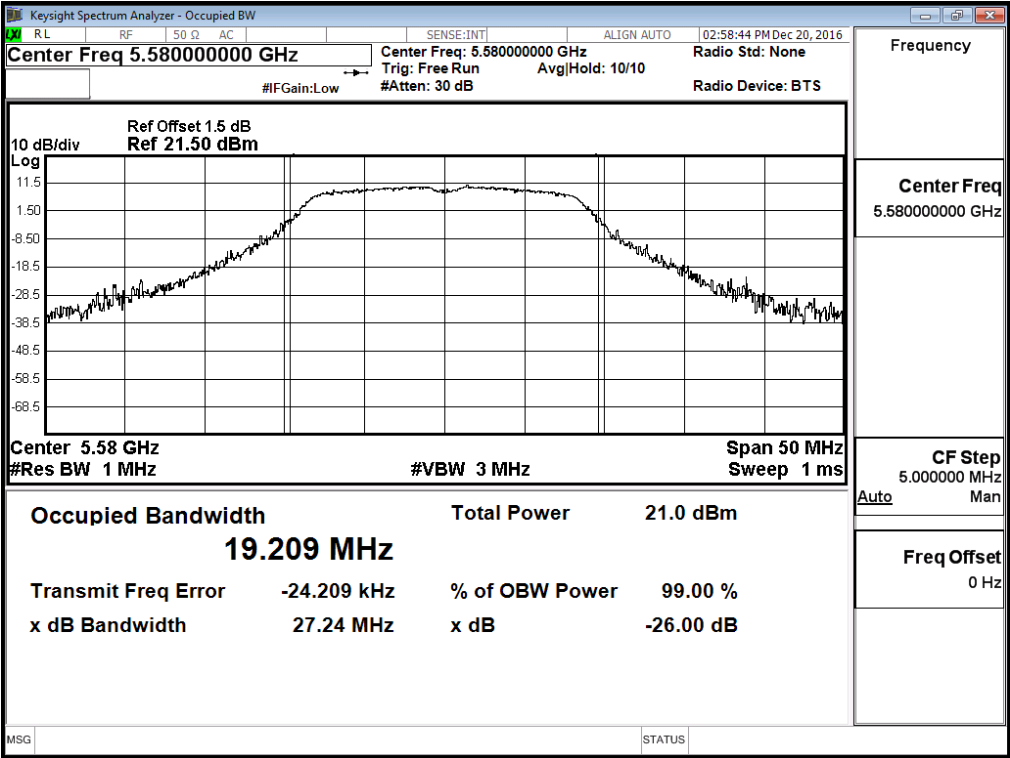
Channel 64



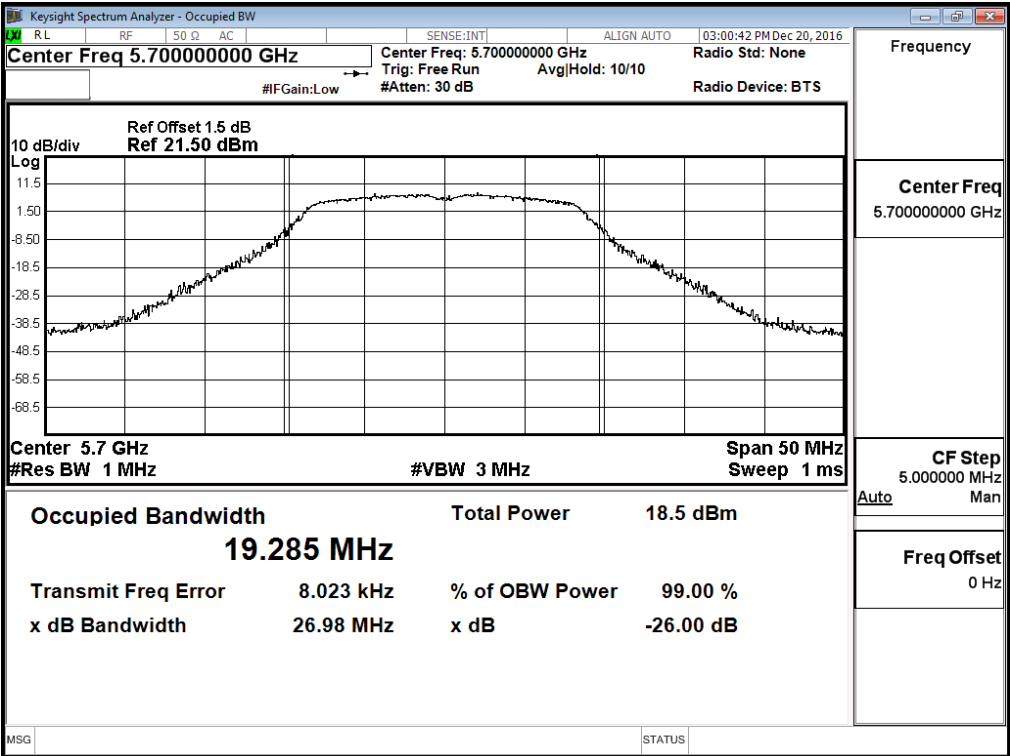
Channel 100



Channel 116

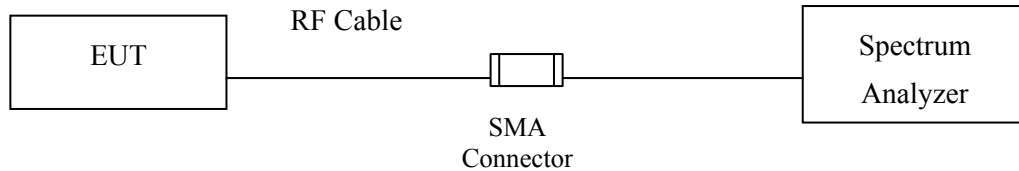


Channel 140



4. Peak Power Spectral Density

4.1. Test Setup



4.2. 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 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.+
- (2) 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.
- (3) 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, 2009; 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. Uncertainty

$\pm 1.62\text{ dB}$

4.5. Test Result of Peak Power Spectral Density

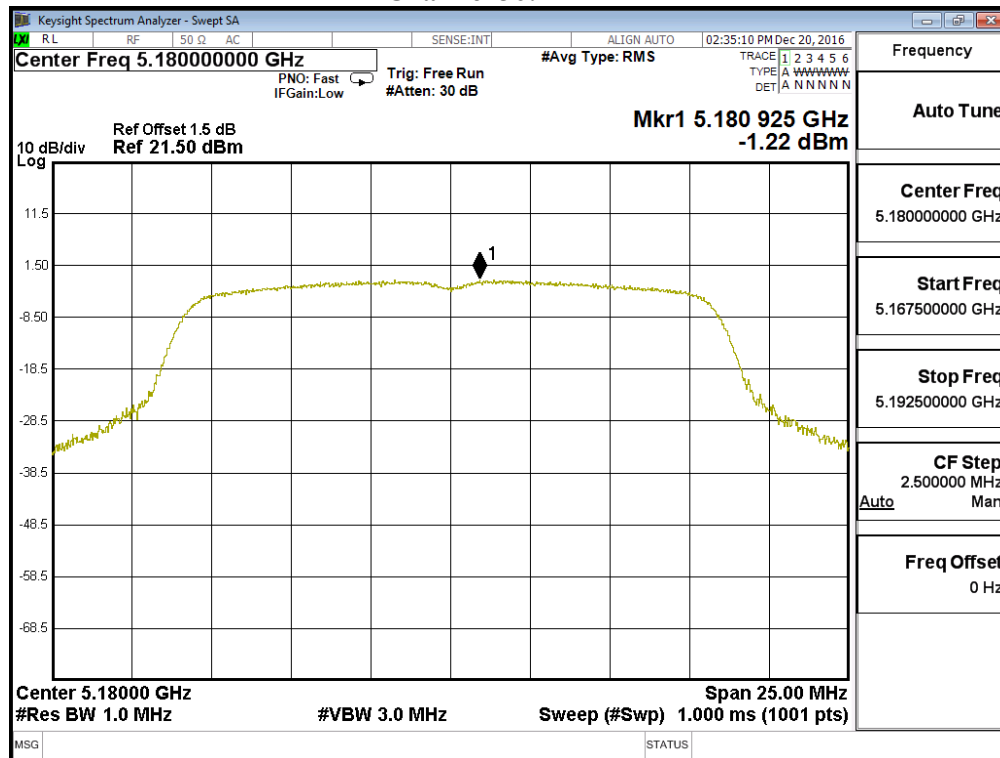
Product : Key programming device
 Test Item : Peak Power Spectral Density
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Channel Number	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dBm)	Required Limit (dBm)	Result
36	5180	6	-1.220	11	Pass
44	5220	6	-1.650	11	Pass
48	5240	6	-1.590	11	Pass
52	5260	6	-1.740	11	Pass
60	5300	6	-1.480	11	Pass
64	5320	6	-1.820	11	Pass
100	5500	6	-1.450	11	Pass
116	5580	6	-1.570	11	Pass
140	5700	6	-1.900	11	Pass

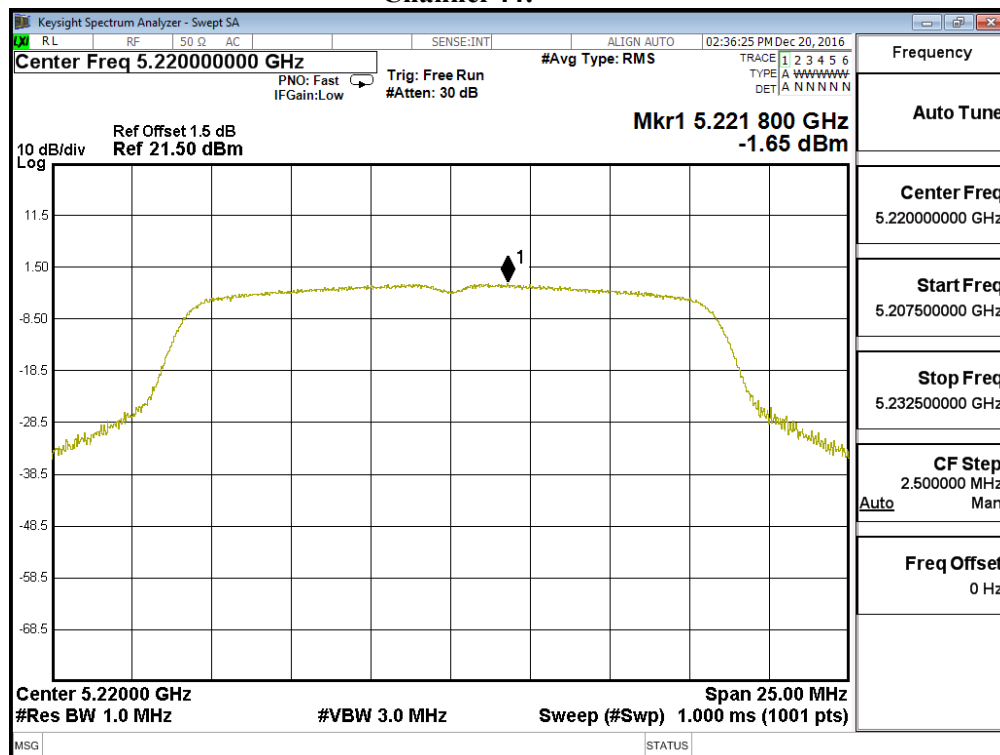
Channel Number	Frequency (MHz)	Data Rate (Mbps)	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm)	Required Limit (dBm)	Result
149	5745	6	-8.450	6.98	-1.47	<30	Pass
157	5785	6	-8.660	6.98	-1.68	<30	Pass
165	5825	6	-8.440	6.98	-1.46	<30	Pass

Note: Total PPSD Value = PPSD value + BWCF.

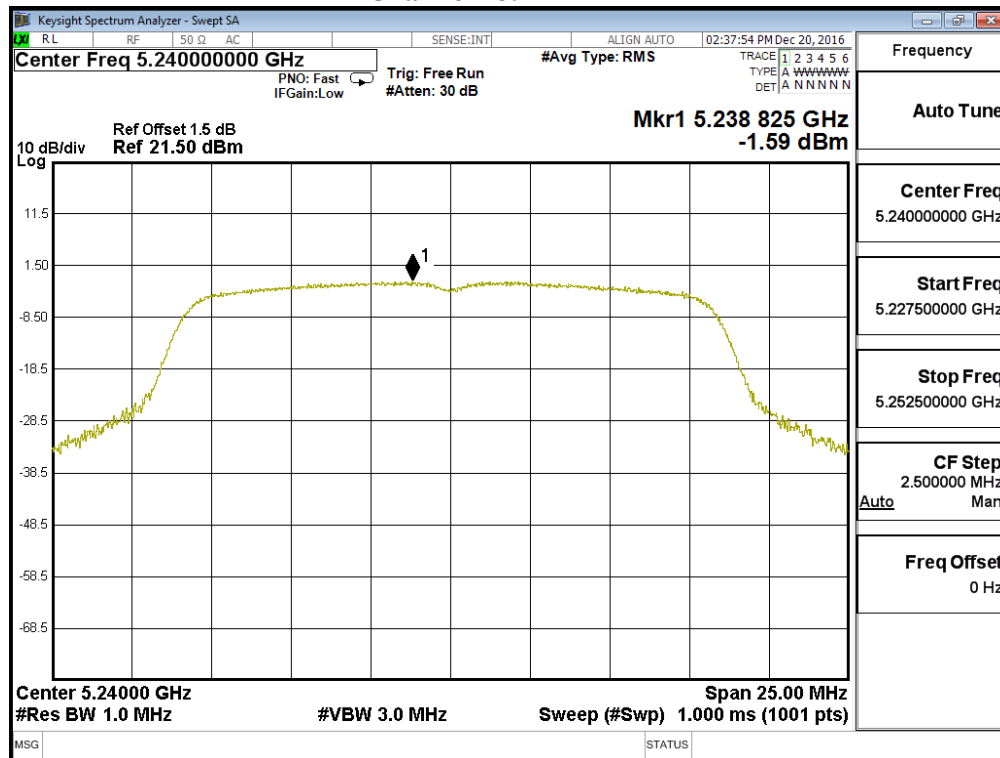
Channel 36:



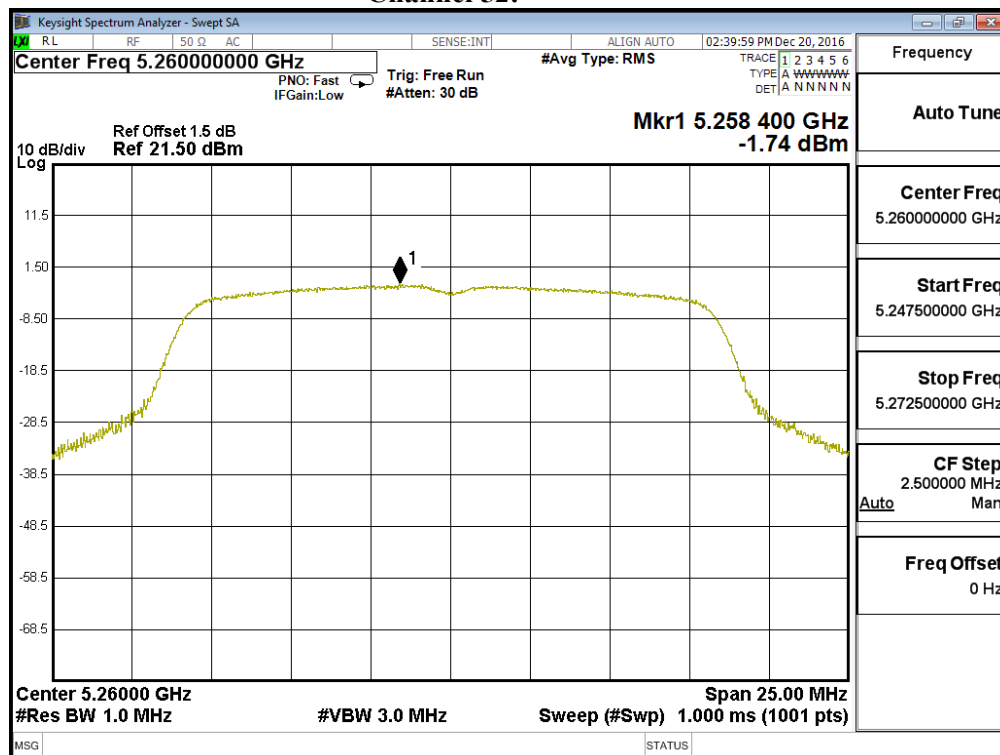
Channel 44:



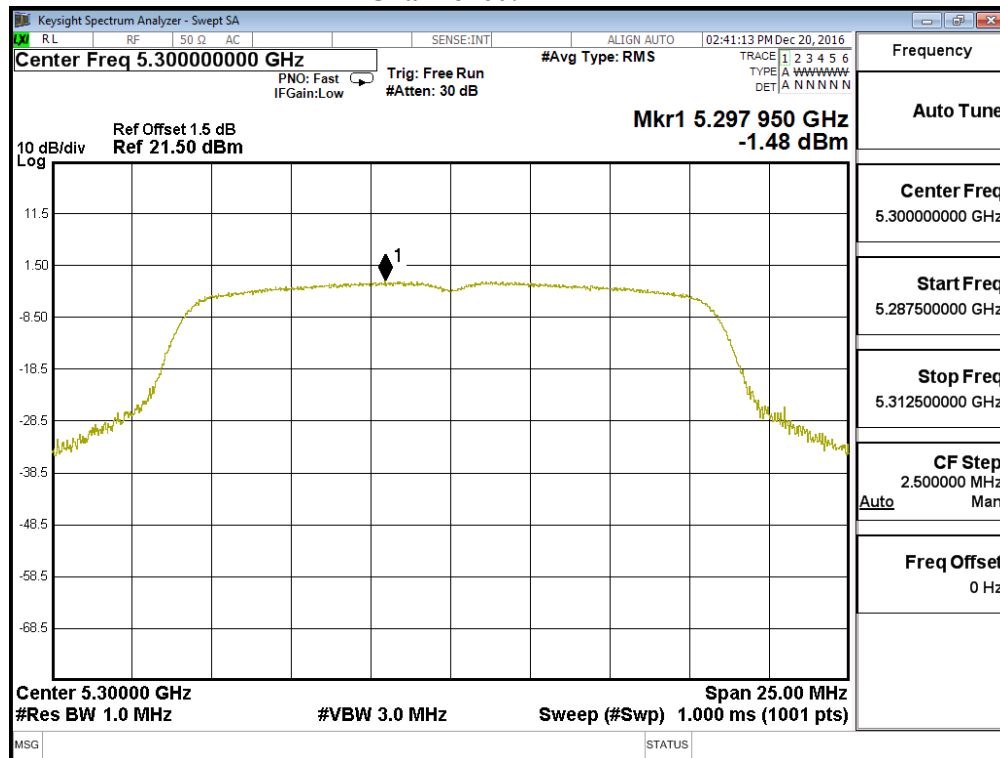
Channel 48:



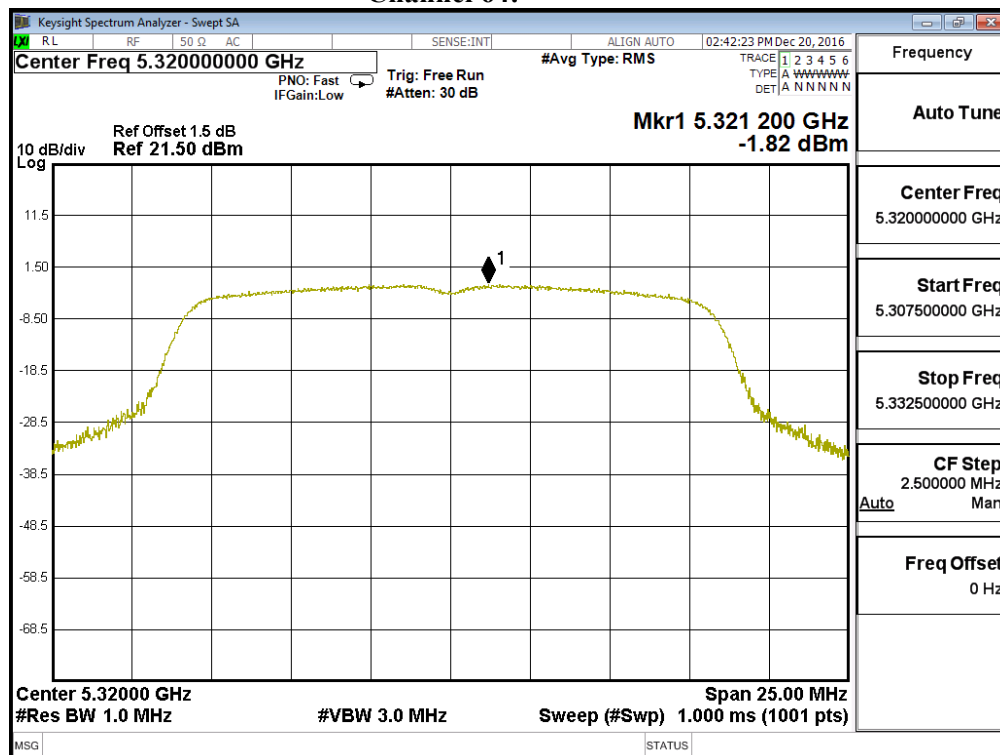
Channel 52:



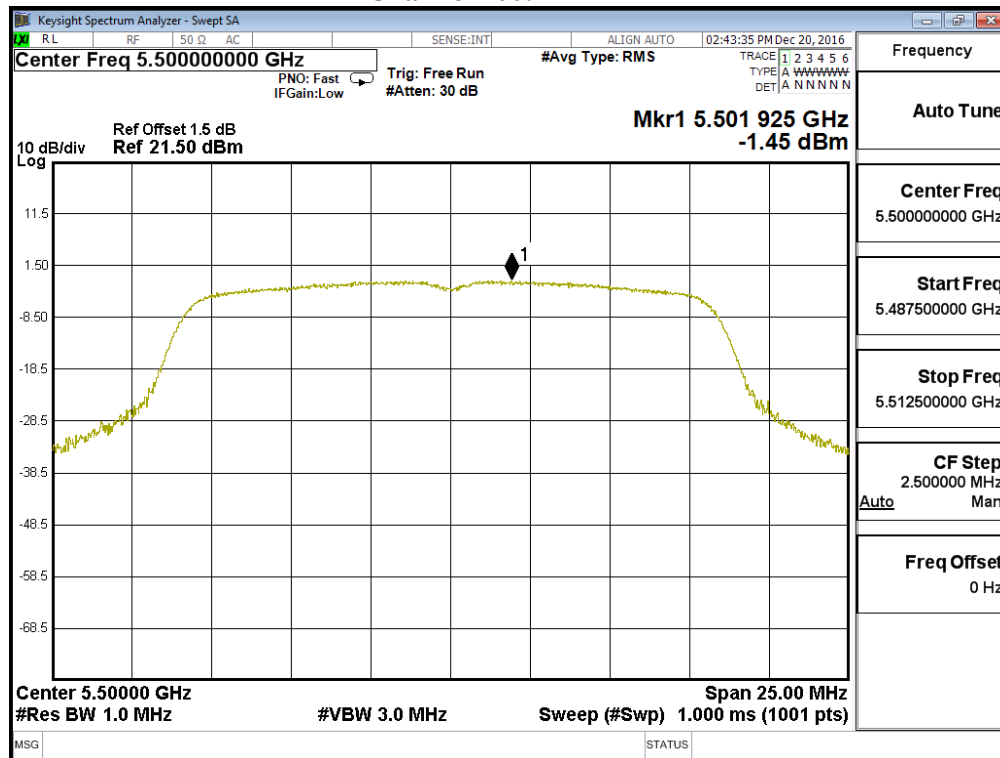
Channel 60:



