FCC Test Report

Product Name	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Model No	AWK-1137C-XXXXX (x=0-9,A-Z, blank or dash for marketing purpose and no impact safety related critical components and constructions)
FCC ID	SLE-1137C

Applicant	MOXA Inc.
Address	FL.4, NO. 135. LANE 235, BAOQIAO RD. XINDIAN DIST.,NEW TAIPEI CITY, TAIWAN

Date of Receipt	Mar. 03, 2017
Issued Date	May 31, 2017
Report No.	1730078R-RFUSP48V00
Report Version	V1.0

Testing Laboratory
3023

Test Report

Issued Date: May 31, 2017
Report No.: 1730078R-RFUSP48V00

Product Name	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Applicant	MOXA Inc.
Address	FL.4, NO. 135. LANE 235, BAOQIAO RD. XINDIAN DIST.,NEW TAIPEI CITY, TAIWAN
Manufacturer	MOXA Inc.
Model No.	AWK-1137C-XXXXX (x=0-9,A-Z, blank or dash for marketing purpose and no impact safety related critical components and constructions)
FCC ID.	SLE-1137C
EUT Rated Voltage	DC 9-30V
EUT Test Voltage	DC 24V
Trade Name	MOXA
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E: 2016 ANSI C63.4: 2014, ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01r04
Test Result	Complied

Documented By : Joanne Lin

(Senior Adm. Specialist / Joanne Lin)

Tested By : Paul Jiang

(Engineer / Paul Jiang)

Approved By :

(Director / Vincent Lin)

TABLE OF CONTENTS

	Description	Page
1.	**GENERAL INFORMATION**	**5**
1.1.	EUT Description	5
1.2.	Operational Description	7
1.3.	Tested System Datails	8
1.4.	Configuration of tested System	8
1.5.	EUT Exercise Software	8
1.6.	Test Facility	9
1.7.	List of Test Equipment	10
2.	**Conducted Emission**	**11**
2.1.	Test Setup	11
2.2.	Limits	12
2.3.	Test Procedure	12
2.4.	Uncertainty	12
2.5.	Test Result of Conducted Emission	13
3.	**Maximun conducted output power**	**14**
3.1.	Test Setup	14
3.2.	Limits	15
3.3.	Test Procedure	16
3.4.	Uncertainty	16
3.5.	Test Result of Maximum conducted output power	17
4.	**Peak Power Spectral Density**	**39**
4.1.	Test Setup	39
4.2.	Limits	39
4.3.	Test Procedure	40
4.4.	Uncertainty	40
4.5.	Test Result of Peak Power Spectral Density	41
5.	**Radiated Emission**	**72**
5.1.	Test Setup	72
5.2.	Limits	74
5.3.	Test Procedure	75
5.4.	Uncertainty	75
5.5.	Test Result of Radiated Emission	76
6.	**Band Edge**	**121**
6.1.	Test Setup	121
6.2.	Limits	122
6.3.	Test Procedure	122
6.4.	Uncertainty	122
6.5.	Test Result of Band Edge	123
7.	**Occupied Bandwidth**	**153**
7.1.	Test Setup	153
7.2.	Limits	153
7.3.	.Test Procedure	153
7.4.	Uncertainty	153

7.5. Test Result of Occupied Bandwidth 154

8. Frequency Stability 163

8.1. Test Setup 163
8.2. Limits 163
8.3. Test Procedure 163
8.4. Uncertainty 163
8.5. Test Result of Frequency Stability 164

9. EMI Reduction Method During Compliance Testing 174

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Trade Name	MOXA
FCC ID.	SLE-1137C
Model No.	AWK-1137C-XXXXX (x=0-9,A-Z, blank or dash for marketing purpose and no impact safety related critical components and constructions)
Frequency Range	802.11a/n-20MHz: 5180-5320MHz, 5500-5700MHz, 5745-5825MHz 802.11n-40MHz: 5190-5310MHz, 5510-5670MHz, 5755-5795MHz
Number of Channels	802.11a/n-20MHz: 24; 802.11n-40MHz: 11
Data Rate	802.11a: 6 - 54Mbps 802.11n: up to 300Mbps
Type of Modulation	802.11a/n:OFDM, BPSK, QPSK, 16QAM, 64QAM
Antenna type	Omni-directional Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	WHA YU INDUSTRIAL CO., LTD.	ANT-WDB-ARM-0202	Omni-directional Antenna	1.8dBi for 5.150-5.250 GHz 1.6dBi for 5.250-5.350 GHz 1.8dBi for 5.470-5.725 GHz 1.8dBi For 5.725~5.850GHz

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

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

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

Note:

1. This device is a Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client with a built-in 802.11a/b/g/n WLAN transceiver.
2. The different of each model is shown as below:

Model Number	Description
AWK-1137C-US	Industrial 802.11a/b/g/n Client, US Band, 0°C to 60°C
AWK-1137C-US-T	Industrial 802.11a/b/g/n Client, US Band, -40°C to 75°C
AWK-1137C-EU	Industrial 802.11a/b/g/n Client, EU Band, 0°C to 60°C
AWK-1137C-EU-T	Industrial 802.11a/b/g/n Client, EU Band, -40°C to 75°C
AWK-1137C-JP	Industrial 802.11a/b/g/n Client, JP Band, 0°C to 60°C
AWK-1137C-JP-T	Industrial 802.11a/b/g/n Client, JP Band, -40°C to 75°C

3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. At result of pretests, module supports dual-channel transmission, only the worst case is shown in the report. (802.11a is chain A)
5. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11a is 6Mbps、802.11n-20BW is 14.4Mbps、802.11n-40BW is 30Mbps)
6. 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.
7. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit (802.11a-6Mbps) Mode 2: Transmit (802.11n-20BW 14.4Mbps) Mode 3: Transmit (802.11n-40BW 30Mbps)

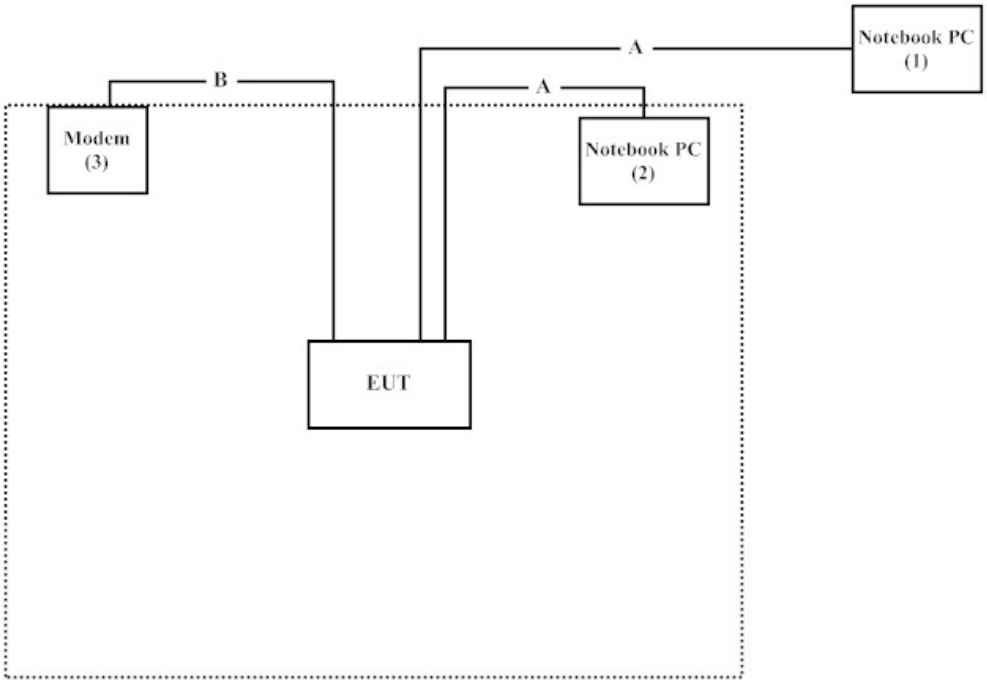
1.3. Tested System Datails

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	DELL	Latitude E5440	B6TYTZ1	Non-Shielded, 1.8m
2	Notebook PC	DELL	Latitude E5440	HG26TZ1	Non-Shielded, 1.8m
3	Modem	ACEEX	DM-1414	0102027536	Non-Shielded, 1.8m

Signal Cable Type		Signal cable Description
A	LAN Cable	Non-Shielded, 3m, two PCS.
B	RS-232 Cable	Non-Shielded, 1.8m

1.4. Configuration of tested System



1.5. EUT Exercise Software

1. Setup the EUT as shown on 1.4
2. Execute software ”ART2-Gui V2.3” 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/english/about/certificates.aspx?bval=5
The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en.aspx

Site Description: Accredited by TAF
Accredited Number: 3023

Site Name: DEKRA Testing and Certification Co., Ltd
Site Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW1014

1.7. List of Test Equipment

For Conducted measurements / CB3 / SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2016/11/28	2017/11/27
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	2016/1/7	2017/1/6
X	LISN	R&S	ENV216	100097	2016/1/7	2017/1/6
X	Coaxial Cable	QTK(Arnist)	RG 400	LC018-RG	2016/6/25	2017/6/24

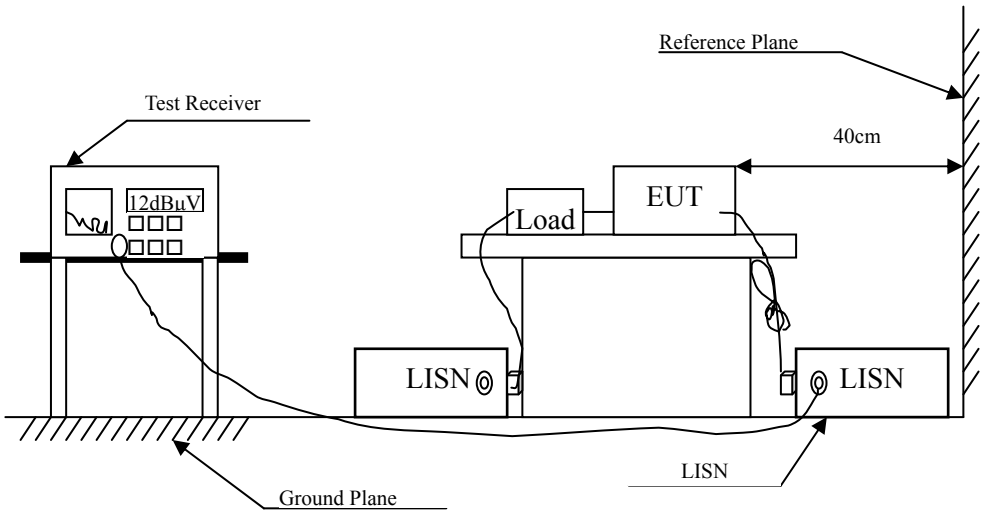
For Radiated measurements / Site3 / CB8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2017/1/5	2018/1/4
	Loop Antenna	Teseq	HLA6121	37133	2017/3/18	2018/3/17
X	Bi-Log Antenna	Schaffner Chase	CBL6112B	2707	2016/6/11	2017/6/10
X	Horn Antenna	ETS-Lindgren	3117	00135205	2017/4/6	2018/4/5
X	Horn Antenna	Schwarzbeck	BBHA9170	9170430	2016/1/11	2017/1/10
X	Pre-Amplifier	QTK	AP/0100A	CHM/0901069	2016/6/23	2017/6/22
X	Pre-Amplifier	EMCI	EMC012630SE	980210	2017/1/26	2018/1/24
X	Pre-Amplifier	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 invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT was setup to ANSI C63.4, 2014; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

2.4. Uncertainty

± 2.26 dB

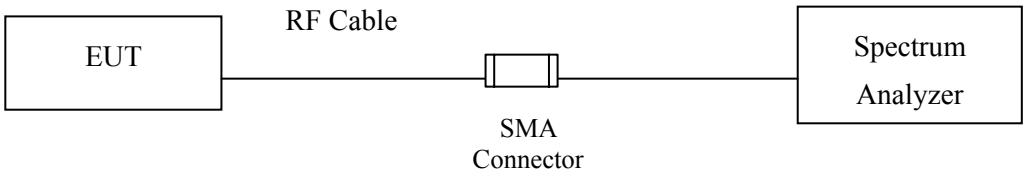
2.5. Test Result of Conducted Emission

Owing to the DC operation of EUT, this test item is not performed.

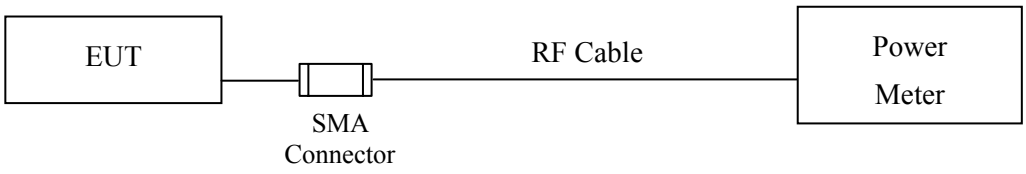
3. Maximun conducted output power

3.1. Test Setup

99% Occupied Bandwidth



Conduction Power Measurement (for 802.11an)



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-topoint 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 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 the 6dB BW of the emission under test. Maximum conducted output power was read directly from the meter across all data rates, and across three channels within each sub-band. Special care was used to make sure that the EUT was transmitting in continuous mode. This method exceeds the limitations of FCC KDB-789033, and provides more accurate measurements.

802.11an (BW≦40MHz) Maximum conducted output power using KDB 789033 section E)3)b) Method PM-G (Measurement using a gated RF average power meter)
Note: the power meter have a video bandwidth that is greater than or equal to the measurement bandwidth, (Anritsu/ MA2411B video bandwidth: 65MHz)

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

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

3.4. Uncertainty

± 1.62 dB

3.5. Test Result of Maximum conducted output power

Product : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Maximum conducted output power
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		6	9	12	18	24	36	48	54	
		Measurement Level (dBm)								
36	5180	19.48	--	--	--	--	--	--	--	<24dBm
44	5220	21.44	21.25	21.19	21.07	20.95	20.80	20.71	20.62	<24dBm
48	5240	21.45	--	--	--	--	--	--	--	<24dBm
52	5260	21.75	--	--	--	--	--	--	--	<24dBm
60	5300	21.87	21.74	21.62	21.49	21.31	21.19	21.08	20.89	<24dBm
64	5320	18.95	--	--	--	--	--	--	--	<24dBm
100	5500	16.18	--	--	--	--	--	--	--	<24dBm
116	5580	22.36	22.21	22.15	22.04	21.95	21.85	21.71	21.64	<24dBm
140	5700	15.35	--	--	--	--	--	--	--	<24dBm
149	5745	16.28	--	--	--	--	--	--	--	<30dBm
157	5785	16.33	16.22	16.17	16.11	16.01	15.91	15.76	15.55	<30dBm
165	5825	17.41	--	--	--	--	--	--	--	<30dBm

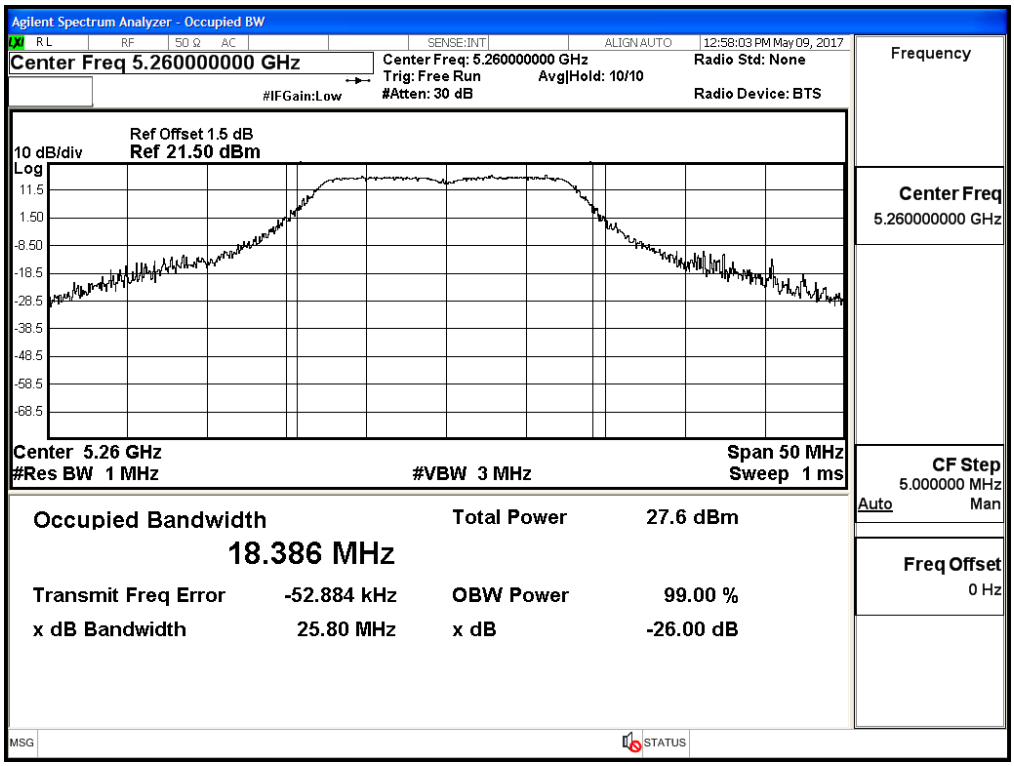
Note: Maximum conducted output power Value =Reading value on average power meter + cable loss

Maximum conducted output power Measurement:

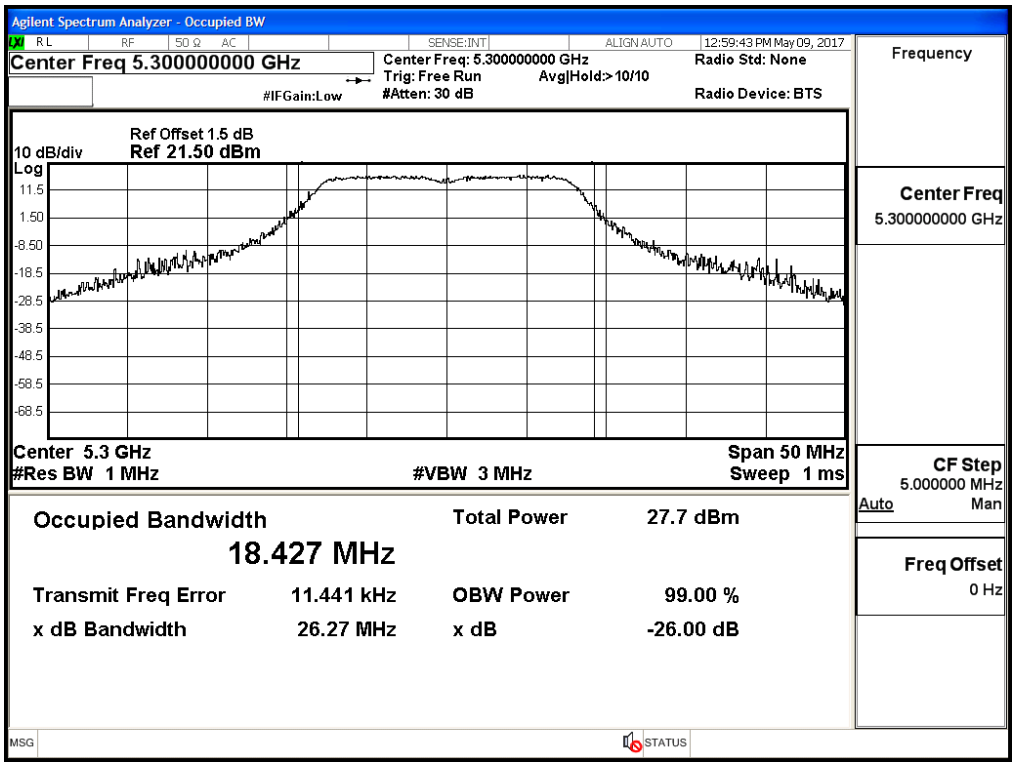
Channel No	Frequency Range (MHz)	99% Bandwidth (MHz)	Output Power (dBm)	Output Power Limit	
				(dBm)	dBm+10log(BW)
36	5180	--	19.48	24	--
44	5220	--	21.44	24	--
48	5240	--	21.45	24	--
52	5260	18.386	21.75	24	23.64
60	5300	18.427	21.87	24	23.65
64	5320	18.268	18.95	24	23.62
100	5500	18.235	16.18	24	23.61
116	5580	18.598	22.36	24	23.69
140	5700	18.231	15.35	24	23.61
149	5745	--	16.28	30	--
157	5785	--	16.33	30	--
165	5825	--	17.41	30	--

Note:
1. Power Output Value =Reading value on average power meter + cable loss
2. 26 dB Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.

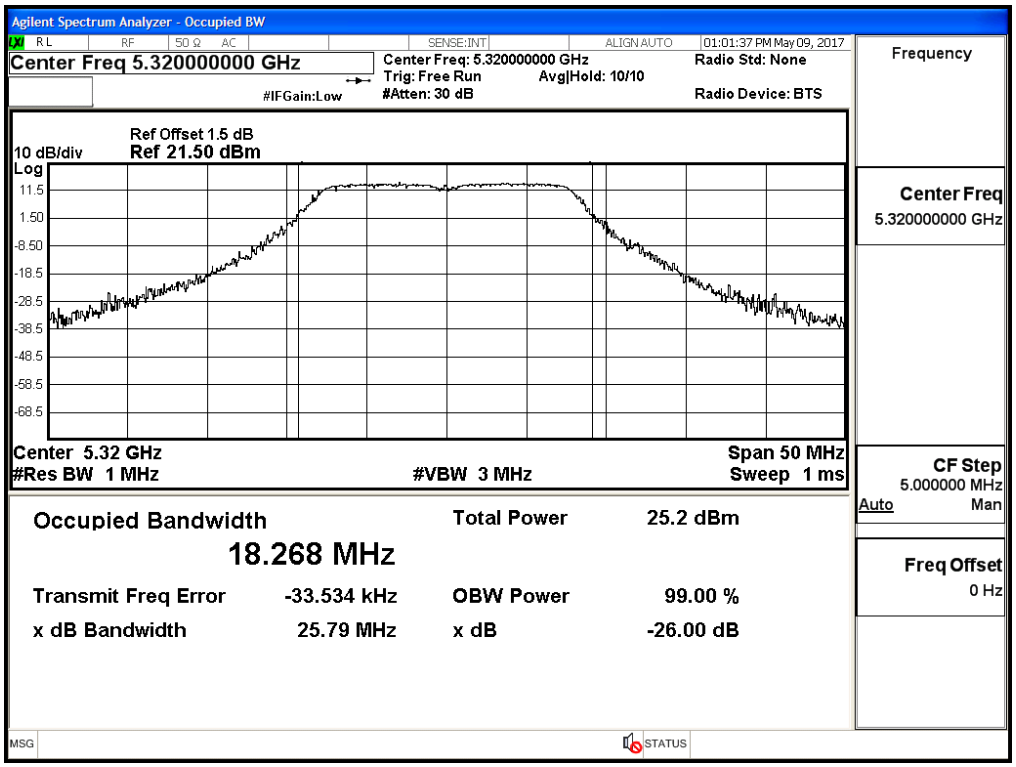
99% Occupied Bandwidth:
Channel 52:



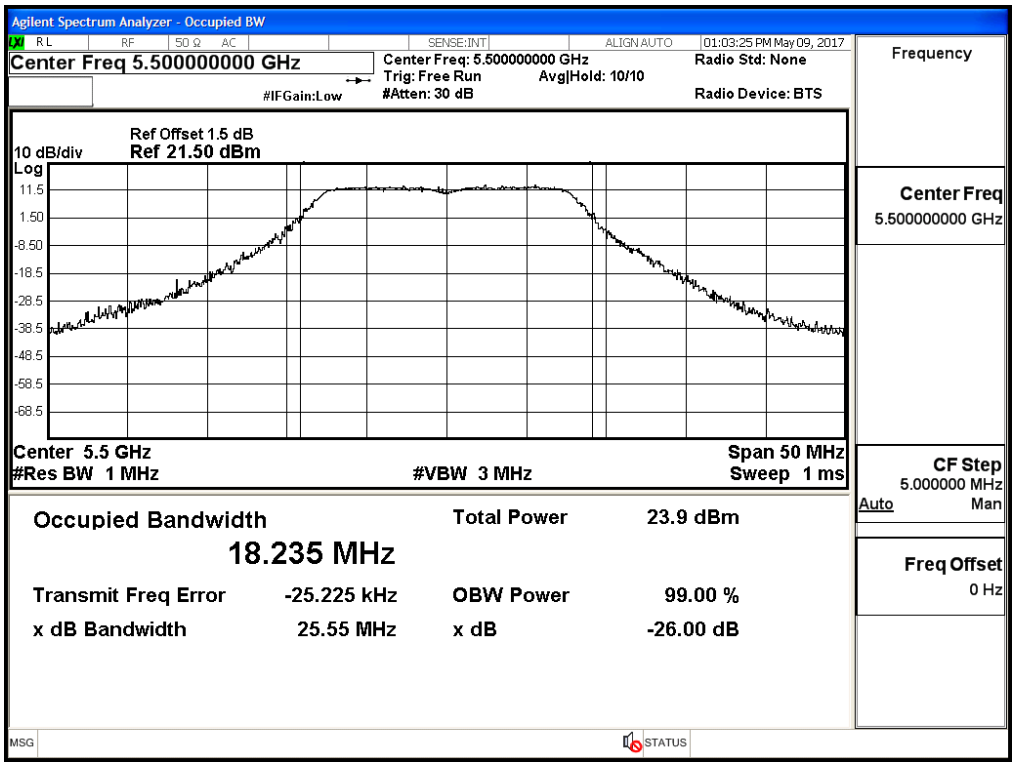
Channel 60:



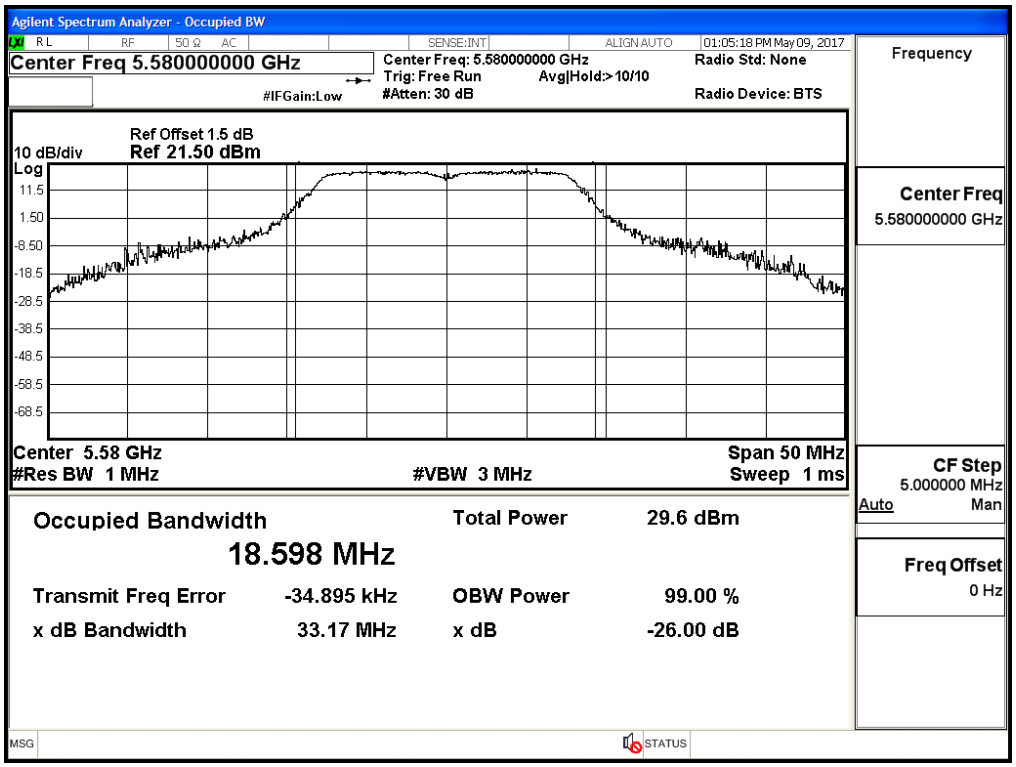
Channel 64:



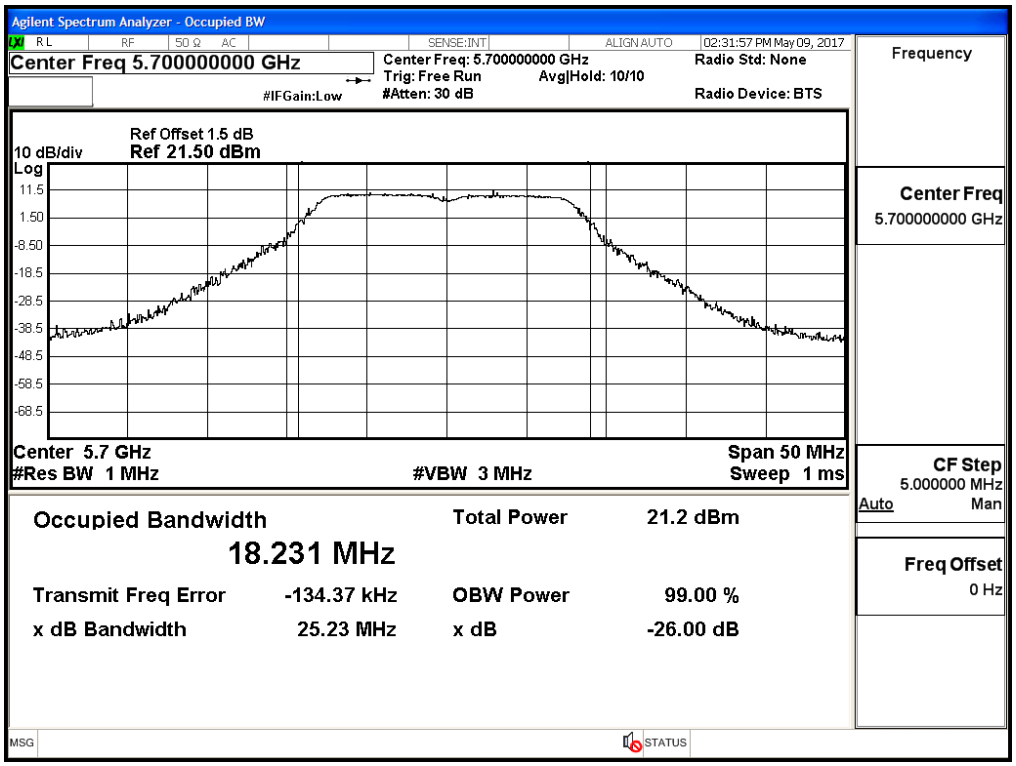
Channel 100:



Channel 116:



Channel 140:



Product : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Maximum conducted output power
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)

Chain A

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4	
		Measurement Level (dBm)								
36	5180	18.30	--	--	--	--	--	--	--	<24dBm
44	5220	18.27	18.17	18.11	18.02	17.95	17.84	17.72	17.59	<24dBm
48	5240	18.09	--	--	--	--	--	--	--	<24dBm
52	5260	18.48	--	--	--	--	--	--	--	<24dBm
60	5300	18.72	18.62	18.51	18.40	18.24	18.17	18.07	17.95	<24dBm
64	5320	19.35	--	--	--	--	--	--	--	<24dBm
100	5500	15.25	--	--	--	--	--	--	--	<24dBm
116	5580	19.30	19.21	19.17	19.07	18.92	18.76	18.62	18.54	<24dBm
140	5700	18.03	--	--	--	--	--	--	--	<24dBm
149	5745	16.65	--	--	--	--	--	--	--	<30dBm
157	5785	18.17	18.12	18.02	17.92	17.83	17.62	17.52	17.40	<30dBm
165	5825	18.59	--	--	--	--	--	--	--	<30dBm

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

Chain B

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4	
		Measurement Level (dBm)								
36	5180	18.66	--	--	--	--	--	--	--	<24dBm
44	5220	19.64	19.51	19.40	19.28	19.17	19.11	19.01	18.82	<24dBm
48	5240	19.48	--	--	--	--	--	--	--	<24dBm
52	5260	19.72	--	--	--	--	--	--	--	<24dBm
60	5300	19.65	19.52	19.39	19.24	19.14	19.02	18.85	18.65	<24dBm
64	5320	19.79	--	--	--	--	--	--	--	<24dBm
100	5500	15.94	--	--	--	--	--	--	--	<24dBm
116	5580	20.17	20.06	19.96	19.75	19.62	19.52	19.38	19.21	<24dBm
140	5700	16.81	--	--	--	--	--	--	--	<24dBm
149	5745	17.42	--	--	--	--	--	--	--	<30dBm
157	5785	19.84	19.70	19.62	19.52	19.37	19.21	19.11	18.94	<30dBm
165	5825	19.78	--	--	--	--	--	--	--	<30dBm

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

Maximum conducted output power Measurement:

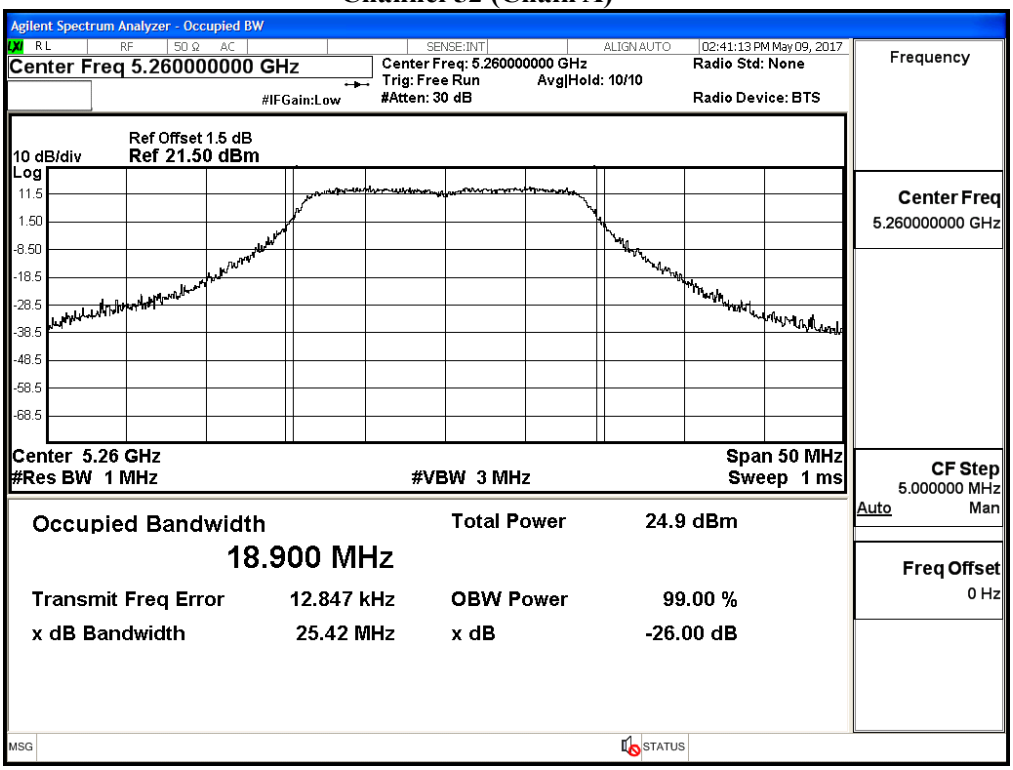
Chain A+ B

Channel Number	Frequency (MHz)	99% Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit	
						(dBm)	dBm+10log(BW)
36	5180	--	18.30	18.66	21.49	24	--
44	5220	--	18.27	19.64	22.02	24	--
48	5240	--	18.09	19.48	21.85	24	--
52	5260	18.813	18.48	19.72	22.15	24	23.74
60	5300	18.850	18.72	19.65	22.22	24	23.75
64	5320	18.843	19.35	19.79	22.59	24	23.75
100	5500	18.846	15.25	15.94	18.62	24	23.75
116	5580	18.939	19.30	20.17	22.77	24	23.77
140	5700	18.784	18.03	16.81	20.47	24	23.74
149	5745	--	16.65	17.42	20.06	30	--
157	5785	--	18.17	19.84	22.10	30	--
165	5825	--	18.59	19.78	22.24	30	--

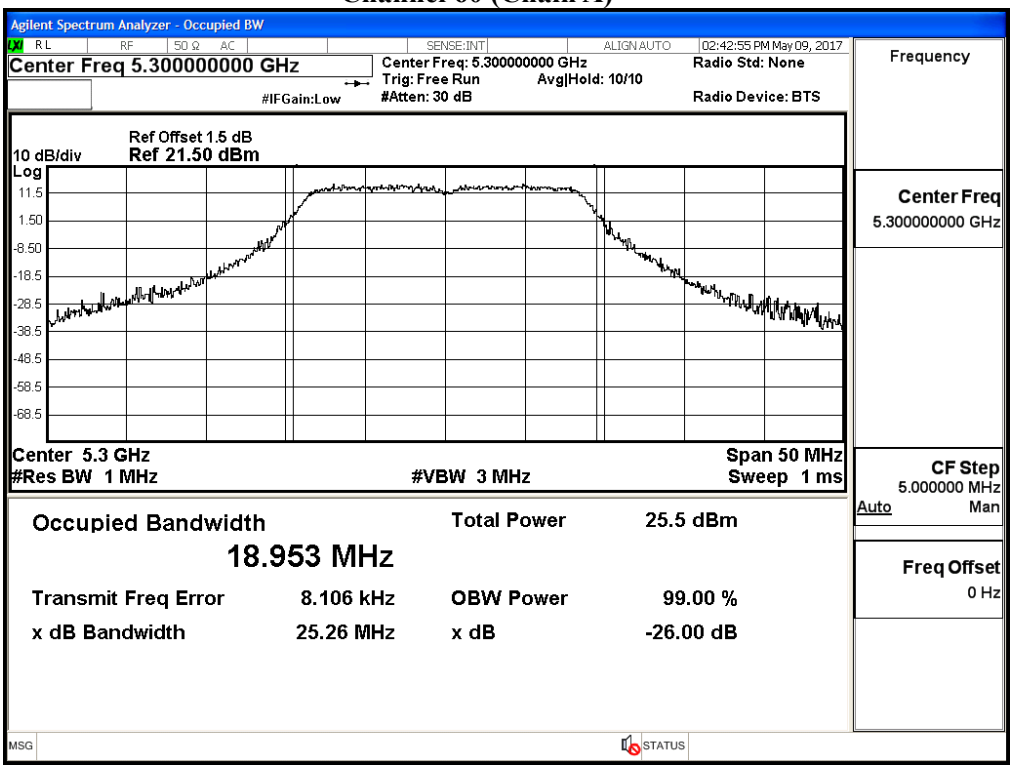
Note:

1. Power Output Value =Reading value on average power meter + cable loss
2. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))
3. 26 dB Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.

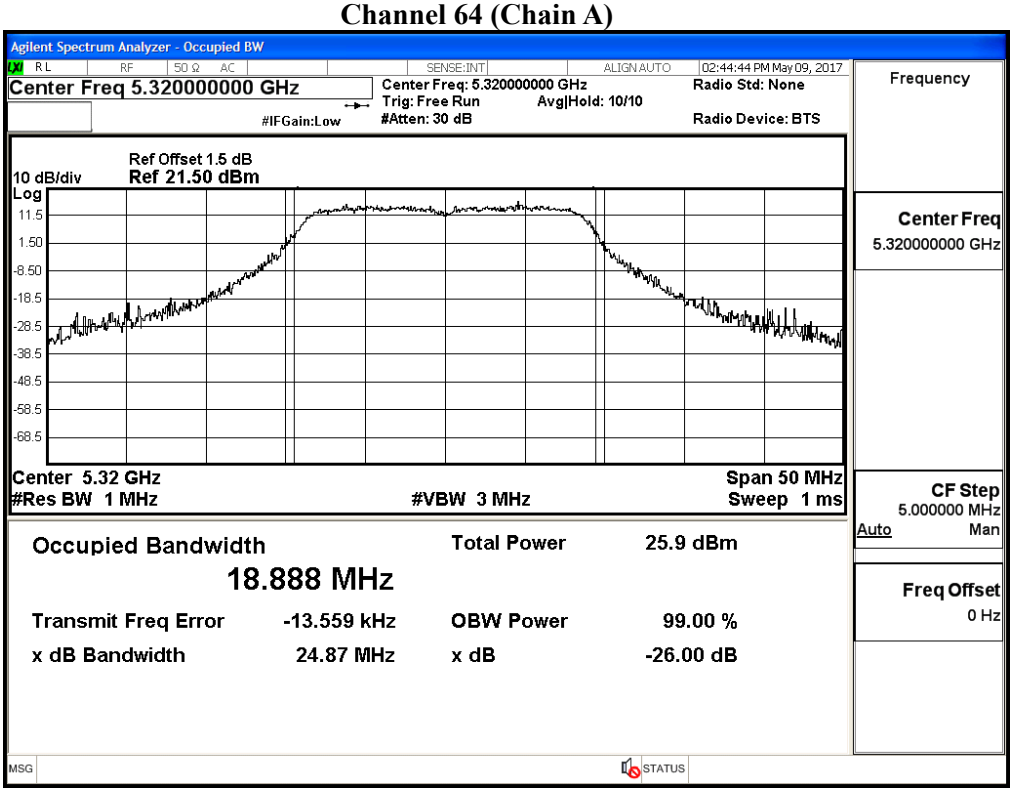
99% Occupied Bandwidth:
Channel 52 (Chain A)



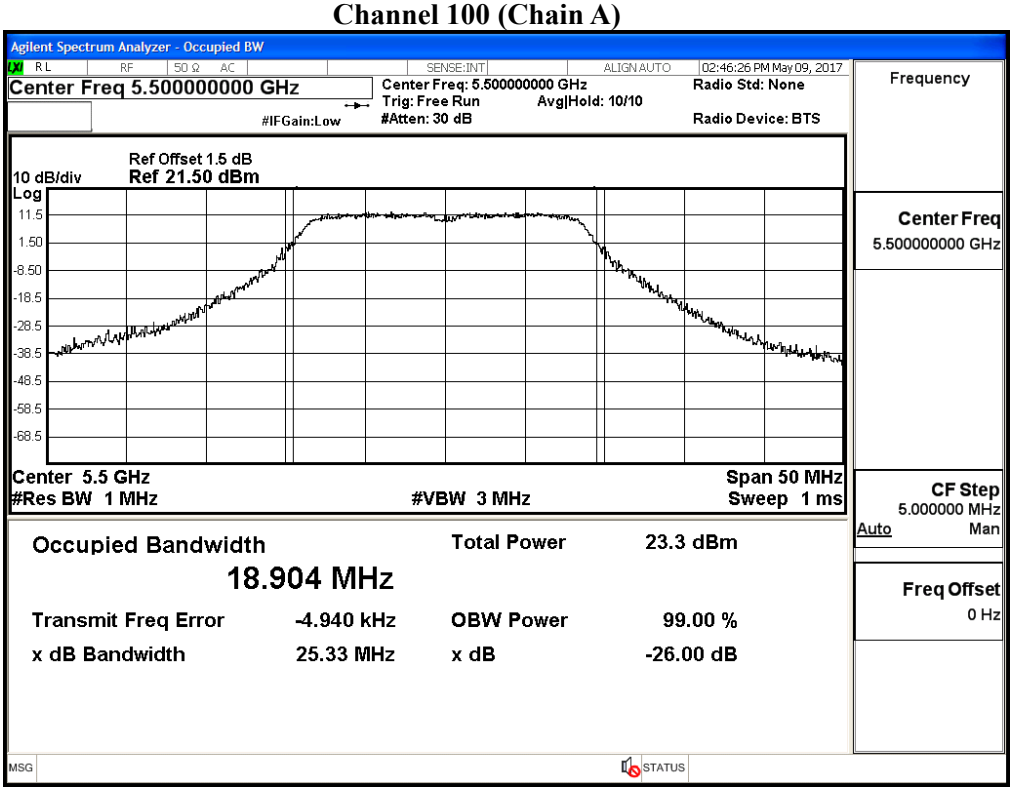
Channel 60 (Chain A)



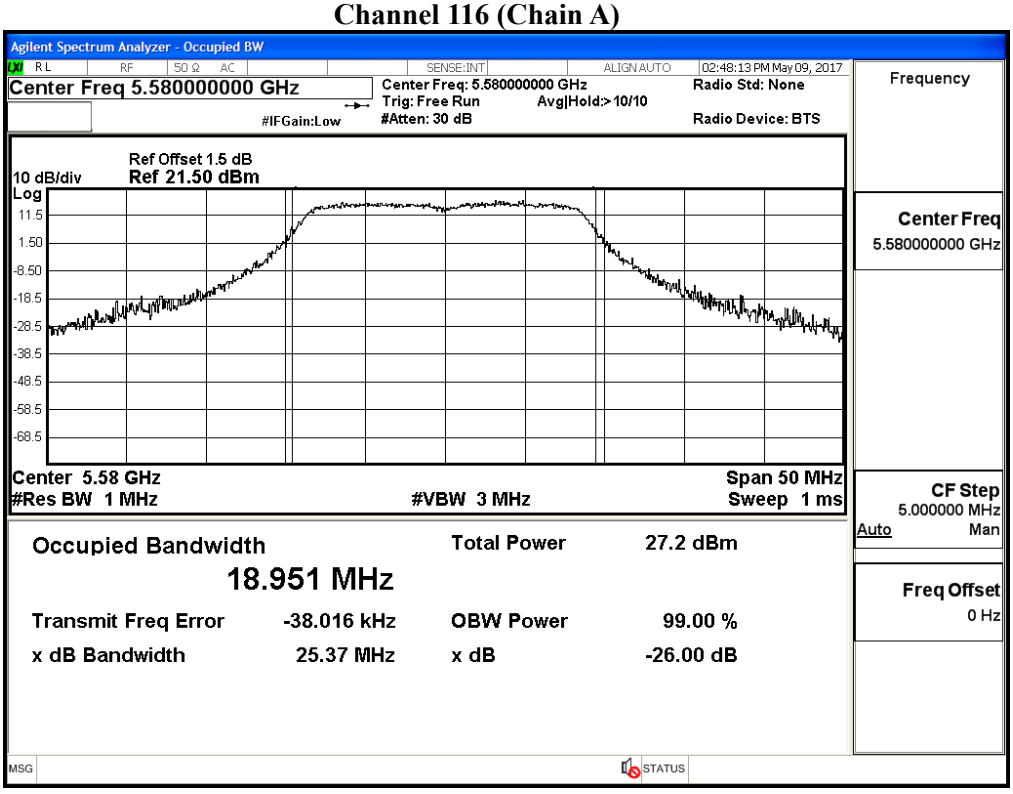
Channel 64 (Chain A)



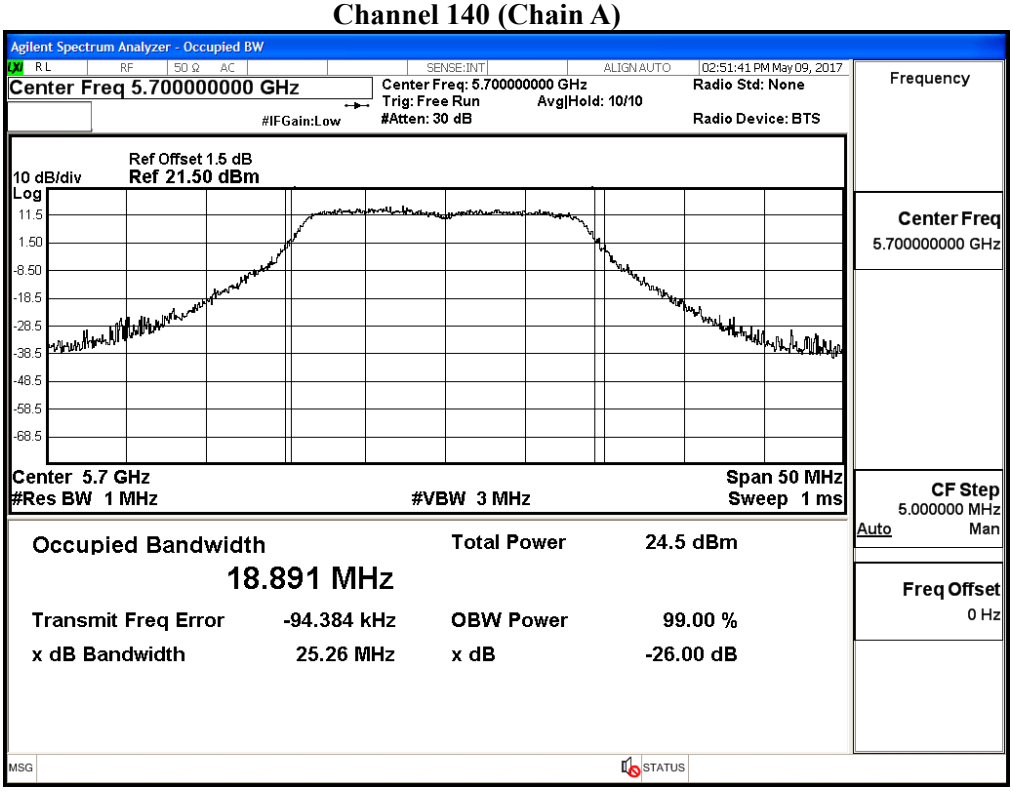
Channel 100 (Chain A)



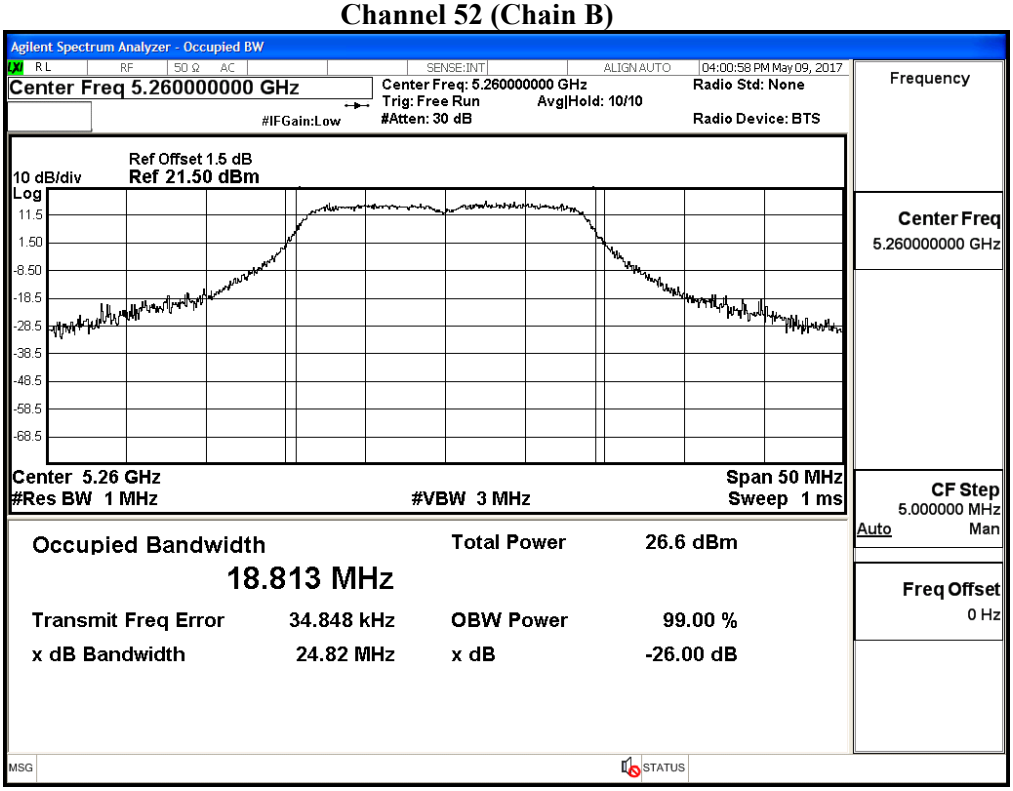
Channel 116 (Chain A)



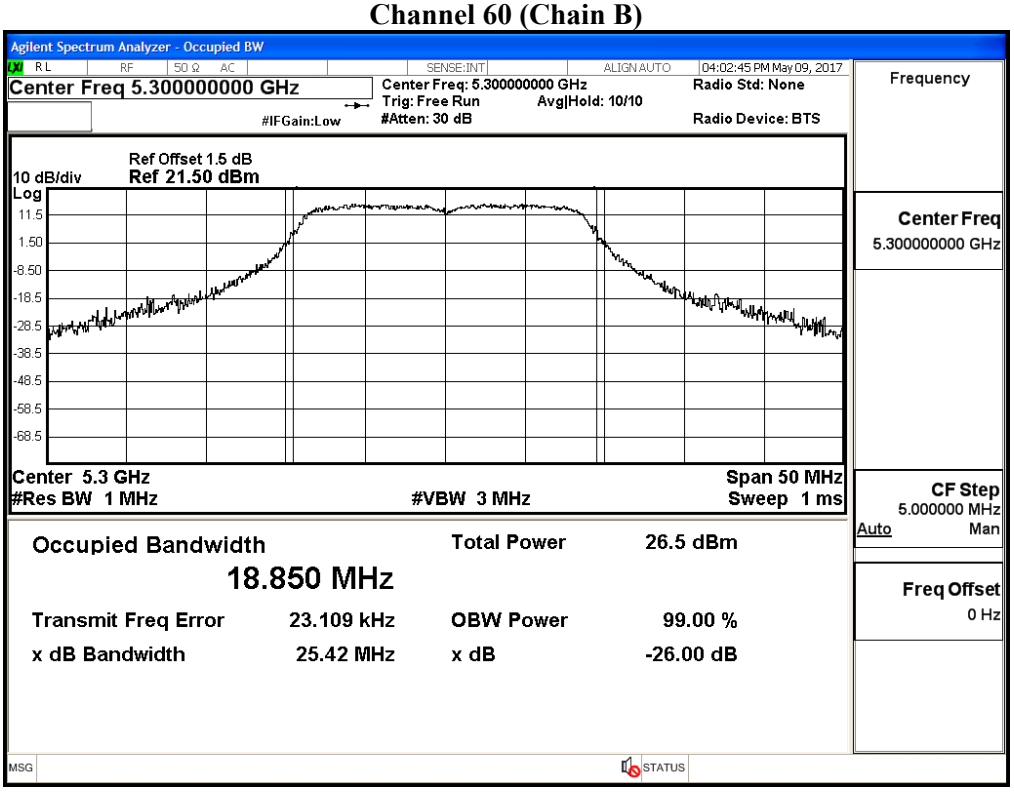
Channel 140 (Chain A)



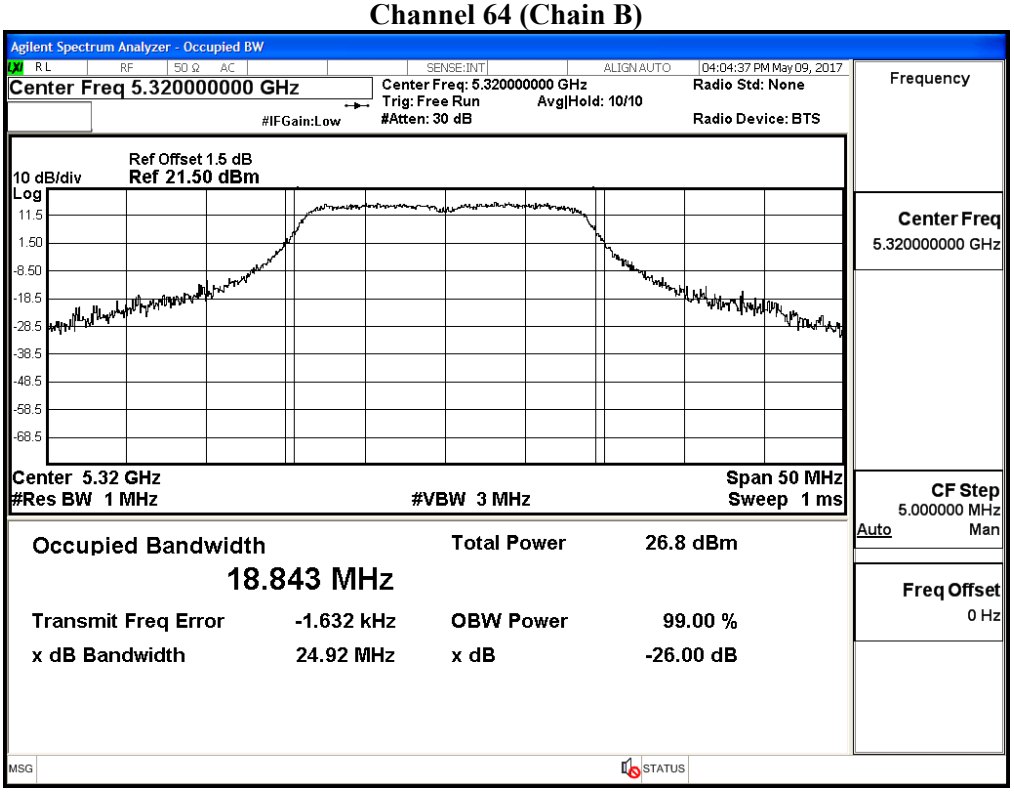
99% Occupied Bandwidth:
Channel 52 (Chain B)



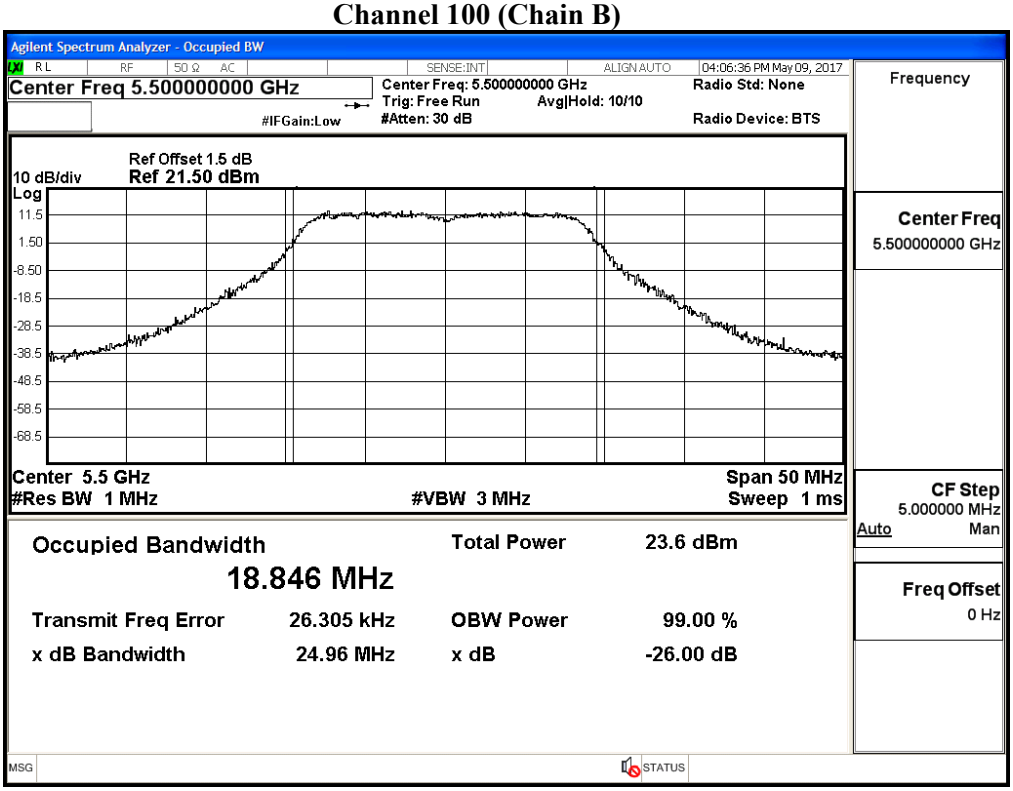
Channel 60 (Chain B)



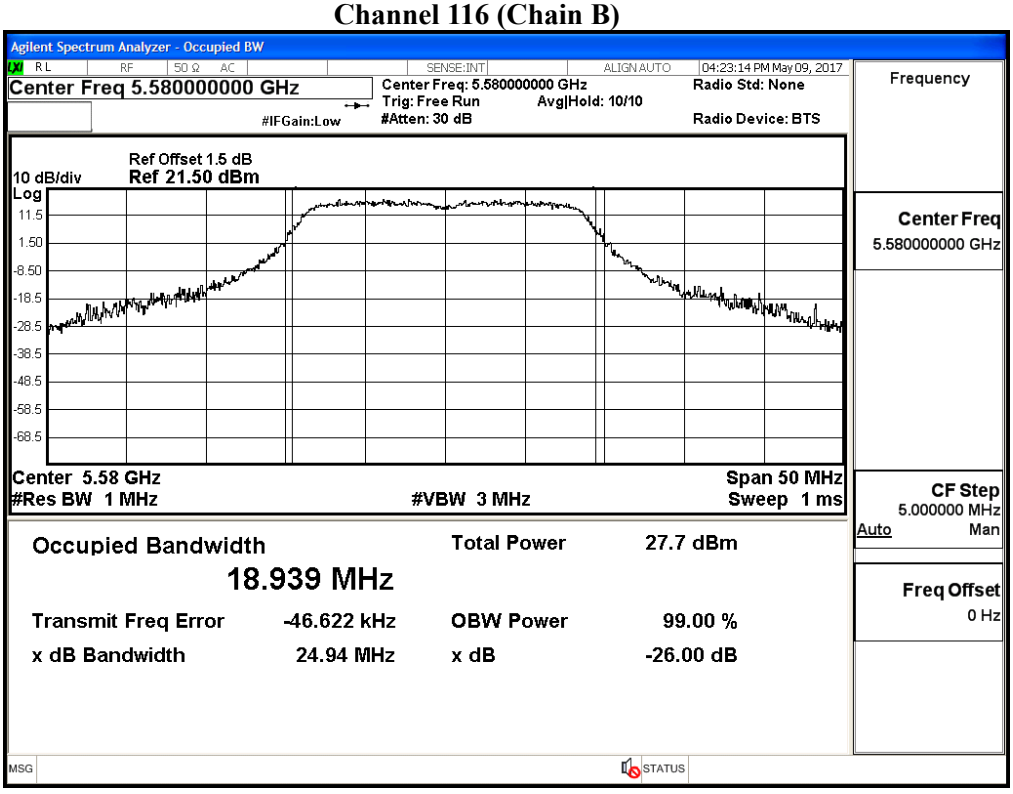
Channel 64 (Chain B)



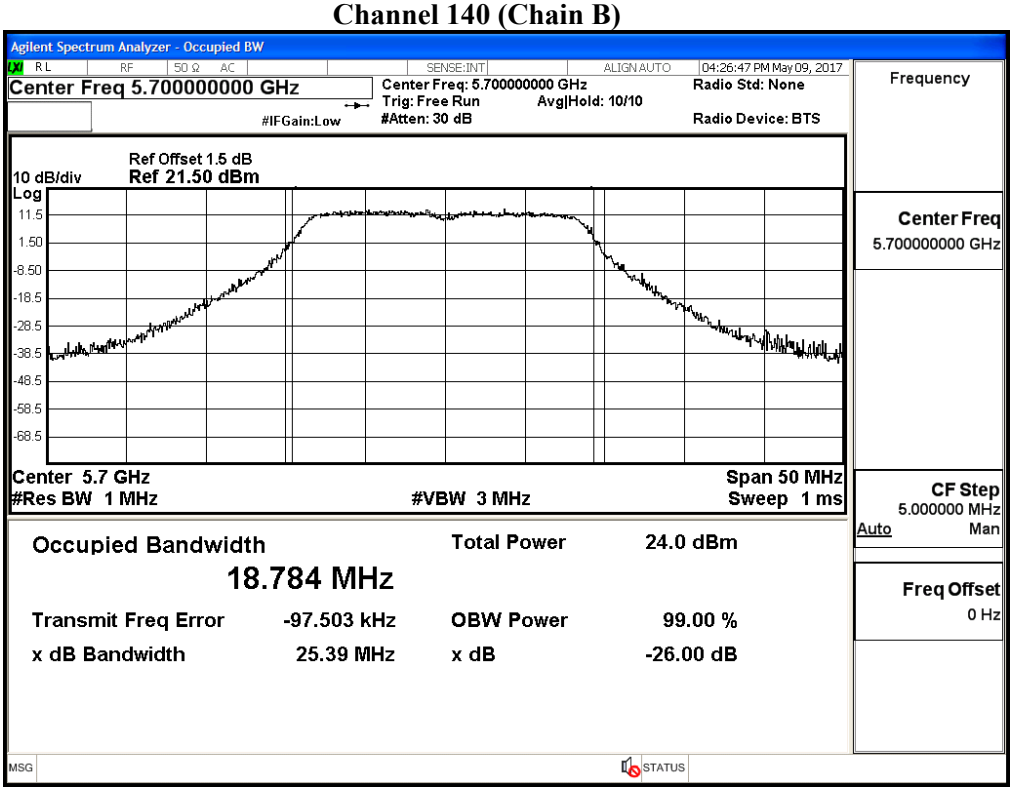
Channel 100 (Chain B)



Channel 116 (Chain B)



Channel 140 (Chain B)



Product : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Maximum conducted output power
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)

Chain A

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		30	60	90	120	180	240	270	300	
		Measurement Level (dBm)								
38	5190	13.94	--	--	--	--	--	--	--	<24dBm
46	5230	19.97	19.82	19.70	19.54	19.34	19.23	19.12	19.01	<24dBm
54	5270	20.08	--	--	--	--	--	--	--	<24dBm
62	5310	15.52	15.34	15.20	15.01	14.92	14.74	14.58	14.38	<24dBm
102	5510	13.24	--	--	--	--	--	--	--	<24dBm
110	5550	19.95	19.76	19.65	19.52	19.39	19.27	19.20	19.03	<24dBm
134	5670	18.99	--	--	--	--	--	--	--	<24dBm
151	5755	14.31	--	--	--	--	--	--	--	<30dBm
159	5795	18.62	18.53	18.44	18.30	18.19	18.01	17.93	17.80	<30dBm

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

Chain B

Cable loss=1dB		Maximum conducted output power								
Channel No.	Frequency (MHz)	Data Rate (Mbps)								Required Limit
		30	60	90	120	180	240	270	300	
		Measurement Level (dBm)								
38	5190	14.01	--	--	--	--	--	--	--	<24dBm
46	5230	21.27	21.14	21.02	20.92	20.84	20.70	20.57	20.34	<24dBm
54	5270	21.04	--	--	--	--	--	--	--	<24dBm
62	5310	15.79	15.67	15.54	15.39	15.27	15.14	14.95	14.82	<24dBm
102	5510	14.61	--	--	--	--	--	--	--	<24dBm
110	5550	20.37	20.17	20.06	19.95	19.84	19.76	19.59	19.42	<24dBm
134	5670	17.52	--	--	--	--	--	--	--	<24dBm
151	5755	14.95	--	--	--	--	--	--	--	<30dBm
159	5795	20.27	20.17	20.03	19.85	19.72	19.63	19.54	19.39	<30dBm

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

Maximum conducted output power Measurement:

Chain A+ B

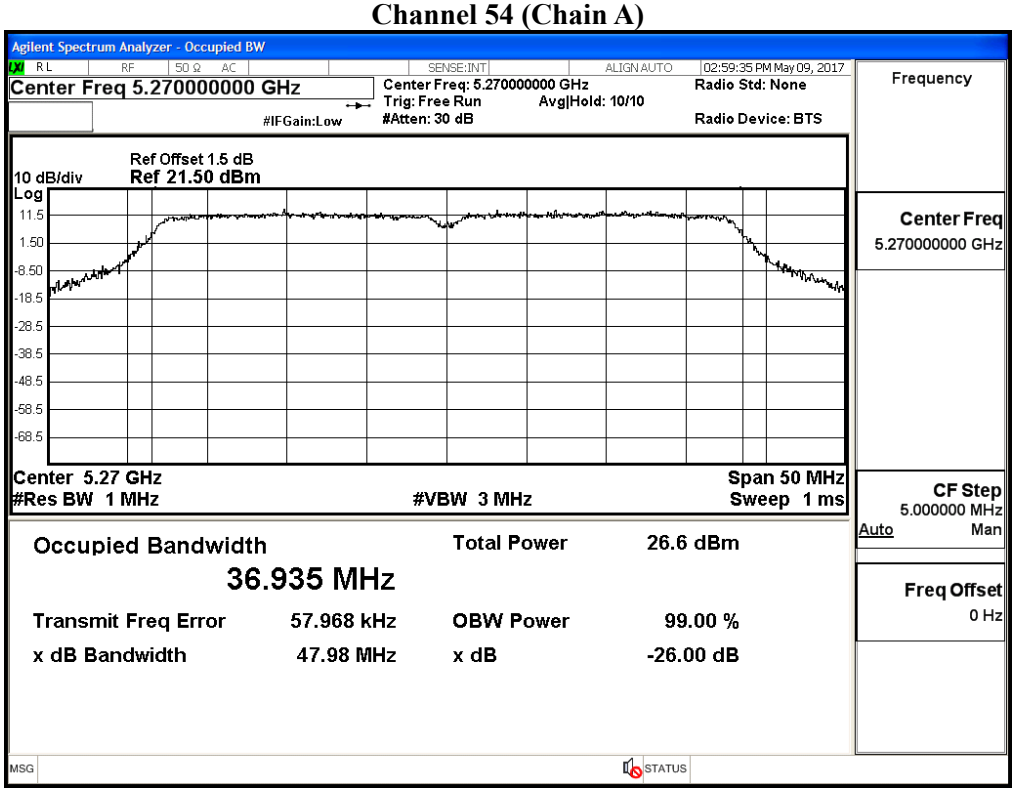
Channel Number	Frequency (MHz)	99% Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit	
						(dBm)	dBm+10log(BW)
38	5190	--	13.94	14.01	16.99	24	--
46	5230	--	19.97	21.27	23.68	24	--
54	5270	36.879	20.08	21.04	23.60	24	26.67
62	5310	36.894	15.52	15.79	18.67	24	26.67
102	5510	36.905	13.24	14.61	16.99	24	26.67
110	5550	37.047	19.95	20.37	23.18	24	26.69
134	5670	36.910	18.99	17.52	21.33	24	26.67
151	5755	--	14.31	14.95	17.65	30	--
159	5795	--	18.62	20.27	22.53	30	--

Note:

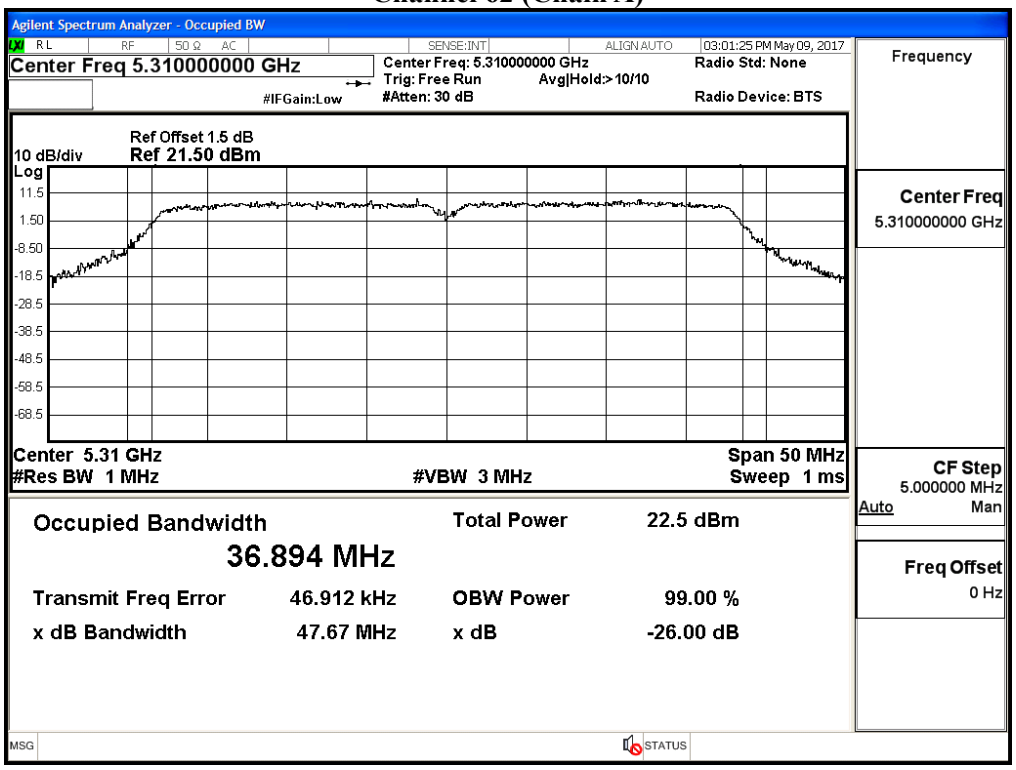
1. Power Output Value =Reading value on average power meter + cable loss
2. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))
3. 26 dB Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.