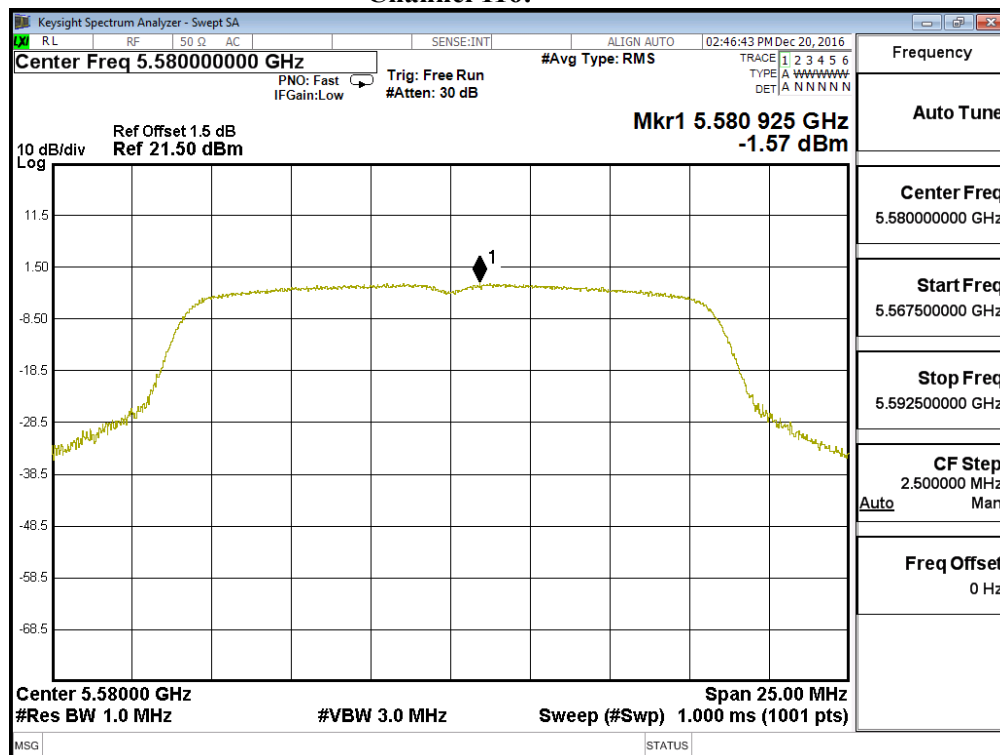
Channel 64:



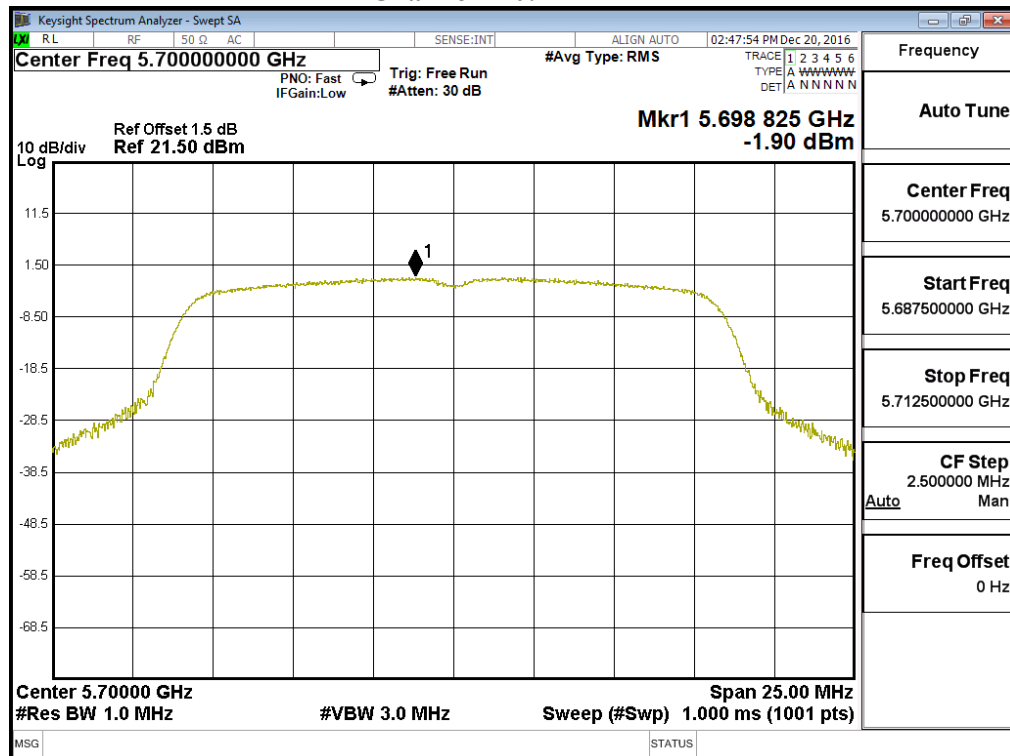
Channel 100:



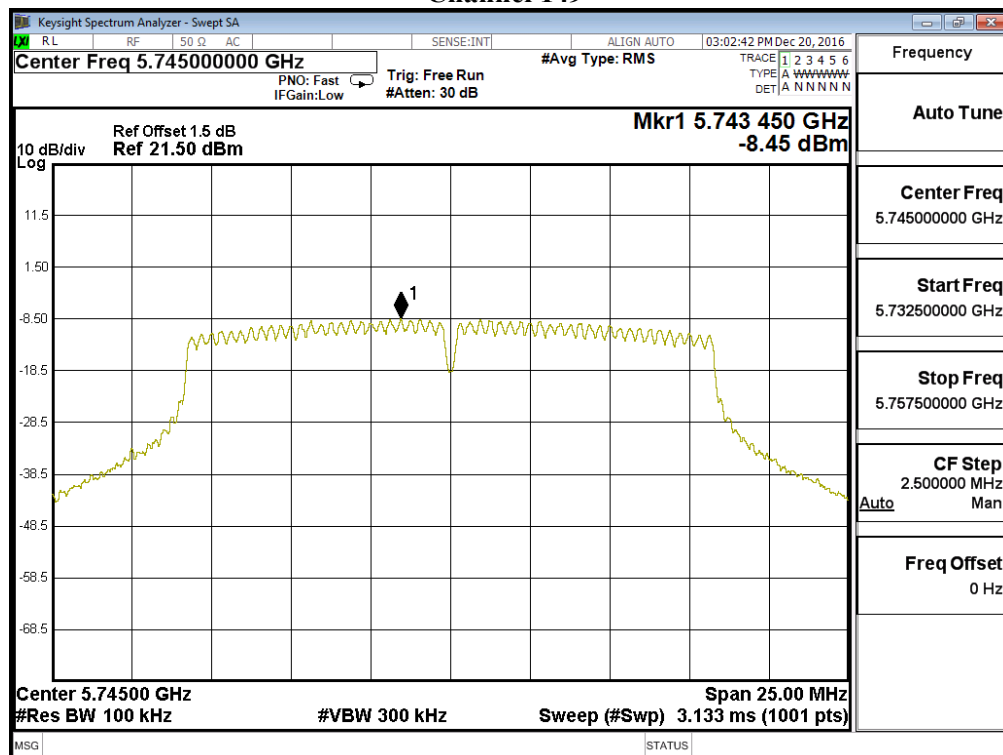
Channel 116:



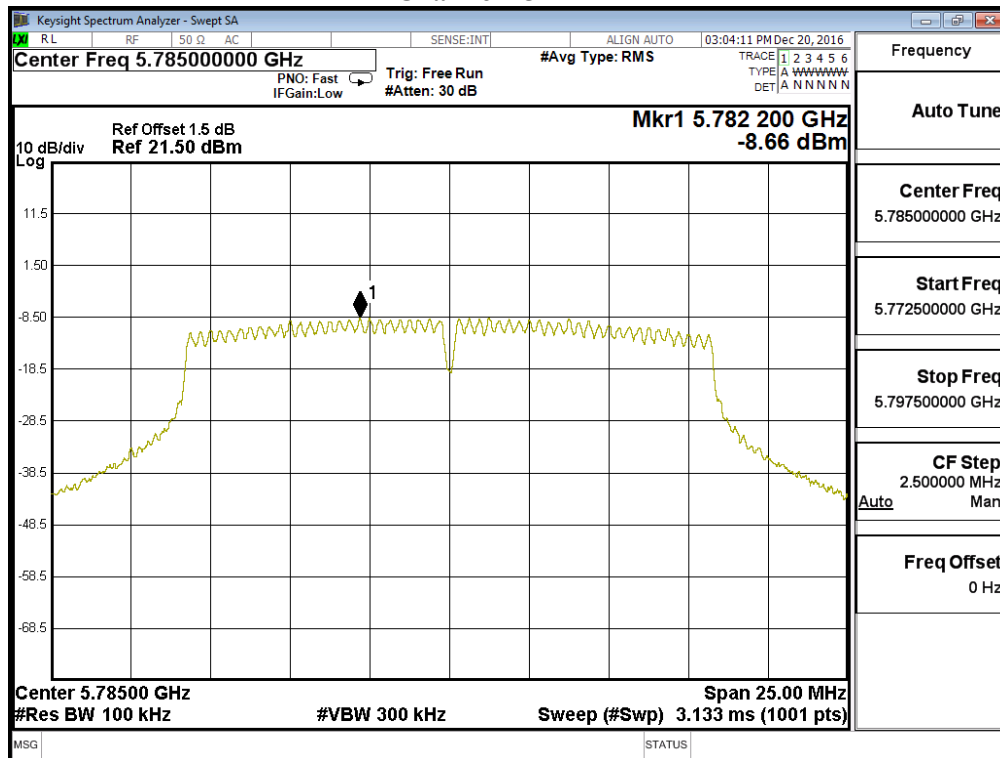
Channel 140:



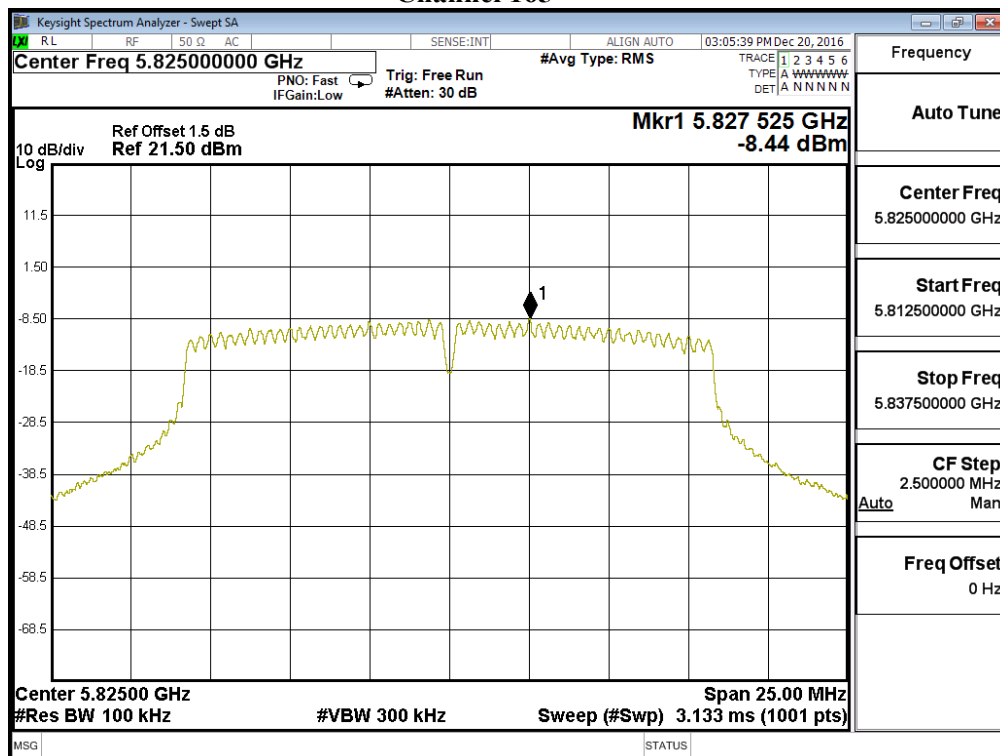
Channel 149



Channel 157



Channel 165



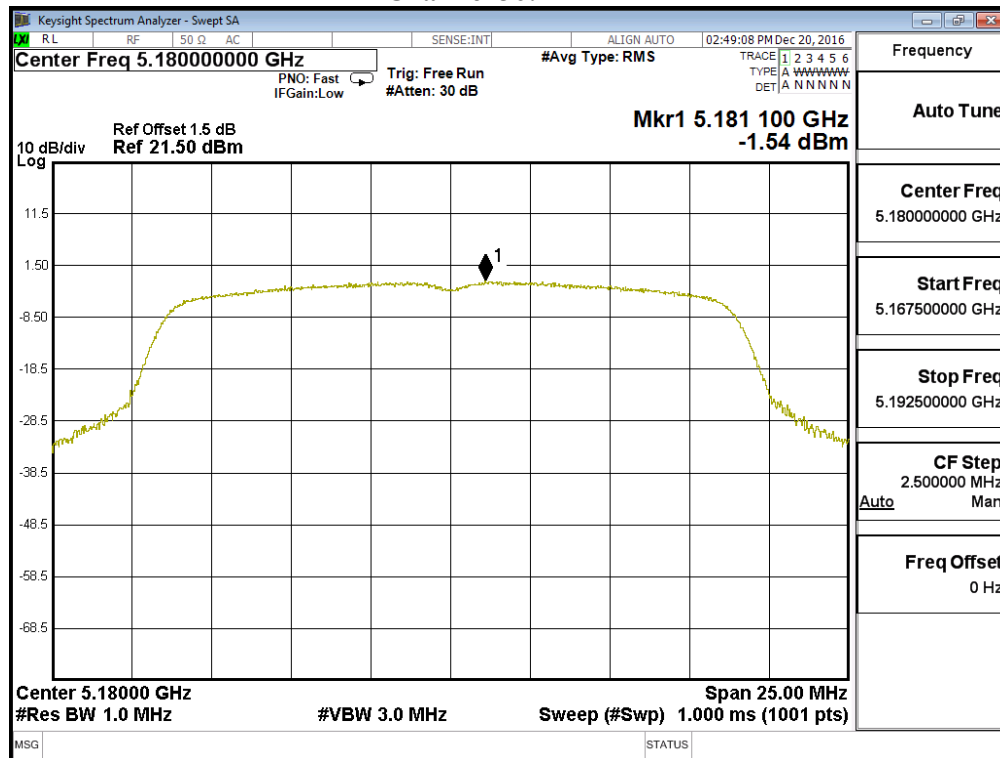
Product : Key programming device
 Test Item : Peak Power Spectral Density
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps)

Channel Number	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dBm)	Required Limit (dBm)	Result
36	5180	7.2	-1.540	11	Pass
44	5220	7.2	-1.450	11	Pass
48	5240	7.2	-1.120	11	Pass
52	5260	7.2	-1.370	11	Pass
60	5300	7.2	-1.110	11	Pass
64	5320	7.2	-1.400	11	Pass
100	5500	7.2	-1.410	11	Pass
116	5580	7.2	-1.450	11	Pass
140	5700	7.2	-1.490	11	Pass

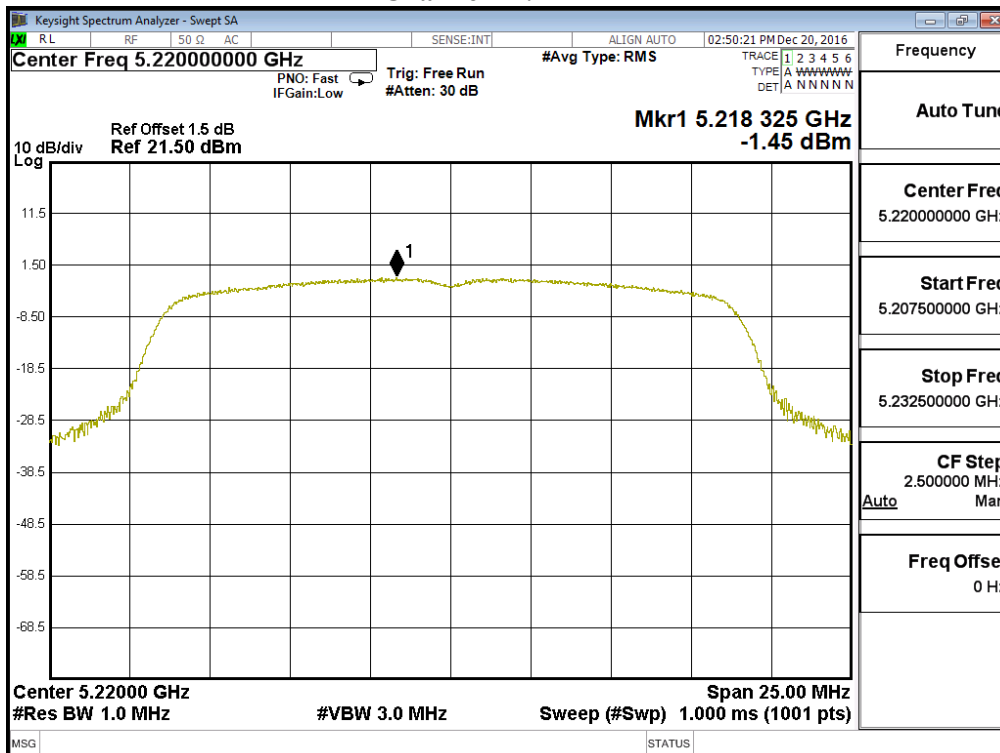
Channel Number	Frequency (MHz)	Data Rate (Mbps)	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm)	Required Limit (dBm)	Result
149	5745	7.2	-10.430	6.98	-3.45	<30	Pass
157	5785	7.2	-10.450	6.98	-3.47	<30	Pass
165	5825	7.2	-10.850	6.98	-3.87	<30	Pass

Note: Total PPSD Value = PPSD value + BWCF.

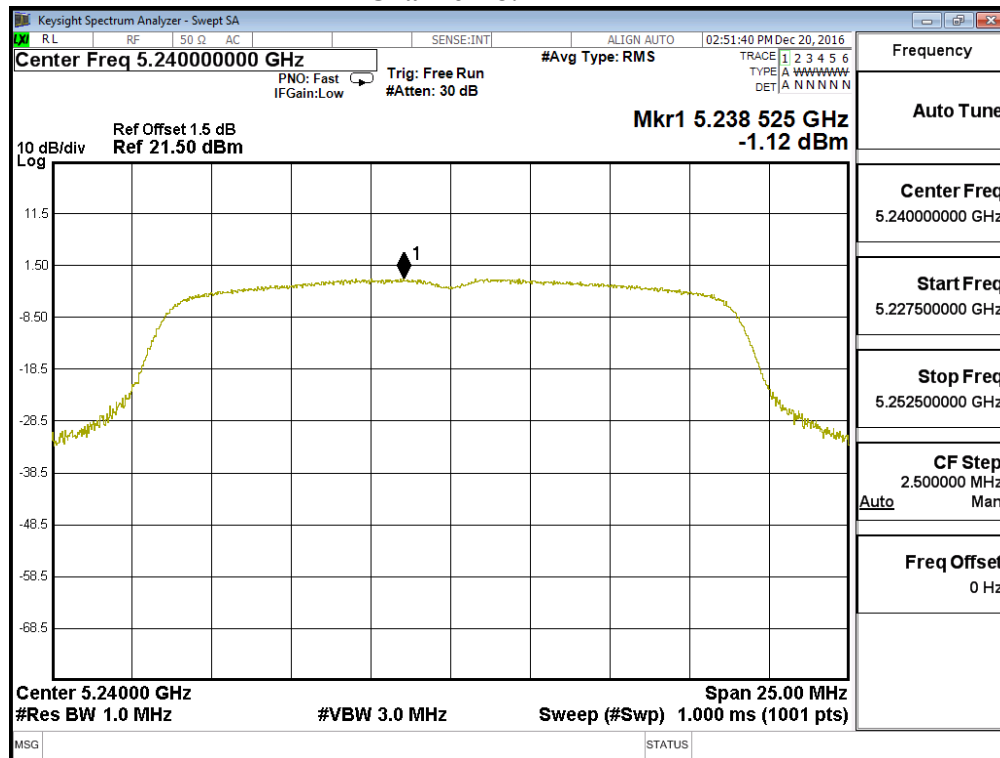
Channel 36:



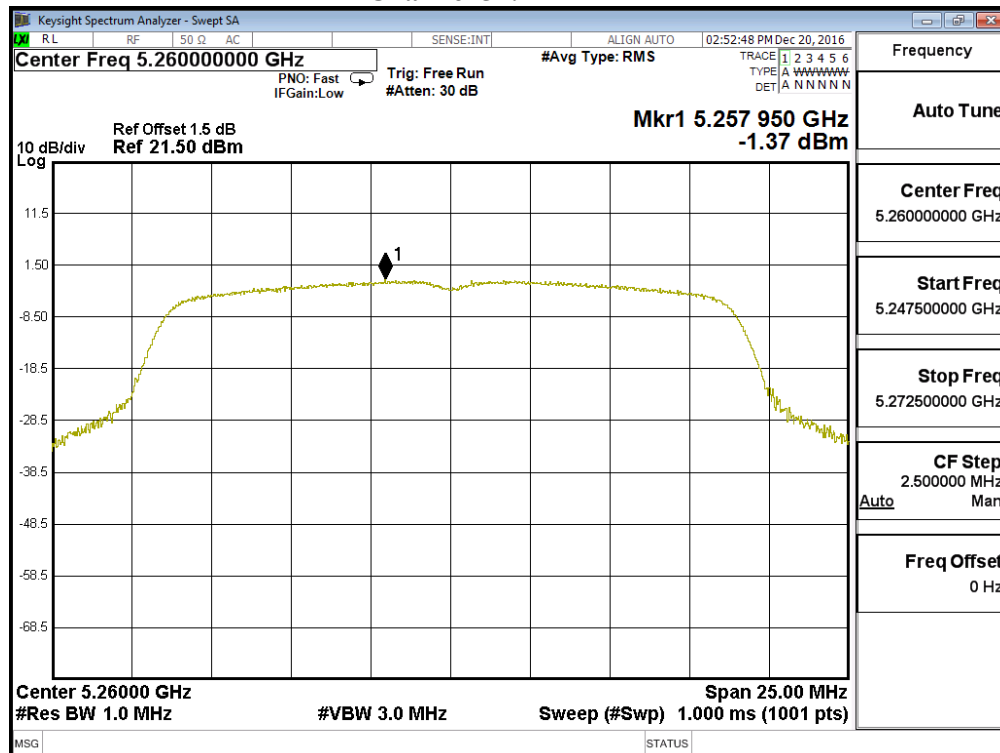
Channel 44:



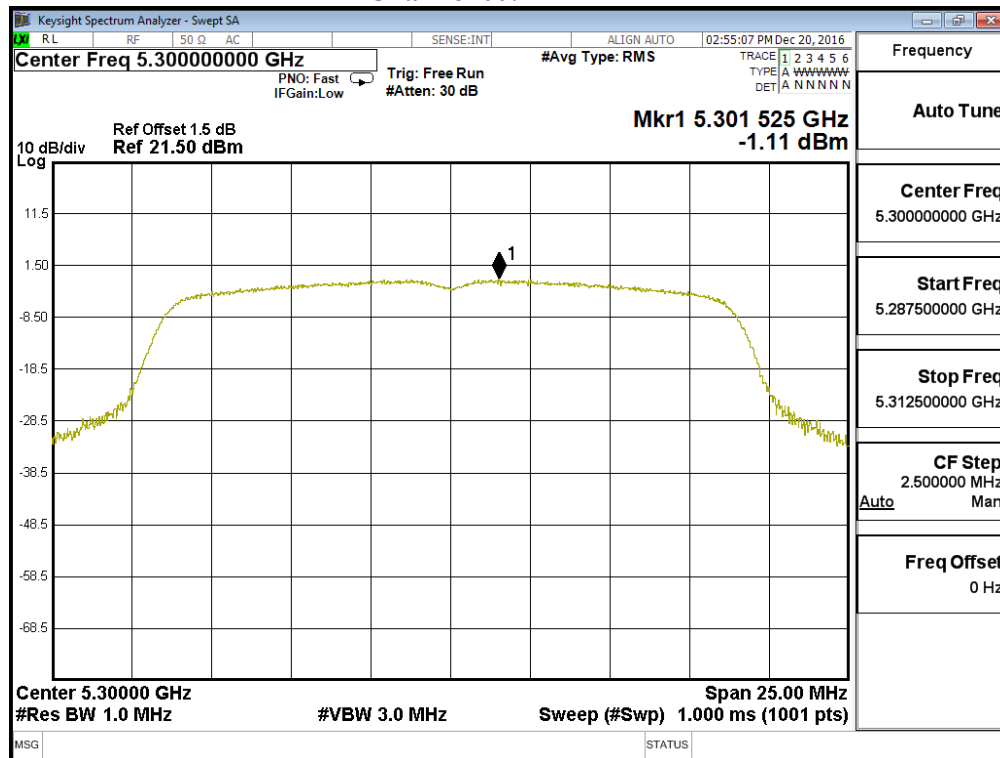
Channel 48:



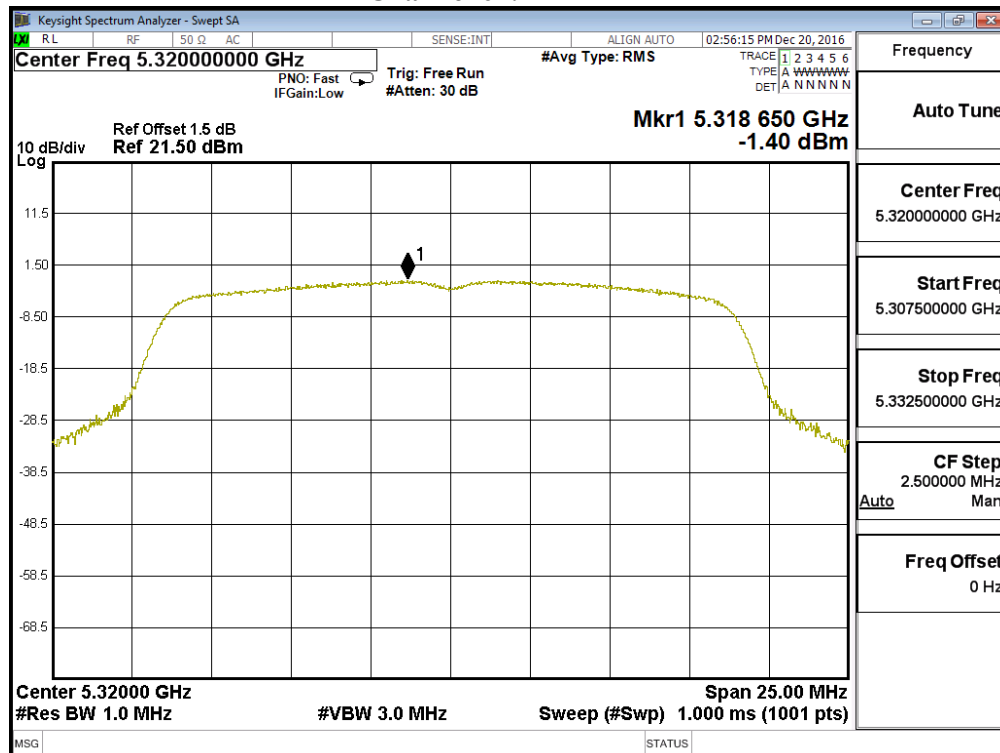
Channel 52:



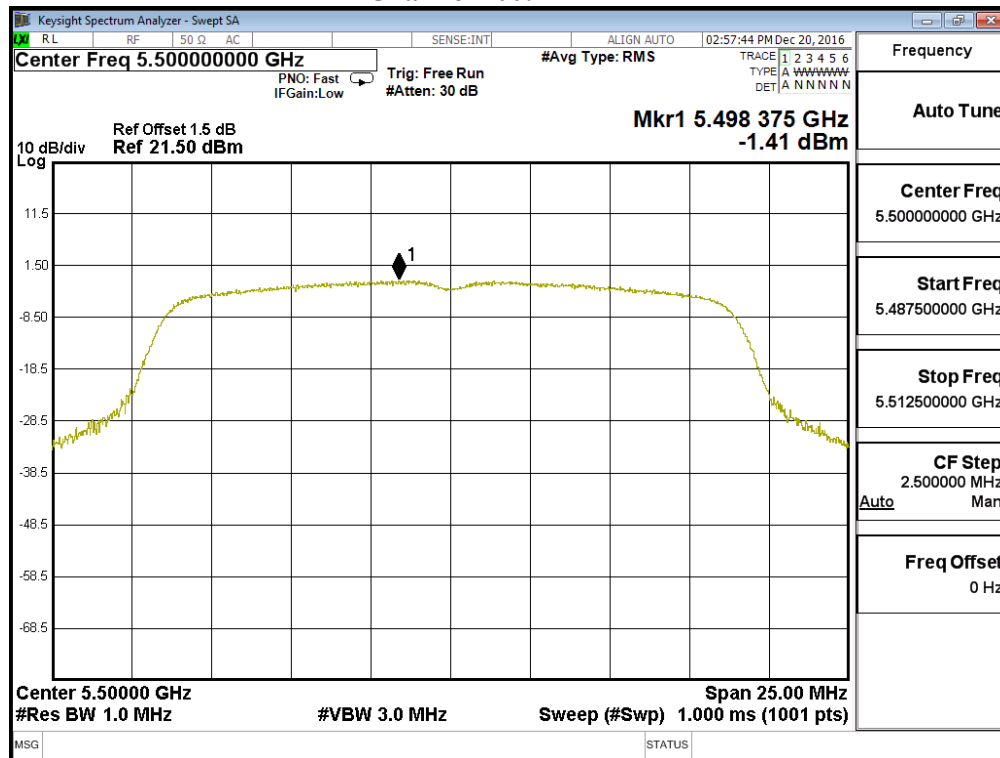
Channel 60:



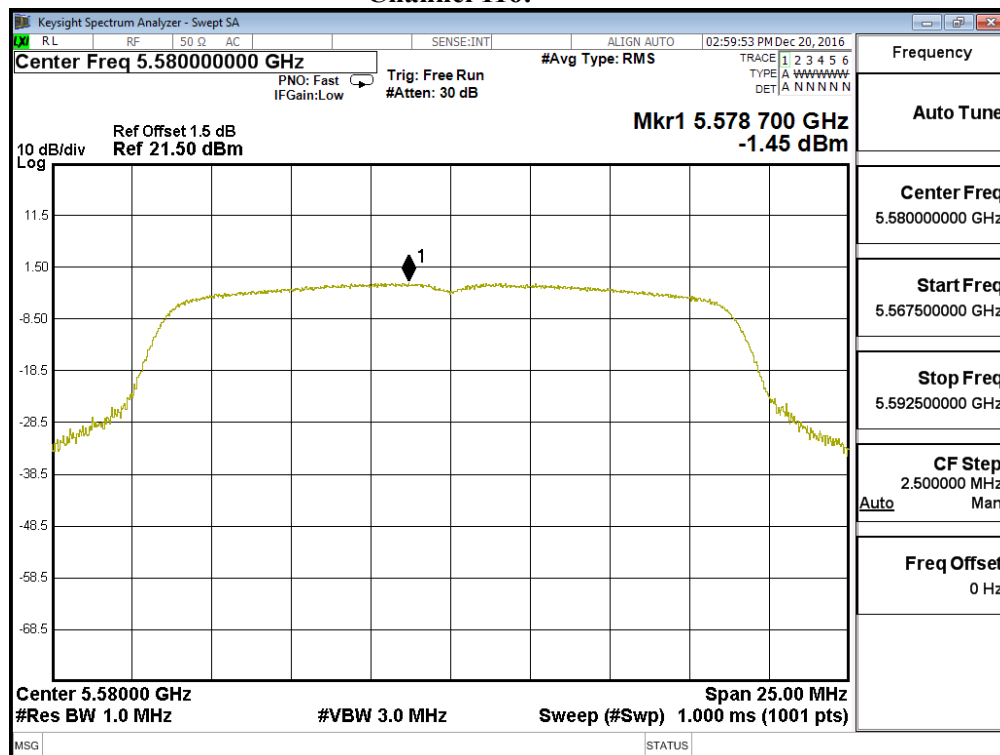
Channel 64:



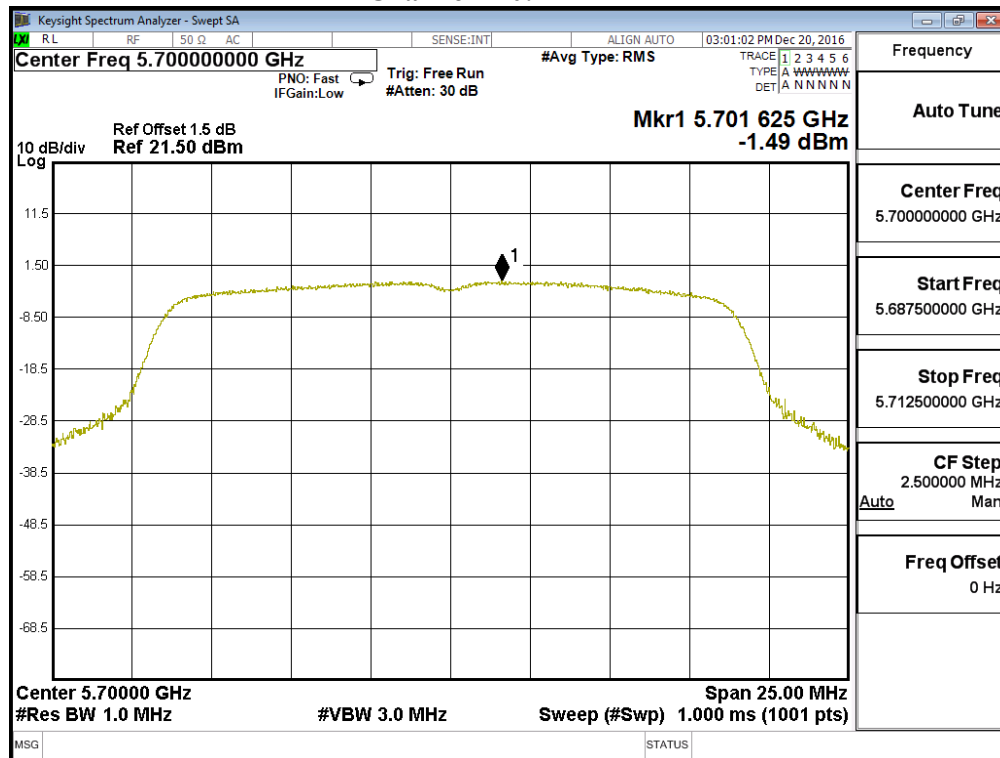
Channel 100:



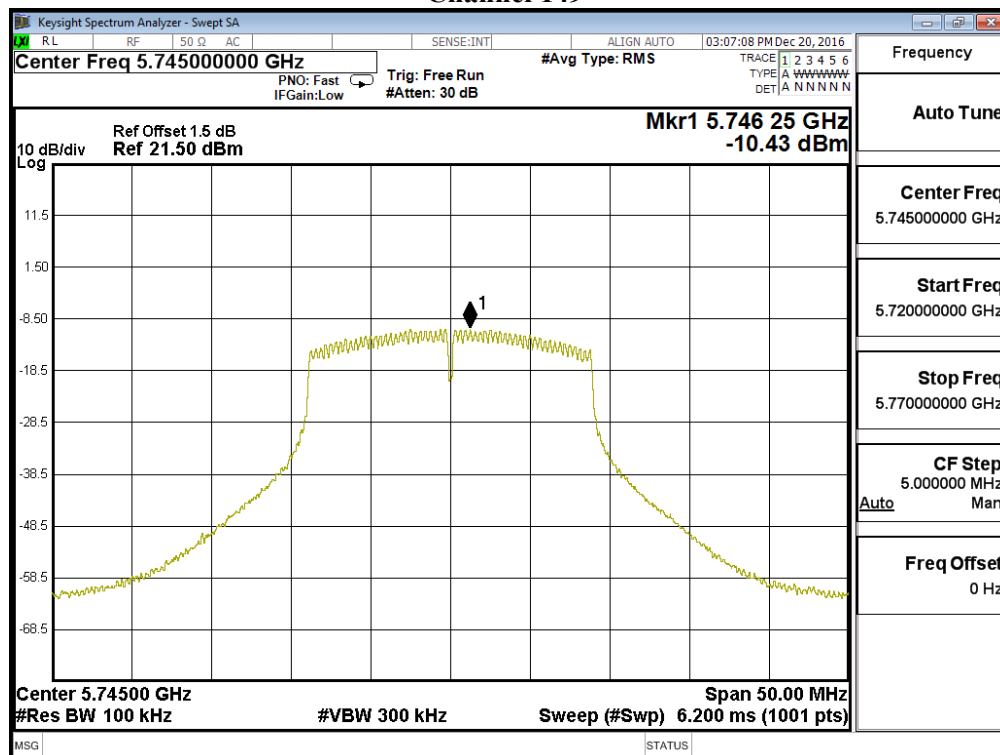
Channel 116:



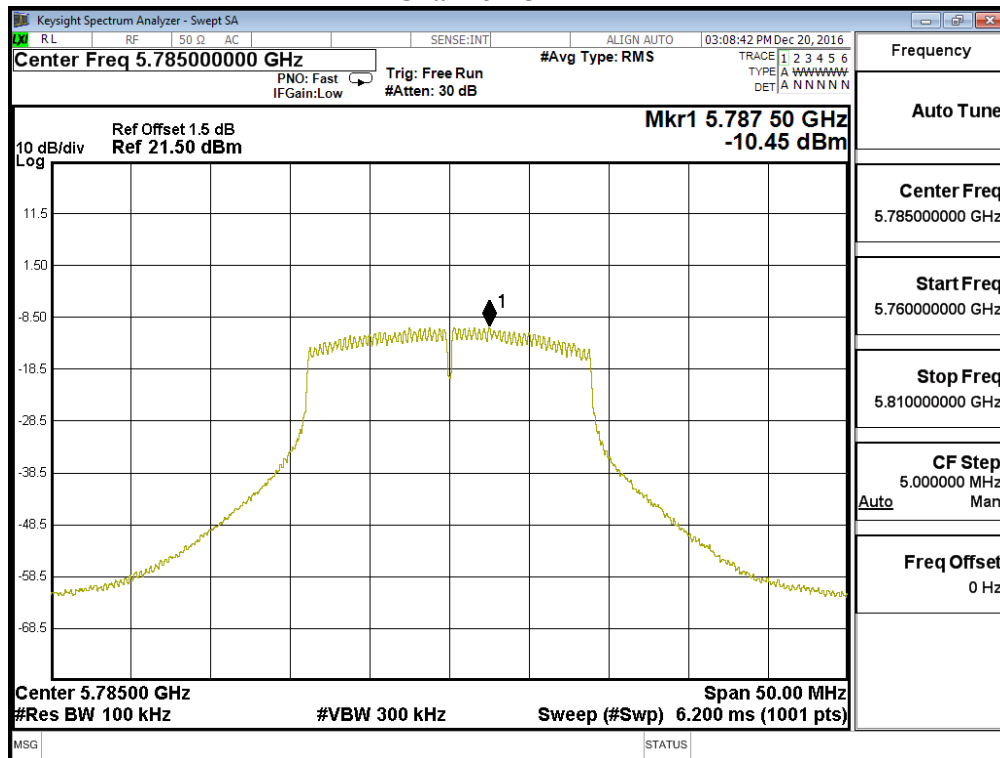
Channel 140:



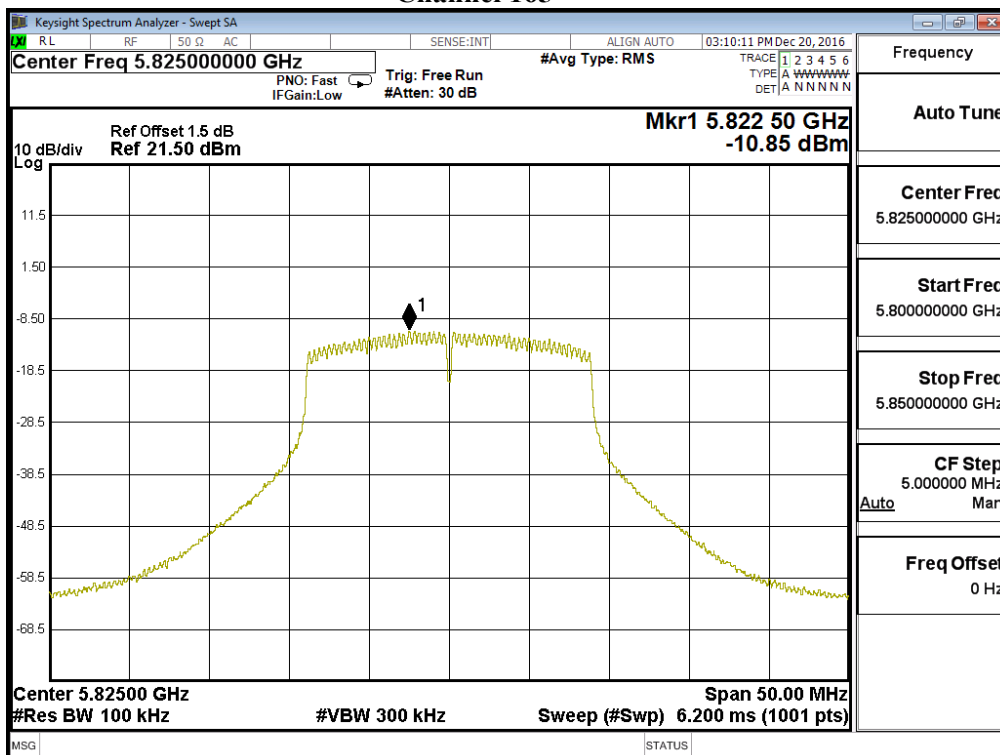
Channel 149



Channel 157



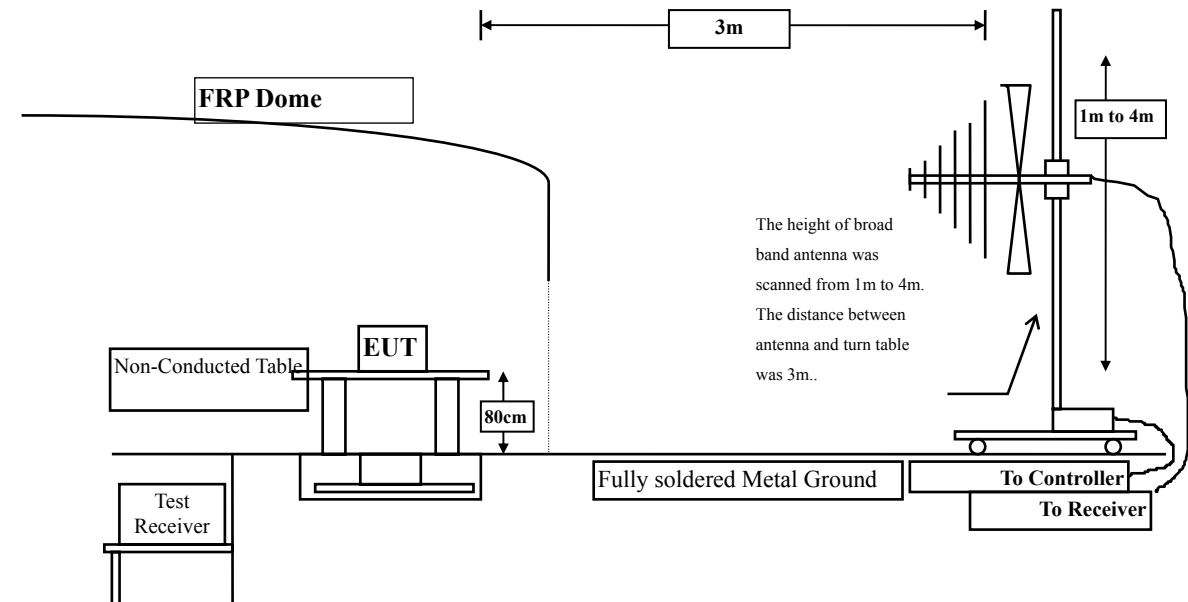
Channel 165



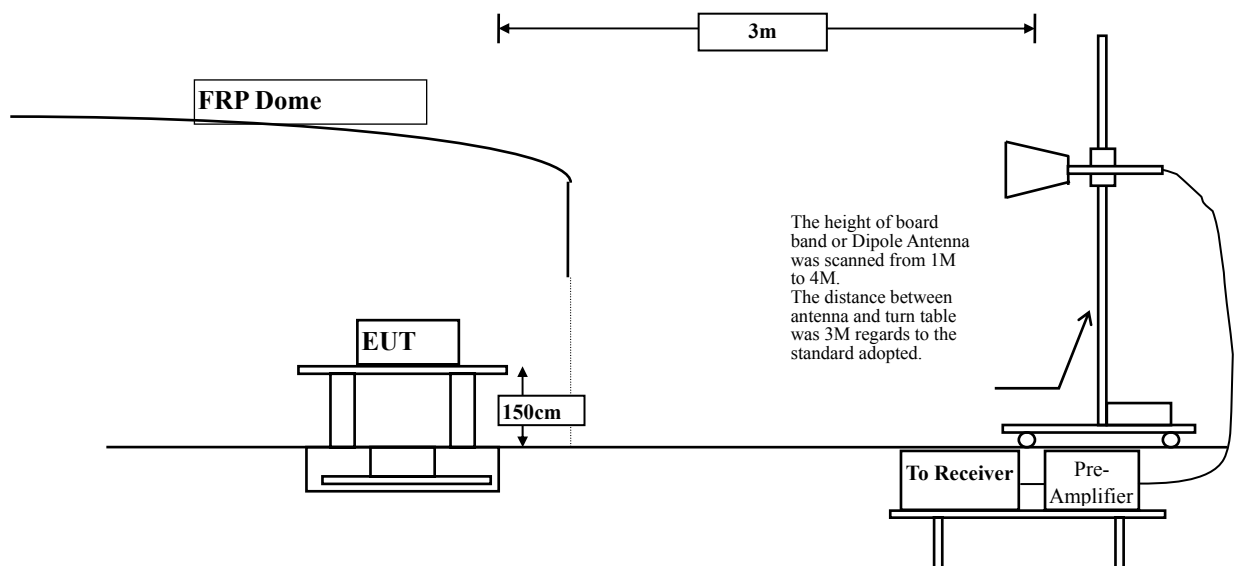
5. Radiated Emission

5.1. Test Setup

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 worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