99% Occupied Bandwidth:

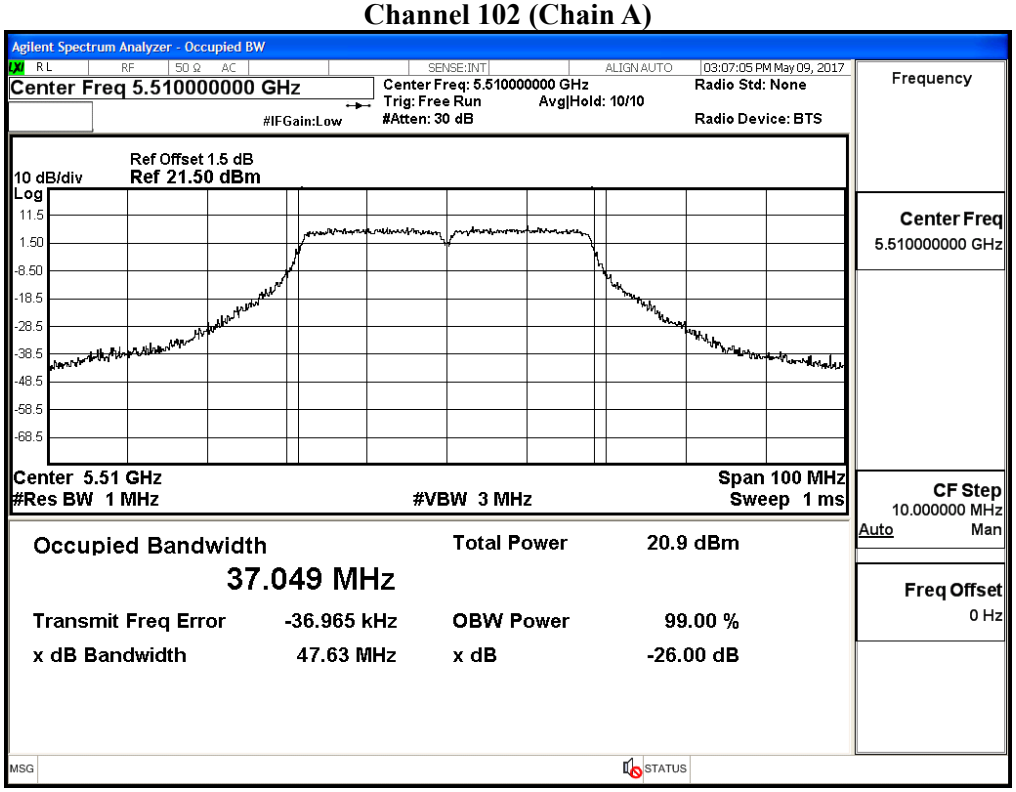
Channel 54 (Chain A)



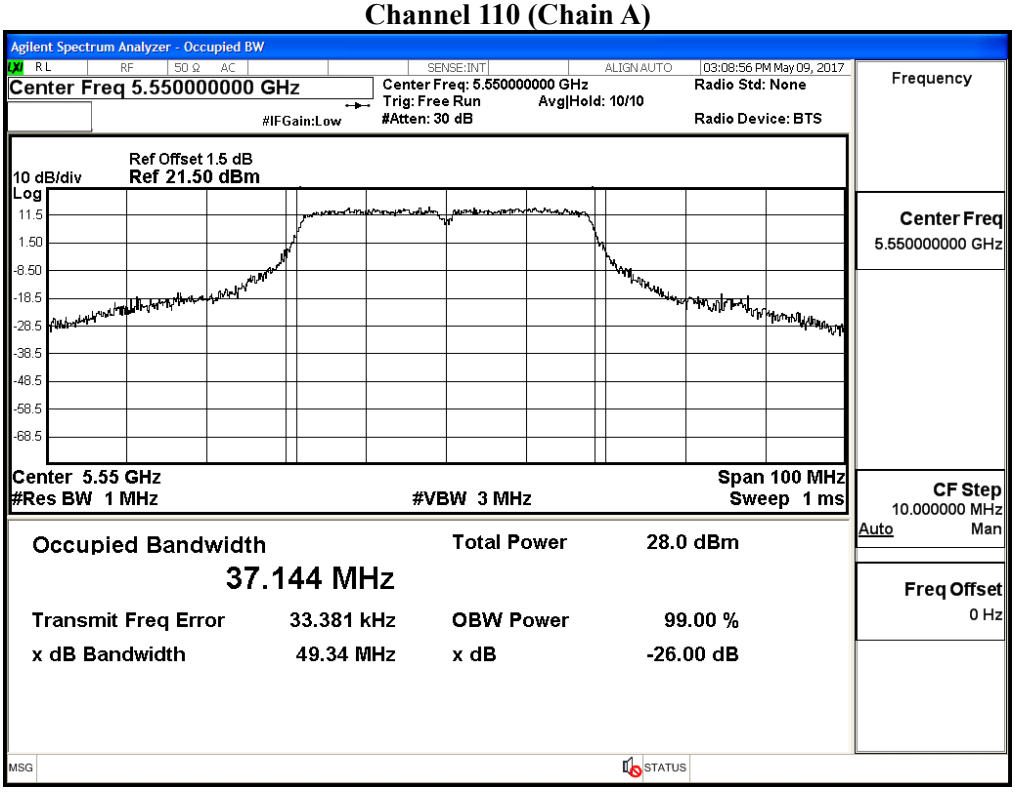
Channel 62 (Chain A)



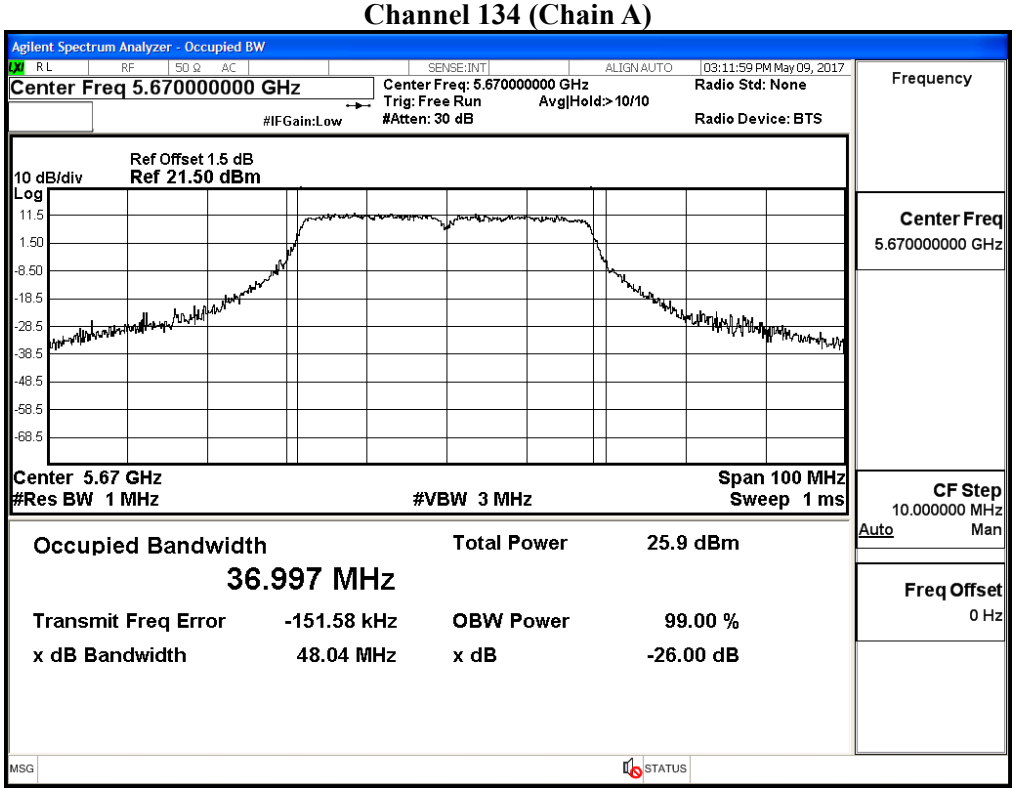
Channel 102 (Chain A)



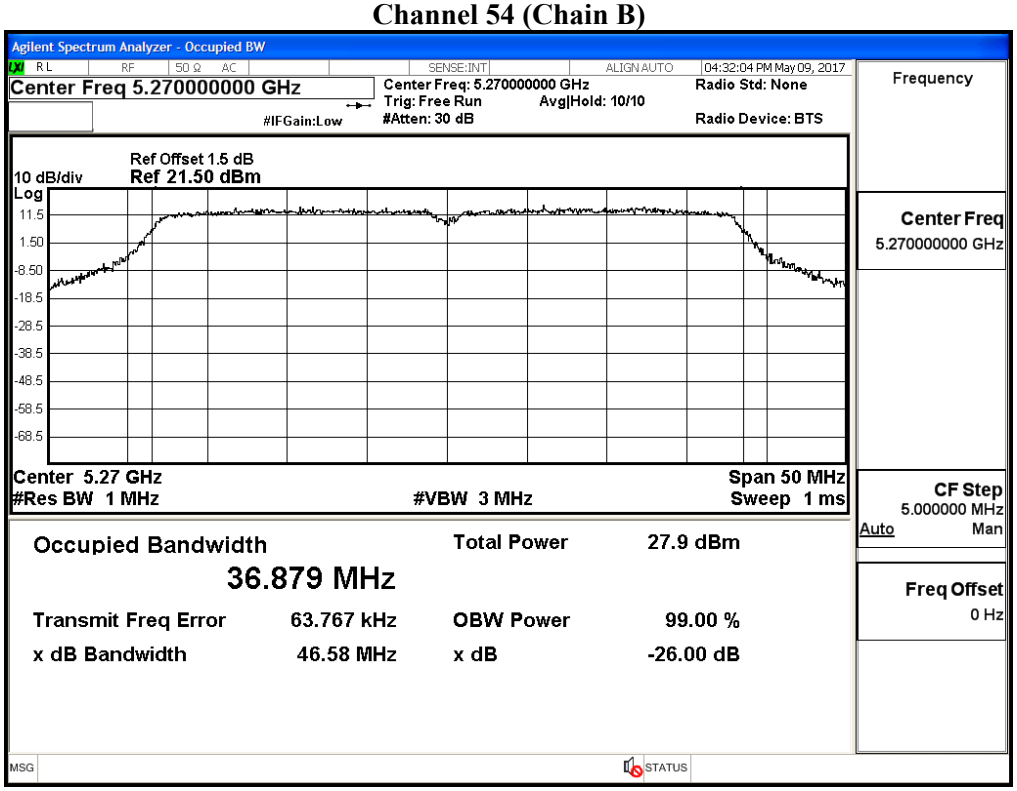
Channel 110 (Chain A)



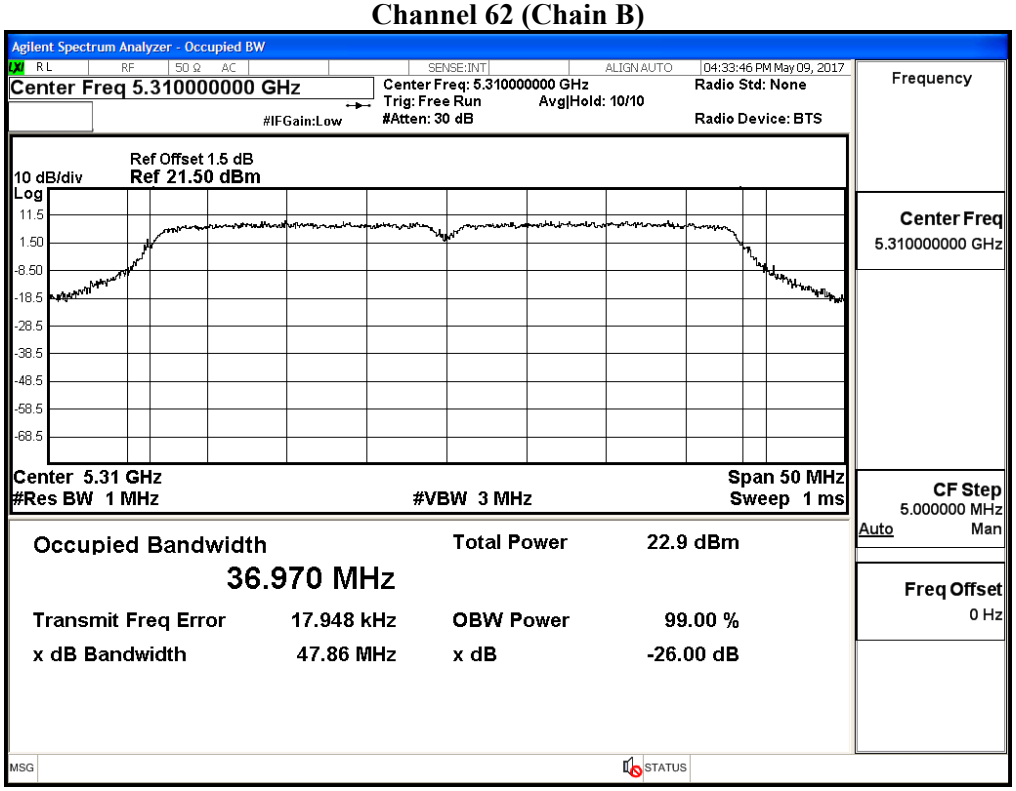
Channel 134 (Chain A)



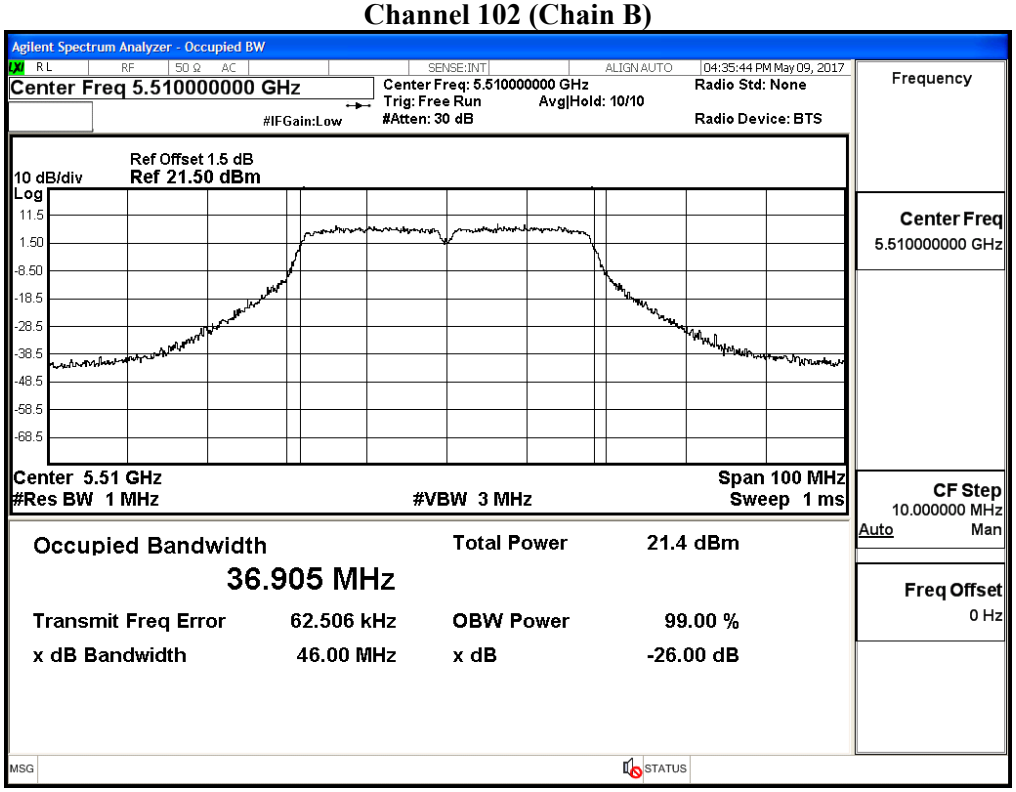
99% Occupied Bandwidth:
Channel 54 (Chain B)



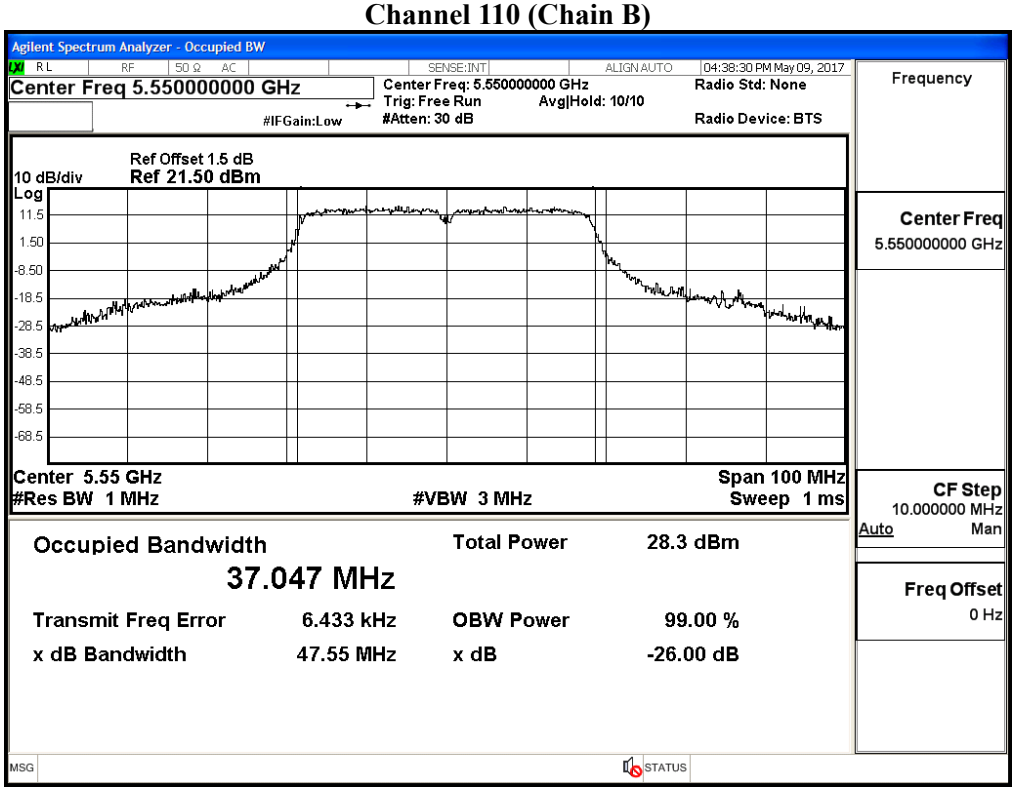
Channel 62 (Chain B)



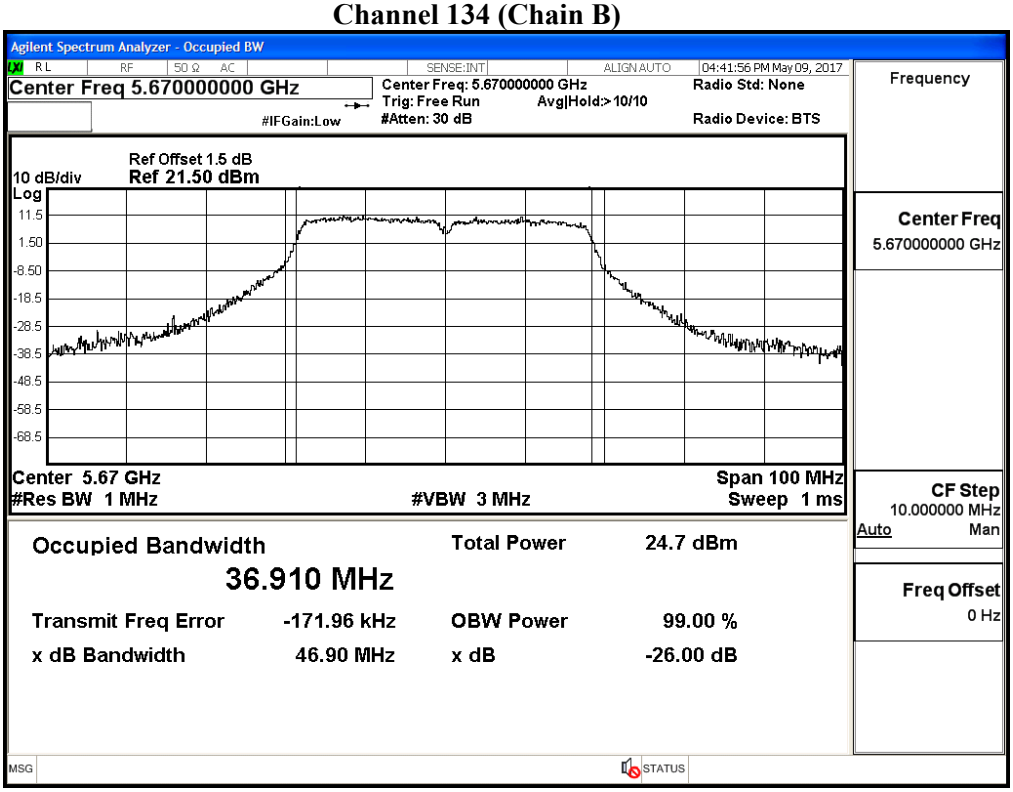
Channel 102 (Chain B)



Channel 110 (Chain B)

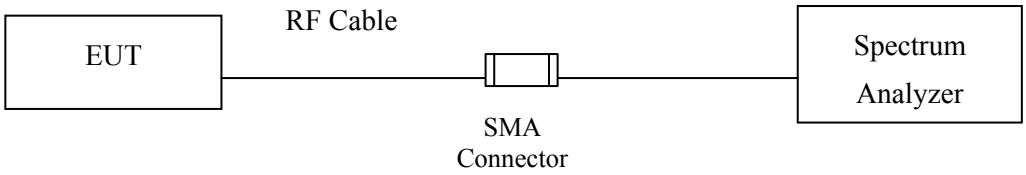


Channel 134 (Chain B)



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-topoint 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, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.
The Peak Power Spectral Density using KDB 789033 section F) procedure, Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer.
SA-1 method is selected to run the test.
For the band 5.725-5.85 GHz, Scale the observed power level to an equivalent value in 500 kHz by adjusting (increase) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log (500 kHz/100 kHz) = 6.98 dB.

4.4. Uncertainty

± 1.62 dB

4.5. Test Result of Peak Power Spectral Density

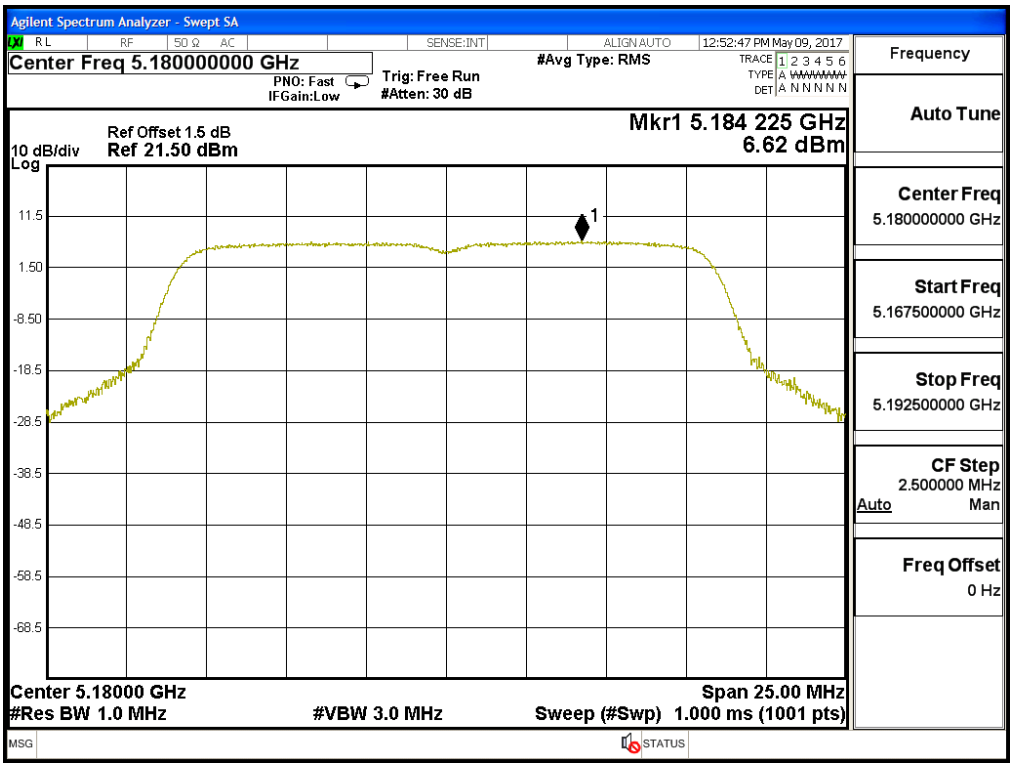
Product : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Peak Power Spectral Density
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Channel Number	Frequency (MHz)	Data Rate (Mbps)	Measurement Level (dBm)	Required Limit (dBm)	Result
36	5180	6	6.620	11	Pass
44	5220	6	8.270	11	Pass
48	5240	6	8.130	11	Pass
52	5260	6	8.440	11	Pass
60	5300	6	8.900	11	Pass
64	5320	6	6.080	11	Pass
100	5500	6	4.840	11	Pass
116	5580	6	10.640	11	Pass
140	5700	6	2.270	11	Pass

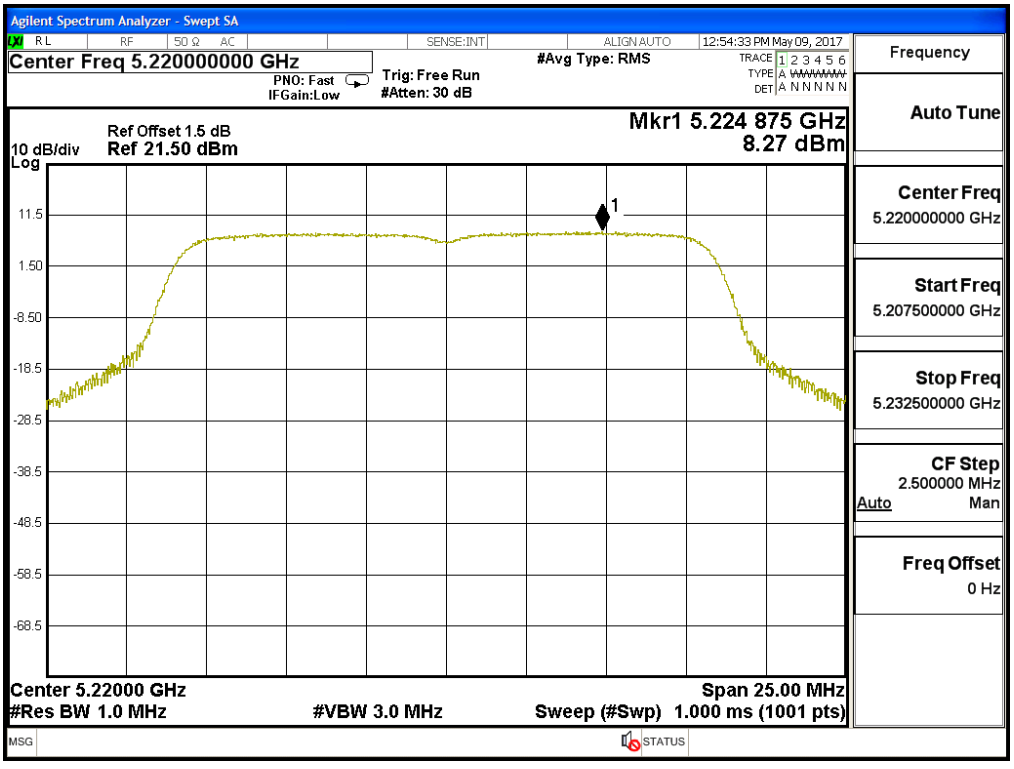
Channel Number	Frequency (MHz)	Data Rate (Mbps)	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm)	Required Limit (dBm)	Result
149	5745	6	-5.990	6.980	0.990	<30	Pass
157	5785	6	-5.880	6.980	1.100	<30	Pass
165	5825	6	-4.650	6.980	2.330	<30	Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

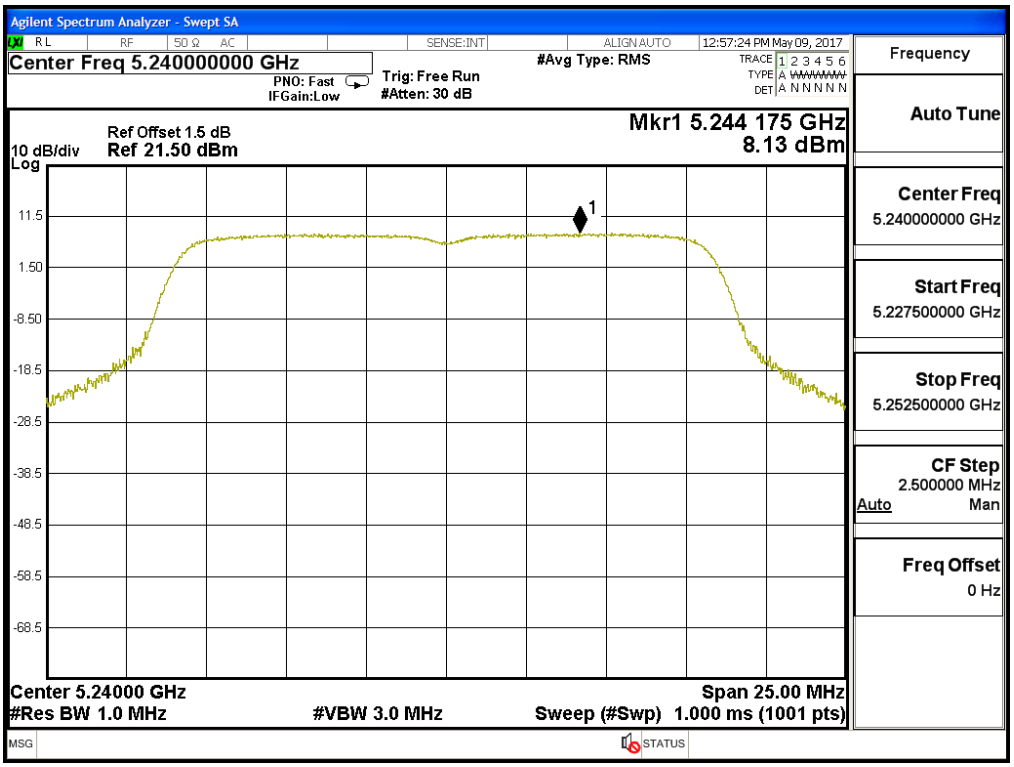
Channel 36:



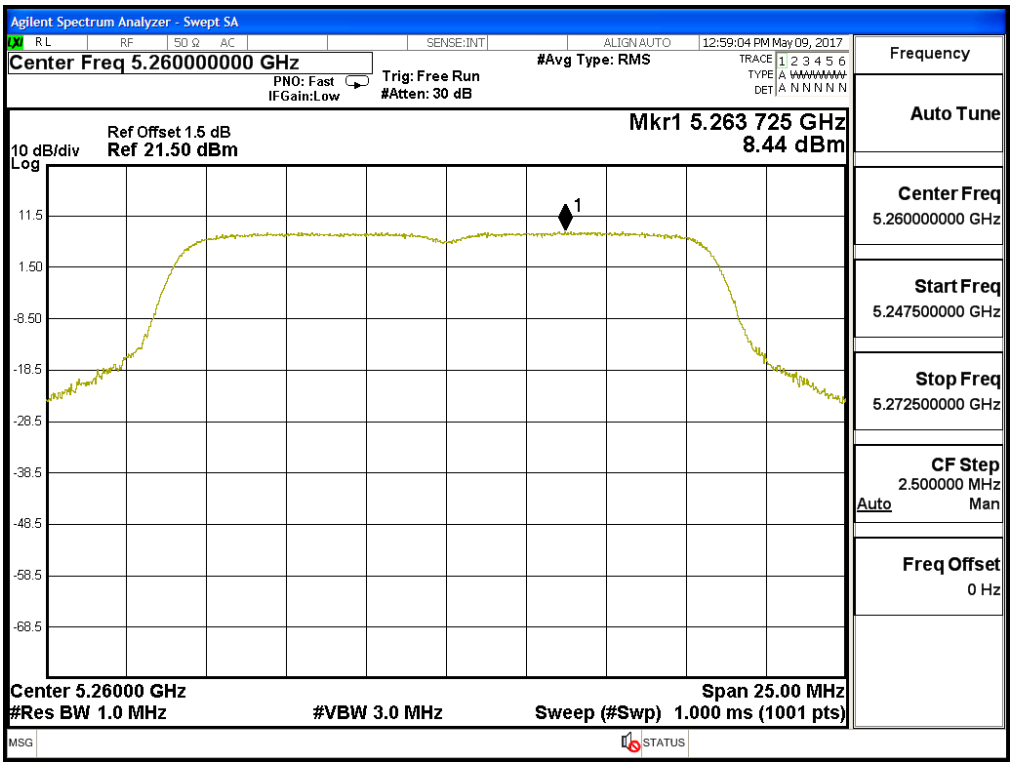
Channel 44:



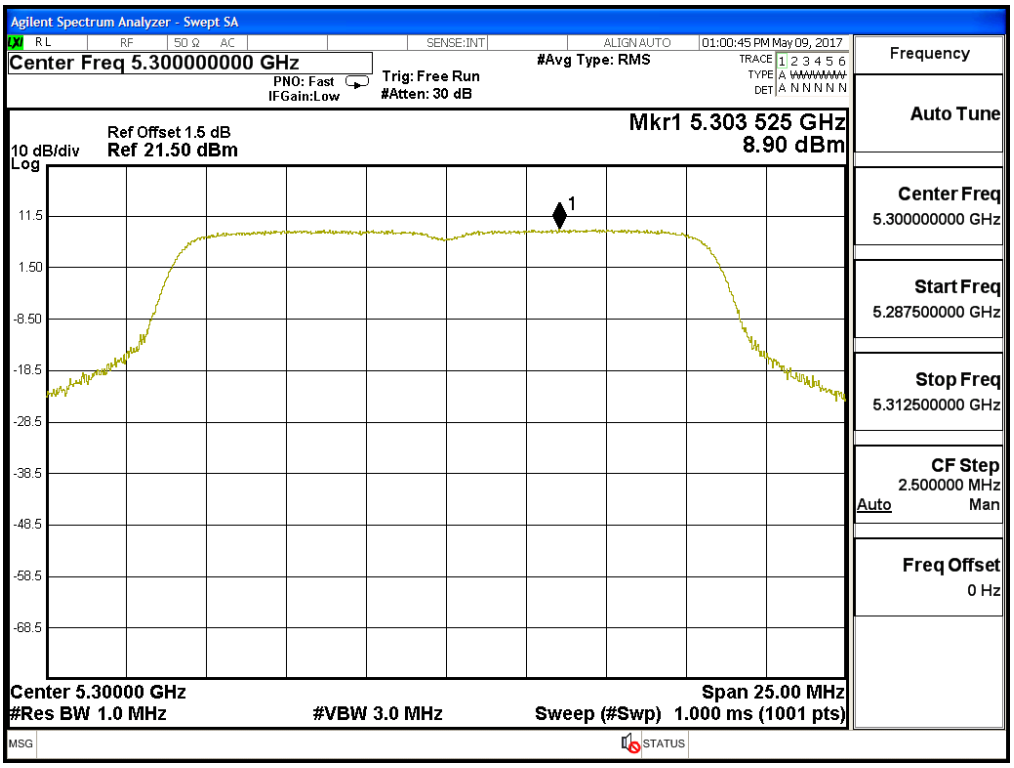
Channel 48:



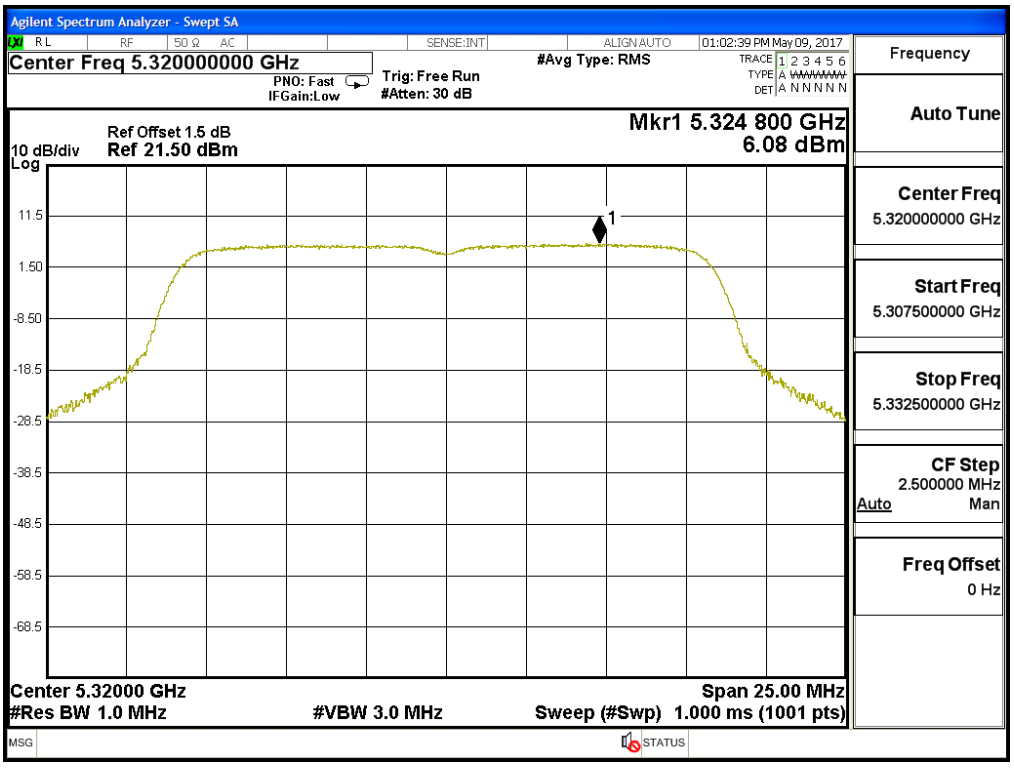
Channel 52:



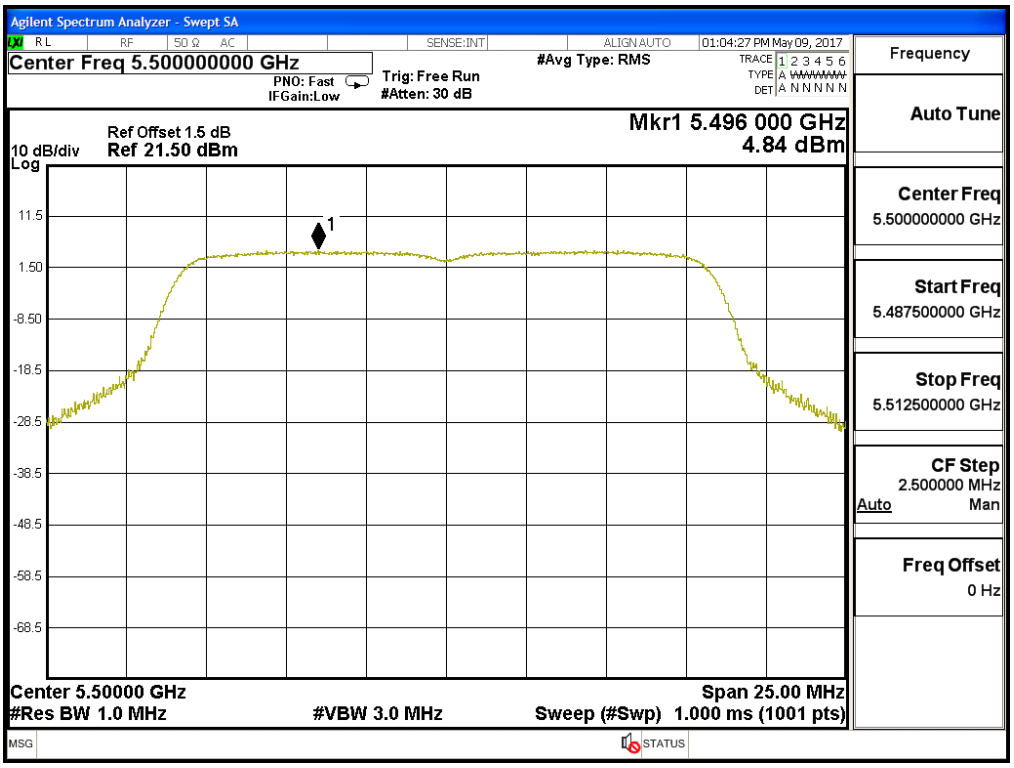
Channel 60:



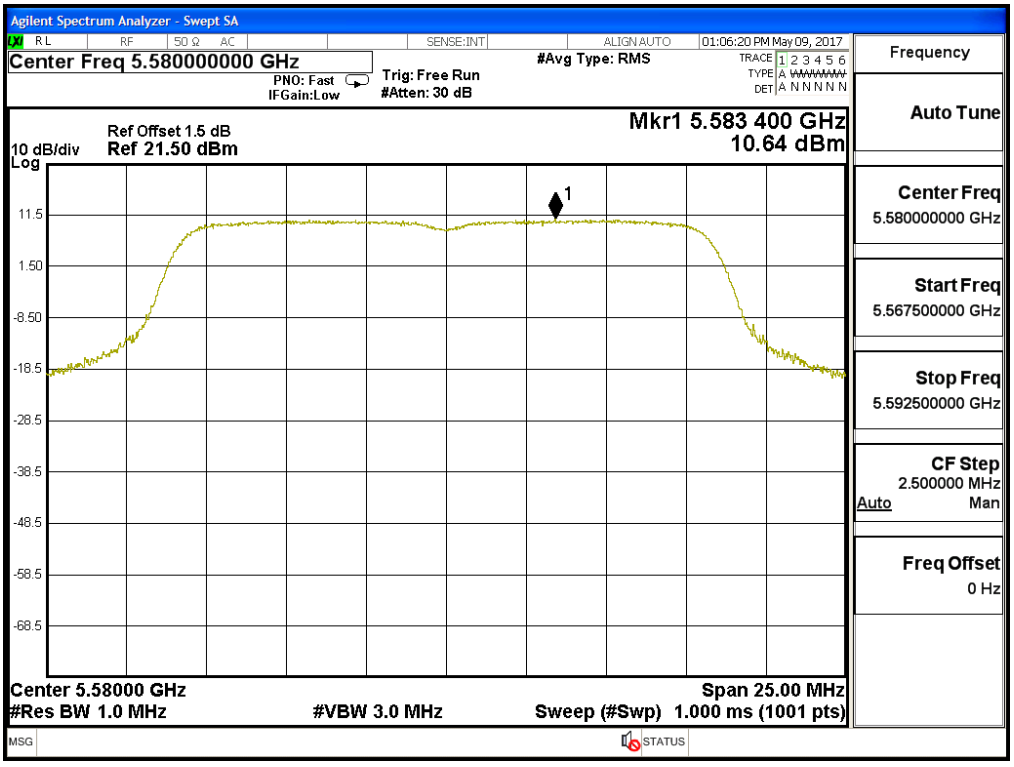
Channel 64:



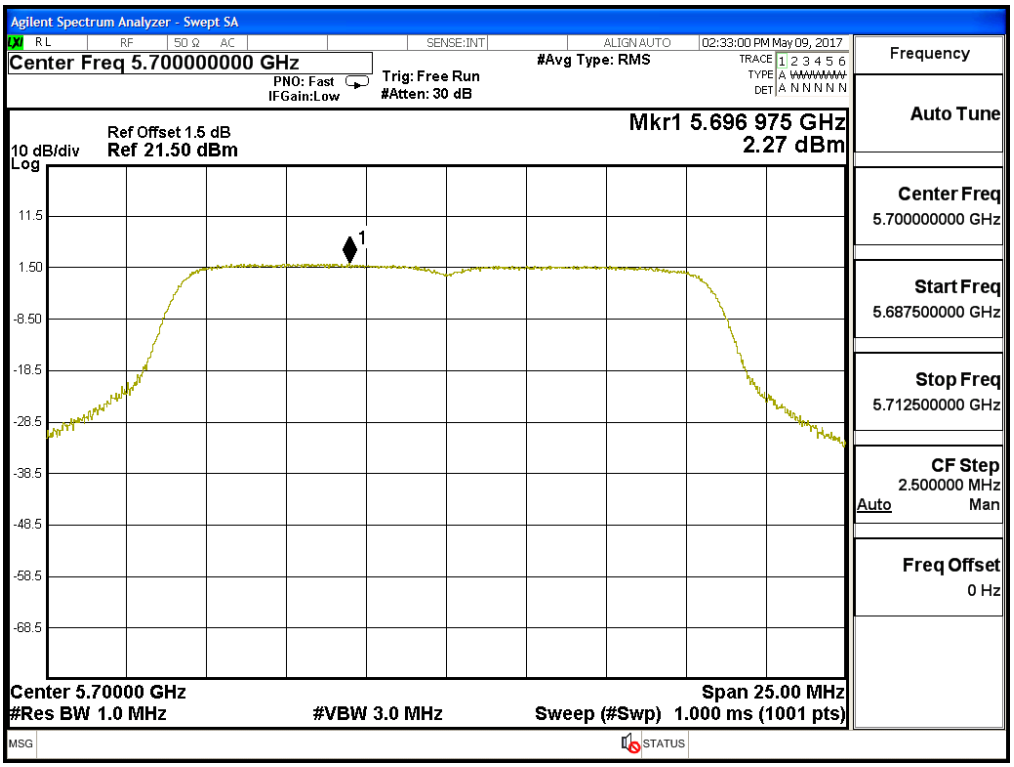
Channel 100:



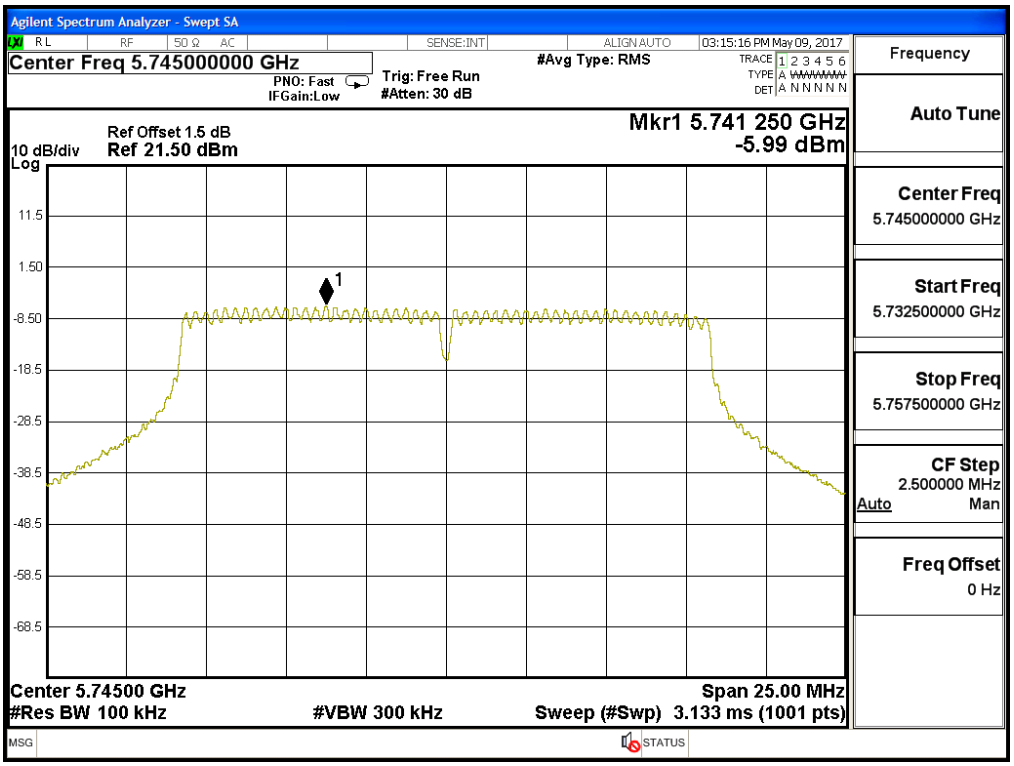
Channel 116:



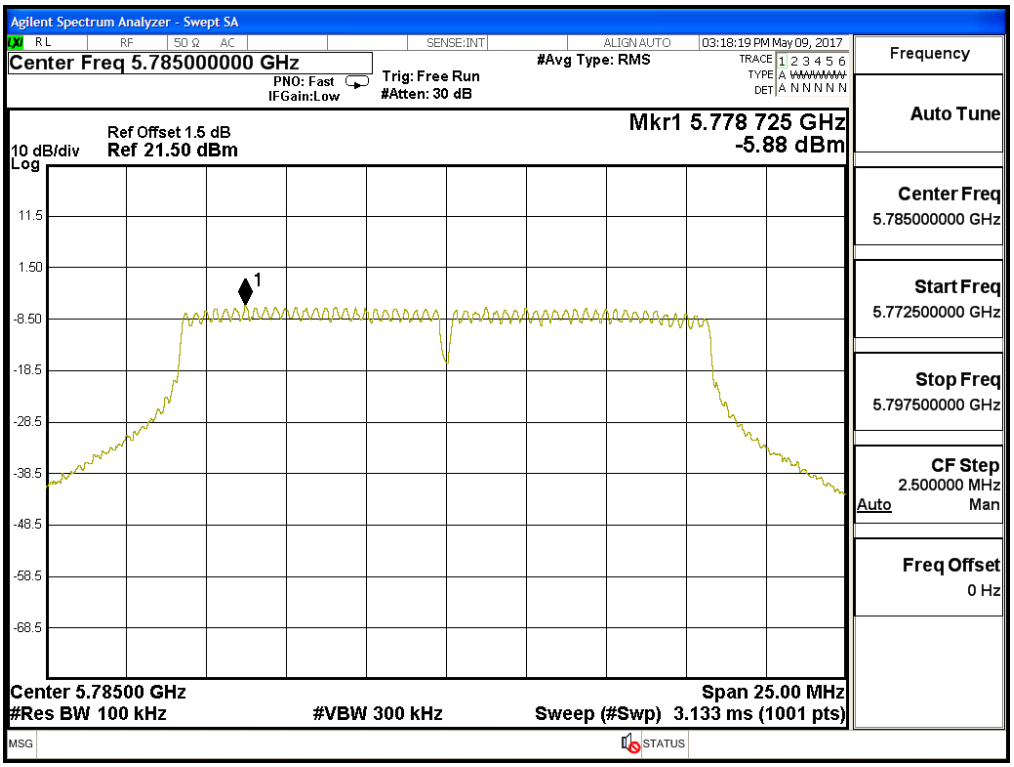
Channel 140:



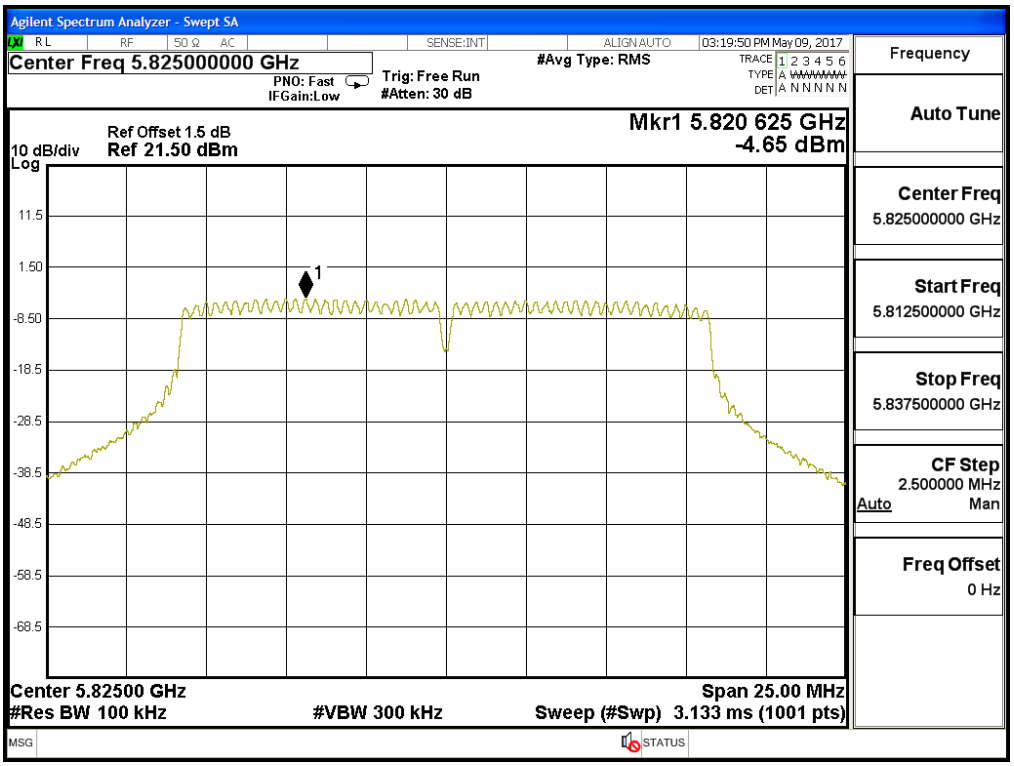
Channel 149



Channel 157



Channel 165



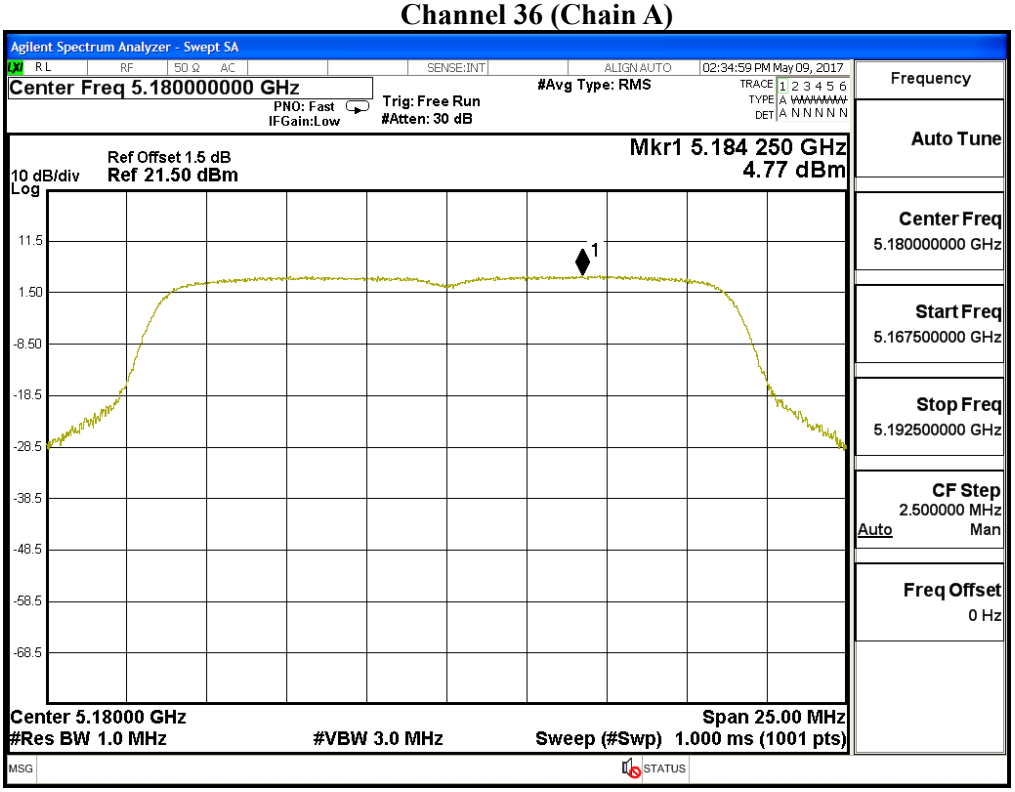
Product : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Peak Power Spectral Density
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)

Channel Number	Frequency (MHz)	Chain	PPSD (dBm)	Total PPSD (dBm)[1]	Required Limit (dBm)	Result
36	5180	A	4.770	7.780	11	Pass
		B	5.550	8.560	11	Pass
44	5220	A	4.490	7.500	11	Pass
		B	6.600	9.610	11	Pass
48	5240	A	4.380	7.390	11	Pass
		B	6.360	9.370	11	Pass
52	5260	A	4.960	7.970	11	Pass
		B	6.930	9.940	11	Pass
60	5300	A	5.520	8.530	11	Pass
		B	6.750	9.760	11	Pass
64	5320	A	6.160	9.170	11	Pass
		B	7.030	10.040	11	Pass
100	5500	A	3.460	6.470	11	Pass
		B	3.750	6.760	11	Pass
116	5580	A	7.320	10.330	11	Pass
		B	7.760	10.770	11	Pass
140	5700	A	5.180	8.190	11	Pass
		B	4.090	7.100	11	Pass

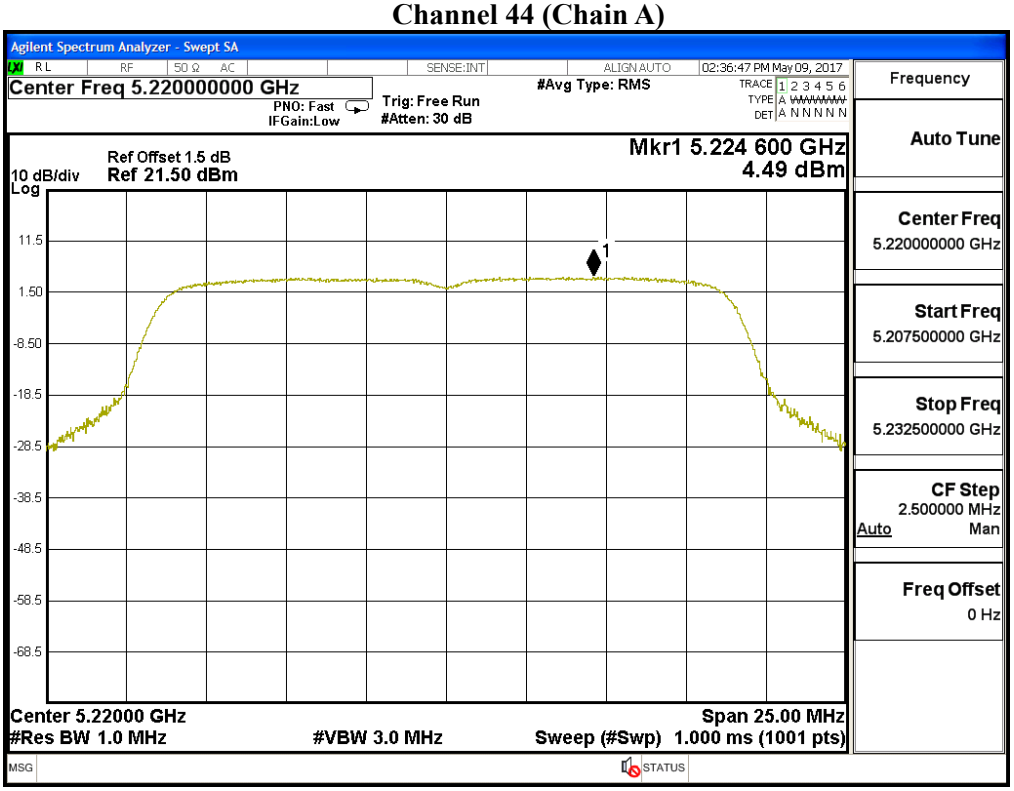
Channel Number	Frequency (MHz)	Chain	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm)[1]	Required Limit (dBm)	Result
149	5745	A	-5.220	6.980	4.770	<30	Pass
		B	-4.240	6.980	5.750	<30	Pass
157	5785	A	-3.960	6.980	6.030	<30	Pass
		B	-2.160	6.980	7.830	<30	Pass
165	5825	A	-3.760	6.980	6.230	<30	Pass
		B	-2.630	6.980	7.360	<30	Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

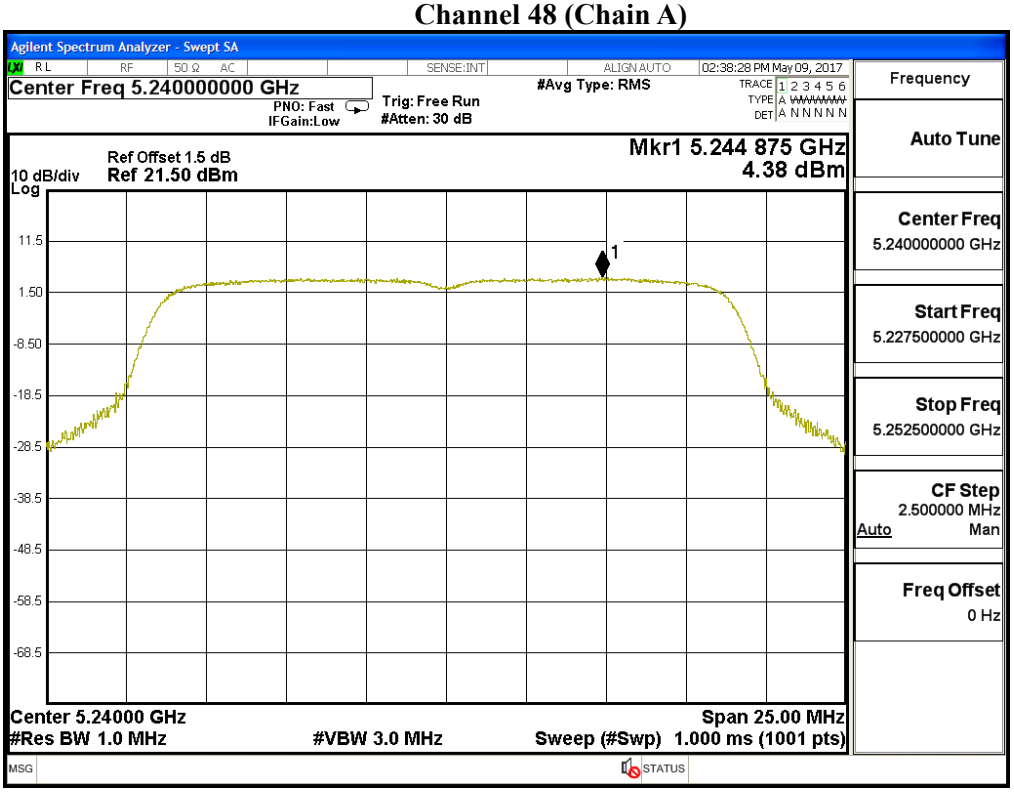
Channel 36 (Chain A)



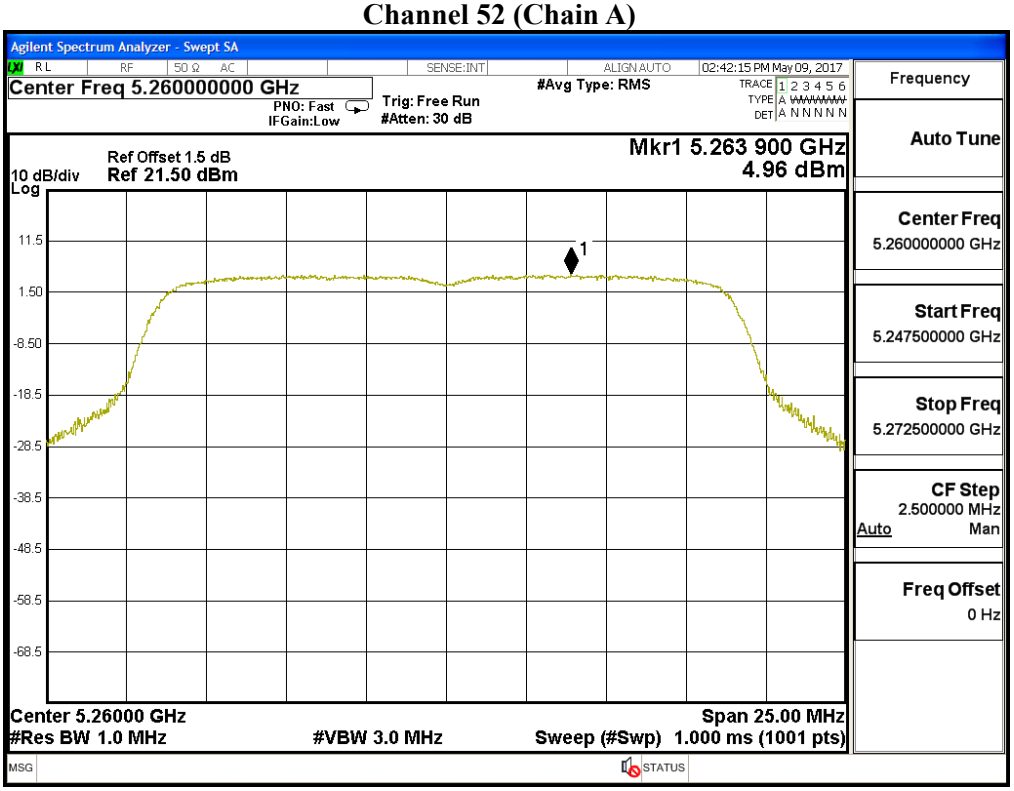
Channel 44 (Chain A)



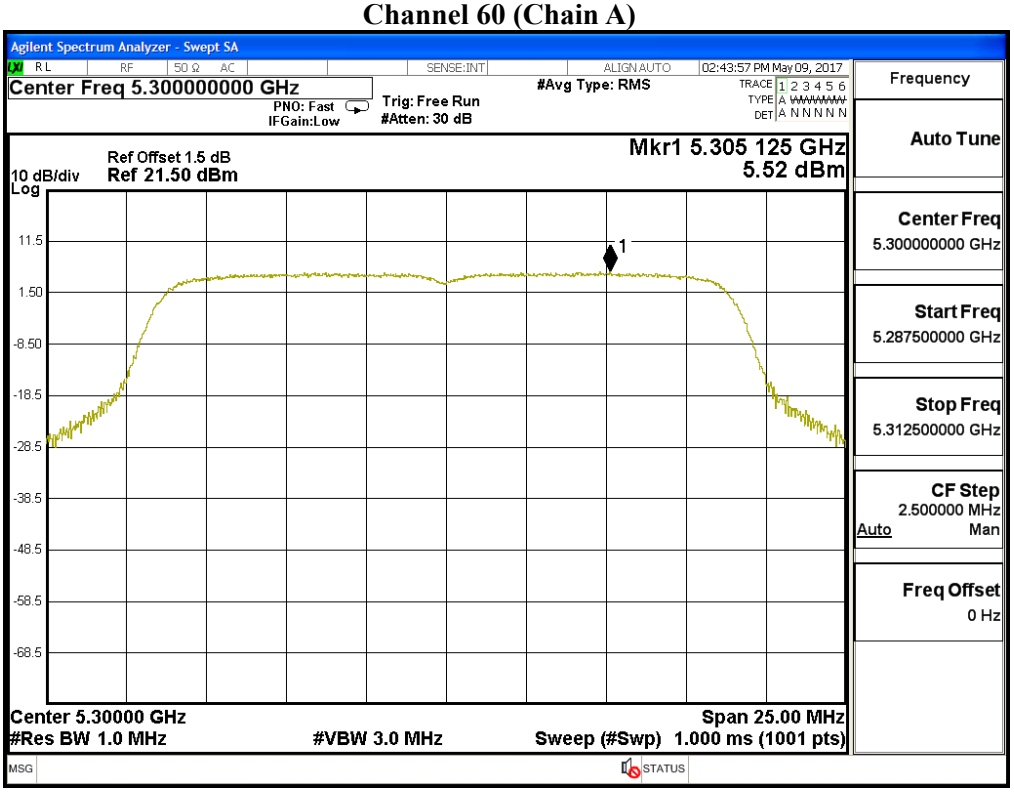
Channel 48 (Chain A)



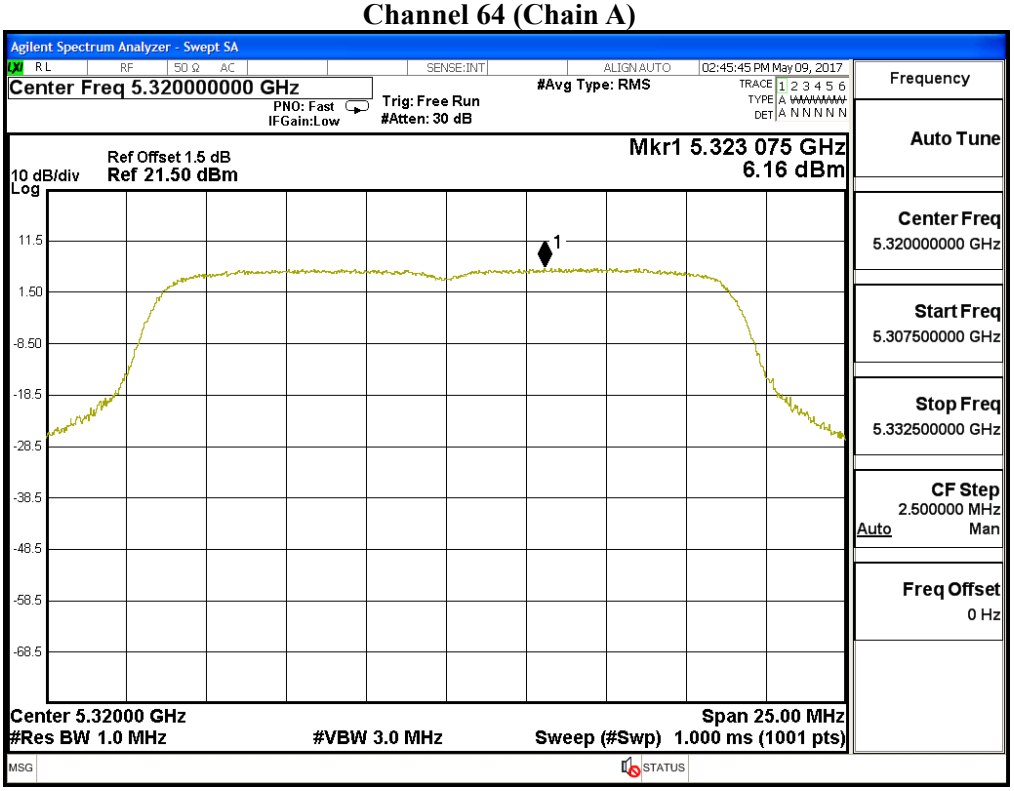
Channel 52 (Chain A)



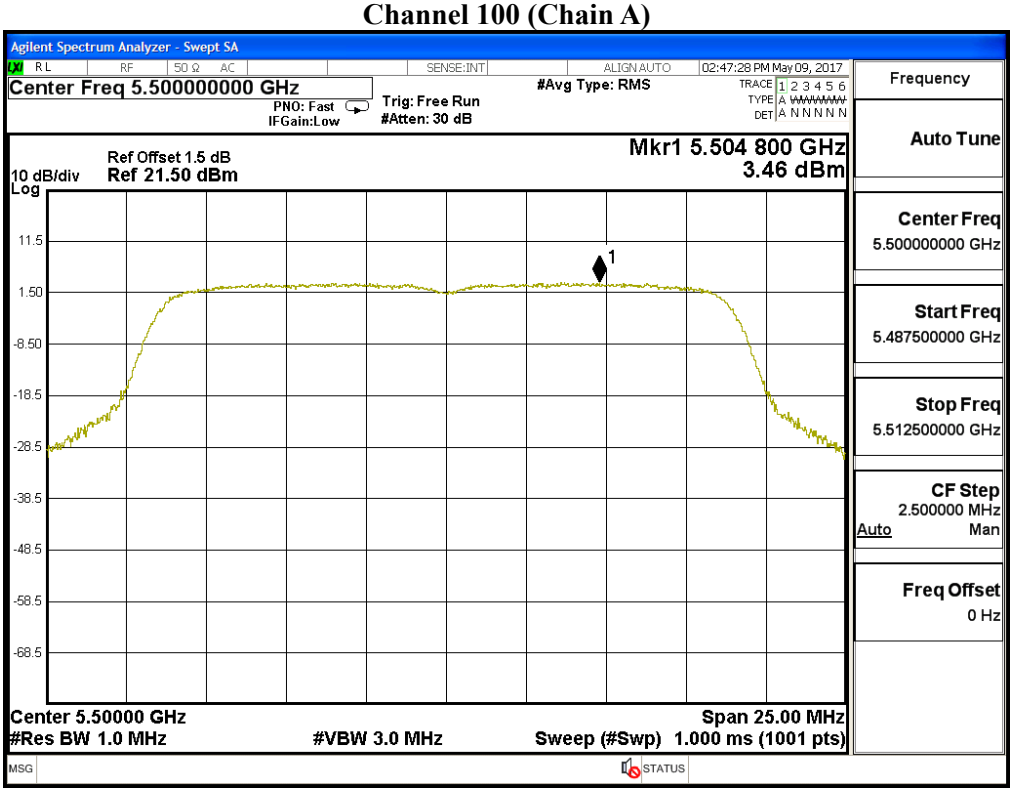
Channel 60 (Chain A)