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

5.4. Uncertainty

± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

5.5. Test Result of Radiated Emission

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5180MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
10360.000	10.540	41.620	52.160	-21.840	74.000
15540.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
10360.000	12.044	41.030	53.073	-20.927	74.000
15540.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5220MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
10440.000	9.649	41.720	51.368	-22.632	74.000
15660.000	*	*	*	*	74.000
20880.000	*	*	*	*	74.000
26100.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
10440.000	11.429	41.640	53.068	-20.932	74.000
15660.000	*	*	*	*	74.000
20880.000	*	*	*	*	74.000
26100.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5240MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
10480.000	10.166	41.610	51.776	-22.224	74.000
15720.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
10480.000	12.101	41.130	53.231	-20.769	74.000
15720.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5260MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
10520.000	11.021	42.230	53.251	-20.749	74.000
15780.000	*	*	*	*	74.000
21040.000	*	*	*	*	74.000
26300.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
10520.000	12.931	40.380	53.311	-20.689	74.000
15780.000	*	*	*	*	74.000
21040.000	*	*	*	*	74.000
26300.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5300MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
10600.000	11.868	41.920	53.788	-20.212	74.000
15900.000	*	*	*	*	74.000
21200.000	*	*	*	*	74.000
26500.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
10600.000	13.403	40.410	53.813	-20.187	74.000
15900.000	*	*	*	*	74.000
21200.000	*	*	*	*	74.000
26500.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5320MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
10640.000	11.844	41.610	53.454	-20.546	74.000
15960.000	*	*	*	*	74.000
21280.000	*	*	*	*	74.000
26600.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
10640.000	13.517	40.310	53.827	-20.173	74.000
15960.000	*	*	*	*	74.000
21280.000	*	*	*	*	74.000
26600.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5500MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
11000.000	12.392	41.080	53.472	-20.528	74.000
16500.000	*	*	*	*	74.000
22000.000	*	*	*	*	74.000
27500.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11000.000	14.514	38.920	53.434	-20.566	74.000
16500.000	*	*	*	*	74.000
22000.000	*	*	*	*	74.000
27500.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5580MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
11160.000	12.201	40.310	52.511	-21.489	74.000
16800.000	*	*	*	*	74.000
22400.000	*	*	*	*	74.000
28000.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11160.000	14.445	39.210	53.655	-20.345	74.000
16800.000	*	*	*	*	74.000
22400.000	*	*	*	*	74.000
28000.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5700MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
11400.000	13.372	38.720	52.092	-21.908	74.000
17100.000	*	*	*	*	74.000
22800.000	*	*	*	*	74.000
28500.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11400.000	14.922	38.730	53.652	-20.348	74.000
17100.000	*	*	*	*	74.000
22800.000	*	*	*	*	74.000
28500.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
11490.000	14.326	38.240	52.565	-21.435	74.000
17235.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11490.000	15.842	37.940	53.781	-20.219	74.000
17235.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
11570.000	14.849	38.130	52.979	-21.021	74.000
17355.000	*	*	*	*	74.000
20800.000	*	*	*	*	74.000
26000.000	*	*	*	*	74.000
31200.000	*	*	*	*	74.000
36400.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11570.000	16.215	36.450	52.664	-21.336	74.000
17355.000	*	*	*	*	74.000
20800.000	*	*	*	*	74.000
26000.000	*	*	*	*	74.000
31200.000	*	*	*	*	74.000
36400.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5825MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
11650.000	13.179	38.430	51.609	-22.391	74.000
17475.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
31440000	*	*	*	*	74.000
36680.000	*	*	*	*	*
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11650.000	14.634	38.280	52.914	-21.086	74.000
17475.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
31440000	*	*	*	*	74.000
36680.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5180MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
10360.000	10.540	41.080	51.620	-22.380	74.000
15540.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
10360.000	12.044	40.310	52.353	-21.647	74.000
15540.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5220MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
10440.000	9.649	41.390	51.038	-22.962	74.000
15660.000	*	*	*	*	74.000
20880.000	*	*	*	*	74.000
26100.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
10440.000	11.429	41.420	52.848	-21.152	74.000
15660.000	*	*	*	*	74.000
20880.000	*	*	*	*	74.000
26100.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5240MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
10480.000	10.166	41.630	51.796	-22.204	74.000
15720.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
10480.000	12.101	40.470	52.571	-21.429	74.000
15720.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5260MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
10520.000	11.021	42.010	53.031	-20.969	74.000
15780.000	*	*	*	*	74.000
21040.000	*	*	*	*	74.000
26300.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
10520.000	12.931	40.310	53.241	-20.759	74.000
15780.000	*	*	*	*	74.000
21040.000	*	*	*	*	74.000
26300.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5300MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
10600.000	11.868	41.280	53.148	-20.852	74.000
15900.000	*	*	*	*	74.000
21200.000	*	*	*	*	74.000
26500.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
10600.000	13.403	40.030	53.433	-20.567	74.000
15900.000	*	*	*	*	74.000
21200.000	*	*	*	*	74.000
26500.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5320MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
10640.000	11.844	40.920	52.764	-21.236	74.000
15960.000	*	*	*	*	74.000
21280.000	*	*	*	*	74.000
26600.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
10640.000	13.517	40.130	53.647	-20.353	74.000
15960.000	*	*	*	*	74.000
21280.000	*	*	*	*	74.000
26600.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5500MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
11000.000	12.392	41.190	53.582	-20.418	74.000
16500.000	*	*	*	*	74.000
22000.000	*	*	*	*	74.000
27500.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11000.000	14.514	38.350	52.864	-21.136	74.000
16500.000	*	*	*	*	74.000
22000.000	*	*	*	*	74.000
27500.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5580MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
11160.000	12.201	40.130	52.331	-21.669	74.000
16800.000	*	*	*	*	74.000
22400.000	*	*	*	*	74.000
28000.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11160.000	14.445	39.130	53.575	-20.425	74.000
16800.000	*	*	*	*	74.000
22400.000	*	*	*	*	74.000
28000.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5700MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector:					
11400.000	13.372	40.040	53.412	-20.588	74.000
17100.000	*	*	*	*	74.000
22800.000	*	*	*	*	74.000
28500.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11400.000	14.922	38.530	53.452	-20.548	74.000
17100.000	*	*	*	*	74.000
22800.000	*	*	*	*	74.000
28500.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5745MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
11490.000	14.326	38.490	52.815	-21.185	74.000
17235.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11490.000	15.842	37.520	53.361	-20.639	74.000
17235.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
31080.000	*	*	*	*	74.000
36260.000	*	*	*	*	74.000
Average Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
11570.000	14.849	38.160	53.009	-20.991	74.000
17355.000	*	*	*	*	74.000
20880.000	*	*	*	*	74.000
26100.000	*	*	*	*	74.000
31320.000	*	*	*	*	74.000
36540.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11570.000	16.215	36.920	53.134	-20.866	74.000
17355.000	*	*	*	*	74.000
20880.000	*	*	*	*	74.000
26100.000	*	*	*	*	74.000
31320.000	*	*	*	*	74.000
36540.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5825MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
11650.000	13.179	38.720	51.899	-22.101	74.000
17475.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
31440.000	*	*	*	*	74.000
36680.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*
Vertical					
Peak Detector:					
11650.000	14.634	39.060	53.694	-20.306	74.000
17475.000	*	*	*	*	74.000
20960.000	*	*	*	*	74.000
26200.000	*	*	*	*	74.000
31440.000	*	*	*	*	74.000
36680.000	*	*	*	*	74.000
Average					
Detector:					
*	*	*	*	*	*

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Key programming device
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5220MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector					
146.550	-7.761	35.341	27.581	-15.919	43.500
261.140	-5.462	37.909	32.447	-13.553	46.000
362.250	0.043	41.171	41.214	-4.786	46.000
577.820	3.294	34.301	37.594	-8.406	46.000
751.150	4.220	27.981	32.201	-13.799	46.000
933.470	7.046	27.548	34.594	-11.406	46.000
Vertical					
Peak Detector					
234.550	-6.916	36.875	29.959	-16.041	46.000
371.280	-0.330	39.989	39.659	-6.341	46.000
546.330	0.845	29.601	30.447	-15.553	46.000
693.950	1.662	21.922	23.584	-22.416	46.000
796.650	2.637	29.507	32.144	-13.856	46.000
922.540	3.196	30.029	33.225	-12.775	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Key programming device
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5300MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector					
157.540	-9.073	38.245	29.172	-14.328	43.500
359.680	-0.252	28.087	27.835	-18.165	46.000
561.860	1.949	28.556	30.505	-15.495	46.000
681.190	2.816	29.203	32.018	-13.982	46.000
836.210	6.014	26.240	32.254	-13.746	46.000
942.840	6.818	28.375	35.194	-10.806	46.000
Vertical					
Peak Detector					
85.550	-4.039	27.613	23.574	-16.426	40.000
376.660	0.570	19.315	19.885	-26.115	46.000
536.690	1.679	20.376	22.055	-23.945	46.000
751.250	2.294	22.589	24.884	-21.116	46.000
846.580	1.942	22.216	24.158	-21.842	46.000
962.950	3.556	25.918	29.474	-24.526	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Key programming device
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5580MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector					
97.580	-10.137	38.031	27.895	-15.605	43.500
162.250	-10.059	38.633	28.574	-14.926	43.500
362.540	0.072	29.624	29.696	-16.304	46.000
611.550	3.461	27.717	31.178	-14.822	46.000
824.510	7.307	23.737	31.044	-14.956	46.000
904.580	5.994	32.654	38.648	-7.352	46.000
Vertical					
Peak Detector					
106.690	-4.285	27.329	23.044	-20.456	43.500
383.360	0.105	20.740	20.844	-25.156	46.000
521.280	1.088	20.052	21.141	-24.859	46.000
689.440	2.301	21.813	24.114	-21.886	46.000
824.590	3.072	20.443	23.515	-22.485	46.000
963.640	3.653	24.040	27.694	-26.306	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Key programming device
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector					
142.220	-7.615	33.089	25.474	-18.026	43.500
236.780	-8.053	33.493	25.440	-20.560	46.000
315.660	-4.621	36.605	31.984	-14.016	46.000
516.520	3.198	30.821	34.019	-11.981	46.000
659.540	1.887	25.754	27.641	-18.359	46.000
937.580	6.754	23.193	29.947	-16.053	46.000
Vertical					
Peak Detector					
211.250	-5.696	36.170	30.474	-13.026	43.500
339.590	-1.438	29.333	27.895	-18.105	46.000
441.590	-6.800	28.385	21.585	-24.415	46.000
611.490	1.978	25.871	27.849	-18.151	46.000
834.510	1.490	25.097	26.588	-19.412	46.000
965.850	3.864	25.249	29.113	-24.887	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Key programming device
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5220MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector					
165.140	-9.936	37.522	27.585	-15.915	43.500
253.360	-5.630	37.478	31.848	-14.152	46.000
356.440	-1.112	30.753	29.641	-16.359	46.000
480.520	1.829	36.318	38.147	-7.853	46.000
504.520	2.038	37.810	39.847	-6.153	46.000
926.690	6.916	21.939	28.854	-17.146	46.000
Vertical					
Peak Detector					
136.540	-4.514	36.098	31.584	-11.916	43.500
204.580	-5.474	30.063	24.589	-18.911	43.500
382.390	0.426	31.514	31.940	-14.060	46.000
611.840	1.954	29.924	31.877	-14.123	46.000
851.940	-0.371	29.525	29.154	-16.846	46.000
962.690	3.521	38.023	41.544	-12.456	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Key programming device
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5300MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m
Horizontal					
Peak Detector					
310.250	-4.590	33.071	28.480	-17.520	46.000
481.590	1.715	29.440	31.155	-14.845	46.000
507.850	2.674	28.687	31.361	-14.639	46.000
604.690	4.301	27.810	32.111	-13.889	46.000
757.840	5.115	18.504	23.619	-22.381	46.000
929.690	7.477	20.110	27.587	-18.413	46.000
Vertical					
Peak Detector					
130.210	-3.734	35.424	31.690	-11.810	43.500
184.570	-4.903	33.738	28.836	-14.664	43.500
251.950	-4.988	28.775	23.788	-22.212	46.000
420.250	-6.731	30.046	23.314	-22.686	46.000
495.520	-1.255	25.802	24.547	-21.453	46.000
751.250	2.294	21.352	23.647	-22.353	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Key programming device
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5580MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector					
132.250	-7.431	34.057	26.625	-16.875	43.500
348.470	-1.317	32.573	31.256	-14.744	46.000
483.540	1.508	26.044	27.552	-18.448	46.000
513.360	3.183	34.018	37.201	-8.799	46.000
742.280	3.895	22.797	26.693	-19.307	46.000
942.360	6.805	21.759	28.564	-17.436	46.000
Vertical					
Peak Detector					
186.220	-5.590	29.156	23.566	-19.934	43.500
314.250	-4.099	30.569	26.470	-19.530	46.000
364.470	0.275	27.238	27.514	-18.486	46.000
532.270	1.207	24.678	25.885	-20.115	46.000
699.100	0.050	32.183	32.233	-13.767	46.000
856.660	-0.291	31.516	31.225	-14.775	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Key programming device
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5785MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector					
236.690	-8.093	39.677	31.584	-14.416	46.000
384.580	1.235	36.648	37.884	-8.116	46.000
461.190	3.991	27.261	31.252	-14.748	46.000
521.250	3.195	27.830	31.025	-14.975	46.000
738.940	3.501	29.862	33.363	-12.637	46.000
942.250	6.802	21.094	27.896	-18.104	46.000
Vertical					
Peak Detector					
212.220	-5.745	35.378	29.633	-13.867	43.500
376.690	0.573	30.900	31.474	-14.526	46.000
462.020	-2.282	27.946	25.663	-20.337	46.000
683.470	1.949	21.565	23.514	-22.486	46.000
734.160	-0.854	33.159	32.305	-13.695	46.000
965.520	3.851	23.993	27.844	-26.156	54.000

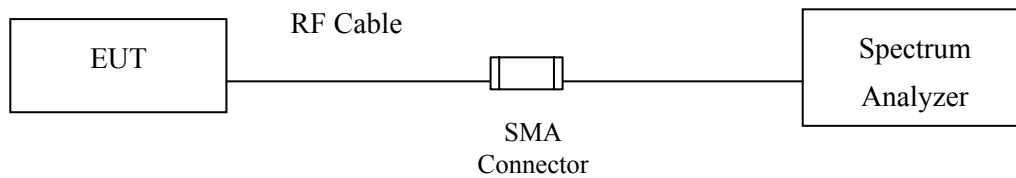
Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

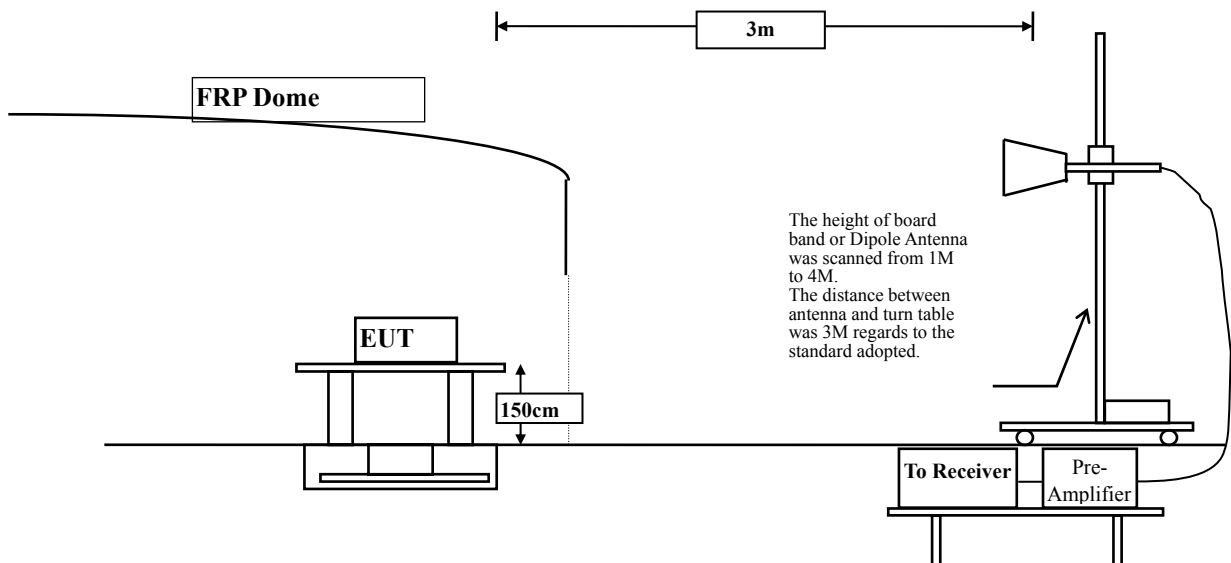
6. Band Edge

6.1. Test Setup

RF Conducted Measurement:



RF Radiated Measurement:



6.2. Limits

The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209:

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m @3m	dBμV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks :

1. RF Voltage (dBμV) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

6.3. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table can rotate 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 can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10:2013 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz, above 1GHz are 1 MHz. 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.

6.4. Uncertainty

± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

6.5. Test Result of Band Edge

Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5180MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
36 (Peak)	5148.800	2.801	47.978	50.778	74.00	54.00	Pass
36 (Peak)	5150.000	2.796	47.287	50.083	74.00	54.00	Pass
36 (Peak)	5178.400	2.701	92.416	95.117	--	--	--
36 (Average)	5150.000	2.796	36.396	39.192	74.00	54.00	Pass
36 (Average)	5182.200	2.688	72.045	74.733	--	--	--

Figure Channel 36: Horizontal (Peak)

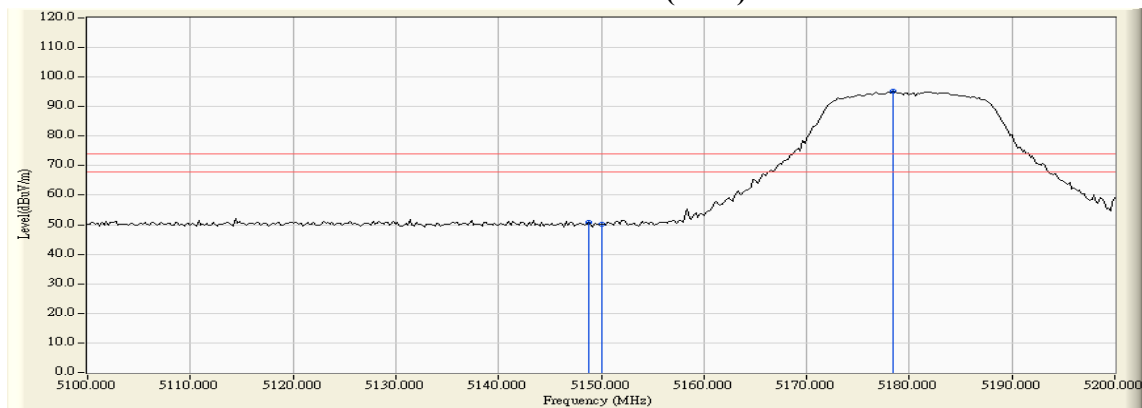
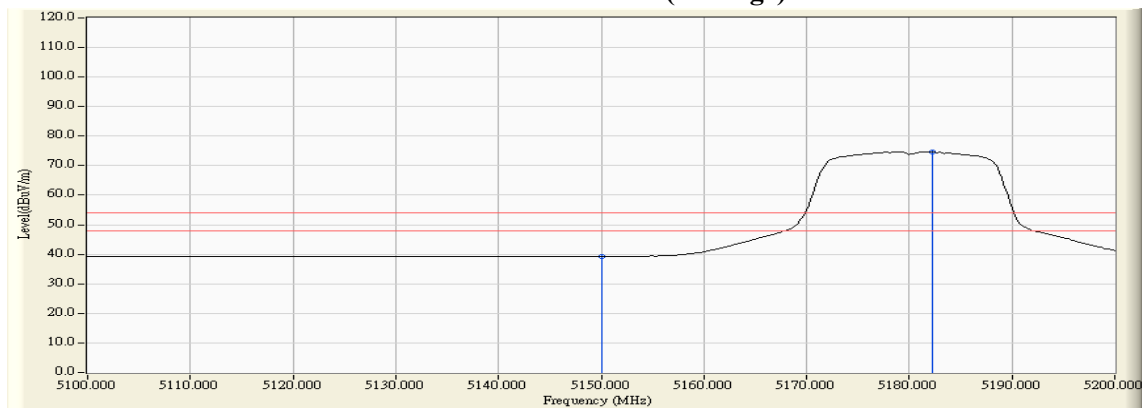


Figure Channel 36: Horizontal (Average)

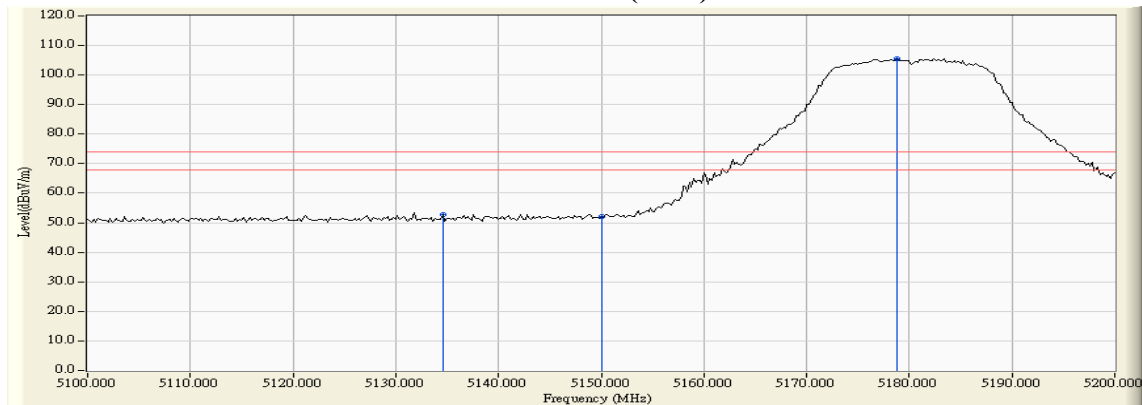
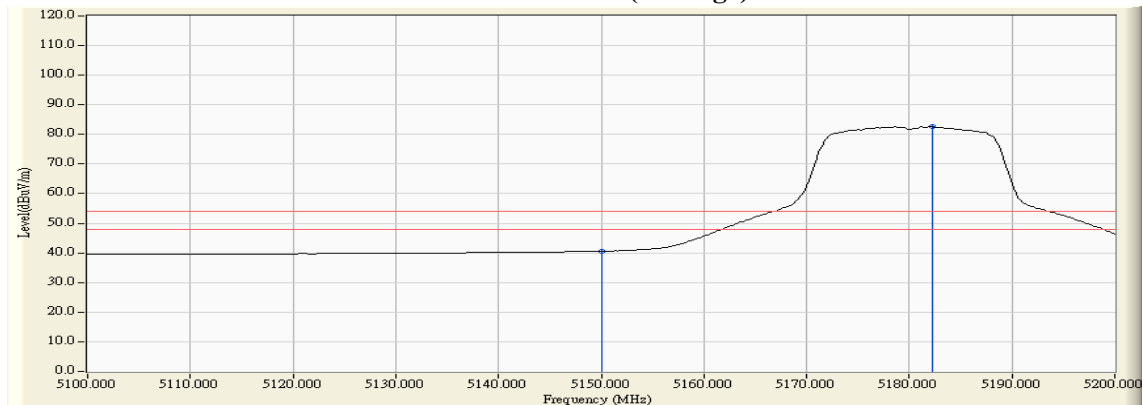


- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5180MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
36 (Peak)	5134.600	3.255	49.498	52.752	74.00	54.00	Pass
36 (Peak)	5150.000	3.331	48.626	51.958	74.00	54.00	Pass
36 (Peak)	5178.800	3.466	102.007	105.474	--	--	--
36 (Average)	5150.000	3.331	37.306	40.638	74.00	54.00	Pass
36 (Average)	5182.200	3.483	79.124	82.607	--	--	--

Figure Channel 36: Vertical (Peak)**Figure Channel 36: Vertical (Average)**

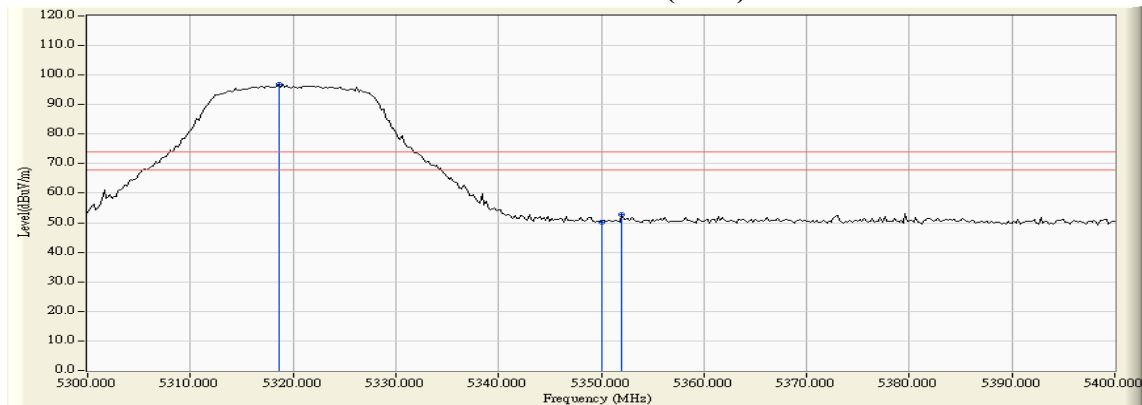
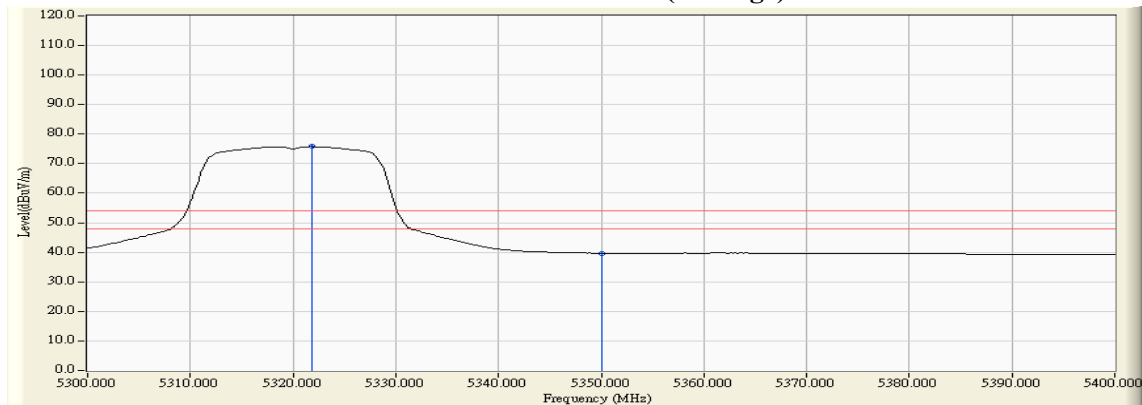
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5320MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
64 (Peak)	5318.600	3.645	93.261	96.906	--	--	--
64 (Peak)	5350.000	3.575	46.681	50.256	74.00	54.00	Pass
64 (Peak)	5352.000	3.570	49.077	52.647	74.00	54.00	Pass
64 (Average)	5321.800	3.639	72.165	75.804	--	--	--
64 (Average)	5350.000	3.575	36.104	39.679	74.00	54.00	Pass

Figure Channel 64: Horizontal (Peak)**Figure Channel 64: Horizontal (Average)**

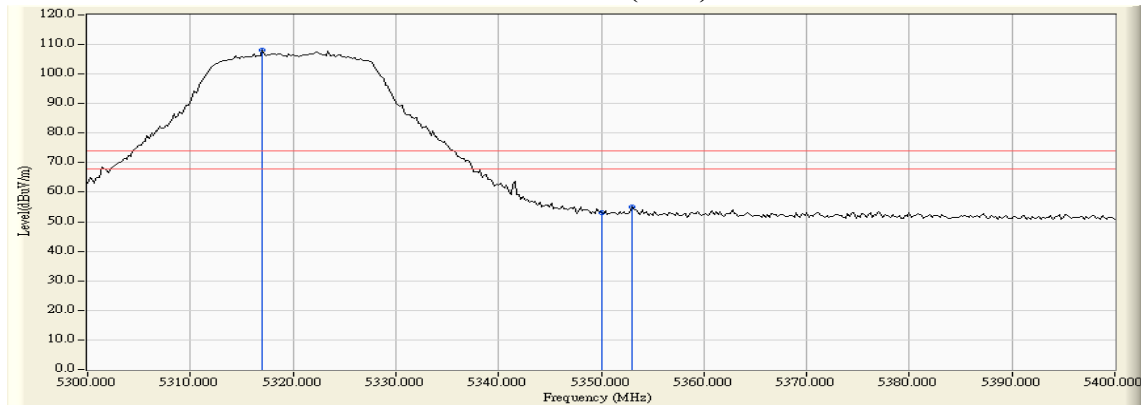
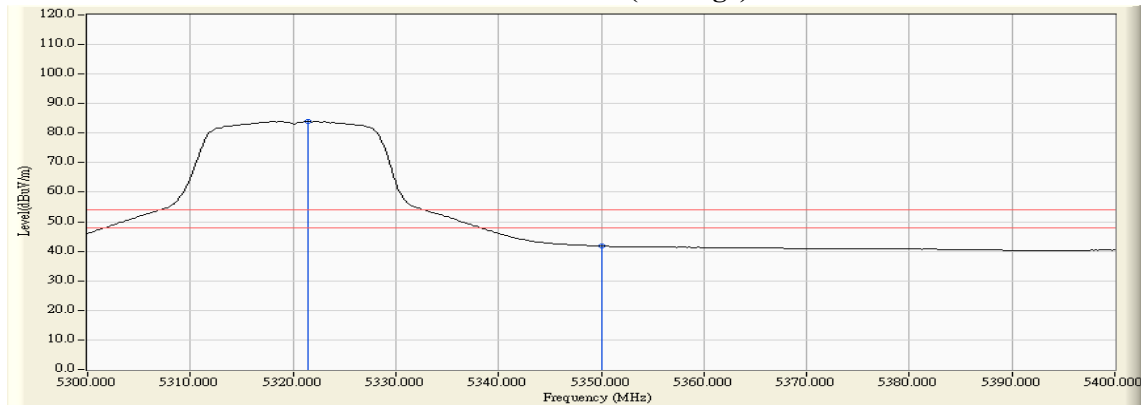
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5320MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
64 (Peak)	5317.000	3.884	104.098	107.982	--	--	--
64 (Peak)	5350.000	3.900	49.174	53.074	74.00	54.00	Pass
64 (Peak)	5353.000	3.894	51.020	54.915			
64 (Average)	5321.400	3.887	80.143	84.031	--	--	--
64 (Average)	5350.000	3.900	37.848	41.748	74.00	54.00	Pass

Figure Channel 64: Vertical (Peak)

Figure Channel 64: Vertical (Average)


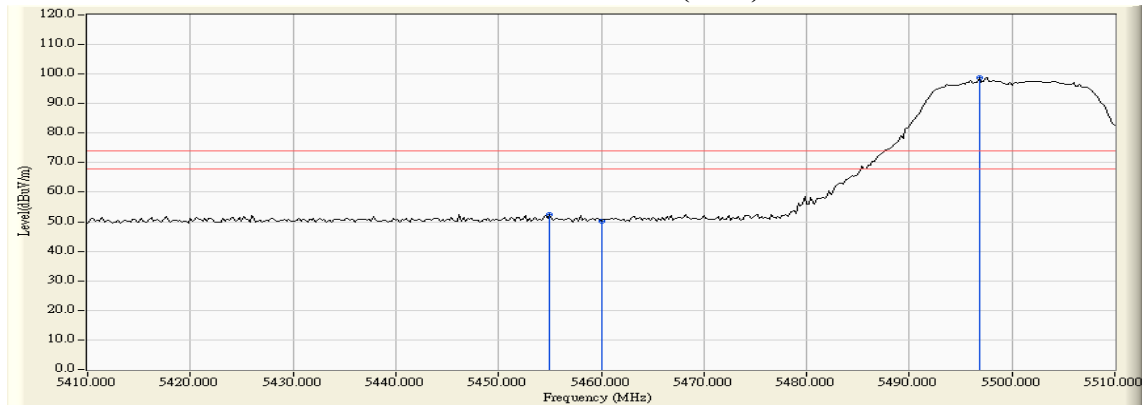
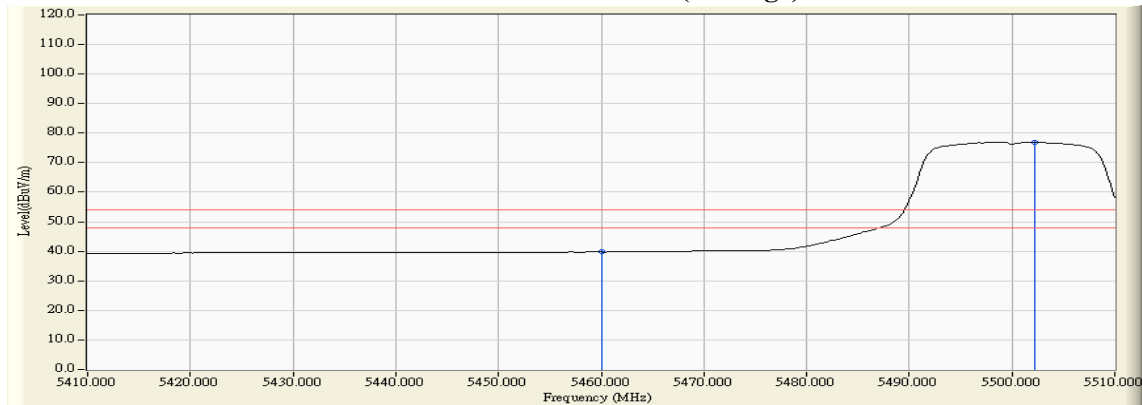
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5500MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
100 (Peak)	5455.000	3.678	48.771	52.449	74.00	54.00	Pass
100 (Peak)	5460.000	3.775	46.262	50.037	74.00	54.00	Pass
100 (Peak)	5496.800	4.436	94.479	98.914	--	--	--
100 (Average)	5460.000	3.775	35.973	39.748	74.00	54.00	Pass
100 (Average)	5502.200	4.509	72.527	77.035	--	--	--

Figure Channel 100: Horizontal (Peak)**Figure Channel 100: Horizontal (Average)**

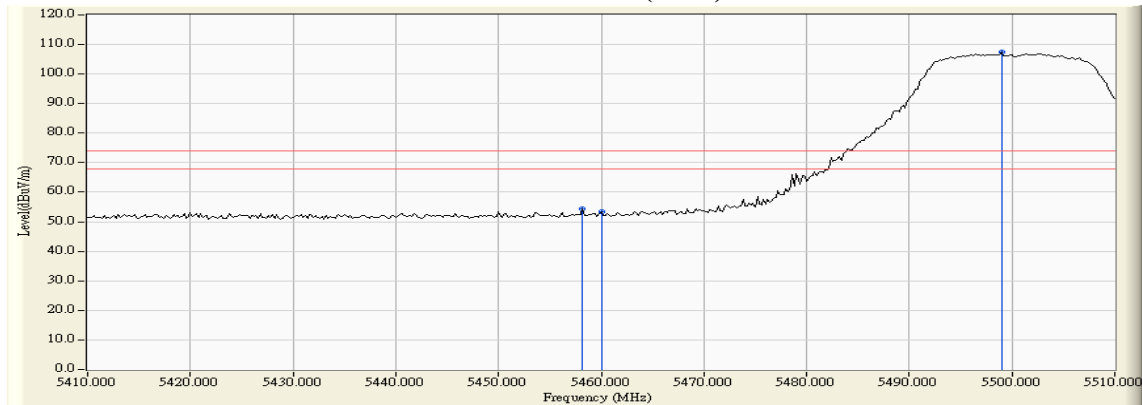
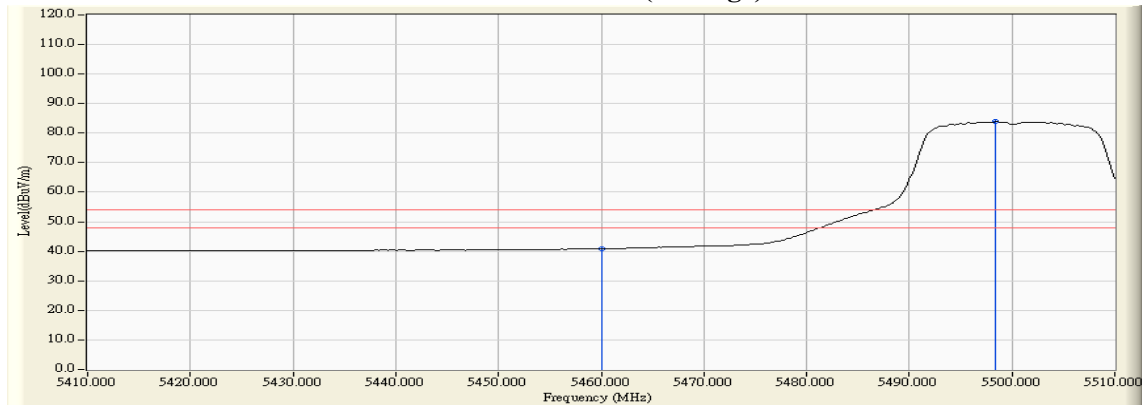
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5500MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
100 (Peak)	5458.200	3.910	50.340	54.249	74.00	54.00	Pass
100 (Peak)	5460.000	3.934	49.394	53.329	74.00	54.00	Pass
100 (Peak)	5499.000	4.450	102.908	107.357	--	--	--
100 (Average)	5460.000	3.934	36.916	40.851	74.00	54.00	Pass
100 (Average)	5498.400	4.443	79.457	83.900	--	--	--

Figure Channel 100: Vertical (Peak)

Figure Channel 100: Vertical (Average)


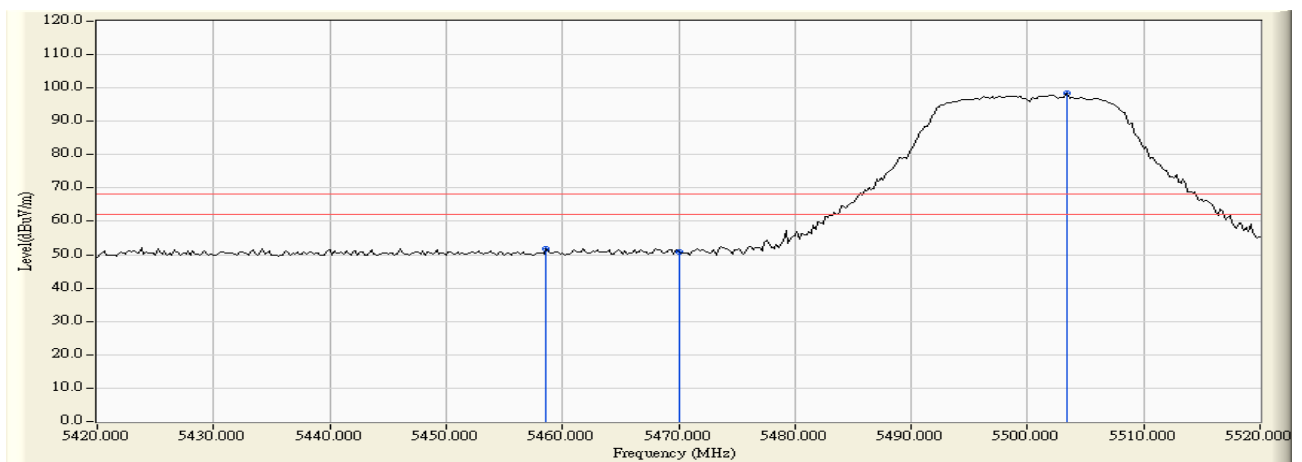
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

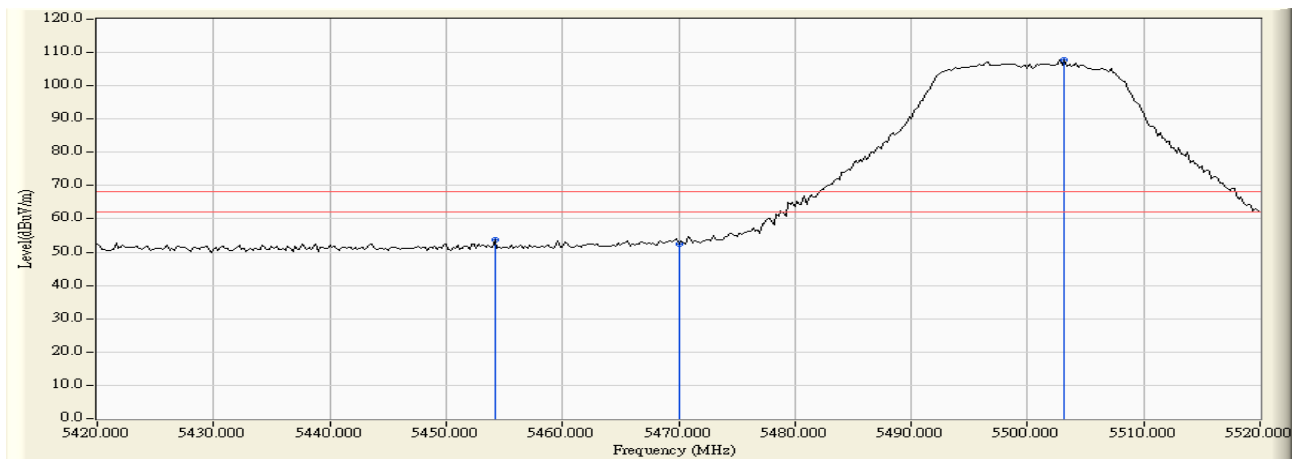
Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5500MHz)

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5458.600	3.749	48.096	51.844	-16.376	68.220	Pass
Horizontal	5470.000	3.970	46.881	50.851	-17.369	68.220	Pass
Horizontal	5503.400	4.525	94.034	98.559	--	--	--



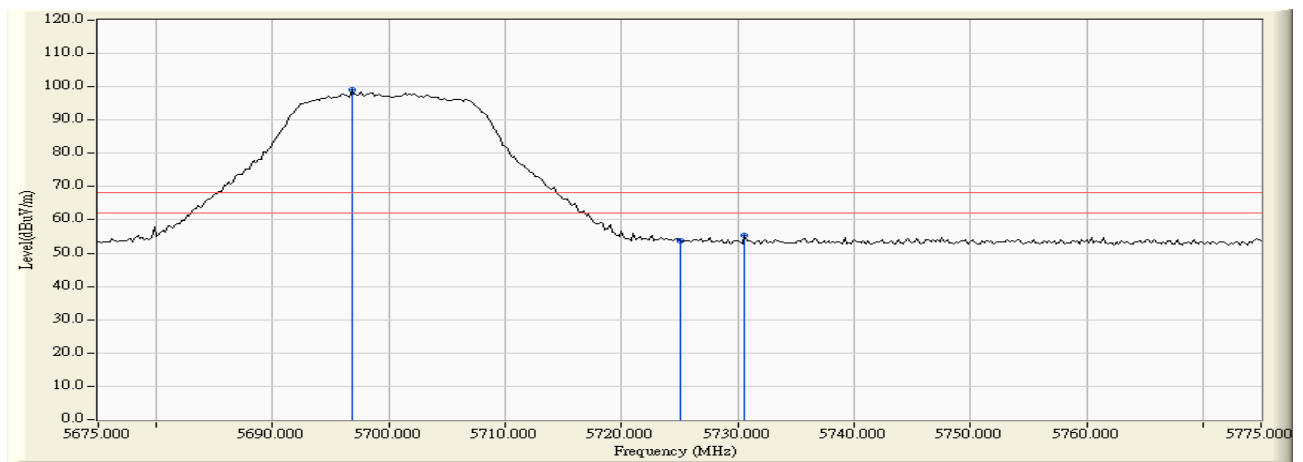
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5454.200	3.851	49.946	53.798	-14.422	68.220	Pass
Vertical	5470.000	4.079	48.394	52.473	-15.747	68.220	Pass
Vertical	5503.200	4.493	103.284	107.777	--	--	--



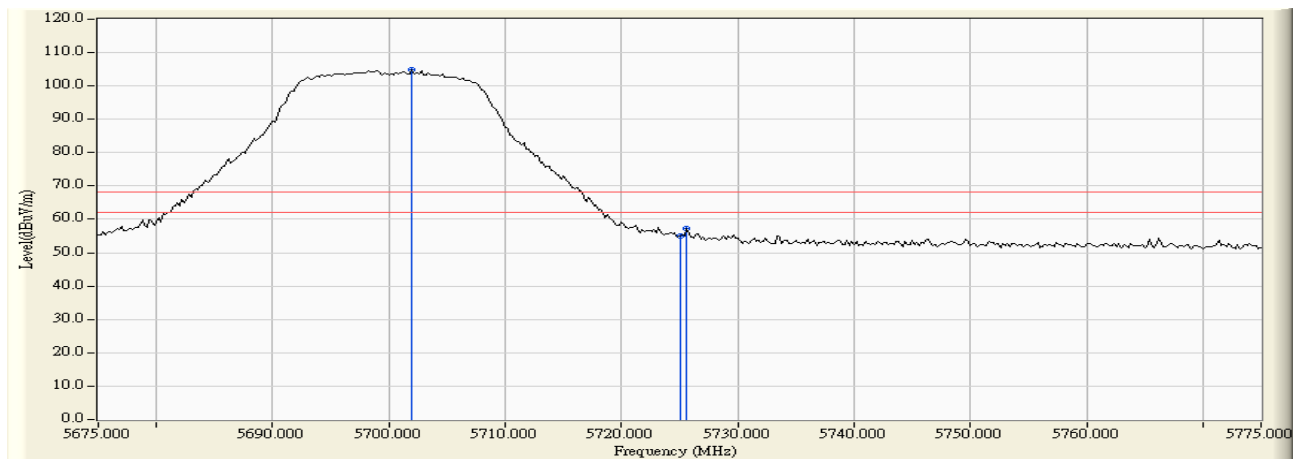
Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5700MHz)

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5696.800	4.989	94.010	98.999	--	--	--
Horizontal	5725.000	5.104	48.751	53.854	-14.366	68.220	Pass
Horizontal	5730.600	5.127	50.088	55.215	-13.005	68.220	Pass