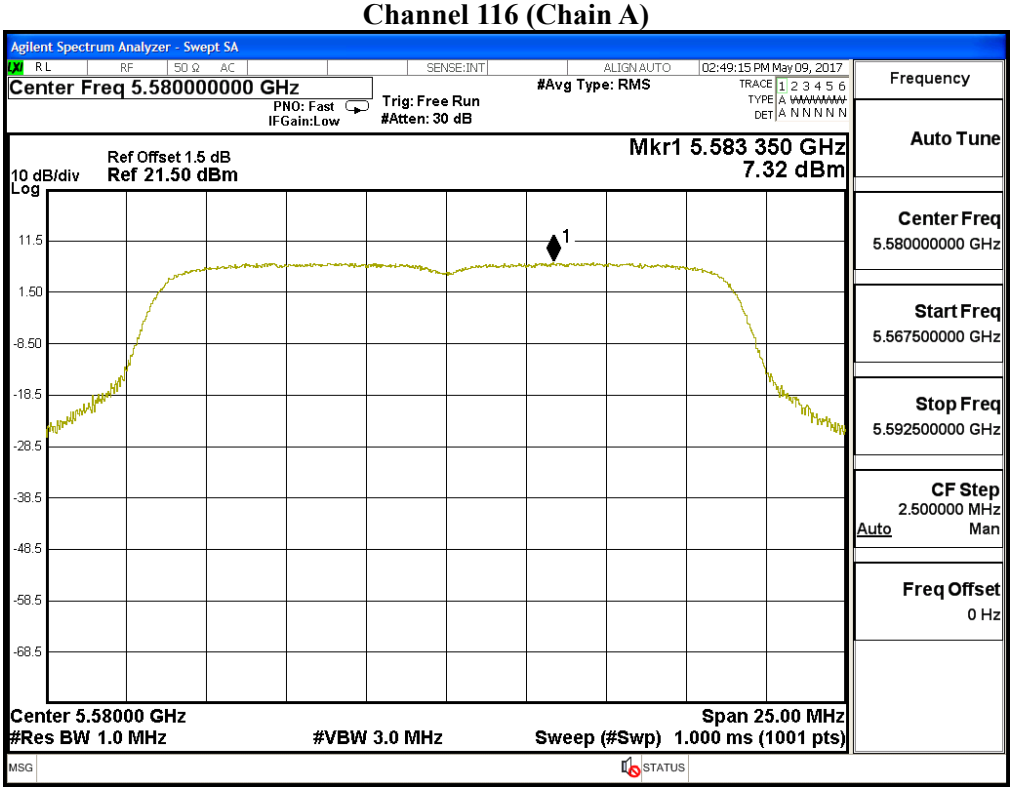
Channel 64 (Chain A)



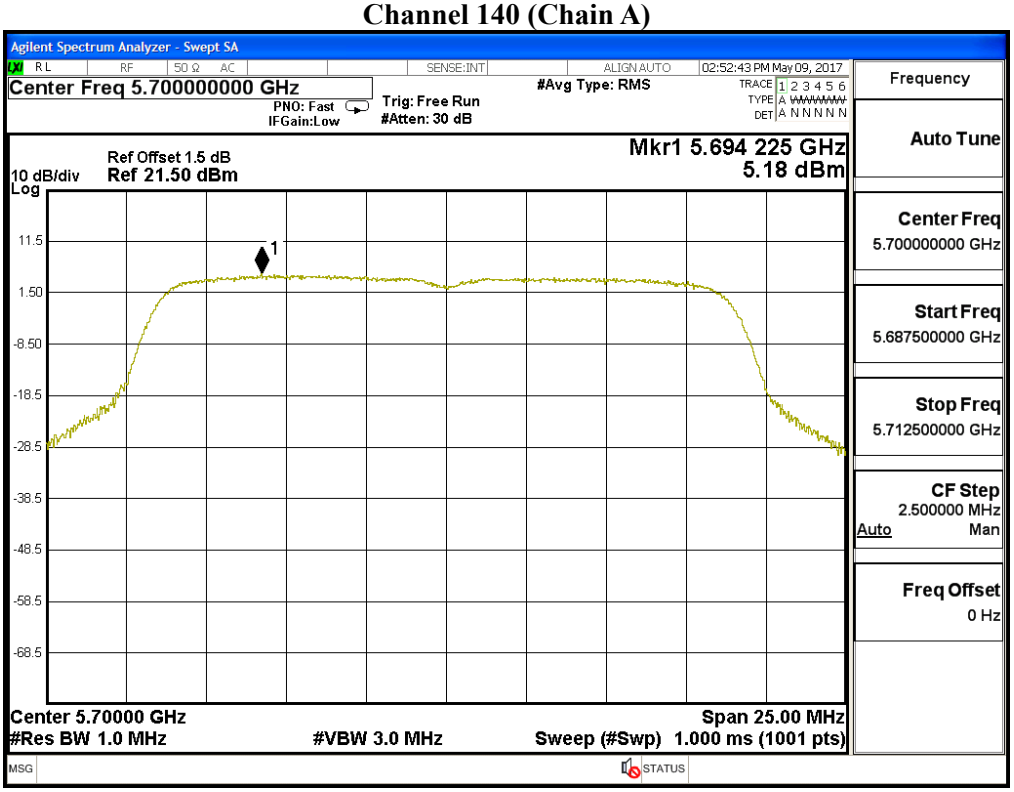
Channel 100 (Chain A)



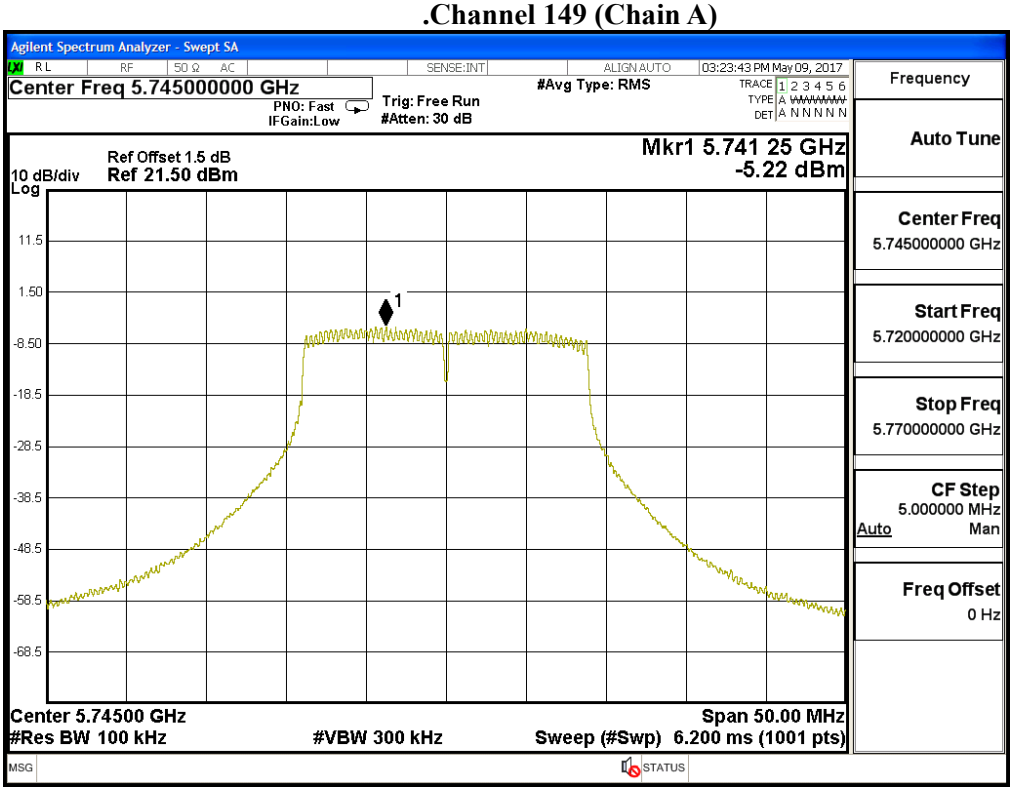
Channel 116 (Chain A)



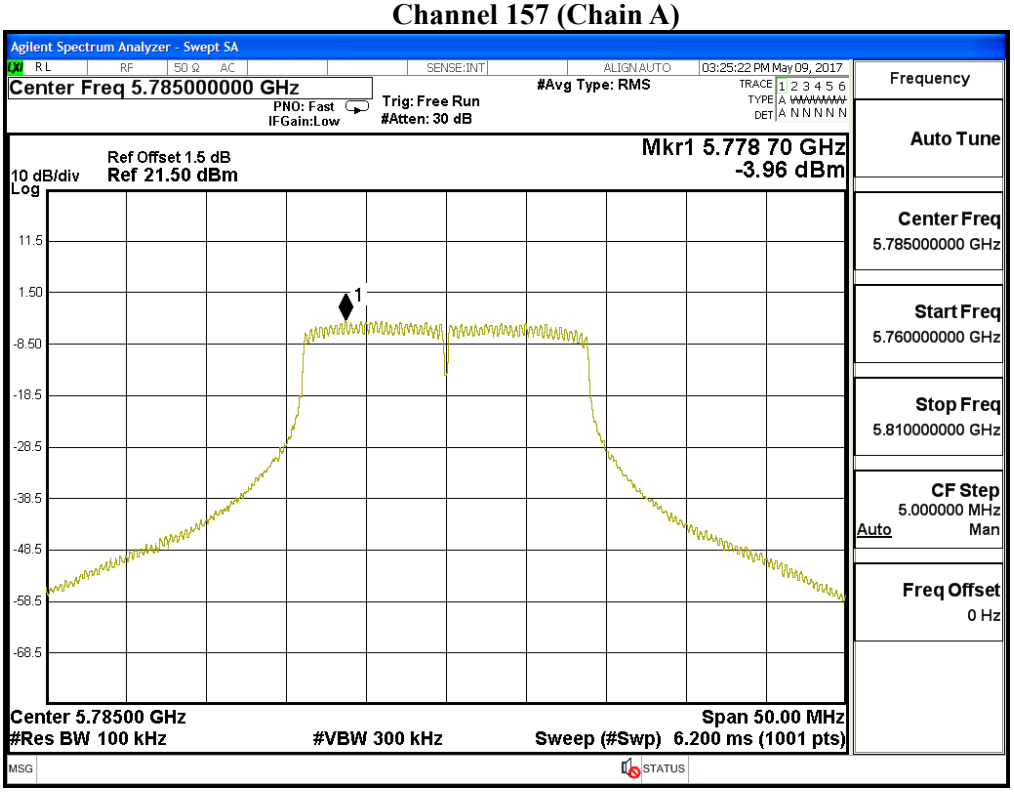
Channel 140 (Chain A)



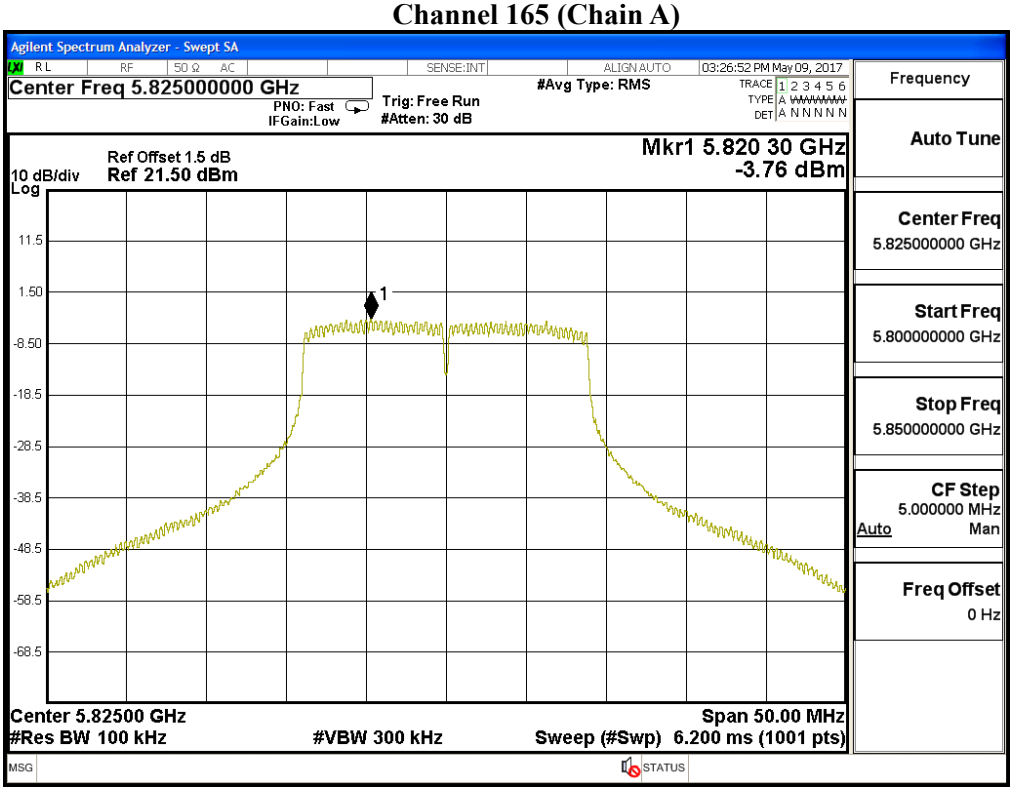
.Channel 149 (Chain A)



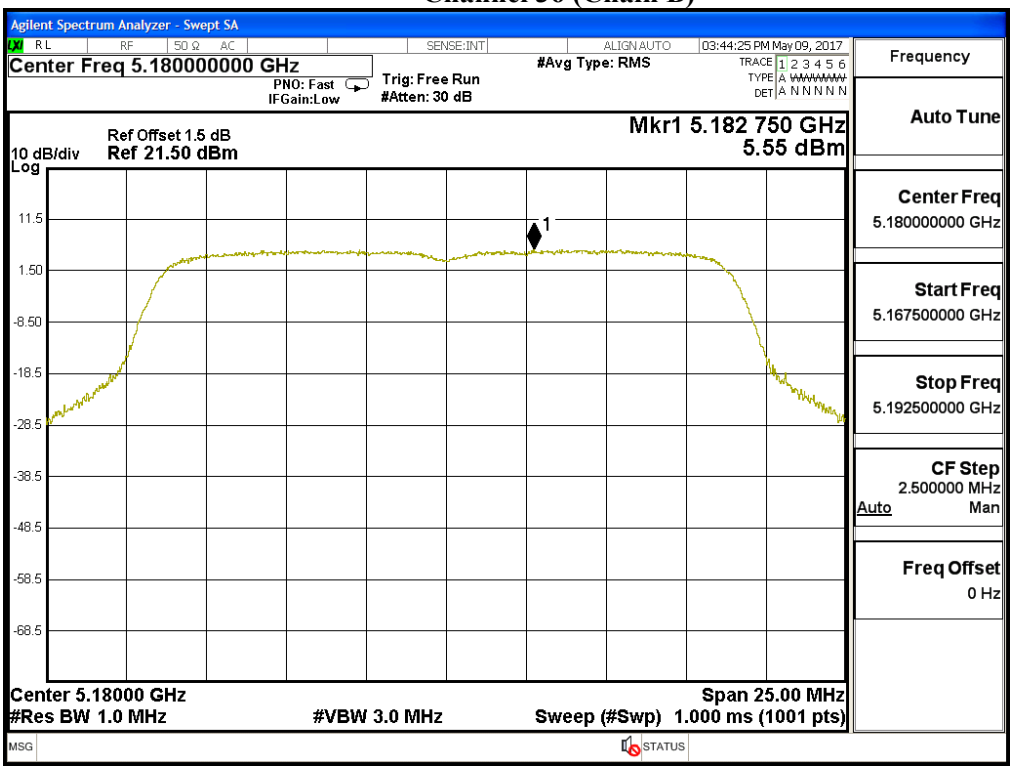
Channel 157 (Chain A)



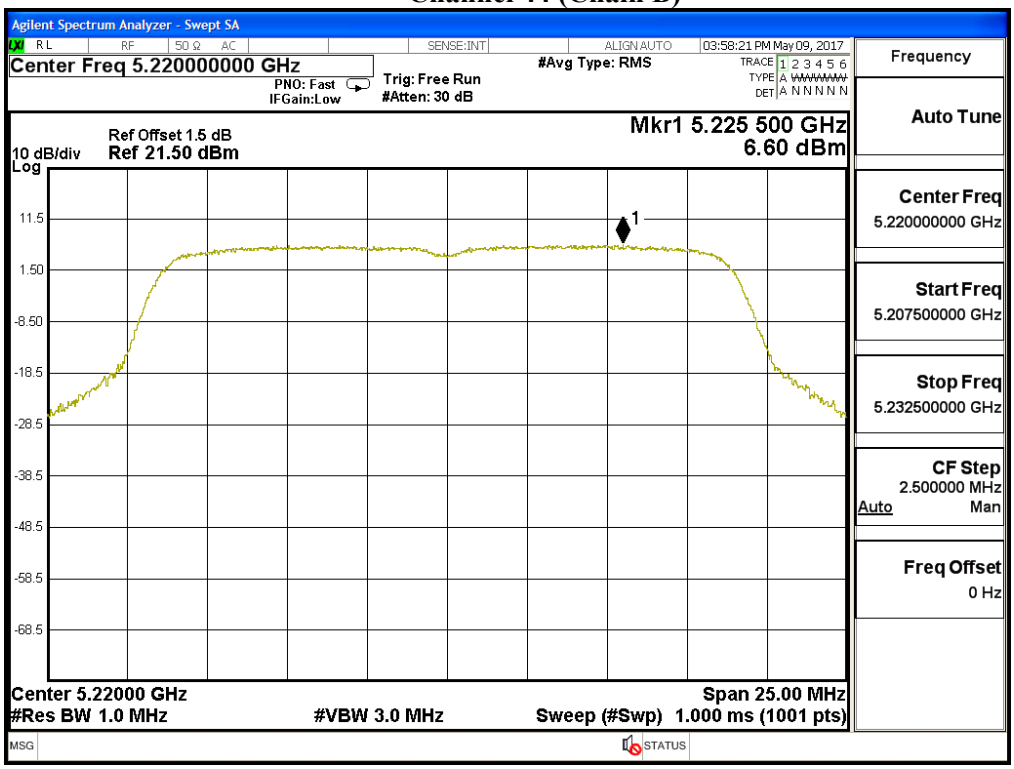
Channel 165 (Chain A)



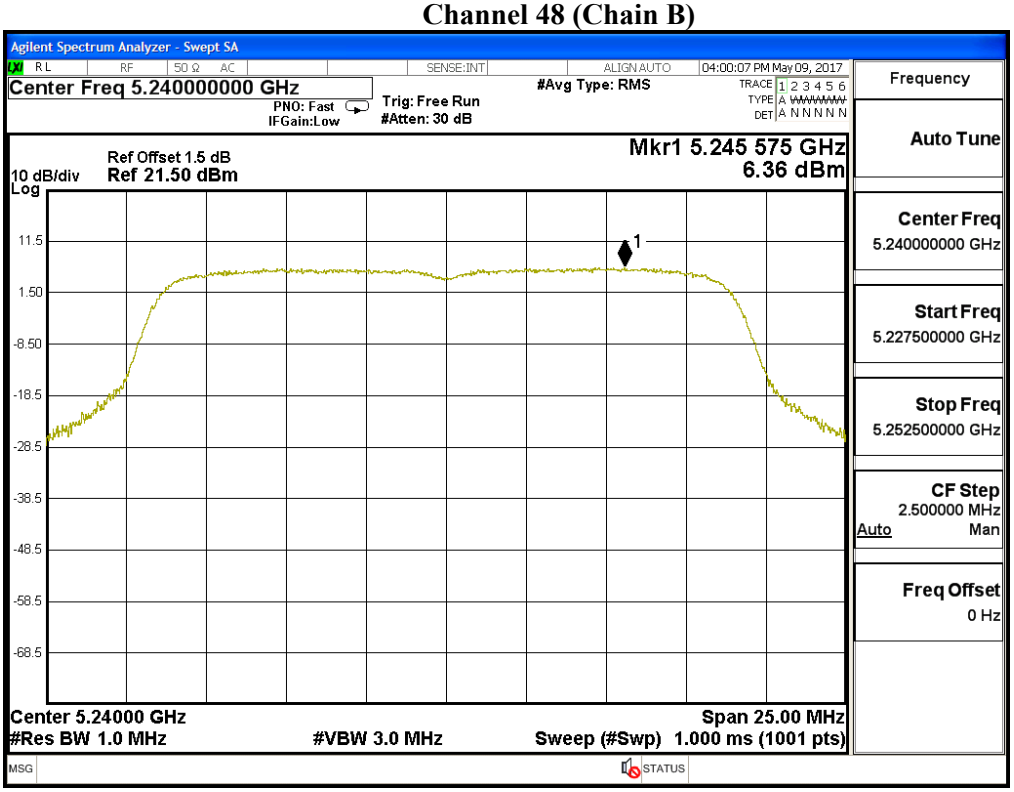
Channel 36 (Chain B)



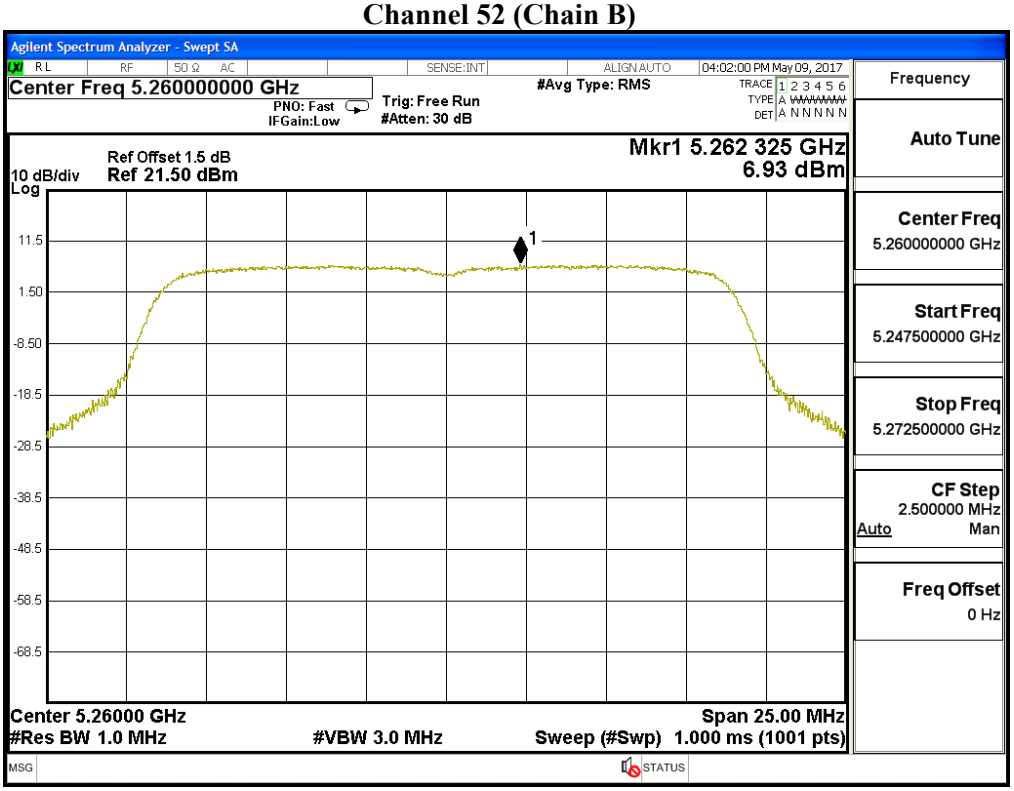
Channel 44 (Chain B)



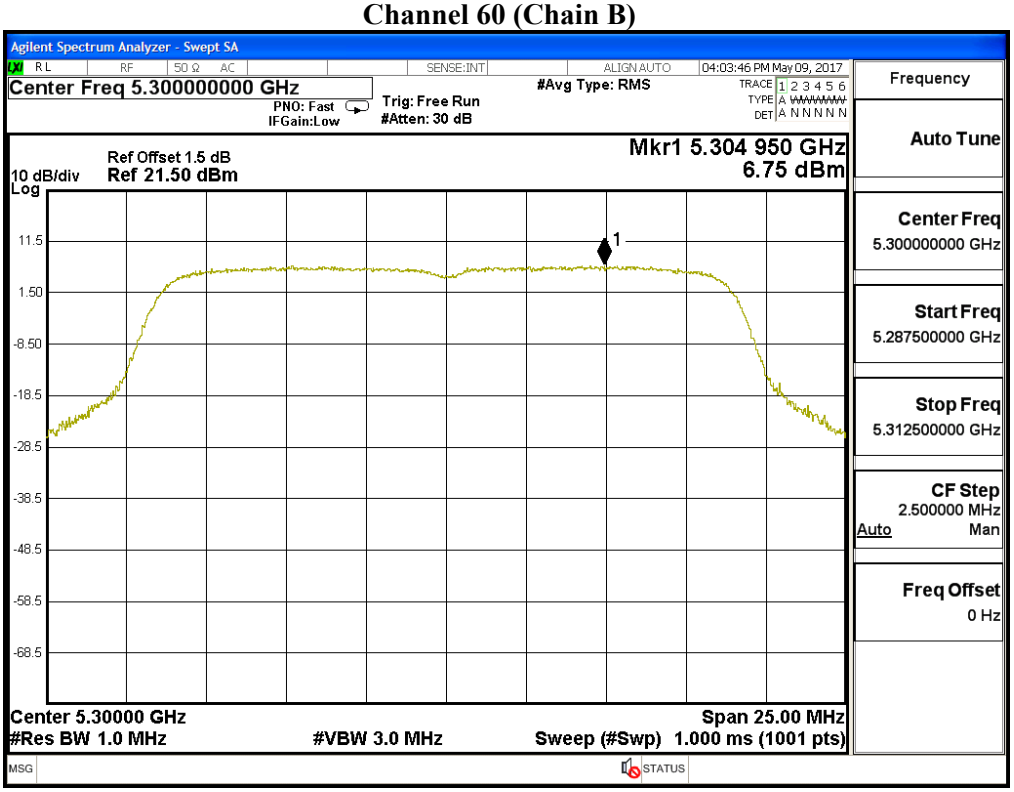
Channel 48 (Chain B)



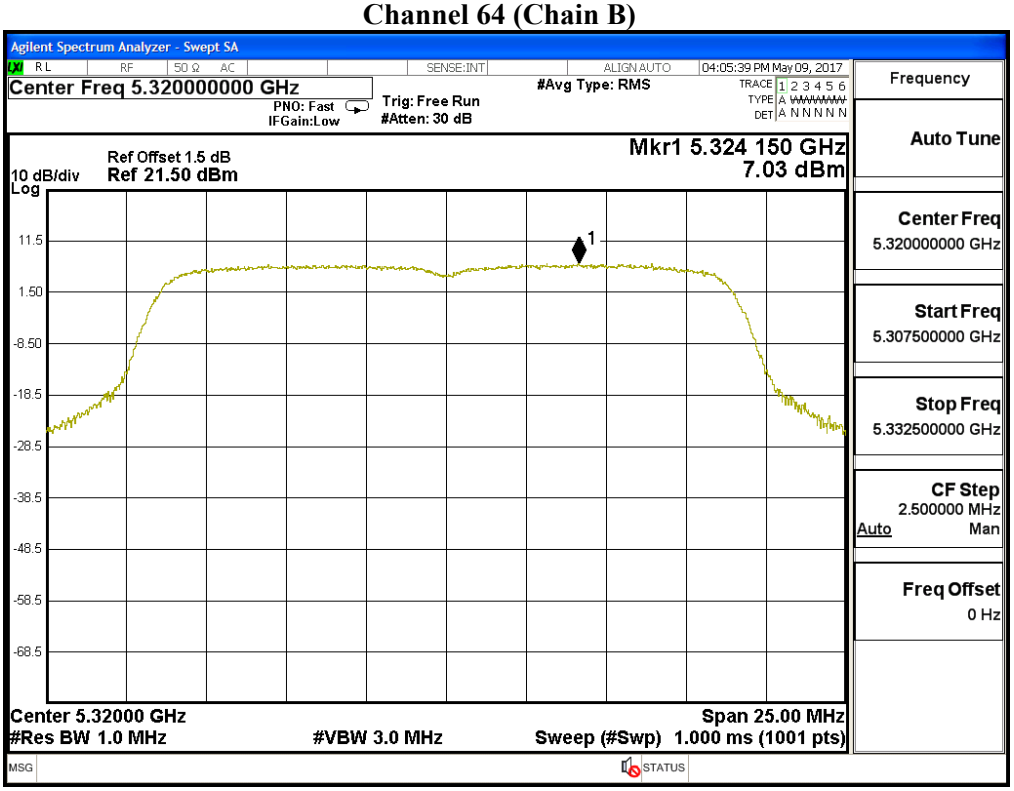
Channel 52 (Chain B)



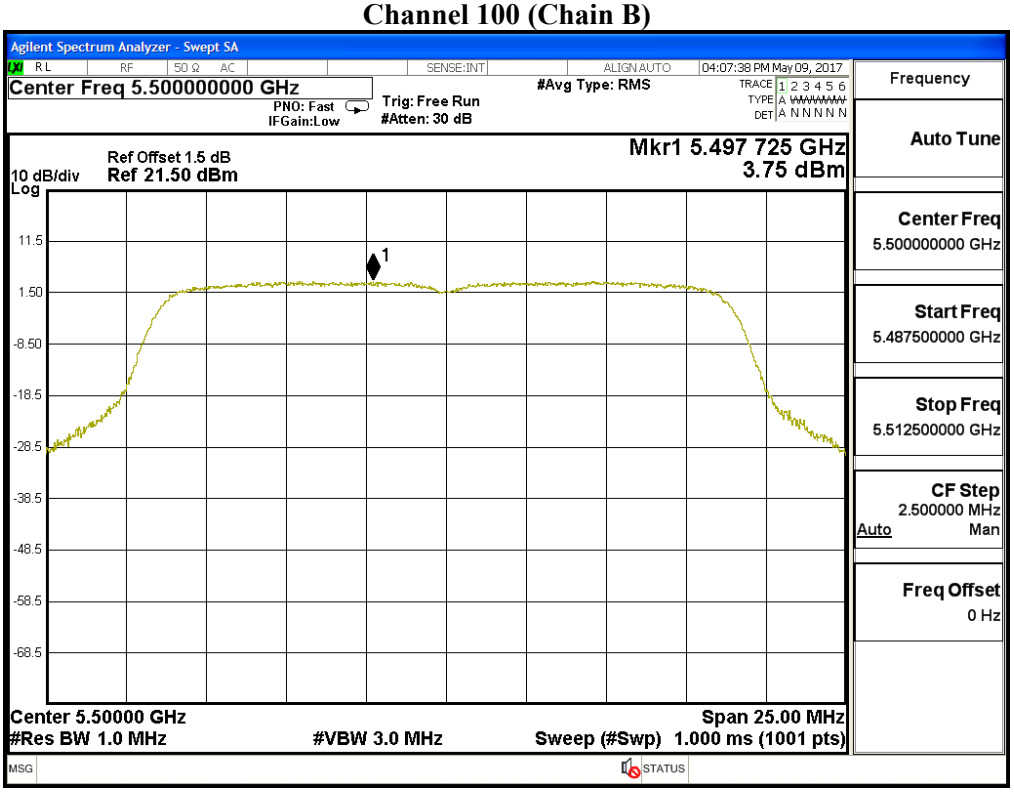
Channel 60 (Chain B)



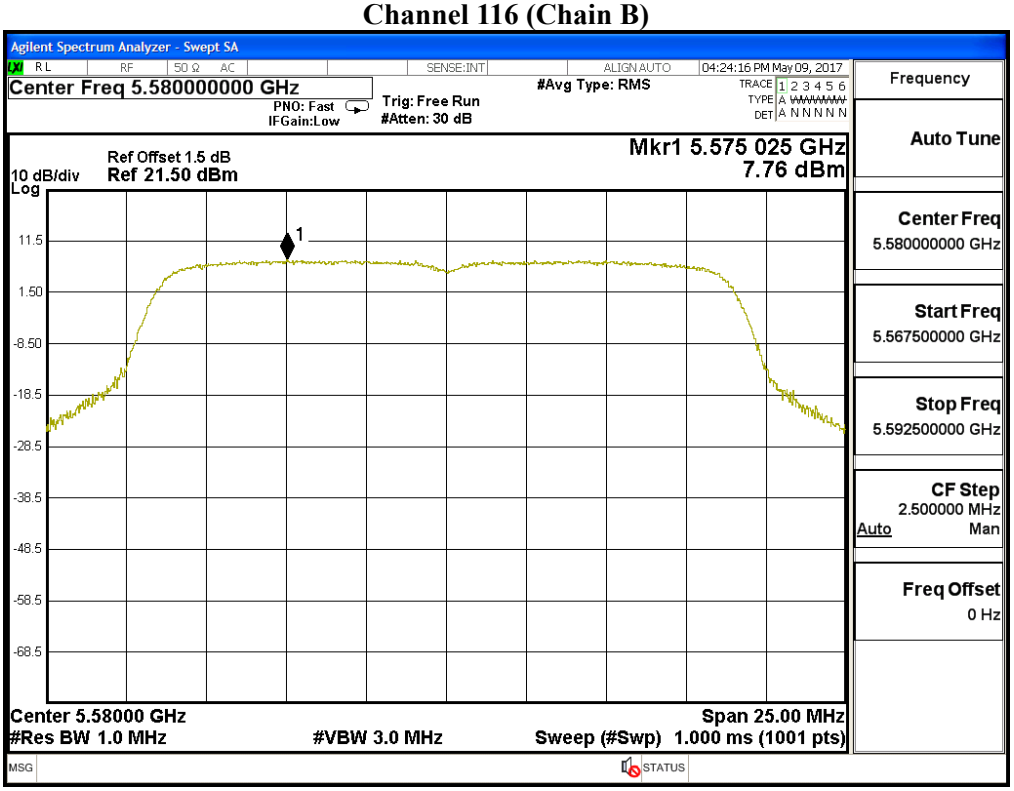
Channel 64 (Chain B)



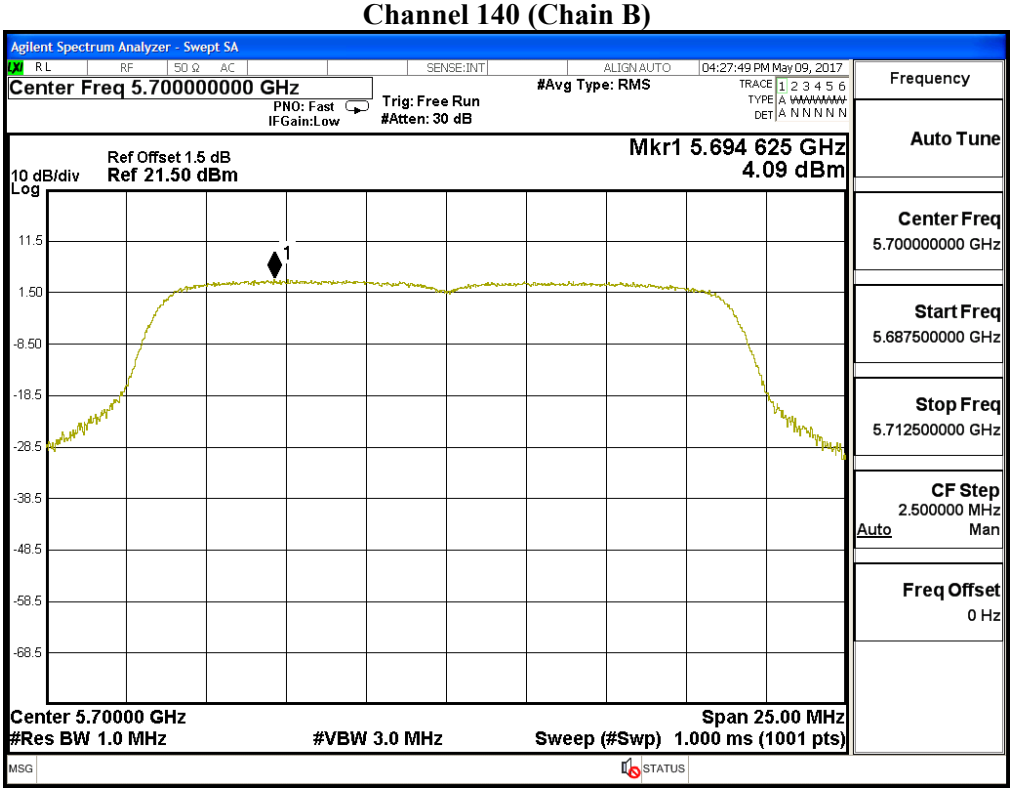
Channel 100 (Chain B)



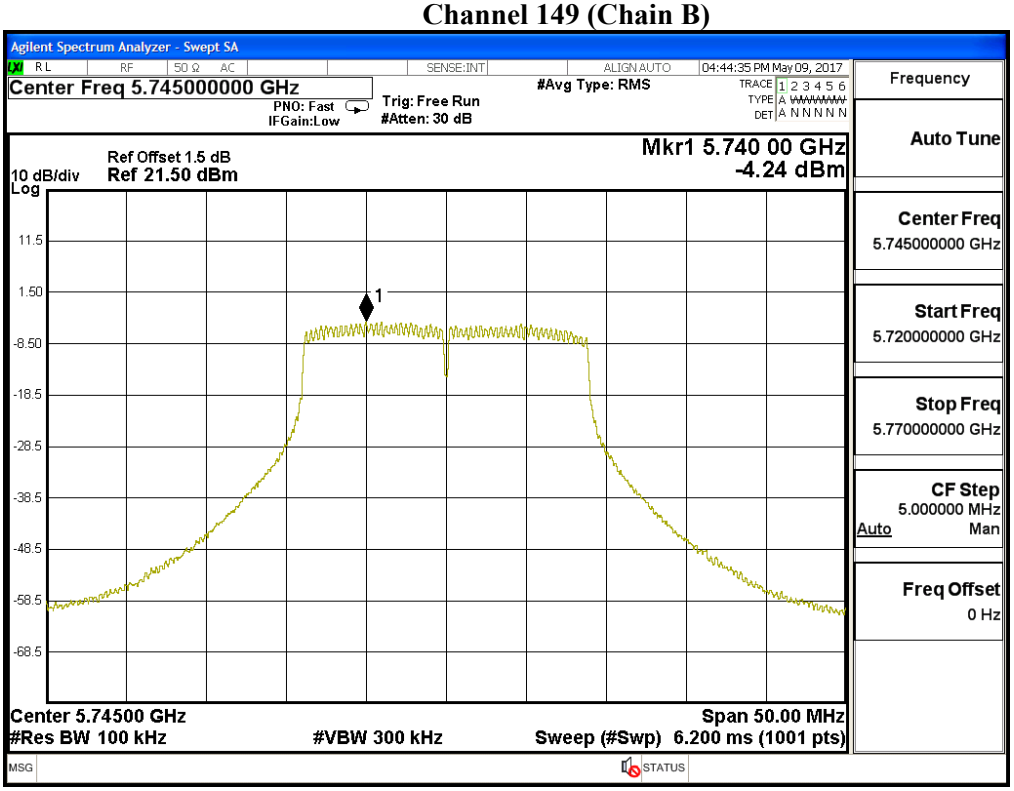
Channel 116 (Chain B)



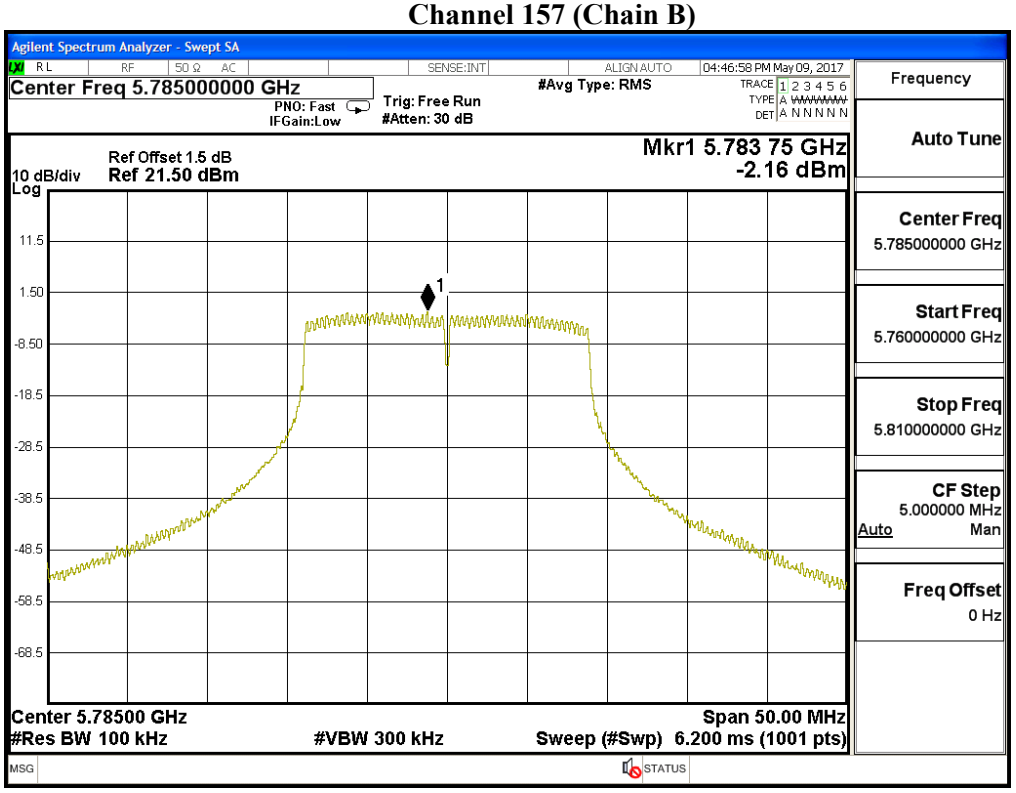
Channel 140 (Chain B)



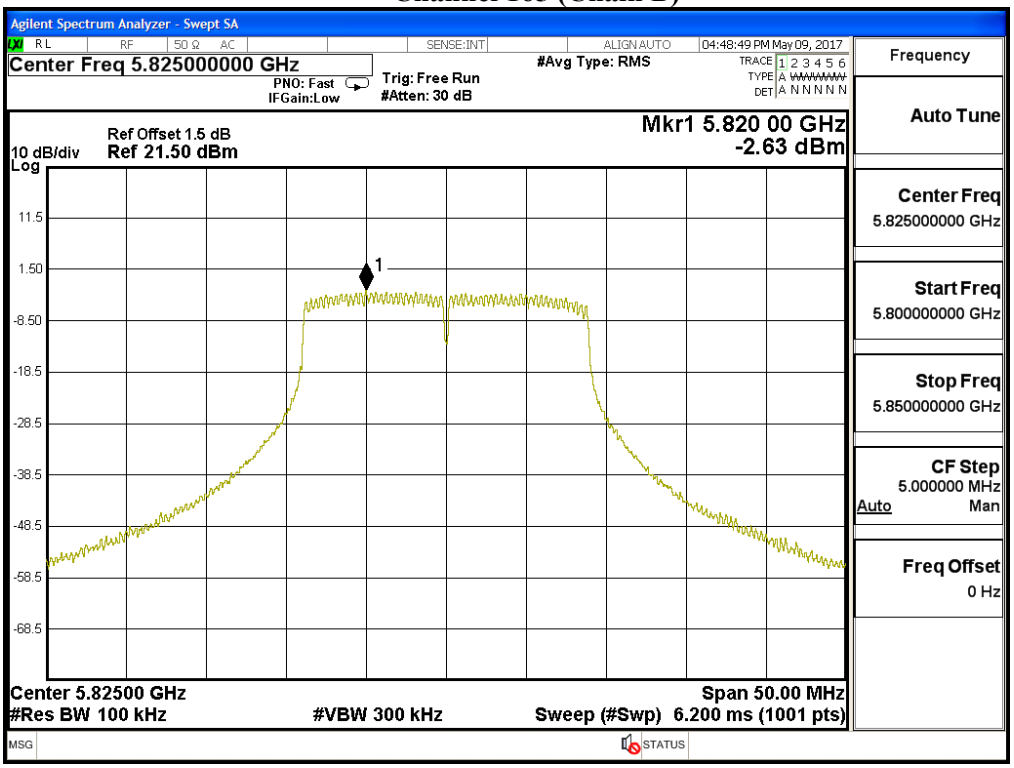
Channel 149 (Chain B)



Channel 157 (Chain B)



Channel 165 (Chain B)



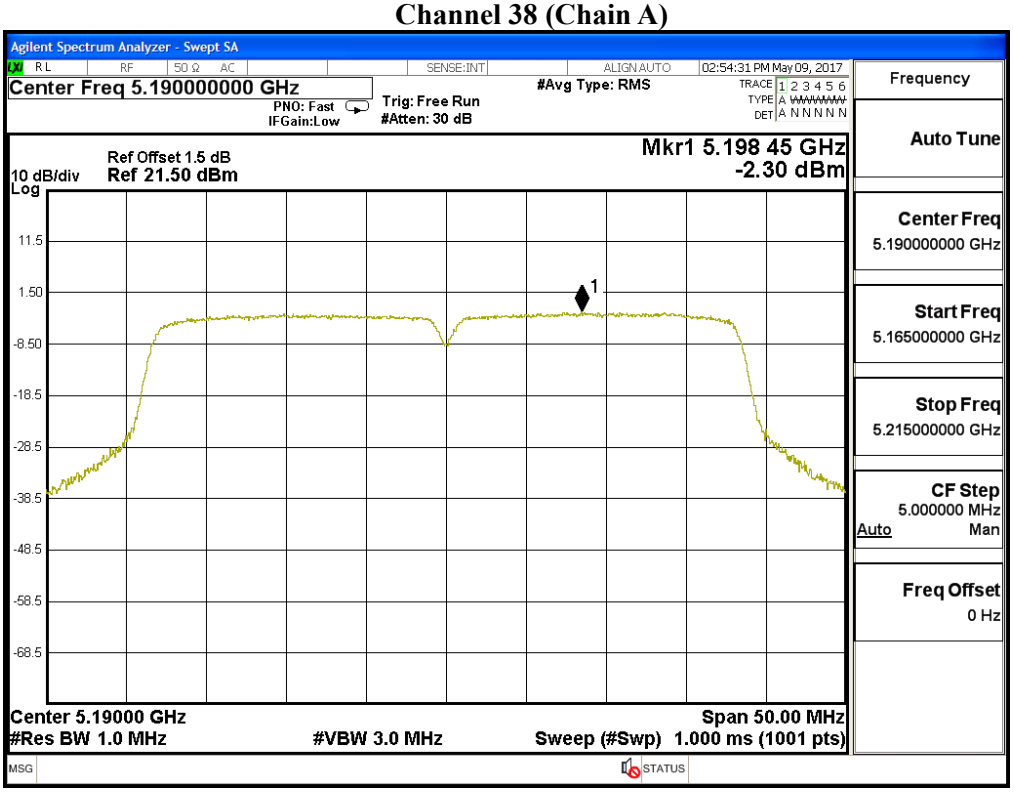
Product : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Peak Power Spectral Density
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)

Channel Number	Frequency (MHz)	Chain	PPSD (dBm)	Total PPSD (dBm) [1]	Required Limit (dBm)	Result
38	5190	A	-2.300	0.710	11	Pass
		B	-2.050	0.960	11	Pass
46	5230	A	4.100	7.110	11	Pass
		B	5.350	8.360	11	Pass
54	5270	A	3.770	6.780	11	Pass
		B	5.170	8.180	11	Pass
62	5310	A	-0.450	2.560	11	Pass
		B	0.070	3.080	11	Pass
102	5510	A	-2.060	0.950	11	Pass
		B	-1.770	1.240	11	Pass
110	5550	A	5.160	8.170	11	Pass
		B	5.300	8.310	11	Pass
134	5670	A	3.250	6.260	11	Pass
		B	1.870	4.880	11	Pass

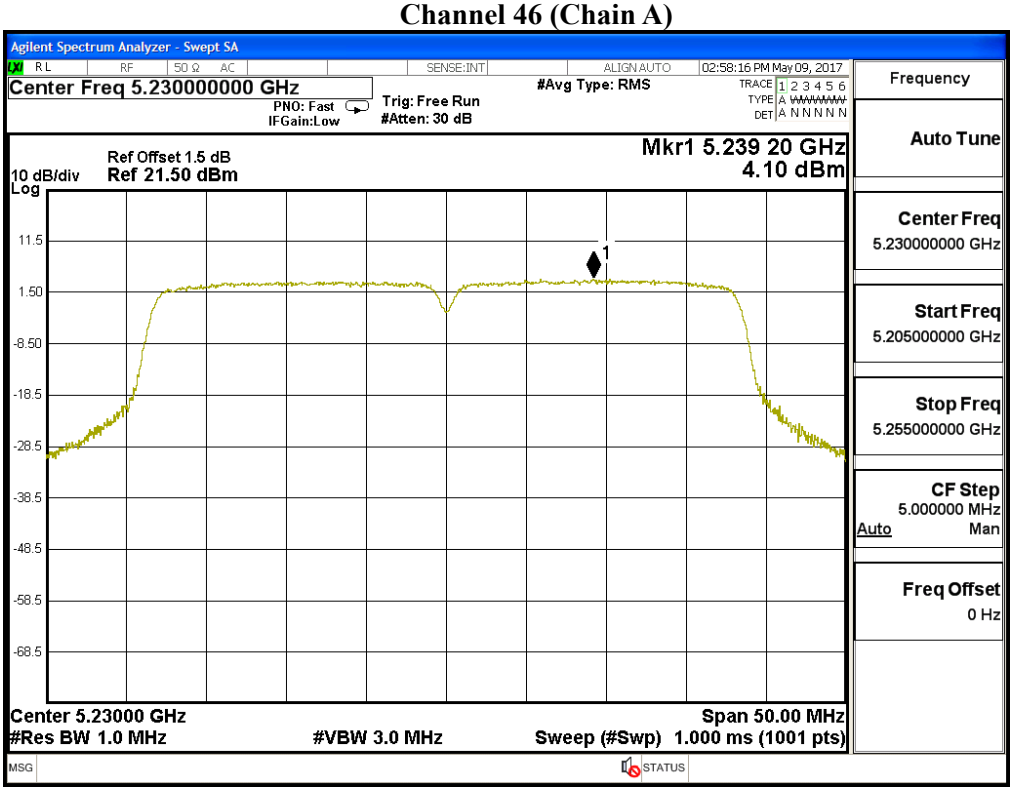
Channel Number	Frequency (MHz)	Chain	PPSD (dBm)	BWCF (dB)	Total PPSD (dBm) [1]	Required Limit (dBm)	Result
151	5755	A	-10.780	6.980	-0.790	<30	Pass
		B	-10.440	6.980	-0.450	<30	Pass
159	5795	A	-5.870	6.980	4.120	<30	Pass
		B	-4.300	6.980	5.690	<30	Pass

Note 1: The quantity 10*log 2 (two antennas) is added to the spectrum peak value according to document 662911 D01.

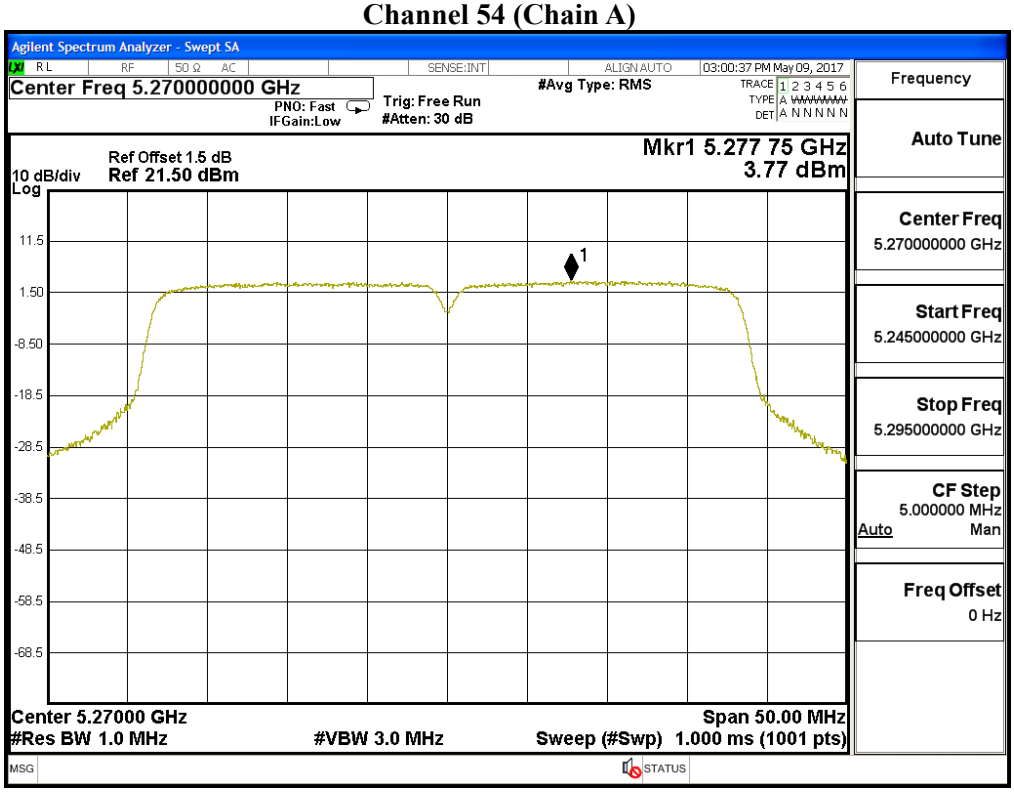
Channel 38 (Chain A)



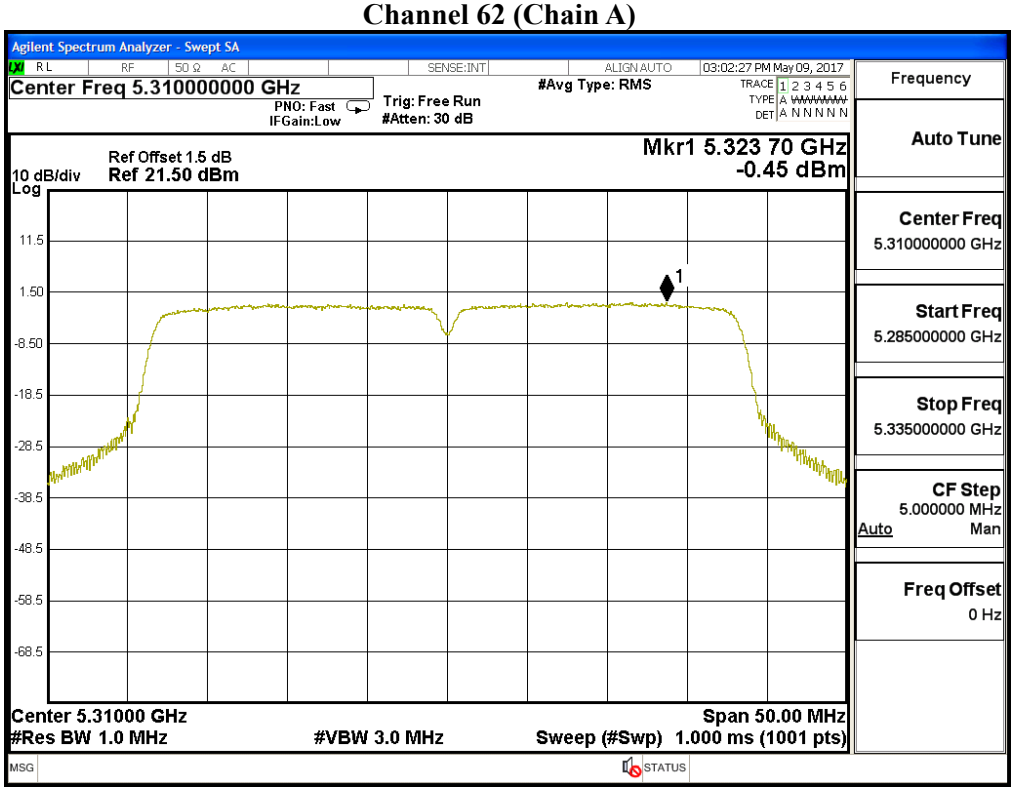
Channel 46 (Chain A)



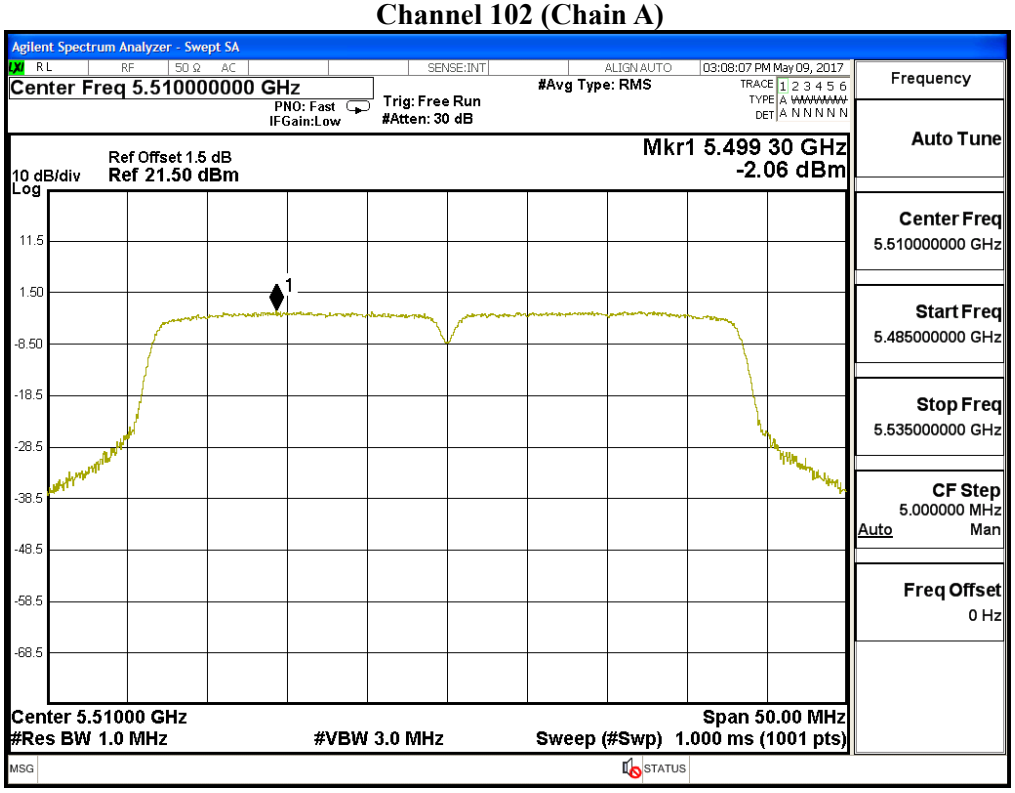
Channel 54 (Chain A)



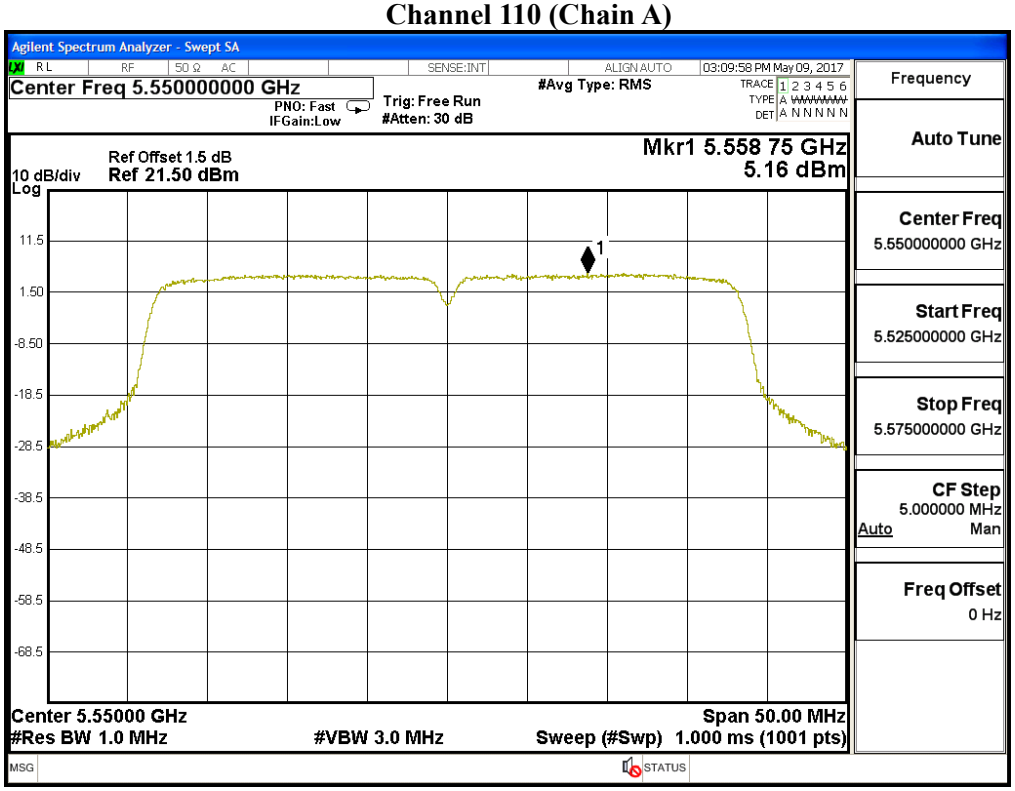
Channel 62 (Chain A)



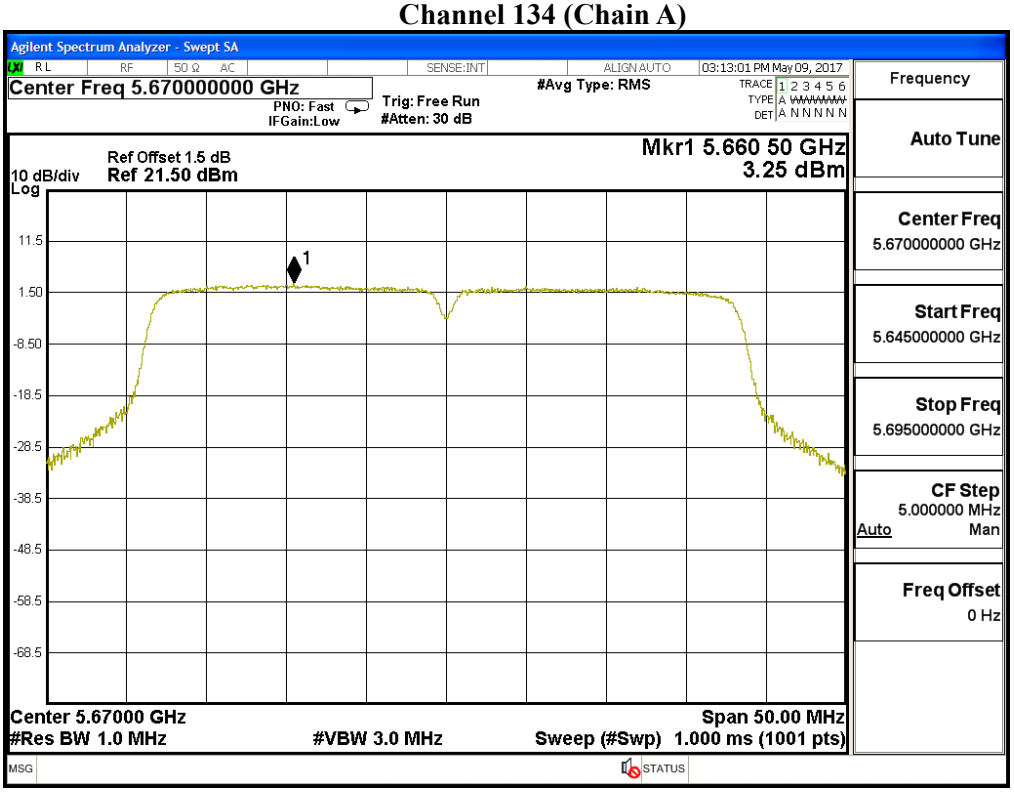
Channel 102 (Chain A)



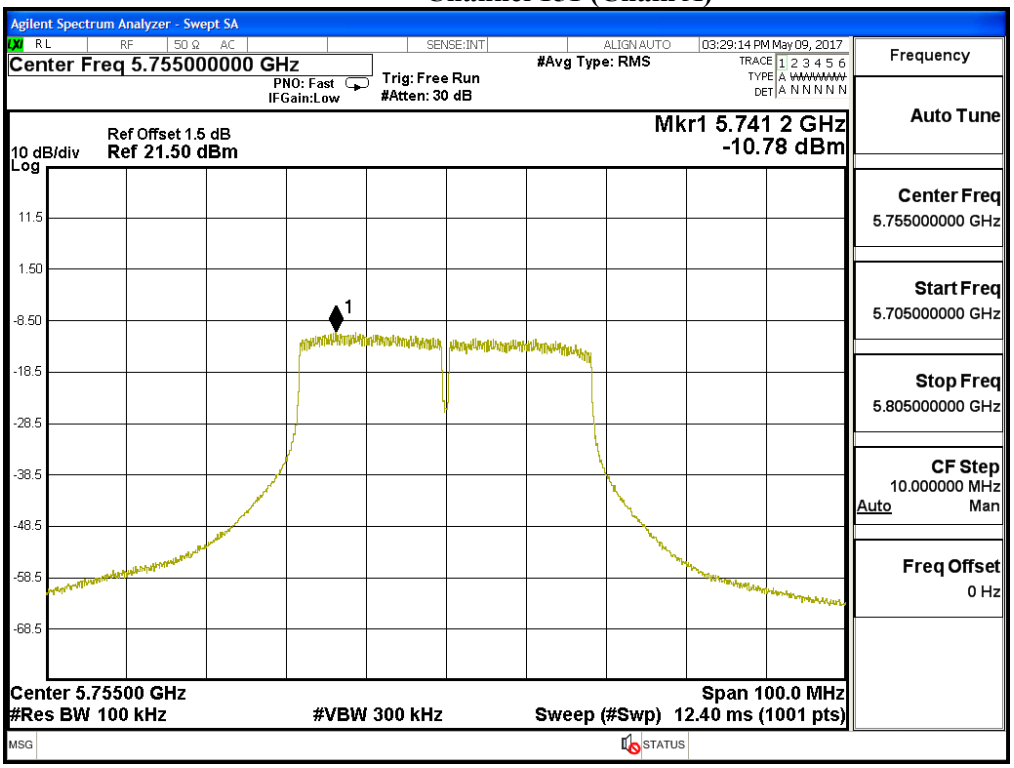
Channel 110 (Chain A)



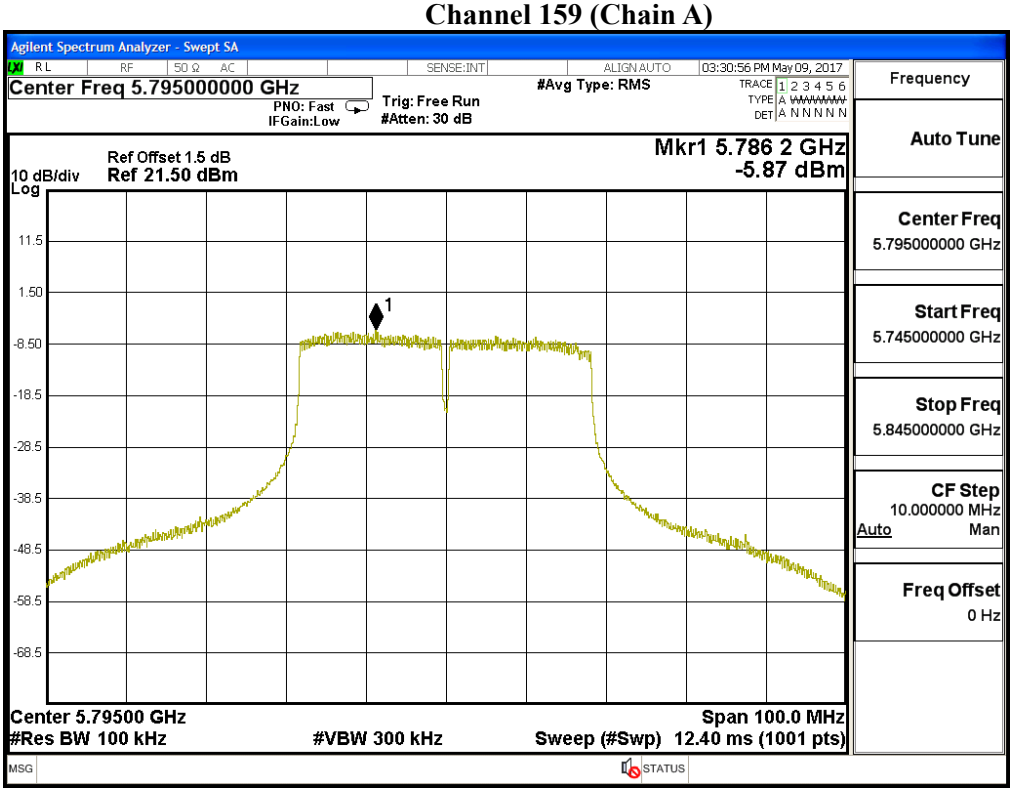
Channel 134 (Chain A)



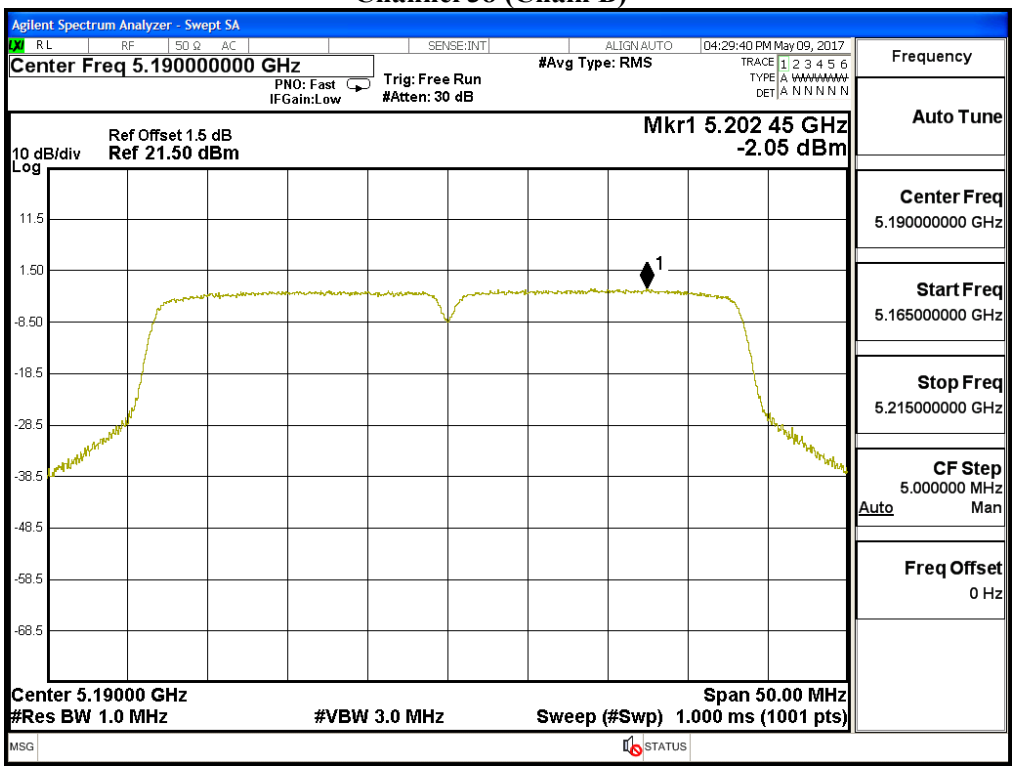
Channel 151 (Chain A)



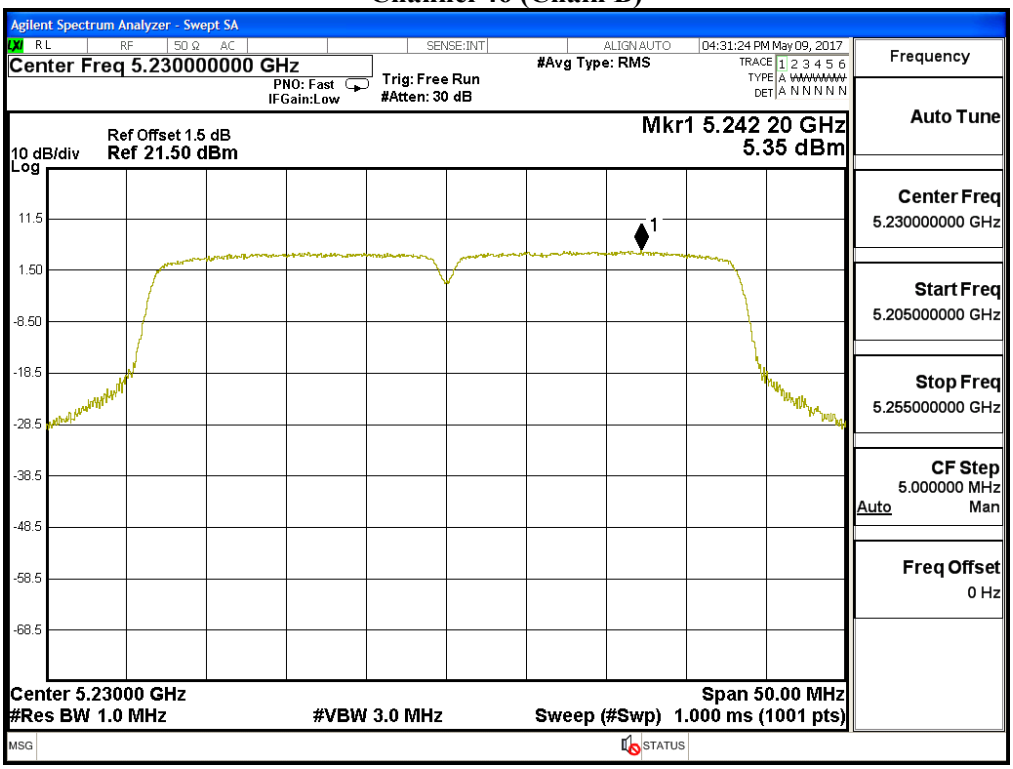
Channel 159 (Chain A)