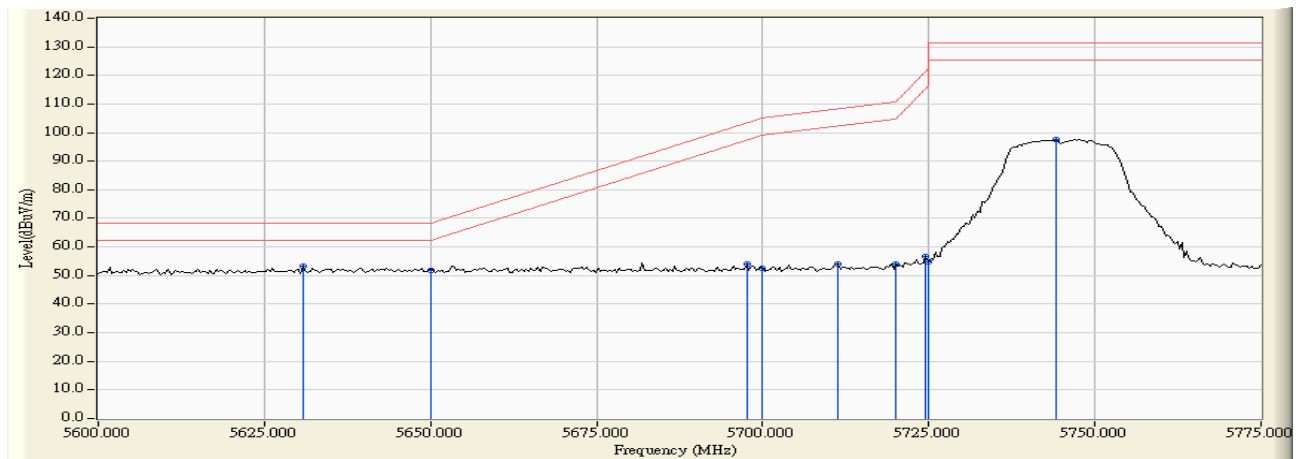
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5702.000	4.174	100.618	104.792	--	--	--
Vertical	5725.000	4.215	50.823	55.038	-13.182	68.220	Pass
Vertical	5725.600	4.216	53.078	57.294	-10.926	68.220	Pass



Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

RF Radiated Measurement:

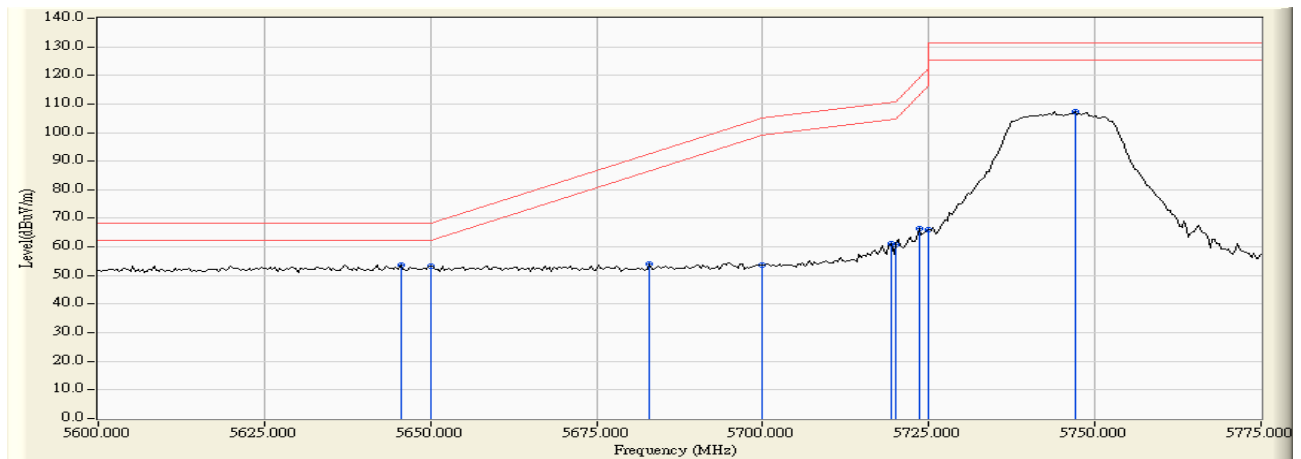
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5630.800	4.518	48.926	53.445	-14.775	68.220	Pass
Horizontal	5650.000	4.764	47.208	51.973	-16.247	68.220	Pass
Horizontal	5697.650	4.992	48.998	53.990	-49.472	103.462	Pass
Horizontal	5700.000	5.002	47.529	52.531	-52.669	105.200	Pass
Horizontal	5711.300	5.048	49.013	54.061	-54.303	108.364	Pass
Horizontal	5720.000	5.083	48.834	53.917	-56.883	110.800	Pass
Horizontal	5724.600	5.102	51.420	56.522	-64.766	121.288	Pass
Horizontal	5725.000	5.104	49.797	54.900	-67.300	122.200	Pass
Horizontal	5744.200	5.183	92.536	97.719	-33.481	131.200	Pass



Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

RF Radiated Measurement:

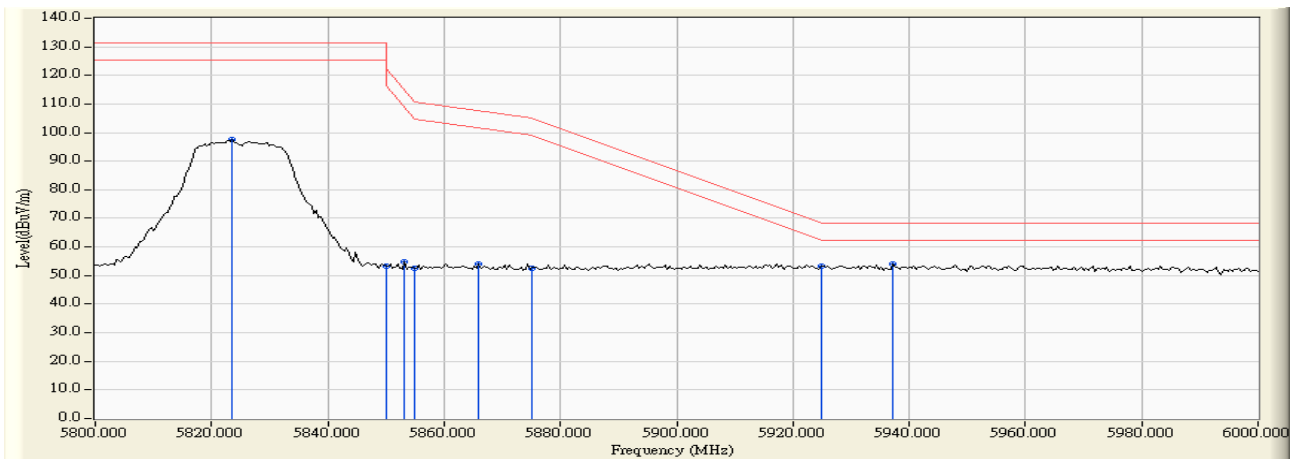
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5645.500	4.358	49.255	53.613	-14.607	68.220	Pass
Vertical	5650.000	4.361	48.749	53.111	-15.109	68.220	Pass
Vertical	5682.950	4.232	49.921	54.153	-38.437	92.590	Pass
Vertical	5700.000	4.176	49.552	53.728	-51.472	105.200	Pass
Vertical	5719.350	4.198	56.854	61.052	-49.566	110.618	Pass
Vertical	5720.000	4.200	56.624	60.824	-49.976	110.800	Pass
Vertical	5723.550	4.211	62.133	66.343	-52.551	118.894	Pass
Vertical	5725.000	4.215	61.854	66.069	-56.131	122.200	Pass
Vertical	5747.000	4.279	103.097	107.376	-23.824	131.200	Pass



Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5825MHz)

RF Radiated Measurement:

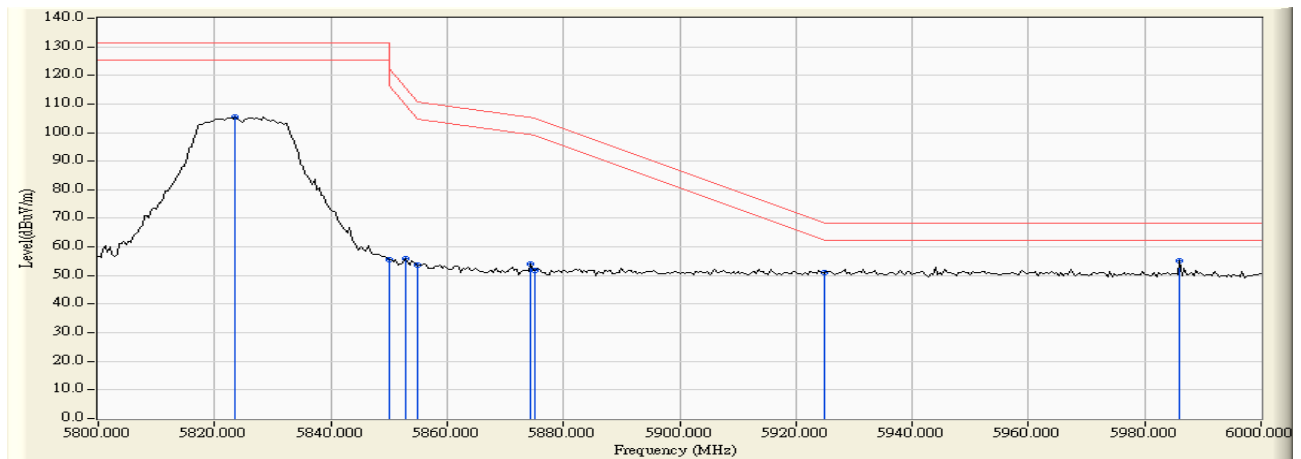
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5823.600	5.532	91.945	97.477	-33.723	131.200	Pass
Horizontal	5850.000	5.715	47.722	53.437	-68.763	122.200	Pass
Horizontal	5853.200	5.741	49.132	54.874	-60.030	114.904	Pass
Horizontal	5855.000	5.757	46.681	52.438	-58.362	110.800	Pass
Horizontal	5866.000	5.851	48.187	54.038	-53.682	107.720	Pass
Horizontal	5875.000	5.931	46.657	52.588	-52.612	105.200	Pass
Horizontal	5925.000	6.245	47.047	53.293	-14.907	68.200	Pass
Horizontal	5937.200	6.286	47.767	54.053	-14.147	68.200	Pass



Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5825MHz)

RF Radiated Measurement:

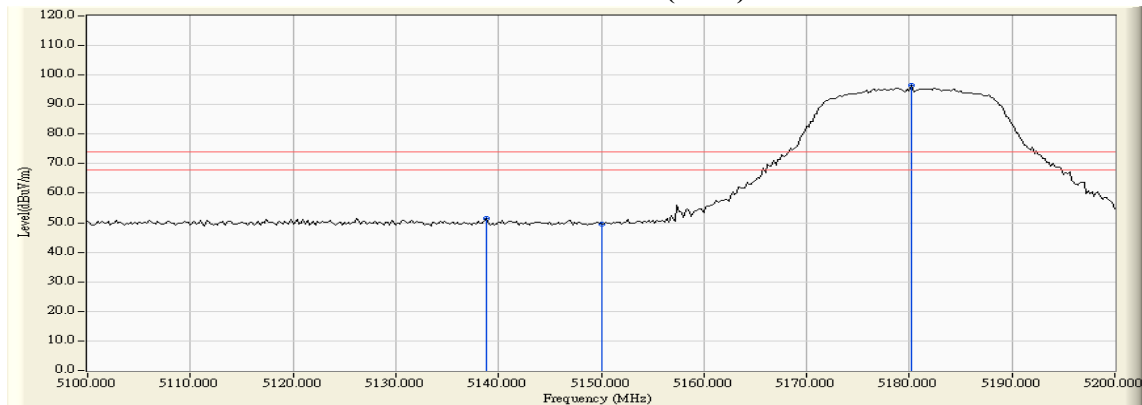
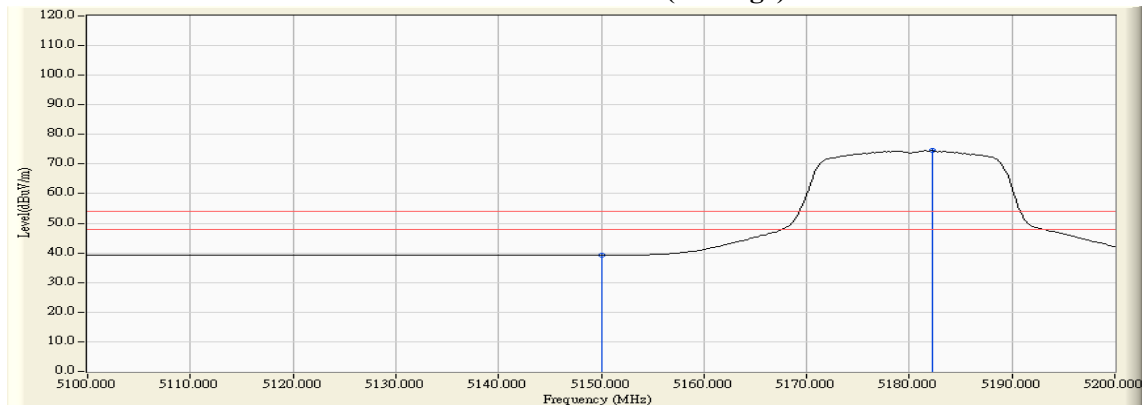
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5823.600	4.298	101.108	105.406	-25.794	131.200	Pass
Vertical	5850.000	4.194	51.322	55.516	-66.684	122.200	Pass
Vertical	5852.800	4.187	51.687	55.874	-59.942	115.816	Pass
Vertical	5855.000	4.181	49.450	53.631	-57.169	110.800	Pass
Vertical	5874.400	4.138	49.974	54.112	-51.256	105.368	Pass
Vertical	5875.000	4.137	47.799	51.936	-53.264	105.200	Pass
Vertical	5925.000	4.270	46.673	50.943	-17.257	68.200	Pass
Vertical	5986.000	4.018	51.322	55.339	-12.861	68.200	Pass



Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5180MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
36 (Peak)	5138.800	2.830	48.648	51.478	74.00	54.00	Pass
36 (Peak)	5150.000	2.796	46.874	49.670	74.00	54.00	Pass
36 (Peak)	5180.200	2.695	93.748	96.443	--	--	--
36 (Average)	5150.000	2.796	36.394	39.190	74.00	54.00	Pass
36 (Average)	5182.200	2.688	71.862	74.550	--	--	--

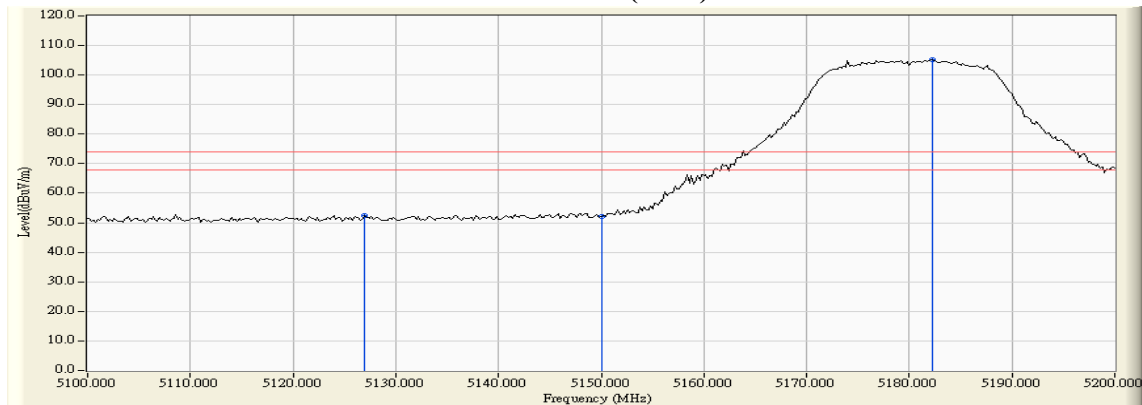
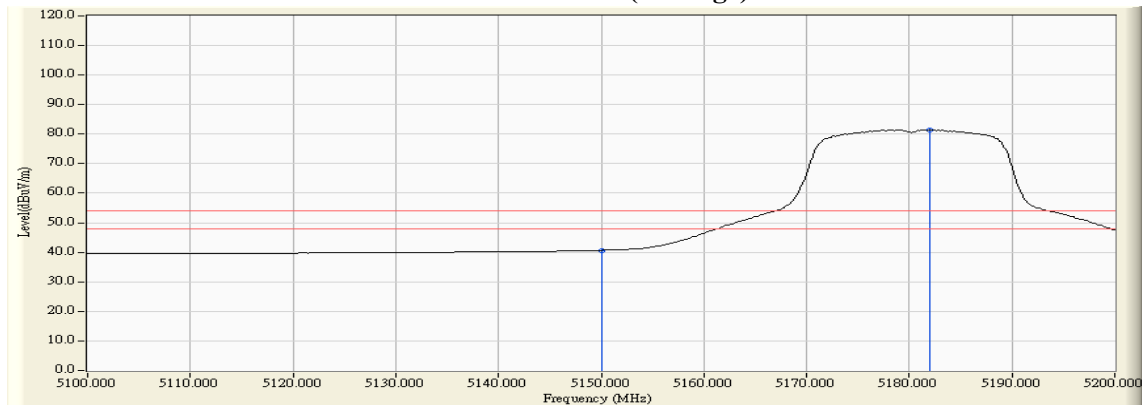
Figure Channel 36: Horizontal (Peak)

Figure Channel 36: Horizontal (Average)

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5180MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
36 (Peak)	5127.000	3.215	49.326	52.541	74.00	54.00	Pass
36 (Peak)	5150.000	3.331	48.938	52.270	74.00	54.00	Pass
36 (Peak)	5182.200	3.483	101.664	105.147	--	--	--
36 (Average)	5150.000	3.331	37.337	40.669	74.00	54.00	Pass
36 (Average)	5182.000	3.482	78.068	81.550	--	--	--

Figure Channel 36: Vertical (Peak)**Figure Channel 36: Vertical (Average)**

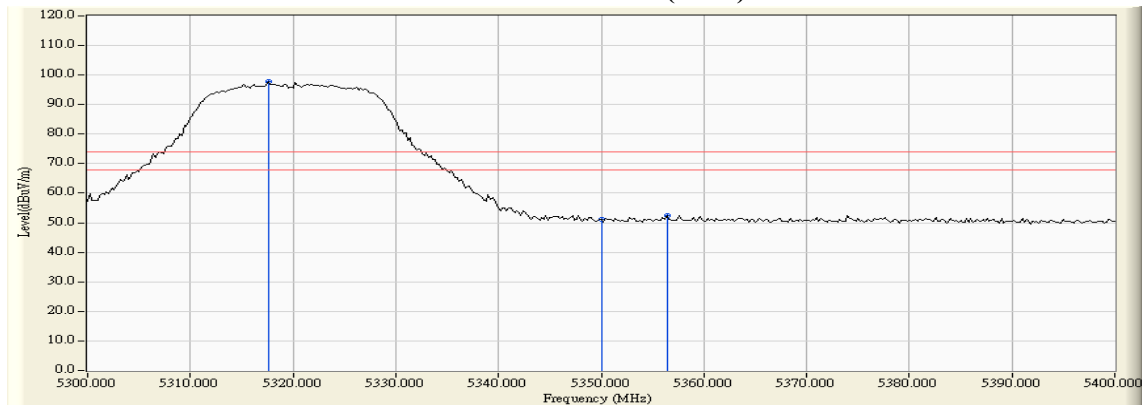
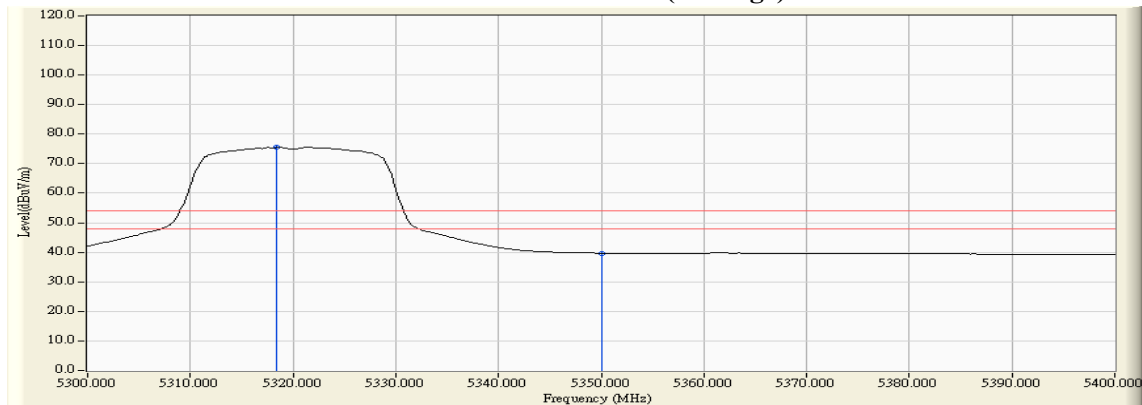
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5320MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
64 (Peak)	5317.600	3.647	94.046	97.693	--	--	--
64 (Peak)	5350.000	3.575	47.504	51.079	74.00	54.00	Pass
64 (Peak)	5356.400	3.535	48.903	52.438	74.00	54.00	Pass
64 (Average)	5318.400	3.646	71.886	75.532	--	--	--
64 (Average)	5350.000	3.575	36.138	39.713	74.00	54.00	Pass

Figure Channel 64: Horizontal (Peak)**Figure Channel 64: Horizontal (Average)**

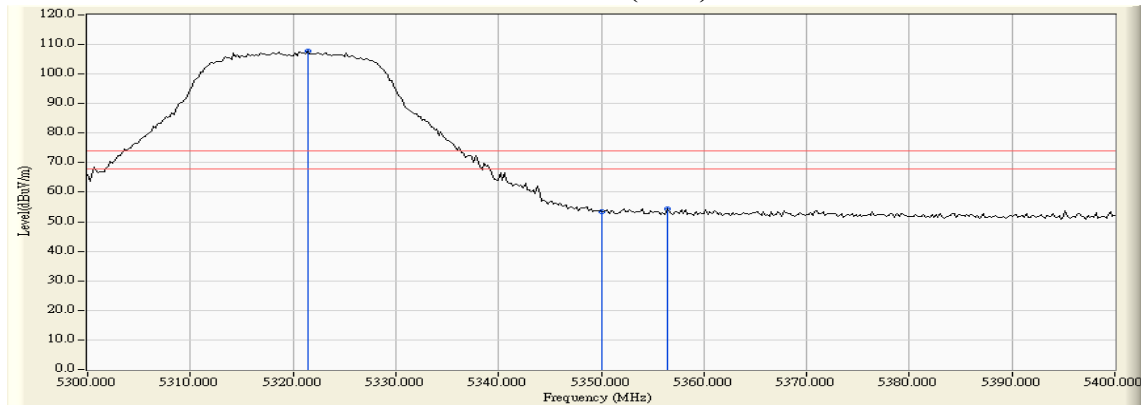
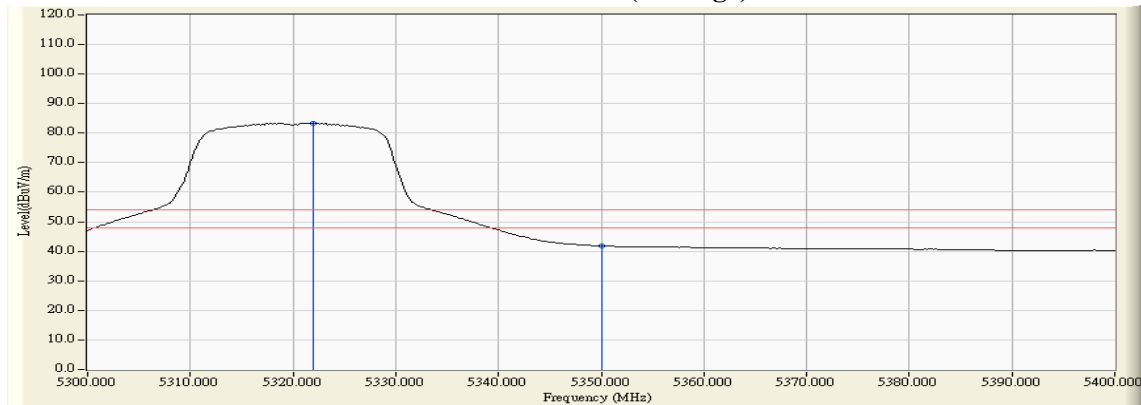
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5320MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
64 (Peak)	5321.400	3.887	103.857	107.745	--	--	--
64 (Peak)	5350.000	3.900	49.527	53.427	74.00	54.00	Pass
64 (Peak)	5356.400	3.877	50.548	54.426	74.00	54.00	Pass
64 (Average)	5322.000	3.889	79.527	83.415	--	--	--
64 (Average)	5350.000	3.900	37.913	41.813	74.00	54.00	Pass