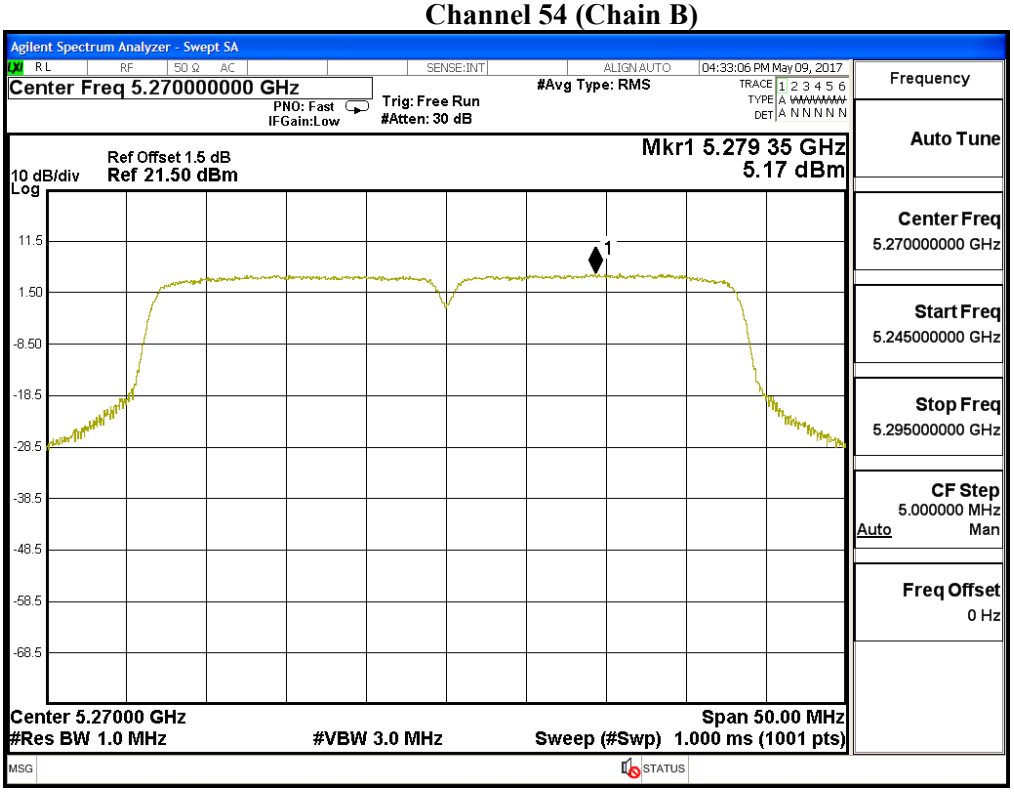
Channel 38 (Chain B)



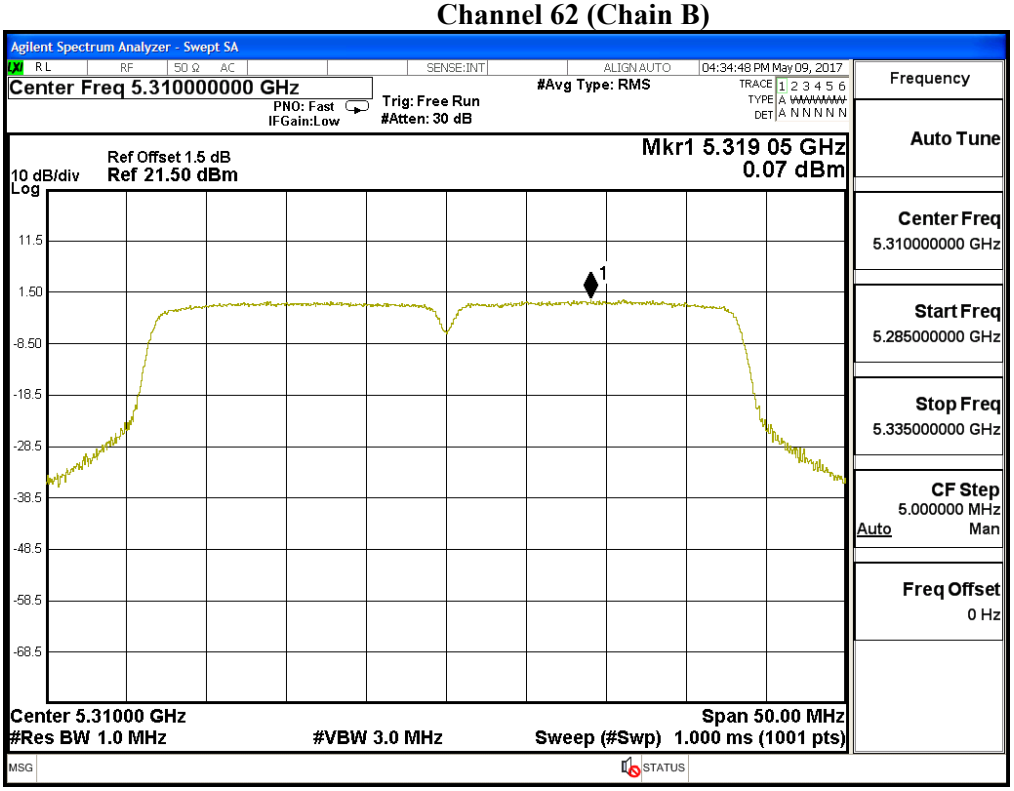
Channel 46 (Chain B)



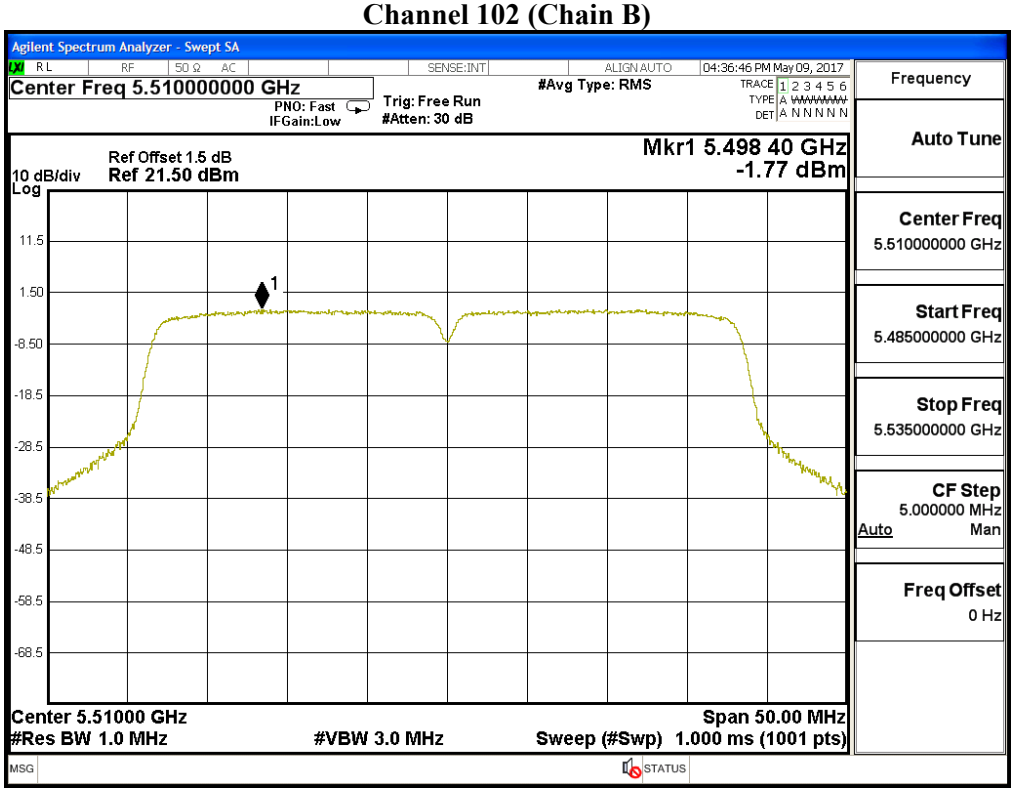
Channel 54 (Chain B)



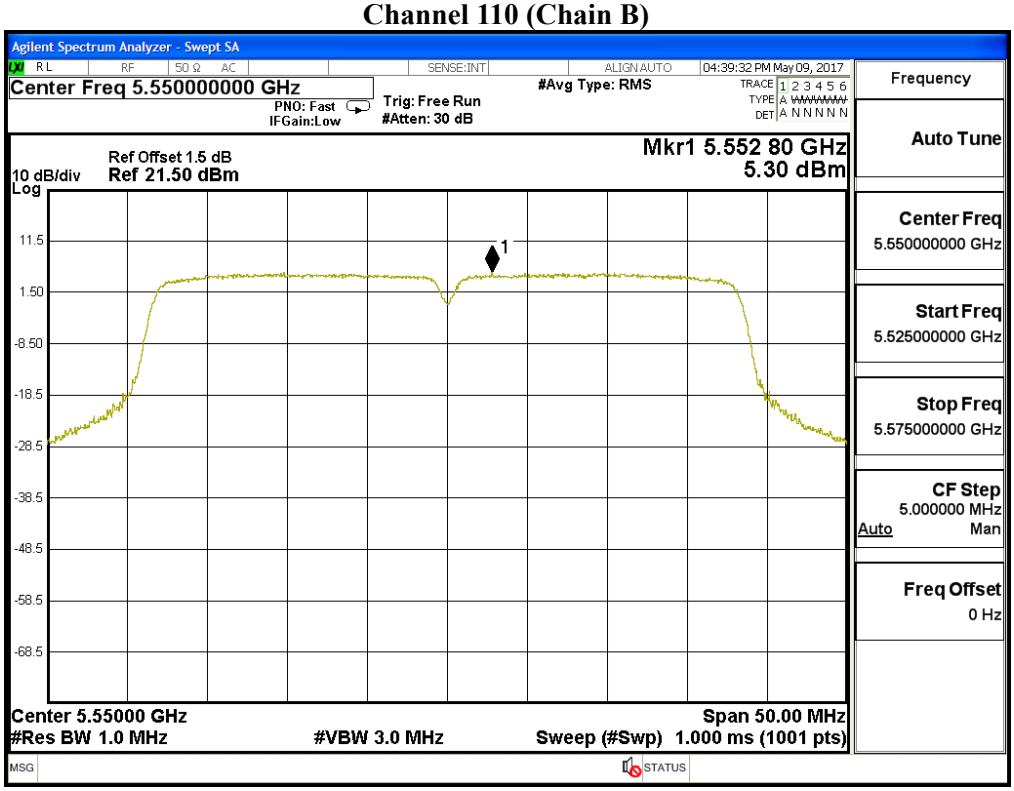
Channel 62 (Chain B)



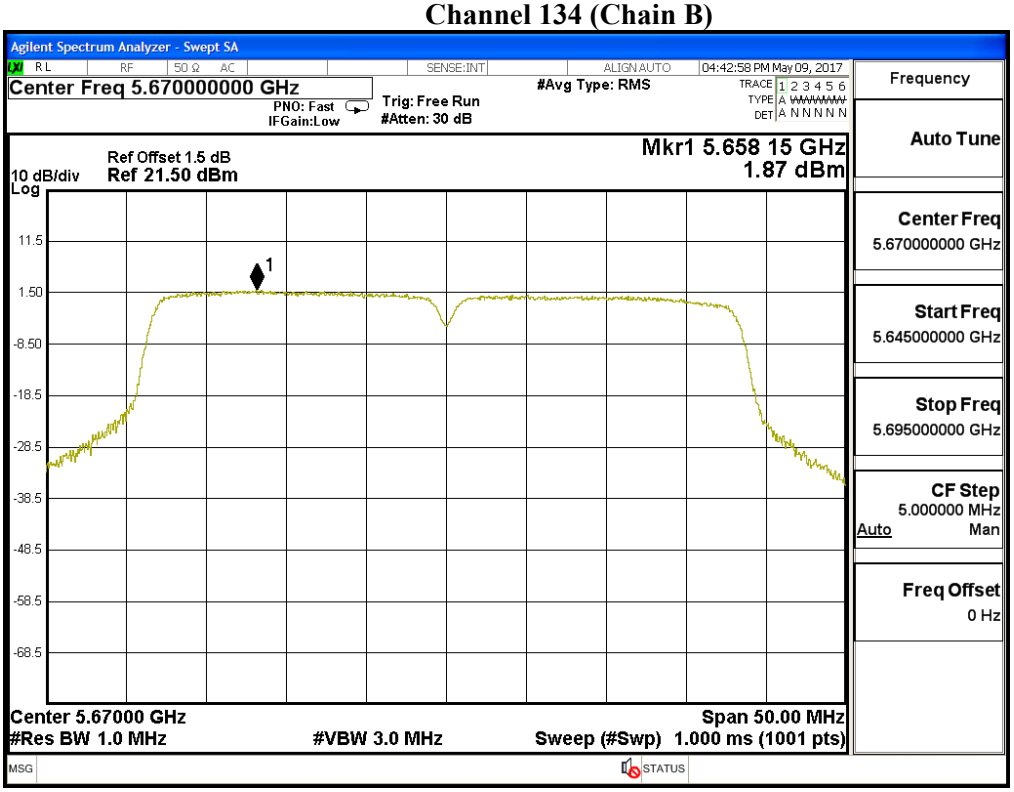
Channel 102 (Chain B)



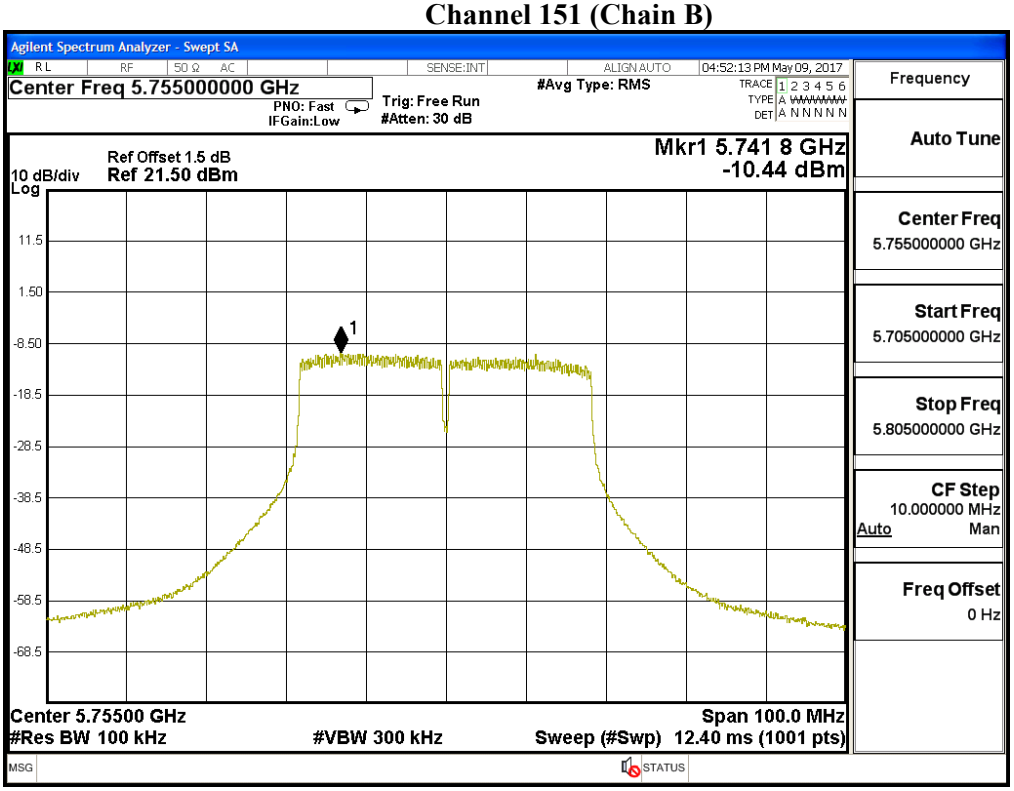
Channel 110 (Chain B)



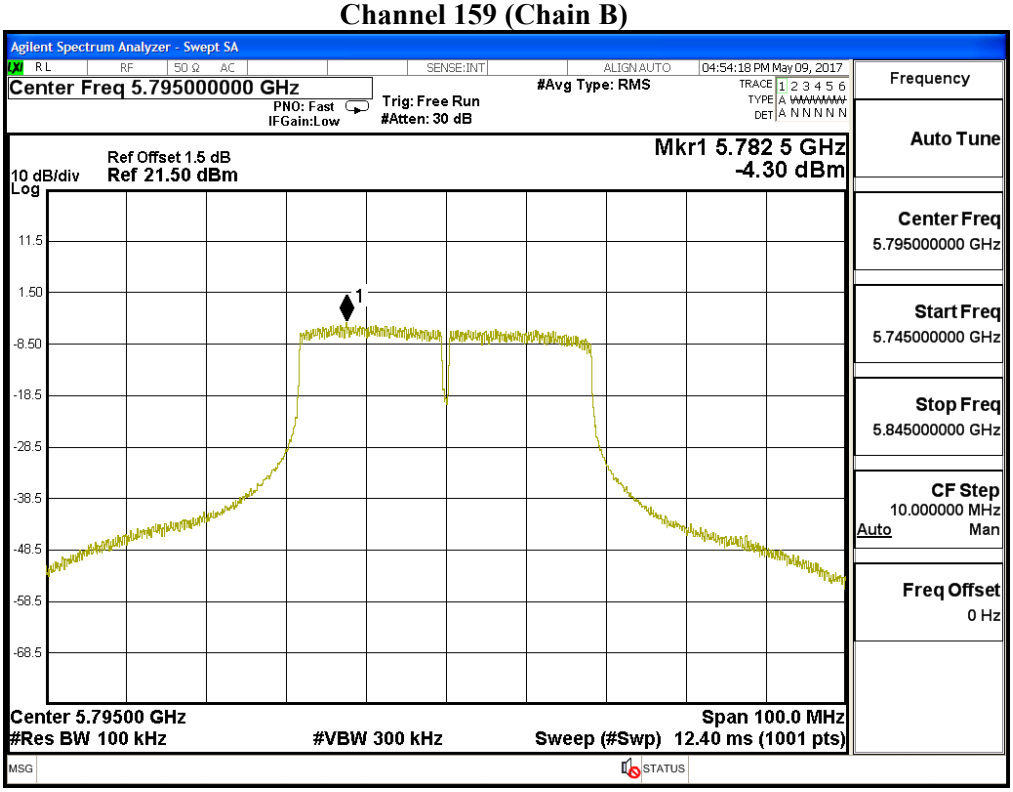
Channel 134 (Chain B)



Channel 151 (Chain B)



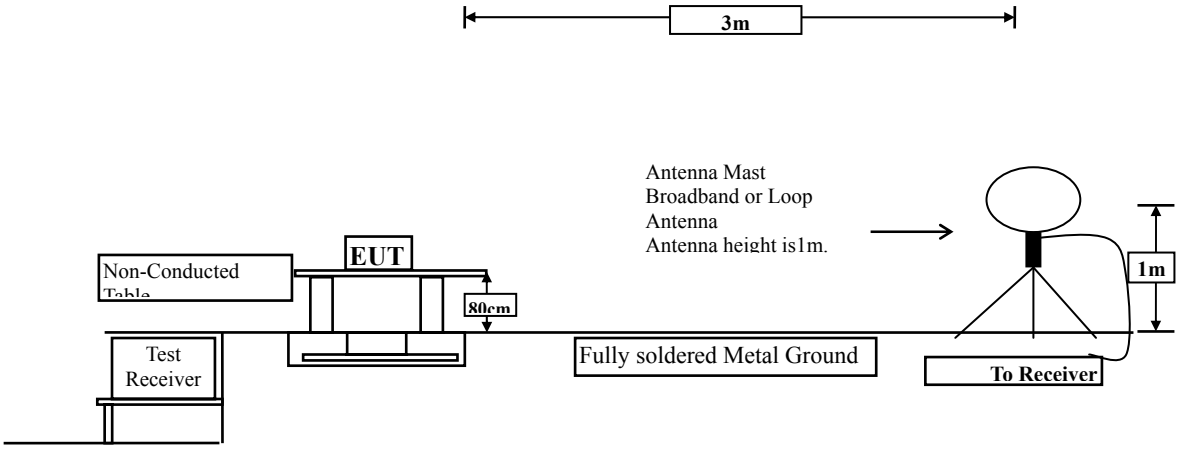
Channel 159 (Chain B)



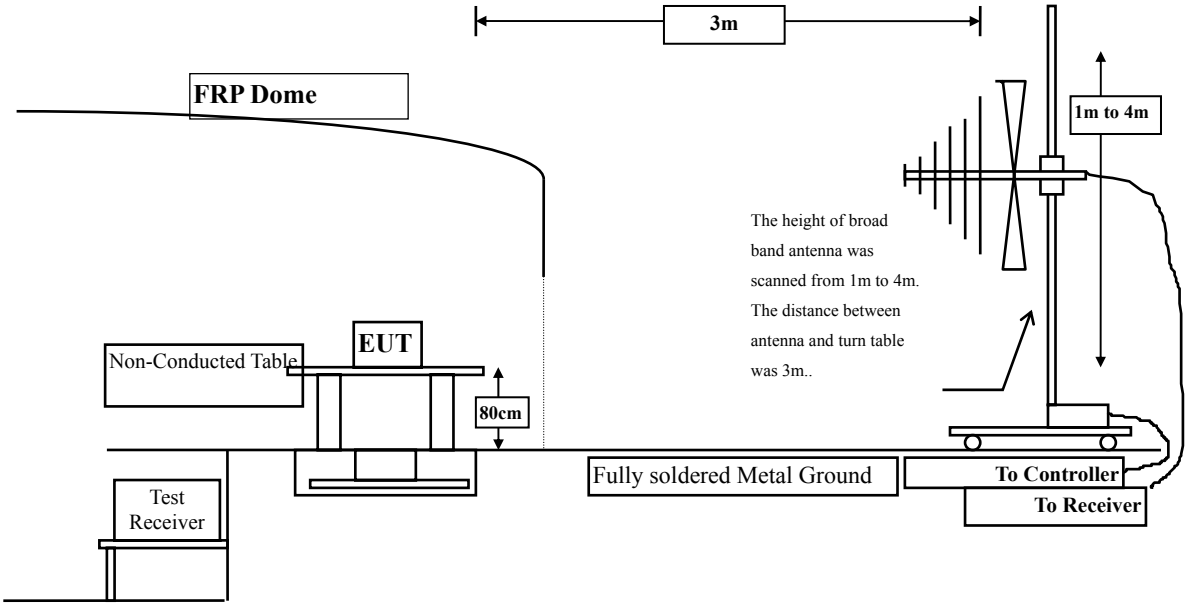
5. Radiated Emission

5.1. Test Setup

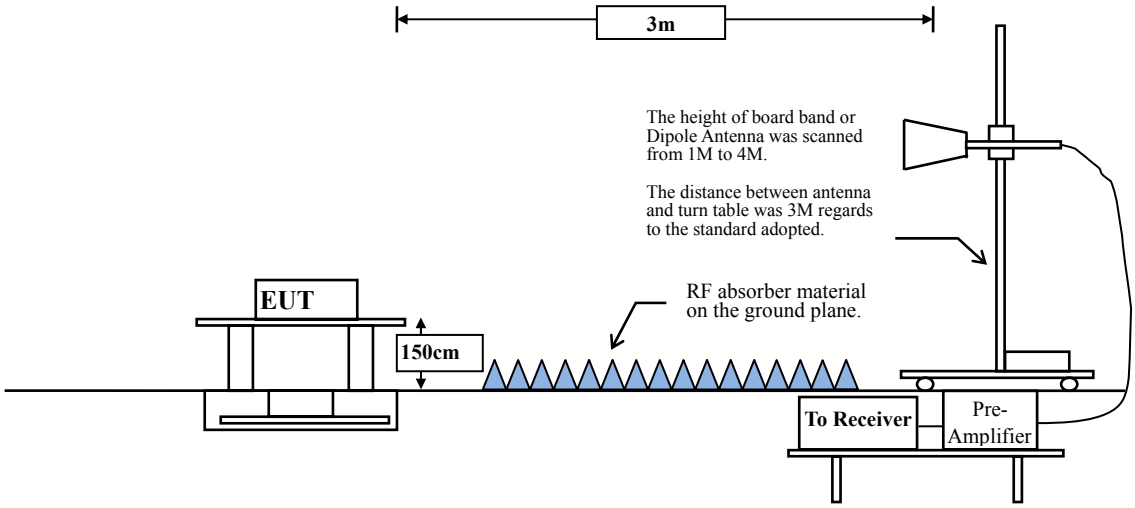
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



5.2. Limits

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

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

Remarks: E field strength (dBμV/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 form 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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5180MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
10360.000	-2.181	40.510	38.329	-35.671	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10360.000	-1.387	44.710	43.323	-30.677	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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2017/03/23
Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5220MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
10440.000	-1.613	43.960	42.347	-31.653	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10440.000	-0.690	44.280	43.590	-30.410	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5240MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
10480.000	-1.075	42.670	41.596	-32.404	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
10480.000	-0.148	44.320	44.173	-29.827	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5260MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
10520.000	-0.575	42.730	42.155	-31.845	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
10520.000	0.228	43.030	43.258	-30.742	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5300MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
10600.000	0.309	42.340	42.648	-31.352	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10600.000	0.640	43.490	44.130	-29.870	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5320MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
10640.000	0.316	41.720	42.036	-31.964	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10640.000	0.709	43.170	43.879	-30.121	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5500MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
11000.000	1.709	41.360	43.069	-30.931	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11000.000	2.442	43.250	45.691	-28.309	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5580MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
11160.000	2.230	42.490	44.720	-29.280	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11160.000	3.209	43.980	47.189	-26.811	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5700MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
11400.000	2.101	41.180	43.282	-30.718	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11400.000	2.709	42.670	45.379	-28.621	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV /m	dB	dBμV /m
Horizontal Peak Detector:					
11490.000	2.672	40.940	43.612	-30.388	74.000
Average Detector:					
--					
Vertical Peak Detector:					
11490.000	3.600	42.360	45.960	-28.040	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5785MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV /m	dB	dBμV /m
Horizontal					
Peak Detector:					
11570.000	2.336	42.190	44.526	-29.474	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11570.000	3.225	43.760	46.984	-27.016	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5825MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV /m	dB	dBμV /m
Horizontal Peak Detector:					
11650.000	1.608	42.090	43.699	-30.301	74.000
Average Detector:					
--					
Vertical Peak Detector:					
11650.000	2.724	43.840	46.565	-27.435	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5180MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
10360.000	-2.181	42.730	40.549	-33.451	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10360.000	-1.387	43.280	41.893	-32.107	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5220MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
10440.000	-1.613	41.560	39.947	-34.053	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10440.000	-0.690	43.280	42.590	-31.410	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5240MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
10480.000	-1.075	40.860	39.786	-34.214	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10480.000	-0.148	42.780	42.633	-31.367	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5260MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
10520.000	-0.575	41.260	40.685	-33.315	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10520.000	0.228	42.520	42.748	-31.252	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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2017/03/23
Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5300MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
10600.000	0.309	41.420	41.728	-32.272	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10600.000	0.640	44.370	45.010	-28.990	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5320MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
10640.000	0.316	43.310	43.626	-30.374	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10640.000	0.709	45.270	45.979	-28.021	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5500MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
11000.000	1.709	41.180	42.889	-31.111	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11000.000	2.442	42.480	44.921	-29.079	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5580MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
11160.000	2.230	43.380	45.610	-28.390	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11160.000	3.209	47.530	50.739	-23.261	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5700MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
11400.000	2.101	43.290	45.392	-28.608	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11400.000	2.709	46.860	49.569	-24.431	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5745MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV /m	dB	dBμV /m
Horizontal					
Peak Detector:					
11490.000	2.672	43.720	46.392	-27.608	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11490.000	3.600	46.980	50.580	-23.420	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5785MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV /m	dB	dBμV /m
Horizontal Peak Detector:					
11570.000	2.336	46.370	48.706	-25.294	74.000
Average Detector:					
--					
Vertical Peak Detector:					
11570.000	3.225	49.420	52.644	-21.356	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5825MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV /m	dB	dBμV /m
Horizontal Peak Detector:					
11650.000	1.608	46.620	48.229	-25.771	74.000
Average Detector:					
--					
Vertical Peak Detector:					
11650.000	2.724	50.730	53.455	-20.545	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5190MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
10380.000	-2.167	40.920	38.753	-35.247	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10380.000	-1.310	42.970	41.660	-32.340	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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2017/03/23
Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5230MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
10460.000	-1.343	42.390	41.046	-32.954	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10460.000	-0.418	43.820	43.401	-30.599	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5270MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
10540.000	-0.344	41.190	40.846	-33.154	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10540.000	0.334	42.960	43.294	-30.706	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5310MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
10620.000	0.331	42.610	42.941	-31.059	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
10620.000	0.678	42.470	43.148	-30.852	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5510MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
11020.000	1.816	40.350	42.165	-31.835	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11020.000	2.566	42.150	44.716	-29.284	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5550MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
11100.000	2.151	44.170	46.321	-27.679	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11100.000	2.993	47.020	50.013	-23.987	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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2017/03/23
Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5670MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
11340.000	1.996	43.840	45.835	-28.165	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11340.000	2.755	48.240	50.995	-23.005	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5755MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV /m	dB	dBμV /m
Horizontal Peak Detector:					
11510.000	2.683	41.180	43.863	-30.137	74.000
Average Detector:					
--					
Vertical Peak Detector:					
11510.000	3.640	43.040	46.680	-27.320	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5795MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV /m	dB	dBμV /m
Horizontal Peak Detector:					
11590.000	2.216	45.380	47.596	-26.404	74.000
Average Detector:					
--					
Vertical Peak Detector:					
11590.000	3.082	49.240	52.322	-21.678	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5220MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector					
140.517	-19.821	45.814	25.993	-17.507	43.500
230.124	-17.537	50.629	33.092	-12.908	46.000
306.831	-12.649	41.293	28.643	-17.357	46.000
450.333	-11.568	38.815	27.247	-18.753	46.000
601.296	-5.826	31.728	25.902	-20.098	46.000
900.188	-4.481	30.251	25.770	-20.230	46.000
Vertical					
Peak Detector					
42.652	-11.944	44.527	32.584	-7.416	40.000
109.493	-9.753	37.296	27.543	-15.957	43.500
229.623	-17.870	51.813	33.943	-12.057	46.000
450.333	-16.938	41.682	24.744	-21.256	46.000
674.926	-10.228	34.945	24.717	-21.283	46.000
900.188	-6.642	37.770	31.128	-14.872	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5300MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector					
137.726	-19.749	45.638	25.888	-17.612	43.500
231.029	-17.602	49.293	31.691	-14.309	46.000
303.371	-12.580	40.816	28.236	-17.764	46.000
450.333	-11.568	38.729	27.161	-18.839	46.000
601.684	-5.739	32.547	26.808	-19.192	46.000
900.188	-4.481	31.472	26.991	-19.009	46.000
Vertical					
Peak Detector					
42.652	-11.944	45.190	33.247	-6.753	40.000
107.916	-9.665	38.417	28.752	-14.748	43.500
234.429	-18.669	51.672	33.003	-12.997	46.000
450.333	-16.938	41.924	24.986	-21.014	46.000
625.178	-12.501	36.838	24.337	-21.663	46.000
900.188	-6.642	37.381	30.739	-15.261	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5580MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector					
137.914	-19.757	45.872	26.115	-17.385	43.500
229.623	-17.595	49.241	31.646	-14.354	46.000
300.849	-12.948	40.917	27.970	-18.030	46.000
450.333	-11.568	38.189	26.621	-19.379	46.000
601.192	-5.834	31.364	25.530	-20.470	46.000
900.188	-4.481	30.095	25.614	-20.386	46.000
Vertical					
Peak Detector					
42.652	-11.944	44.294	32.351	-7.649	40.000
109.125	-9.731	38.143	28.412	-15.088	43.500
230.817	-18.035	51.618	33.583	-12.417	46.000
525.291	-10.172	35.461	25.289	-20.711	46.000
675.946	-9.963	34.932	24.969	-21.031	46.000
900.188	-6.642	38.089	31.447	-14.553	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5785MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector					
137.843	-19.754	46.582	26.828	-16.672	43.500
230.192	-17.540	50.179	32.639	-13.361	46.000
306.379	-12.551	41.817	29.266	-16.734	46.000
450.333	-11.568	38.743	27.175	-18.825	46.000
601.618	-5.755	31.924	26.169	-19.831	46.000
900.188	-4.481	29.681	25.200	-20.800	46.000
Vertical					
Peak Detector					
43.593	-12.513	44.271	31.758	-8.242	40.000
109.125	-9.731	38.693	28.962	-14.538	43.500
229.623	-17.870	51.149	33.279	-12.721	46.000
450.333	-16.938	41.914	24.976	-21.024	46.000
674.918	-10.230	33.482	23.252	-22.748	46.000
900.188	-6.642	36.897	30.255	-15.745	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5220MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector					
137.849	-19.754	46.719	26.965	-16.535	43.500
230.592	-17.560	50.261	32.701	-13.299	46.000
310.267	-13.401	41.593	28.193	-17.807	46.000
450.333	-11.568	39.084	27.516	-18.484	46.000
601.186	-5.835	32.672	26.837	-19.163	46.000
900.188	-4.481	31.468	26.987	-19.013	46.000
Vertical					
Peak Detector					
42.914	-12.102	44.892	32.790	-7.210	40.000
108.725	-9.707	38.915	29.208	-14.292	43.500
229.623	-17.870	50.756	32.886	-13.114	46.000
450.333	-16.938	42.183	25.245	-20.755	46.000
674.986	-10.210	34.381	24.170	-21.830	46.000
900.188	-6.642	37.479	30.837	-15.163	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5300MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector					
140.815	-19.815	45.392	25.577	-17.923	43.500
229.623	-17.595	49.817	32.222	-13.778	46.000
310.189	-13.385	41.073	27.688	-18.312	46.000
450.333	-11.568	38.549	26.981	-19.019	46.000
601.491	-5.785	31.681	25.896	-20.104	46.000
900.188	-4.481	29.938	25.457	-20.543	46.000
Vertical					
Peak Detector					
42.652	-11.944	45.093	33.150	-6.850	40.000
64.187	-14.916	43.834	28.919	-11.081	40.000
234.918	-18.703	52.487	33.784	-12.216	46.000
450.333	-16.938	41.719	24.781	-21.219	46.000
650.491	-14.674	38.392	23.718	-22.282	46.000
900.188	-6.642	37.281	30.639	-15.361	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5580MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector					
137.729	-19.749	45.184	25.434	-18.066	43.500
229.623	-17.595	50.379	32.784	-13.216	46.000
304.291	-12.455	40.728	28.272	-17.728	46.000
450.333	-11.568	38.915	27.347	-18.653	46.000
601.946	-5.677	30.491	24.814	-21.186	46.000
900.188	-4.481	29.563	25.082	-20.918	46.000
Vertical					
Peak Detector					
42.652	-11.944	44.581	32.638	-7.362	40.000
109.276	-9.740	37.473	27.733	-15.767	43.500
234.918	-18.703	51.259	32.556	-13.444	46.000
525.491	-10.180	35.137	24.957	-21.043	46.000
675.849	-9.988	34.814	24.826	-21.174	46.000
900.188	-6.642	38.067	31.425	-14.575	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5785MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector					
137.692	-19.749	46.273	26.525	-16.975	43.500
235.246	-17.974	49.681	31.707	-14.293	46.000
307.381	-12.776	40.816	28.040	-17.960	46.000
450.333	-11.568	38.529	26.961	-19.039	46.000
601.197	-5.834	32.048	26.214	-19.786	46.000
900.188	-4.481	30.392	25.911	-20.089	46.000
Vertical					
Peak Detector					
42.652	-11.944	44.094	32.151	-7.849	40.000
109.267	-9.739	38.183	28.443	-15.057	43.500
229.623	-17.870	51.539	33.669	-12.331	46.000
450.333	-16.938	41.728	24.790	-21.210	46.000
674.819	-10.259	34.276	24.017	-21.983	46.000
900.188	-6.642	36.912	30.270	-15.730	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5190MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector					
137.814	-19.753	46.176	26.423	-17.077	43.500
229.623	-17.595	50.529	32.934	-13.066	46.000
310.297	-13.407	41.815	28.409	-17.591	46.000
450.333	-11.568	38.942	27.374	-18.626	46.000
601.189	-5.835	31.281	25.446	-20.554	46.000
900.188	-4.481	30.493	26.012	-19.988	46.000
Vertical					
Peak Detector					
42.652	-11.944	44.815	32.872	-7.128	40.000
109.317	-9.742	37.638	27.895	-15.605	43.500
229.623	-17.870	50.549	32.679	-13.321	46.000
525.198	-10.168	35.281	25.112	-20.888	46.000
650.486	-14.674	38.704	24.029	-21.971	46.000
900.188	-6.642	37.016	30.374	-15.626	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5270MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector					
137.845	-19.754	46.276	26.522	-16.978	43.500
229.623	-17.595	50.189	32.594	-13.406	46.000
307.186	-12.731	41.437	28.706	-17.294	46.000
450.333	-11.568	38.821	27.253	-18.747	46.000
600.754	-5.871	31.618	25.747	-20.253	46.000
900.188	-4.481	29.948	25.467	-20.533	46.000
Vertical					
Peak Detector					
42.652	-11.944	43.814	31.871	-8.129	40.000
109.217	-9.737	38.291	28.554	-14.946	43.500
234.934	-18.703	52.018	33.314	-12.686	46.000
450.333	-16.938	41.562	24.624	-21.376	46.000
650.479	-14.675	37.926	23.251	-22.749	46.000
900.188	-6.642	38.183	31.541	-14.459	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5550MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector					
137.714	-19.749	45.629	25.880	-17.620	43.500
229.623	-17.595	50.174	32.579	-13.421	46.000
306.498	-12.573	40.718	28.145	-17.855	46.000
450.333	-11.568	38.941	27.373	-18.627	46.000
601.867	-5.696	31.586	25.890	-20.110	46.000
900.188	-4.481	30.392	25.911	-20.089	46.000
Vertical					
Peak Detector					
42.652	-11.944	45.694	33.751	-6.249	40.000
108.725	-9.707	37.649	27.942	-15.558	43.500
230.493	-17.981	50.172	32.191	-13.809	46.000
525.389	-10.176	35.473	25.297	-20.703	46.000
650.914	-14.648	38.286	23.638	-22.362	46.000
900.188	-6.642	37.571	30.929	-15.071	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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5755MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector					
137.826	-19.753	45.719	25.966	-17.534	43.500
229.623	-17.595	50.263	32.668	-13.332	46.000
306.179	-12.519	40.598	28.078	-17.922	46.000
450.333	-11.568	39.172	27.604	-18.396	46.000
601.491	-5.785	30.485	24.700	-21.300	46.000
900.188	-4.481	29.617	25.136	-20.864	46.000
Vertical					
Peak Detector					
42.652	-11.944	45.194	33.251	-6.749	40.000
109.794	-9.806	37.563	27.758	-15.742	43.500
234.471	-18.675	50.816	32.141	-13.859	46.000
450.333	-16.938	41.679	24.741	-21.259	46.000
625.269	-12.505	36.921	24.416	-21.584	46.000
900.188	-6.642	36.487	29.845	-16.155	46.000

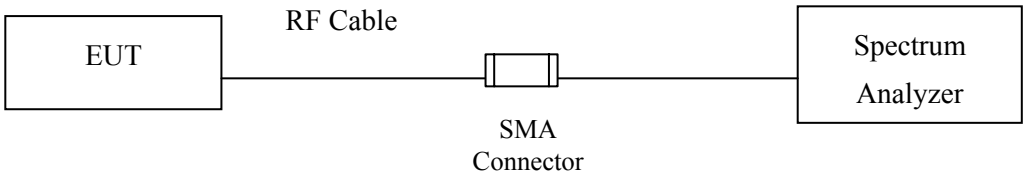
Note:

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.