Figure Channel 64: Vertical (Peak)

Figure Channel 64: Vertical (Average)


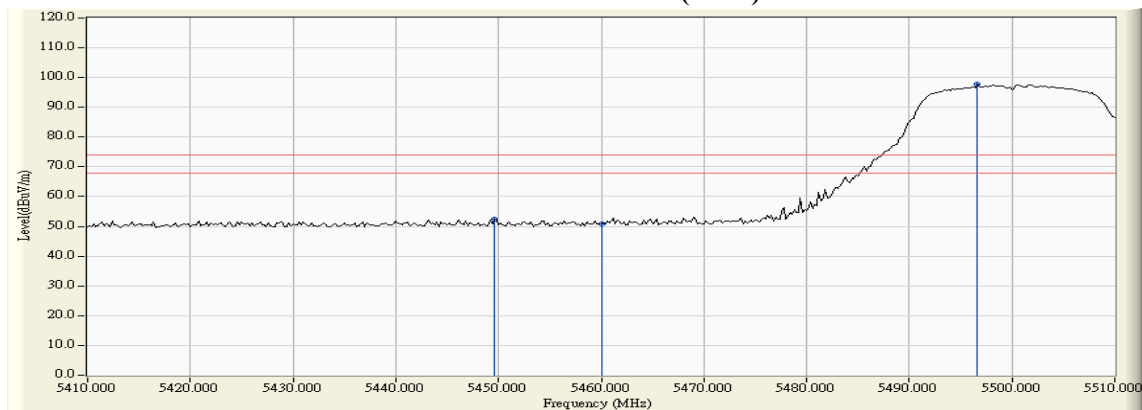
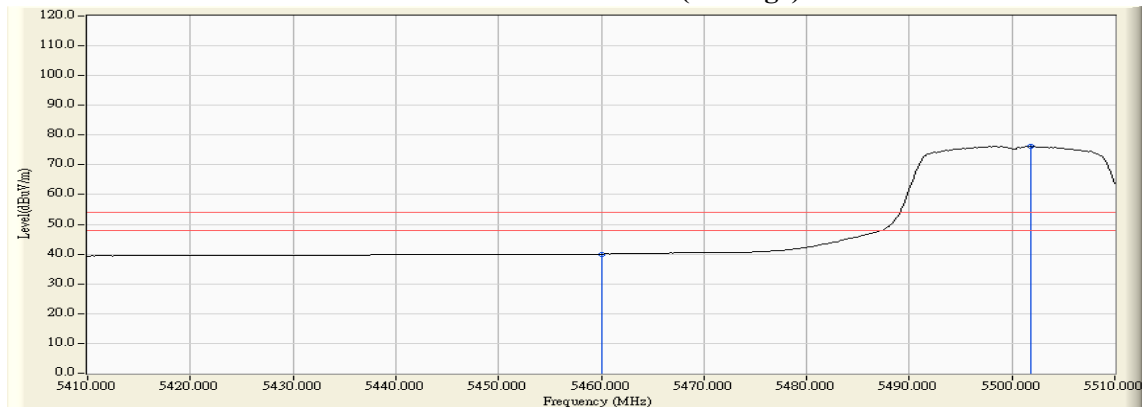
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5500MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
100 (Peak)	5449.600	3.613	48.921	52.533	74.00	54.00	Pass
100 (Peak)	5460.000	3.775	47.031	50.806	74.00	54.00	Pass
100 (Peak)	5496.600	4.433	93.483	97.916	--	--	--
100 (Average)	5460.000	3.775	36.272	40.047	74.00	54.00	Pass
100 (Average)	5501.800	4.503	71.728	76.231	--	--	--

Figure Channel 100: Horizontal (Peak)

Figure Channel 100: Horizontal (Average)


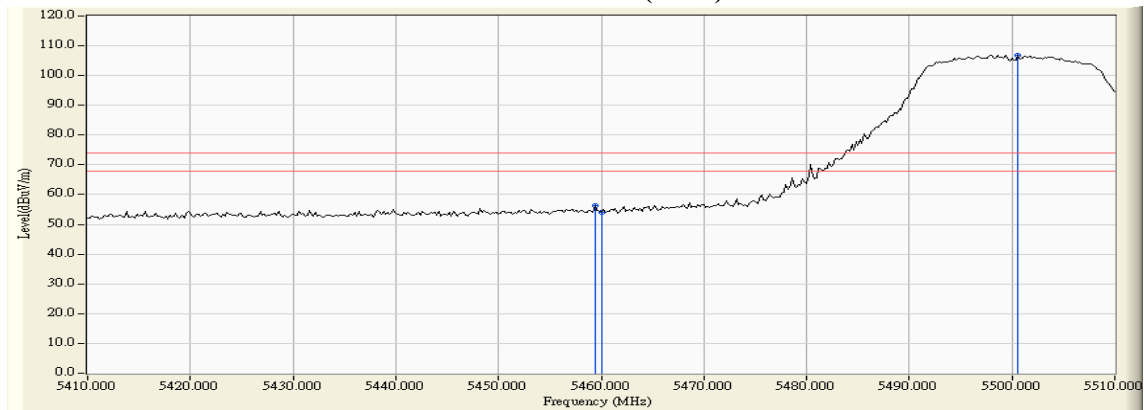
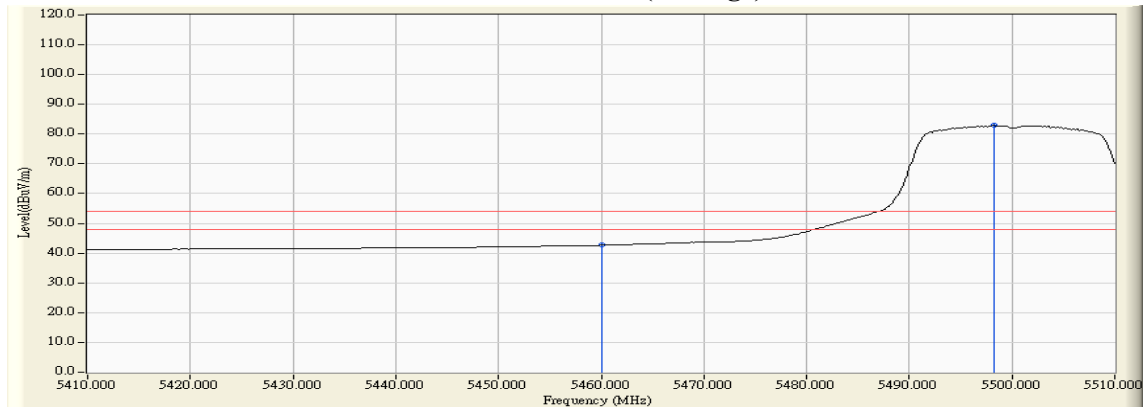
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5500MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V/m)	Peak Limit (dB μ V/m)	Average Limit (dB μ V/m)	Result
100 (Peak)	5459.400	3.927	52.318	56.244	74.00	54.00	Pass
100 (Peak)	5460.000	3.934	50.088	54.023	74.00	54.00	Pass
100 (Peak)	5500.600	4.466	102.261	106.727	--	--	--
100 (Average)	5460.000	3.934	38.708	42.643	74.00	54.00	Pass
100 (Average)	5498.200	4.441	78.438	82.879	--	--	--

Figure Channel 100: Vertical (Peak)**Figure Channel 100: Vertical (Average)**

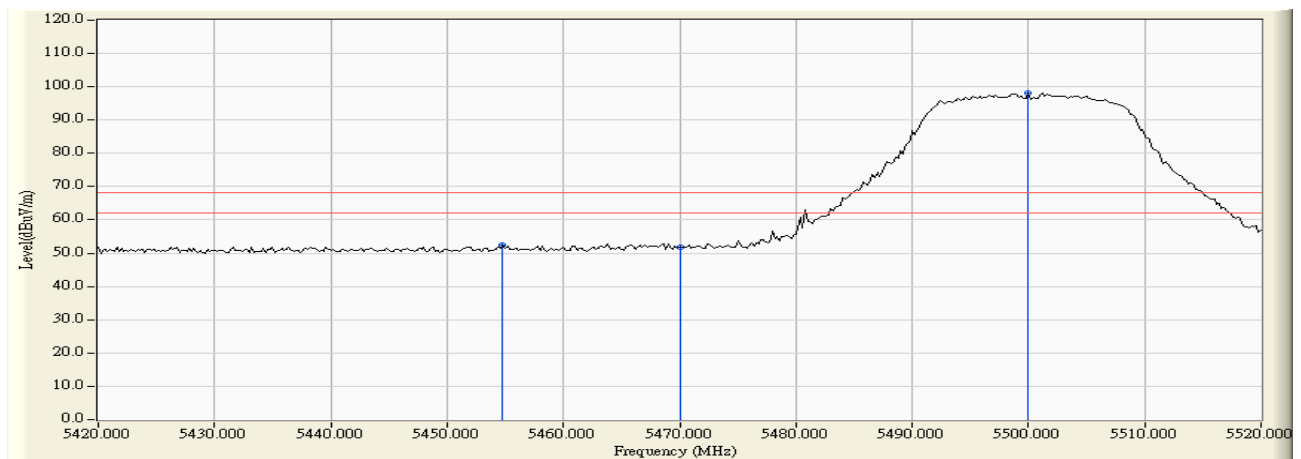
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

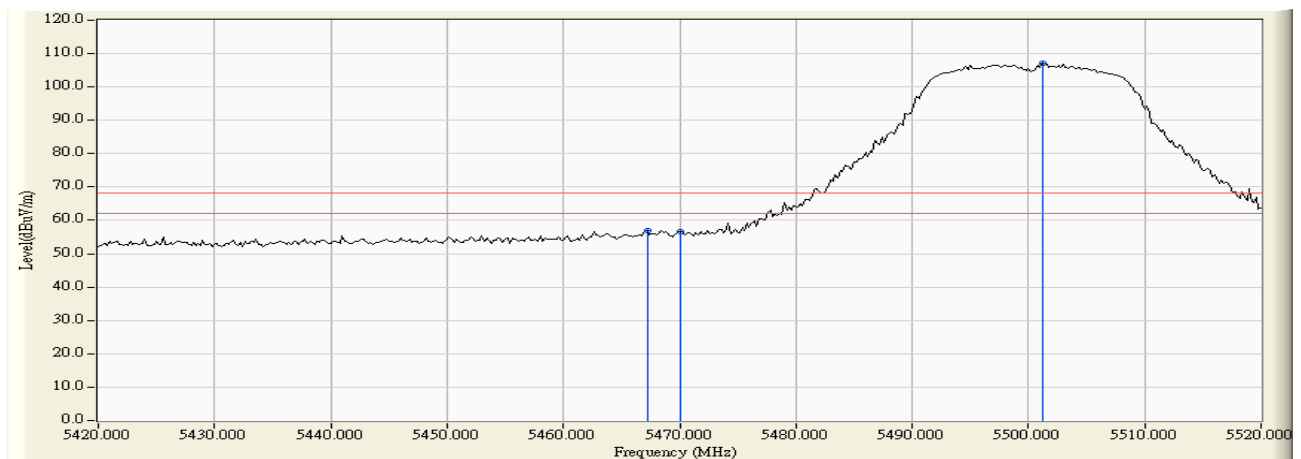
Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5500MHz)

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5454.800	3.675	48.850	52.524	-15.696	68.220	Pass
Horizontal	5470.000	3.970	47.727	51.697	-16.523	68.220	Pass
Horizontal	5500.000	4.479	93.702	98.181	--	--	--



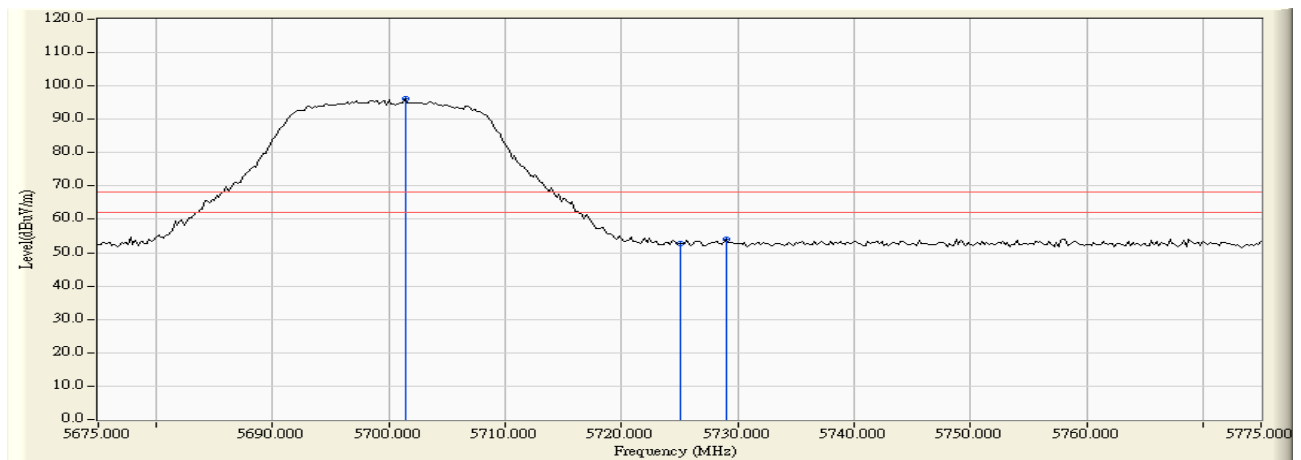
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5467.200	4.039	52.801	56.840	-11.380	68.220	Pass
Vertical	5470.000	4.079	52.523	56.602	-11.618	68.220	Pass
Vertical	5501.200	4.472	102.521	106.993	--	--	--



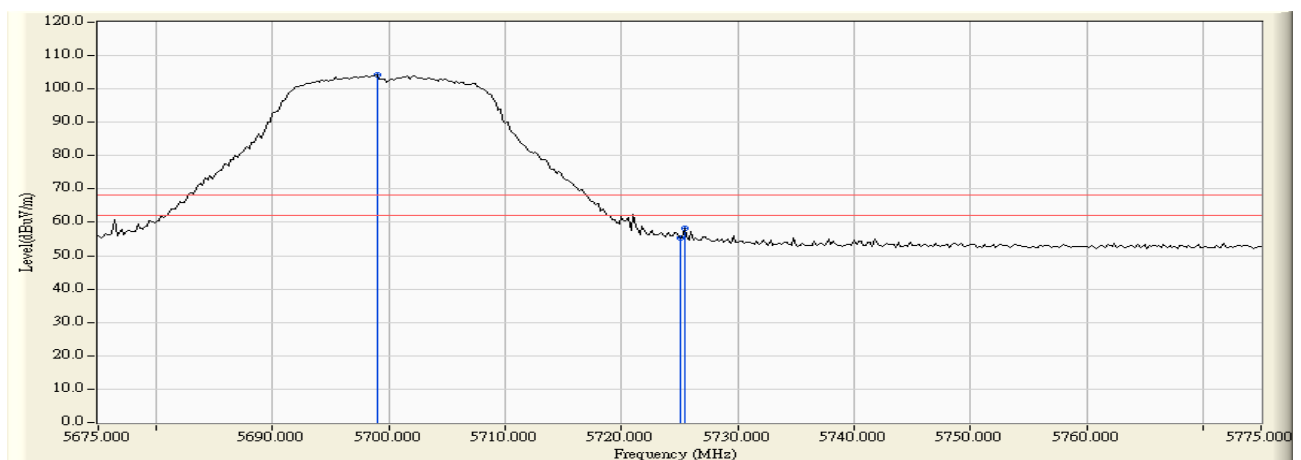
Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5700MHz)

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5701.400	5.008	91.300	96.308	--	--	--
Horizontal	5725.000	5.104	47.797	52.900	-15.320	68.220	Pass
Horizontal	5729.000	5.121	49.019	54.139	-14.081	68.220	Pass



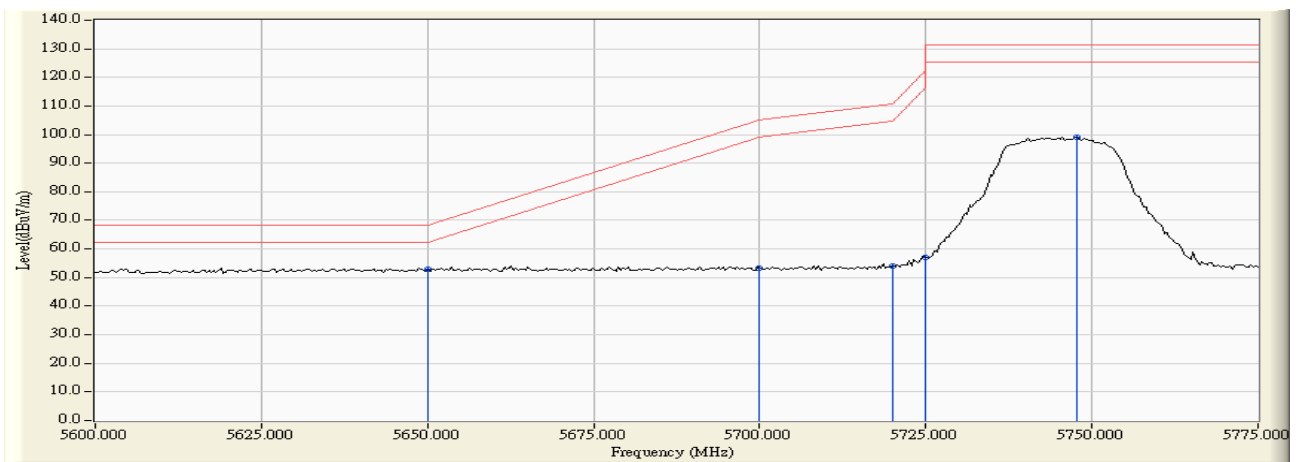
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5699.000	4.176	100.045	104.222	--	--	--
Vertical	5725.000	4.215	51.210	55.425	-12.795	68.220	Pass
Vertical	5725.400	4.216	54.037	58.253	-9.967	68.220	Pass



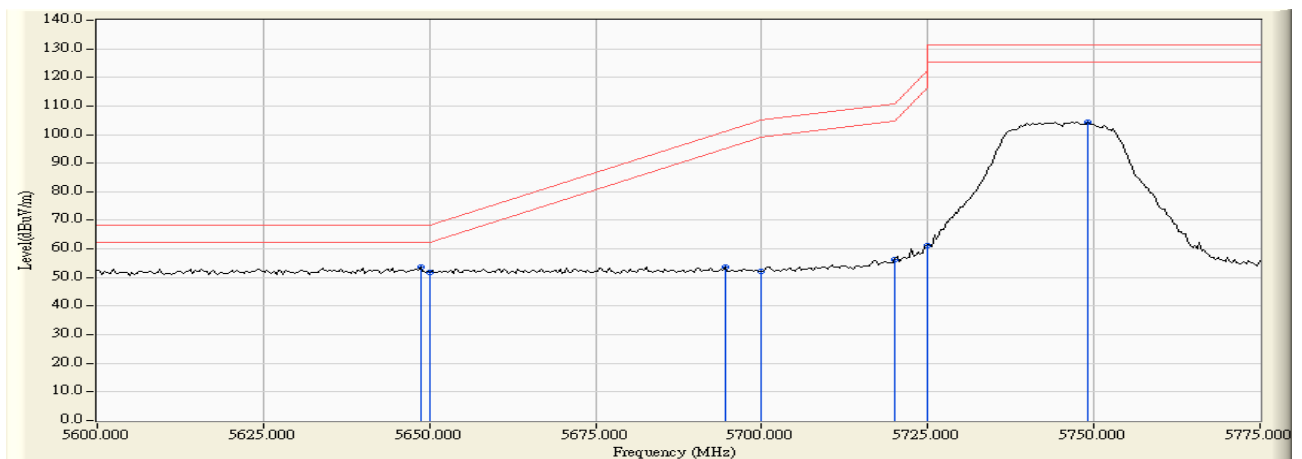
Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5745MHz)

RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5650.000	4.764	48.202	52.967	-15.253	68.220	Pass
Horizontal	5700.000	5.002	48.252	53.254	-51.946	105.200	Pass
Horizontal	5720.000	5.083	49.023	54.106	-56.694	110.800	Pass
Horizontal	5725.000	5.104	51.799	56.902	-65.298	122.200	Pass
Horizontal	5747.700	5.195	93.791	98.987	-32.213	131.200	Pass



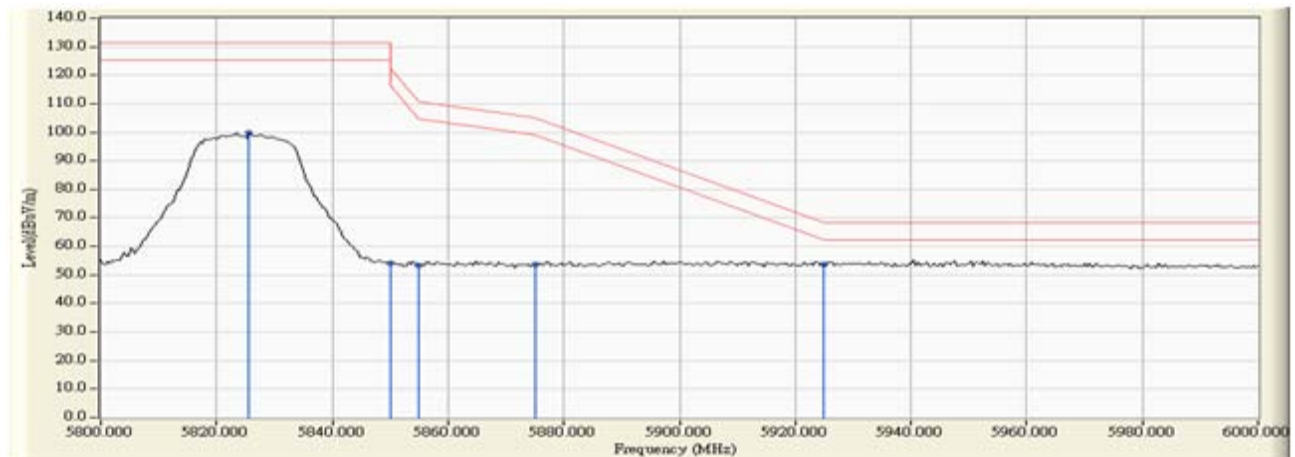
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5648.650	4.360	49.366	53.727	-14.493	68.220	Pass
Vertical	5650.000	4.361	47.545	51.907	-16.313	68.220	Pass
Vertical	5694.500	4.180	49.409	53.589	-47.543	101.132	Pass
Vertical	5700.000	4.176	47.900	52.076	-53.124	105.200	Pass
Vertical	5720.000	4.200	52.170	56.370	-54.430	110.800	Pass
Vertical	5725.000	4.215	57.125	61.340	-60.860	122.200	Pass
Vertical	5749.100	4.284	100.077	104.361	-26.839	131.200	Pass



Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5825MHz)

RF Radiated Measurement:

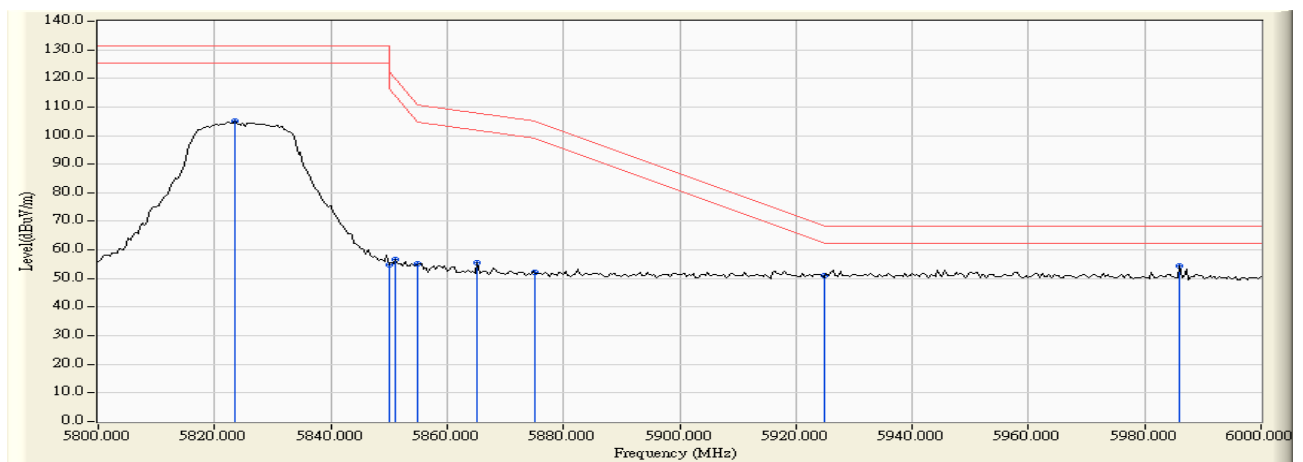
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Horizontal	5825.600	5.546	94.408	99.953	-31.247	131.200	Pass
Horizontal	5850.000	5.715	48.200	53.915	-68.285	122.200	Pass
Horizontal	5855.000	5.757	47.654	53.411	-57.389	110.800	Pass
Horizontal	5875.000	5.931	47.626	53.557	-51.643	105.200	Pass
Horizontal	5925.000	6.245	47.384	53.630	-14.570	68.200	Pass



Product : Key programming device
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps) (5825MHz)

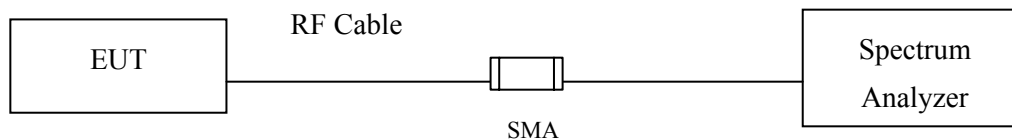
RF Radiated Measurement:

	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBm)	Measure Level (dBm/m)	Margin (dB)	Limit (dBm/m)	Result
Vertical	5823.600	4.298	100.749	105.047	-26.153	131.200	Pass
Vertical	5850.000	4.194	50.539	54.733	-67.467	122.200	Pass
Vertical	5851.200	4.191	52.306	56.497	-62.967	119.464	Pass
Vertical	5855.000	4.181	50.919	55.100	-55.700	110.800	Pass
Vertical	5865.200	4.156	51.282	55.438	-52.506	107.944	Pass
Vertical	5875.000	4.137	48.044	52.181	-53.019	105.200	Pass
Vertical	5925.000	4.270	46.891	51.161	-17.039	68.200	Pass
Vertical	5986.000	4.018	50.296	54.313	-13.887	68.200	Pass



7. Occupied Bandwidth

7.1. Test Setup



7.2. Limits

For the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz

7.3. 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.

7.4. Uncertainty

$\pm 681.6\text{Hz}$

7.5. Test Result of Occupied Bandwidth

Product : Key programming device
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745	15350	>500	Pass
157	5785	15400	>500	Pass
165	5825	16150	>500	Pass

Figure Channel 149:

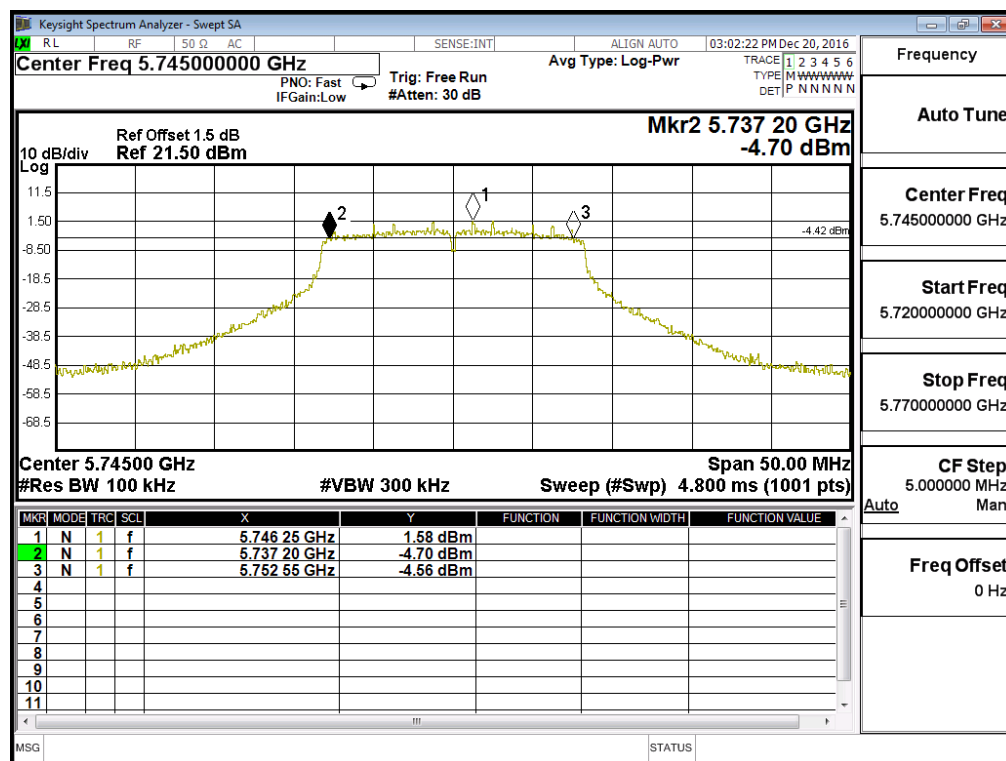


Figure Channel 157:

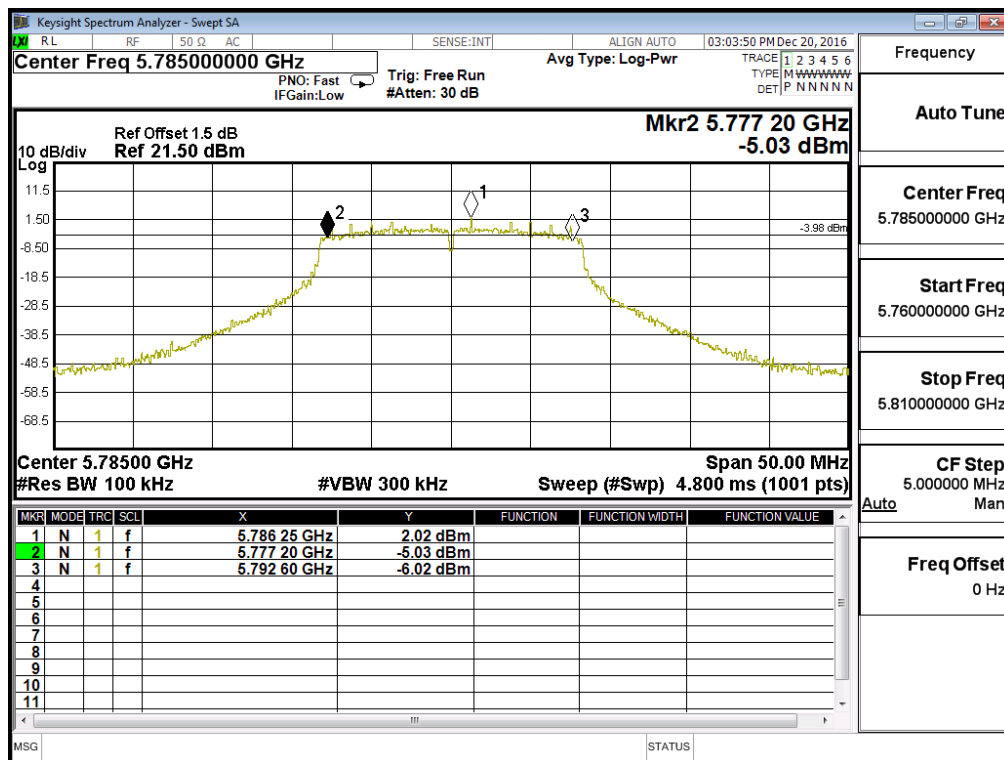
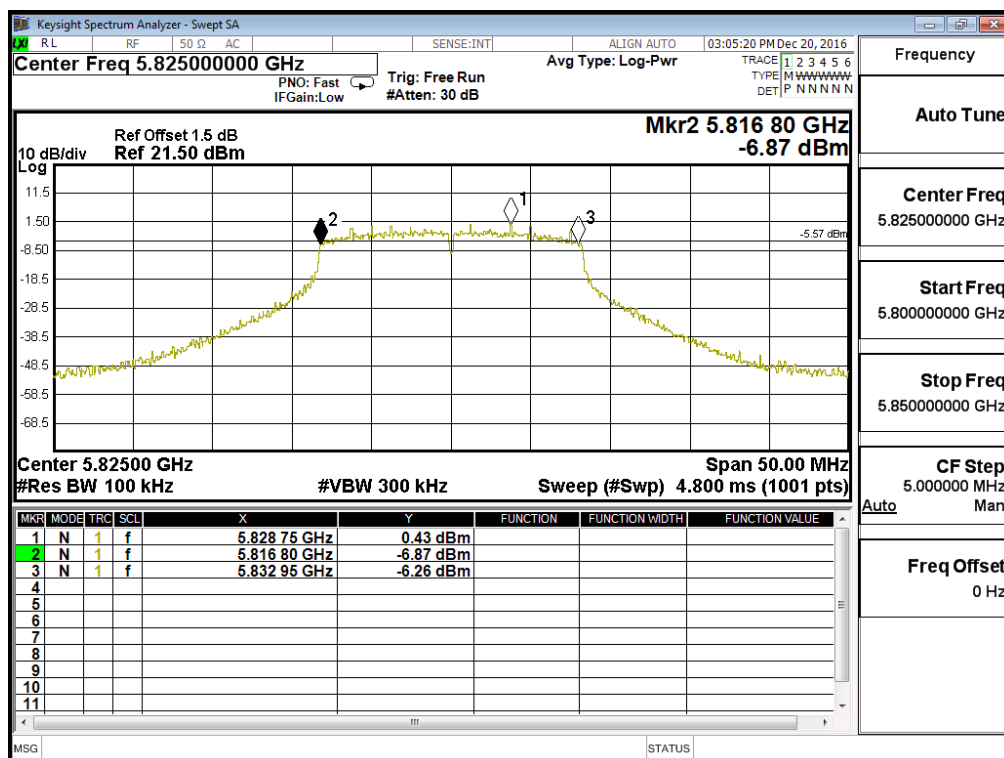


Figure Channel 165:



Product : Key programming device
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Date : 2016/12/20
 Test Mode : Mode 2: Transmit (802.11n-20BW 7.2Mbps)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745	16200	>500	Pass
157	5785	15550	>500	Pass
165	5825	15100	>500	Pass

Figure Channel 149:

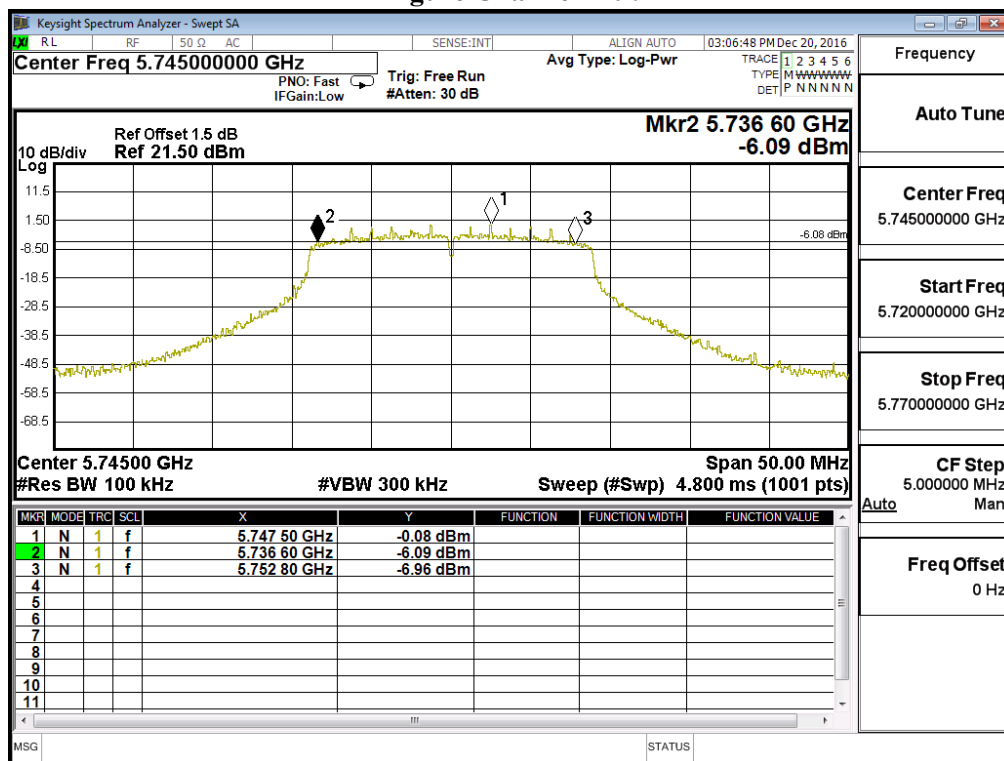


Figure Channel 157:

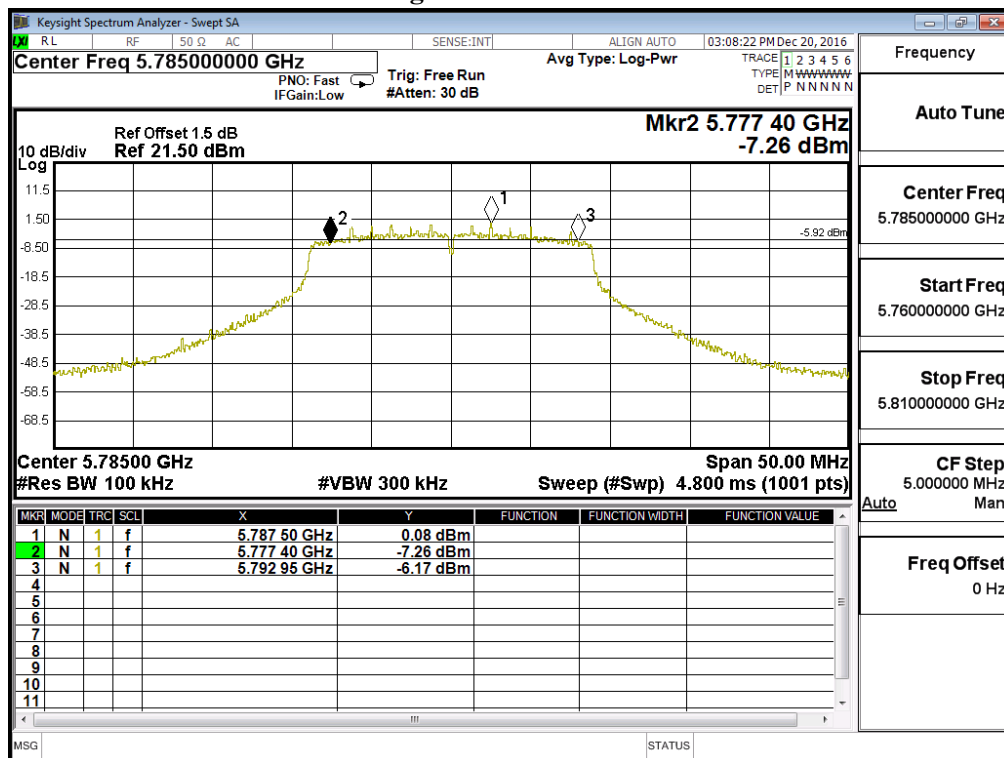
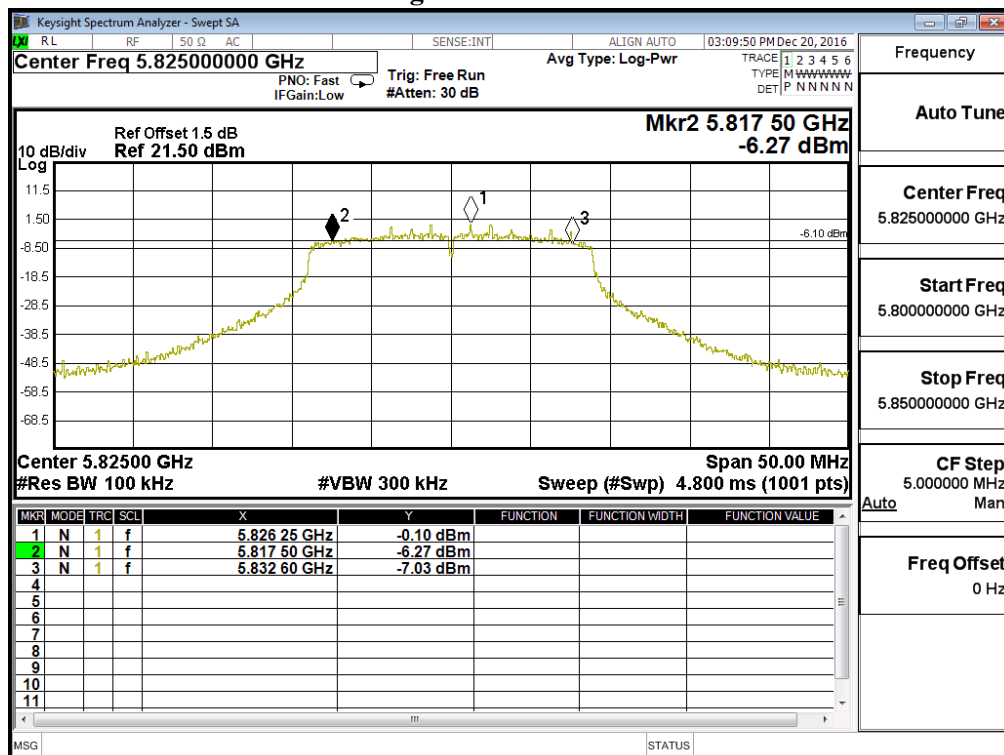
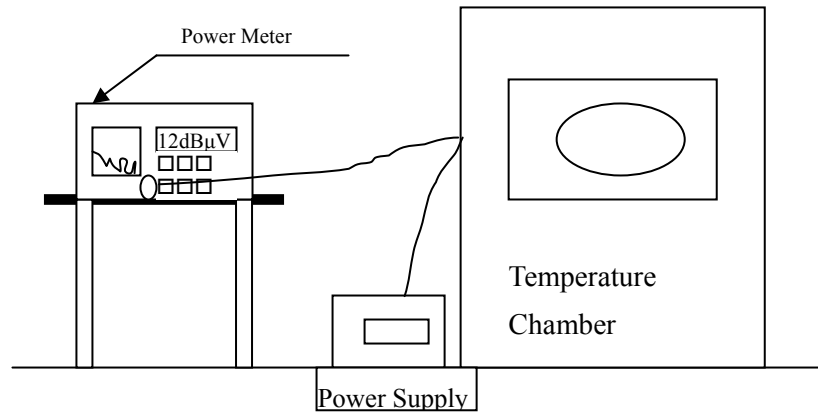


Figure Channel 165:



8. Frequency Stability

8.1. Test Setup



8.2. Limits

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

8.3. 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.

8.4. Uncertainty

$\pm 681.6 \text{ Hz}$

8.5. Test Result of Frequency Stability

Product : Key programming device
 Test Item : Frequency Stability
 Test Site : Temperature Chamber
 Test Date : 2016/12/20
 Test Mode : Carrier Wave

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tnom (20)°C	Vnom (3.6)V	36	5180.0000	5180.0091	-0.0091
		44	5220.0000	5220.0123	-0.0123
		48	5240.0000	5240.0069	-0.0069
		52	5260.0000	5260.0054	-0.0054
		60	5300.0000	5300.0141	-0.0141
		64	5320.0000	5320.0032	-0.0032
		100	5500.0000	5500.0086	-0.0086
		116	5580.0000	5580.0031	-0.0031
		140	5700.0000	5700.0062	-0.0062
		149	5745.0000	5745.0087	-0.0087
		157	5785.0000	5785.0059	-0.0059
		165	5825.0000	5825.0091	-0.0091
Tmax (50)°C	Vmax (4.14)V	36	5180.0000	5180.0061	-0.0061
		44	5220.0000	5220.0069	-0.0069
		48	5240.0000	5240.0042	-0.0042
		52	5260.0000	5260.0081	-0.0081
		60	5300.0000	5300.0041	-0.0041
		64	5320.0000	5320.0052	-0.0052
		100	5500.0000	5500.0091	-0.0091
		116	5580.0000	5580.0048	-0.0048
		140	5700.0000	5700.0059	-0.0059
		149	5745.0000	5745.0098	-0.0098
		157	5785.0000	5785.0062	-0.0062
		165	5825.0000	5825.0063	-0.0063

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tmax (50)°C	Vmin (3.06)V	36	5180.0000	5180.0055	-0.0055
		44	5220.0000	5220.0081	-0.0081
		48	5240.0000	5240.0065	-0.0065
		52	5260.0000	5260.0091	-0.0091
		60	5300.0000	5300.0041	-0.0041
		64	5320.0000	5320.0029	-0.0029
		100	5500.0000	5500.0071	-0.0071
		116	5580.0000	5580.0068	-0.0068
		140	5700.0000	5700.0077	-0.0077
		149	5745.0000	5745.0053	-0.0053
		157	5785.0000	5785.0083	-0.0083
		165	5825.0000	5825.0068	-0.0068
Tmin (-30)°C	Vmax (4.14)V	36	5180.0000	5180.0028	-0.0028
		44	5220.0000	5220.0071	-0.0071
		48	5240.0000	5240.0046	-0.0046
		52	5260.0000	5260.0086	-0.0086
		60	5300.0000	5300.0057	-0.0057
		64	5320.0000	5320.0072	-0.0072
		100	5500.0000	5500.0038	-0.0038
		116	5580.0000	5580.0081	-0.0081
		140	5700.0000	5700.0024	-0.0024
		149	5745.0000	5745.0068	-0.0068
		157	5785.0000	5785.0039	-0.0039
		165	5825.0000	5825.0056	-0.0056

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	ΔF (MHz)
Tmin (-30)°C	Vmin (3.06)V	36	5180.0000	5180.0072	-0.0072
		44	5220.0000	5220.0053	-0.0053
		48	5240.0000	5240.0089	-0.0089
		52	5260.0000	5260.0062	-0.0062
		60	5300.0000	5300.0041	-0.0041
		64	5320.0000	5320.0029	-0.0029
		100	5500.0000	5500.0085	-0.0085
		116	5580.0000	5580.0052	-0.0052
		140	5700.0000	5700.0053	-0.0053
		149	5745.0000	5745.0073	-0.0073
		157	5785.0000	5785.0062	-0.0062
		165	5825.0000	5825.0041	-0.0041

9. EMI Reduction Method During Compliance Testing

No modification was made during testing.