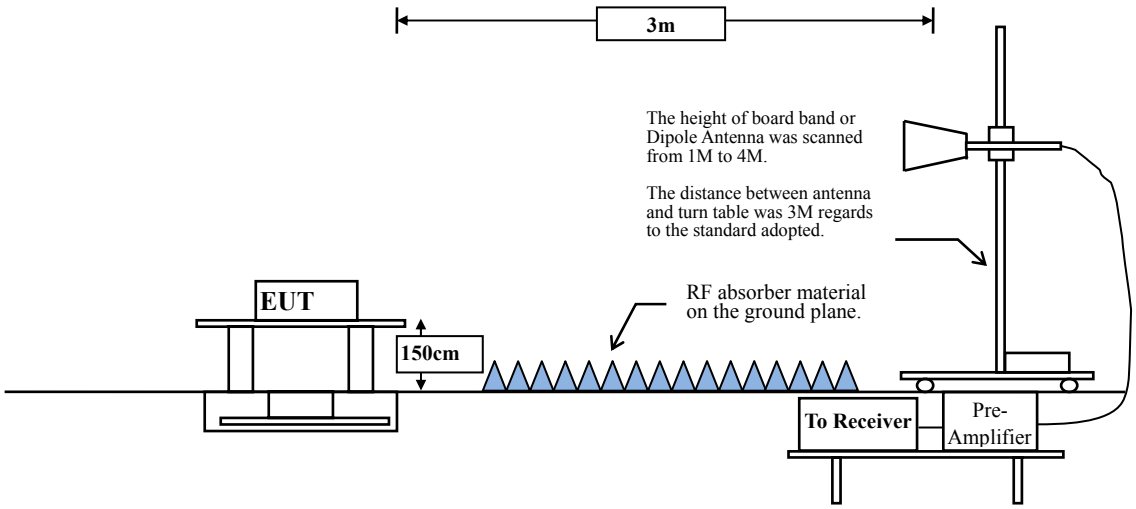
6. Band Edge

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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (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)	5150.000	10.470	38.013	48.484	74.00	54.00	Pass
36 (Peak)	5178.261	10.398	84.858	95.256	--	--	--
36 (Average)	5105.652	10.563	27.955	38.518	74.00	54.00	Pass
36 (Average)	5150.000	10.470	24.738	35.209	74.00	54.00	Pass
36 (Average)	5177.971	10.398	76.878	87.277	--	--	--

Figure Channel 36: Horizontal (Peak)

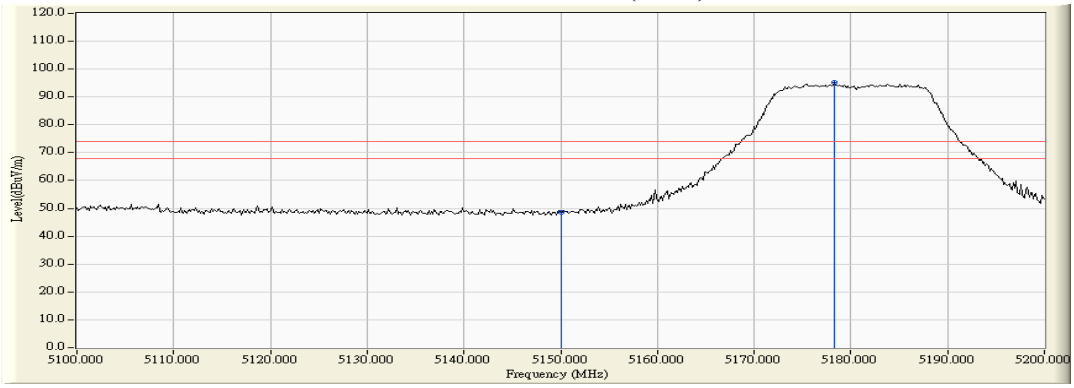
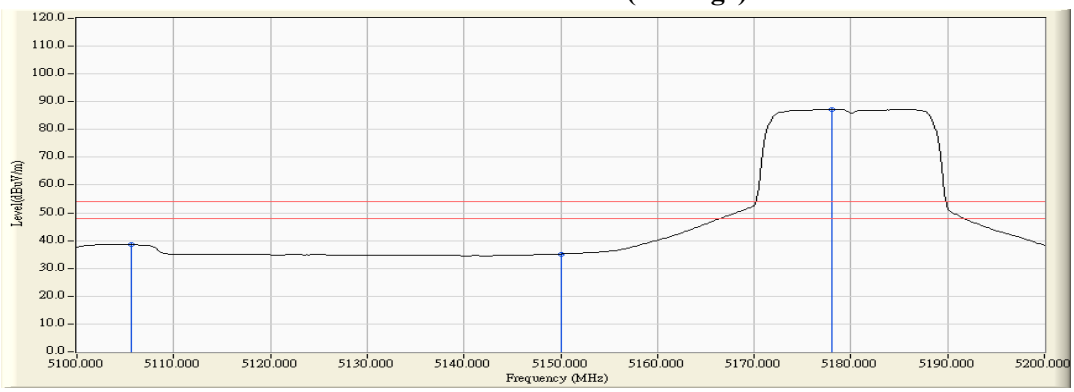


Figure Channel 36: Horizontal (Average)



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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (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)	5150.000	12.390	50.920	63.310	74.00	54.00	Pass
36 (Peak)	5185.652	12.523	96.678	109.200	--	--	--
36 (Average)	5104.203	12.230	36.292	48.522	74.00	54.00	Pass
36 (Average)	5150.000	12.390	31.604	43.994	74.00	54.00	Pass
36 (Average)	5178.261	12.495	88.538	101.033	--	--	--

Figure Channel 36: Vertical (Peak)

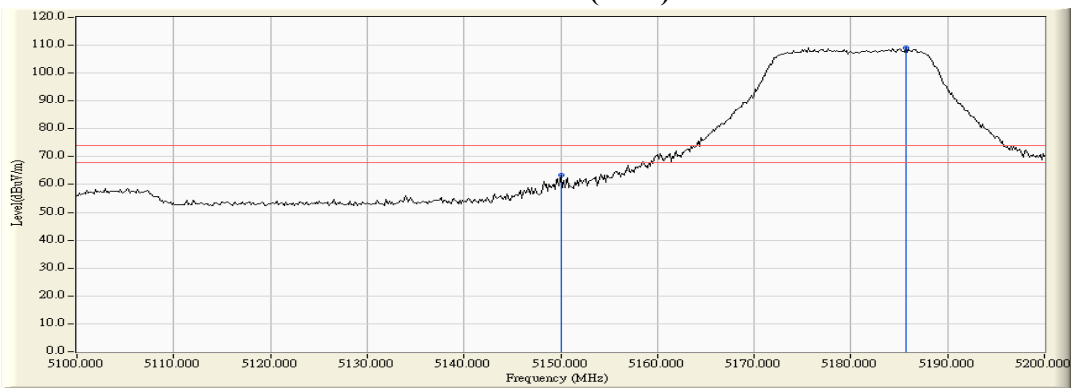
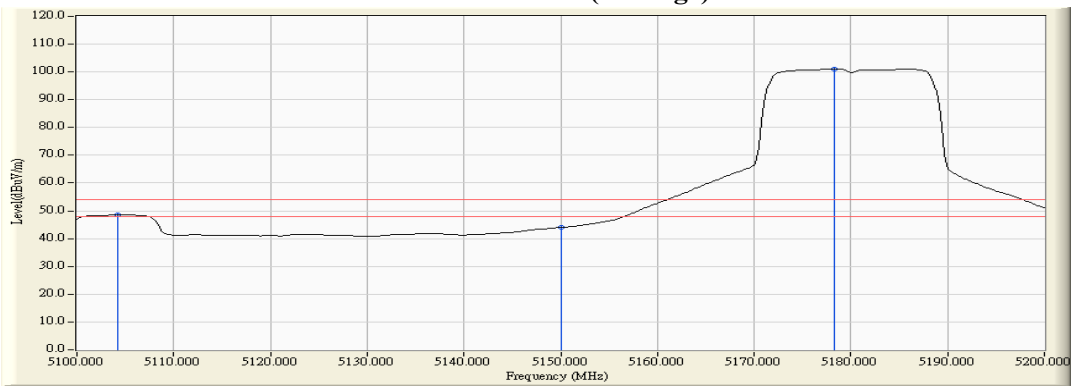


Figure Channel 36: Vertical (Average)



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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2017/03/23
Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5320MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
64 (Peak)	5322.899	11.094	88.694	99.787	--	--	--
64 (Peak)	5350.000	11.024	41.142	52.166	74.00	54.00	Pass
64 (Average)	5324.348	11.089	79.940	91.030	--	--	--
64 (Average)	5350.000	11.024	26.434	37.458	74.00	54.00	Pass

Figure Channel 64: Horizontal (Peak)

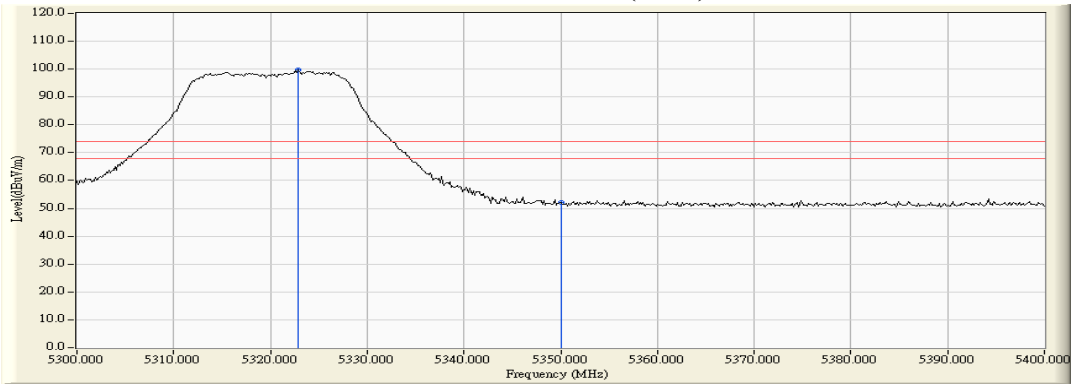
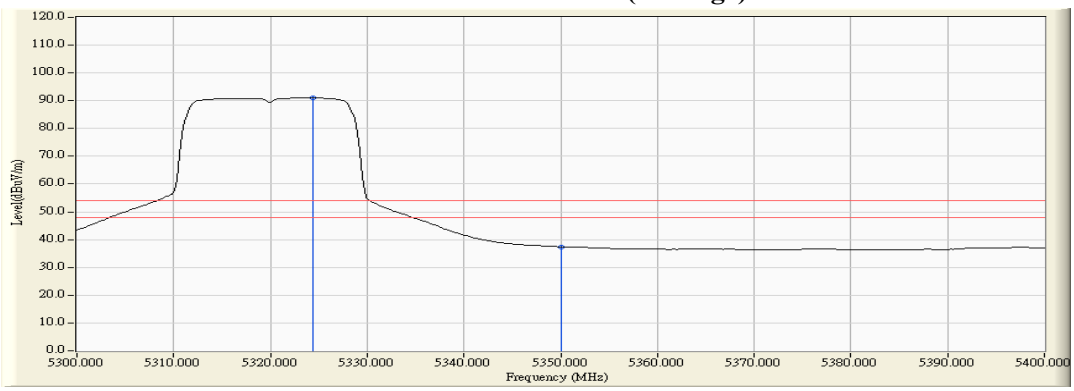


Figure Channel 64: Horizontal (Average)



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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2017/03/23
Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5320MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
64 (Peak)	5326.522	13.013	96.720	109.733	--	--	--
64 (Peak)	5350.000	12.999	44.462	57.461	74.00	54.00	Pass
64 (Peak)	5350.725	13.000	45.821	58.820	74.00	54.00	Pass
64 (Average)	5324.058	13.015	88.653	101.668	--	--	--
64 (Average)	5350.000	12.999	31.281	44.280	74.00	54.00	Pass

Figure Channel 64: Vertical (Peak)

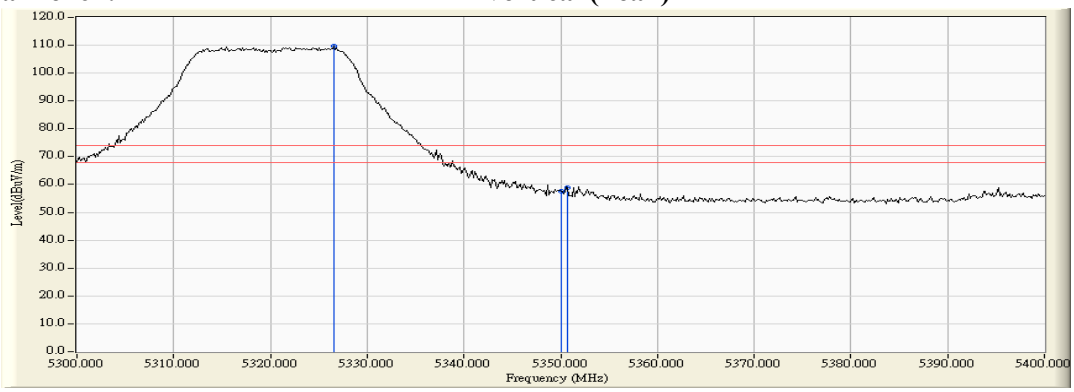
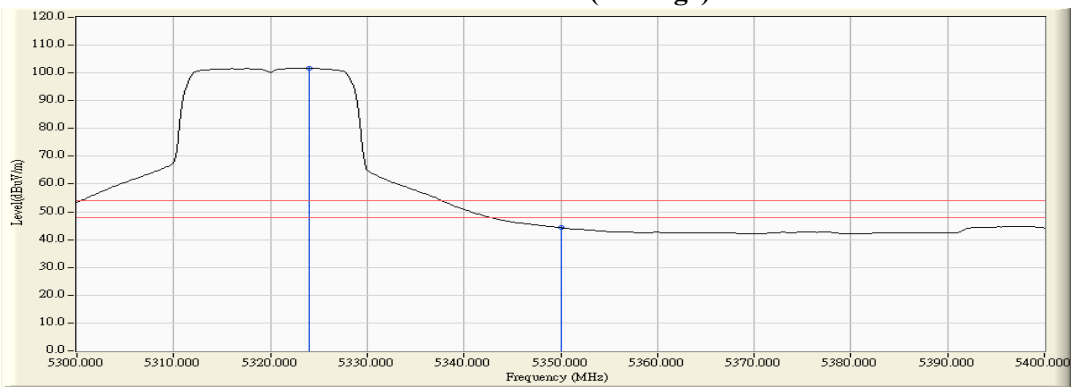


Figure Channel 64: Vertical (Average)



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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2017/03/23
Test Mode : Mode 1: Transmit (802.11a-6Mbps) (5500MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
100 (Peak)	5459.275	11.692	40.325	52.018	74.00	54.00	Pass
100 (Peak)	5460.000	11.703	38.449	50.152	74.00	54.00	Pass
100 (Peak)	5504.203	12.198	82.327	94.525	-	--	--
100 (Average)	5425.507	11.238	26.292	37.531	74.00	54.00	Pass
100 (Average)	5460.000	11.703	24.088	35.791	74.00	54.00	Pass
100 (Average)	5496.087	12.141	74.919	87.060	--	--	--

Figure Channel 100: Horizontal (Peak)

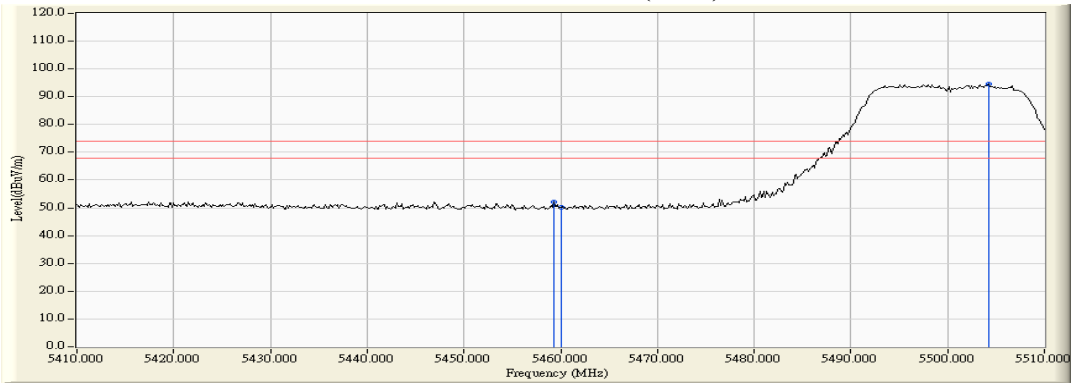
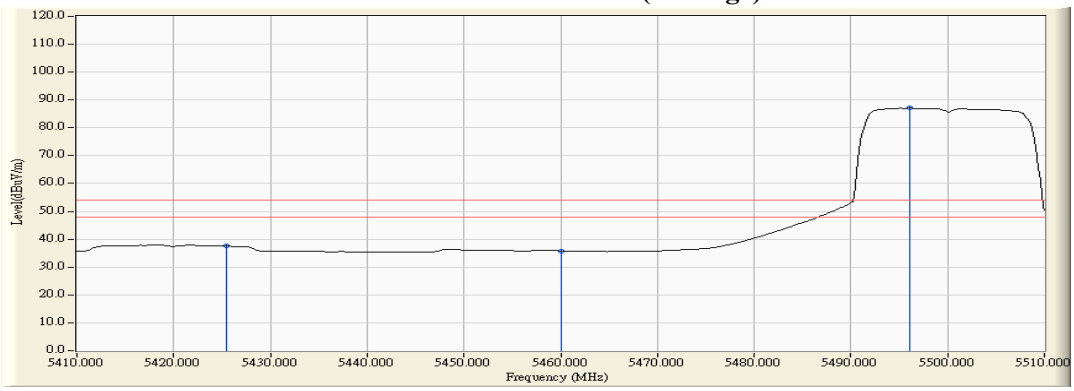


Figure Channel 100: Horizontal (Average)



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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2017/03/23
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)	Arerage Limit (dBμV/m)	Result
100 (Peak)	5427.246	13.158	43.824	56.983	74.00	54.00	Pass
100 (Peak)	5460.000	13.390	39.727	53.117	74.00	54.00	Pass
100 (Peak)	5503.043	13.639	93.622	107.261	--	--	--
100 (Average)	5425.652	13.148	33.623	46.770	74.00	54.00	Pass
100 (Average)	5460.000	13.390	27.496	40.886	74.00	54.00	Pass
100 (Average)	5505.652	13.641	86.107	99.748	--	--	--

Figure Channel 100: Vertical (Peak)

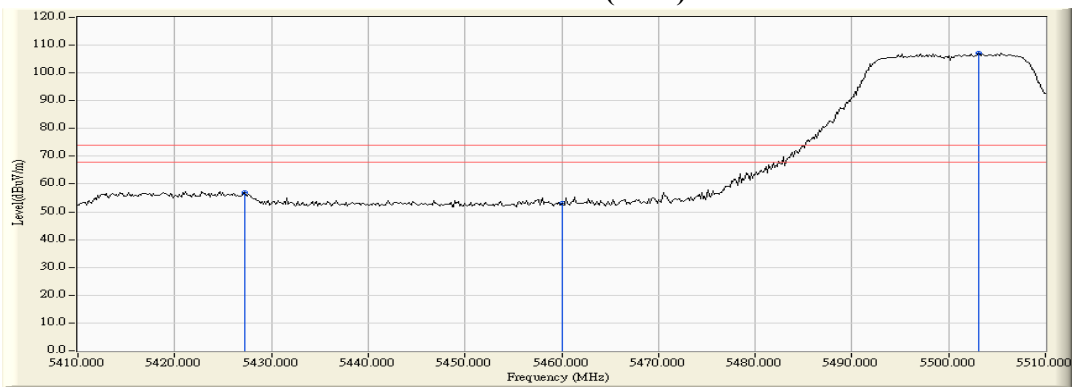
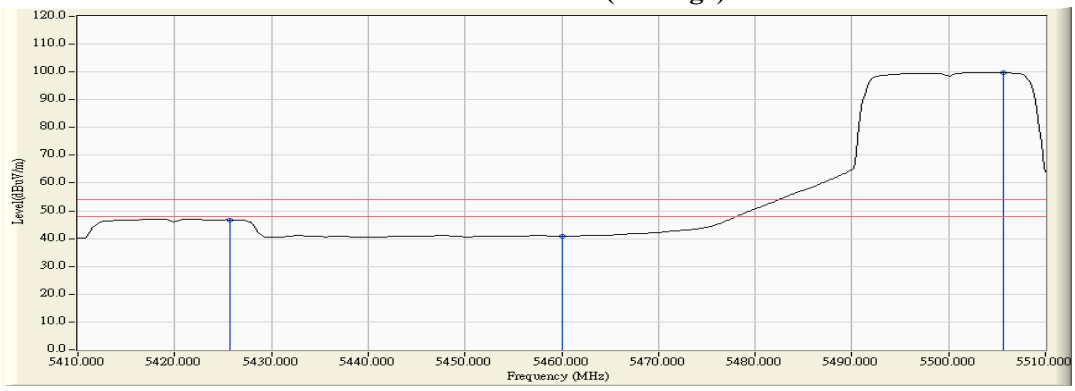


Figure Channel 100: Vertical (Average)

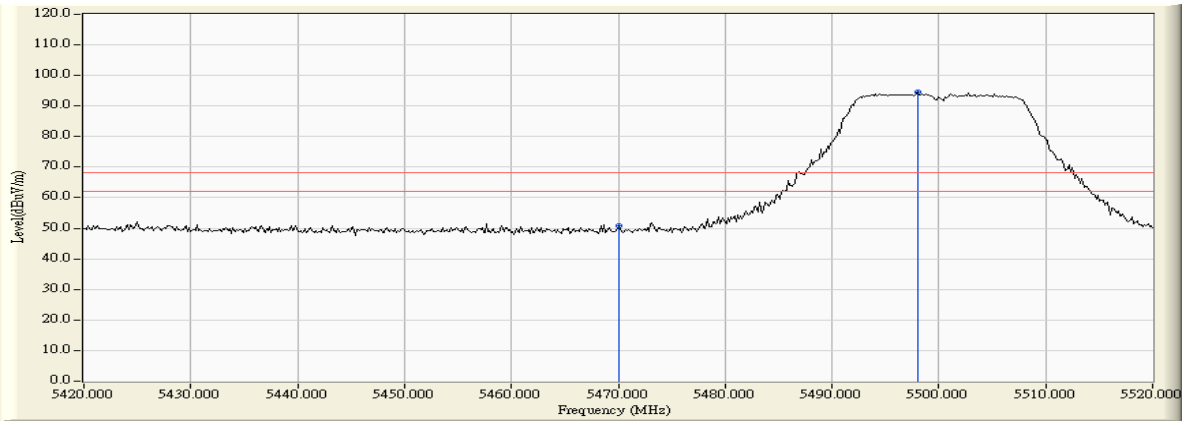


Note:

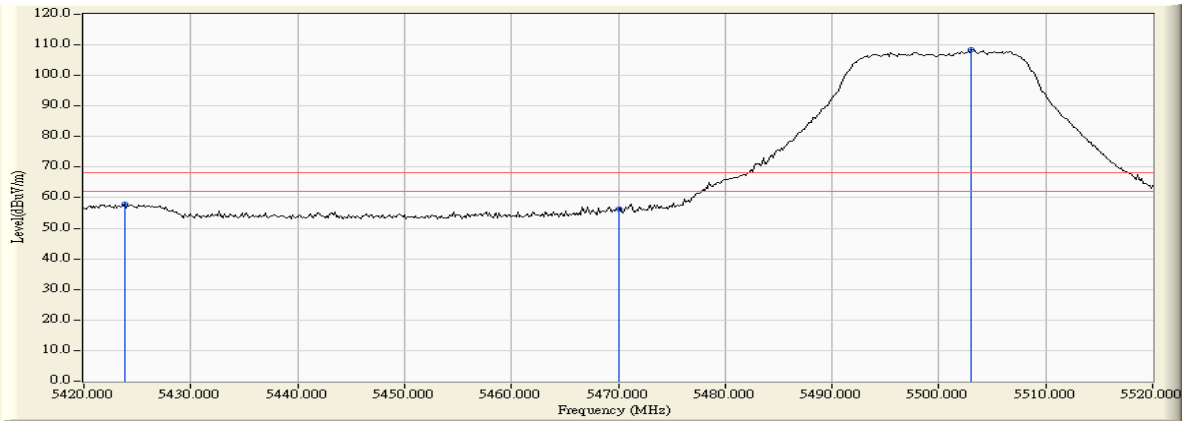
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading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

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5500MHz)

RF Radiated Measurement:



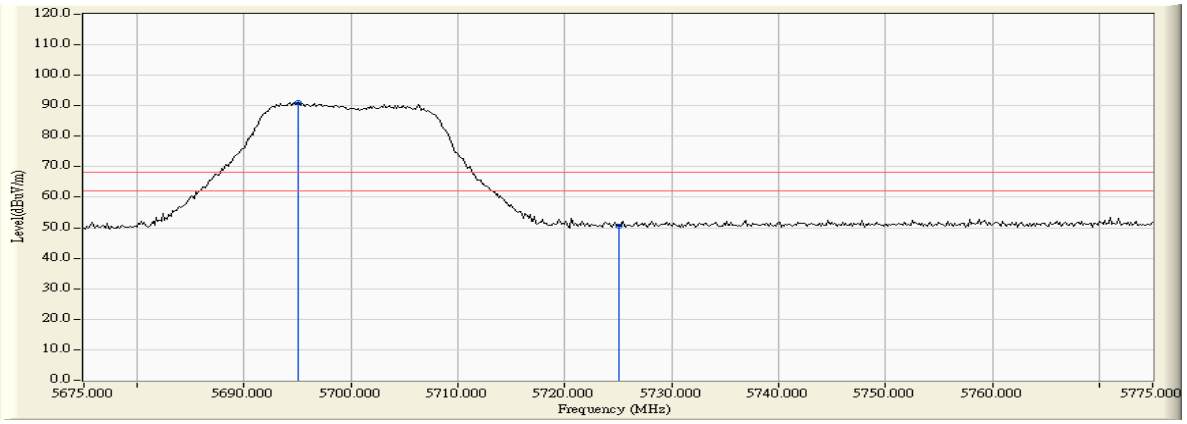
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Horizontal	5470.000	11.838	38.983	50.821	-17.399	68.220	Pass
Horizontal	5497.971	12.154	82.317	94.472	26.252	68.220	Pass



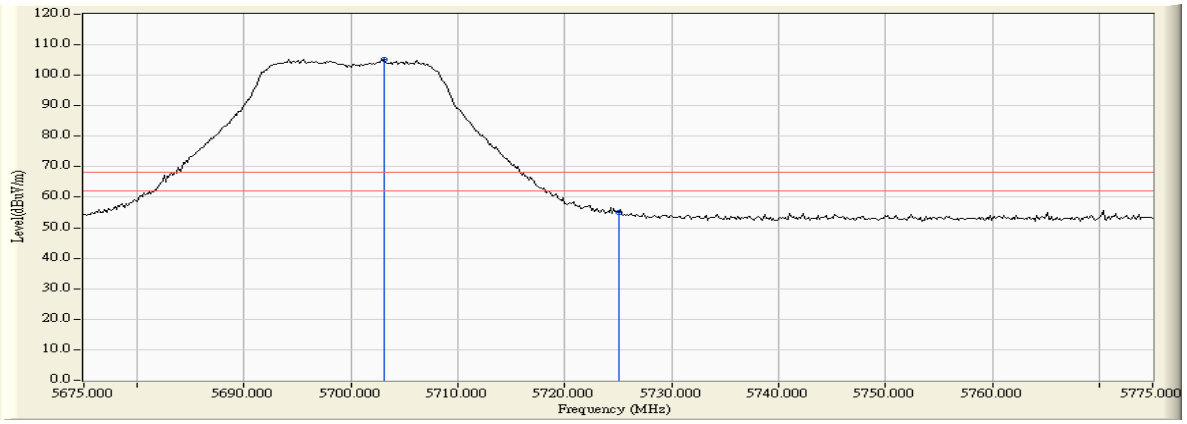
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Vertical	5423.768	13.134	44.801	57.935	-10.285	68.220	Pass
Vertical	5470.000	13.462	42.820	56.282	-11.938	68.220	Pass
Vertical	5503.043	13.639	94.863	108.502	40.282	68.220	Pass

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5700MHz)

RF Radiated Measurement:



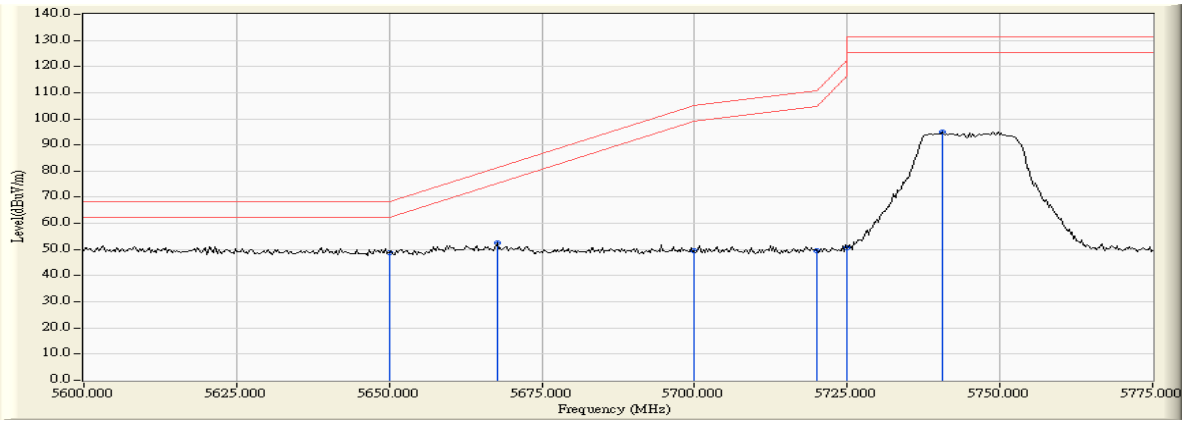
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5695.000	11.651	79.546	91.197	22.977	68.220	Pass
Horizontal	5725.000	11.592	39.026	50.618	-17.602	68.220	Pass



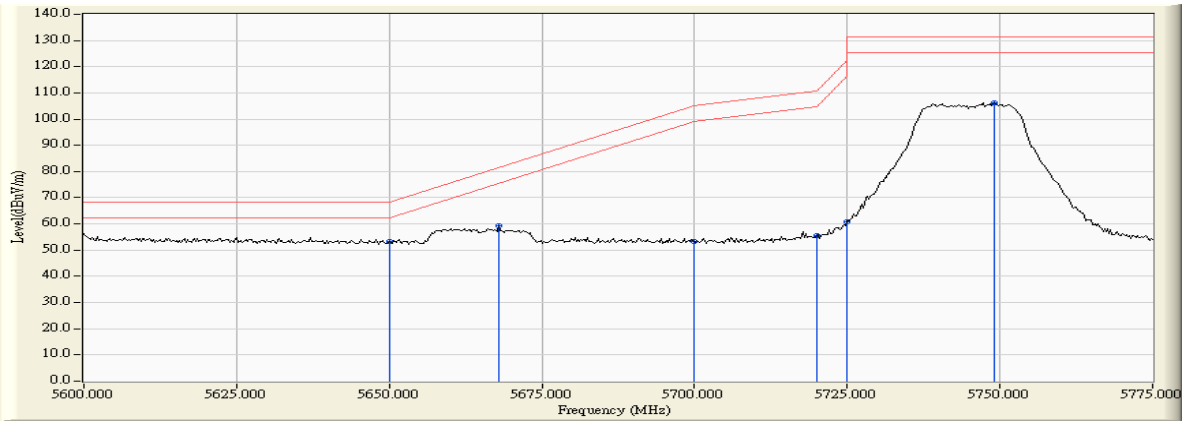
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5703.116	12.997	92.228	105.225	37.005	68.220	Pass
Vertical	5725.000	12.930	42.131	55.061	-13.159	68.220	Pass

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5745MHz)

RF Radiated Measurement:



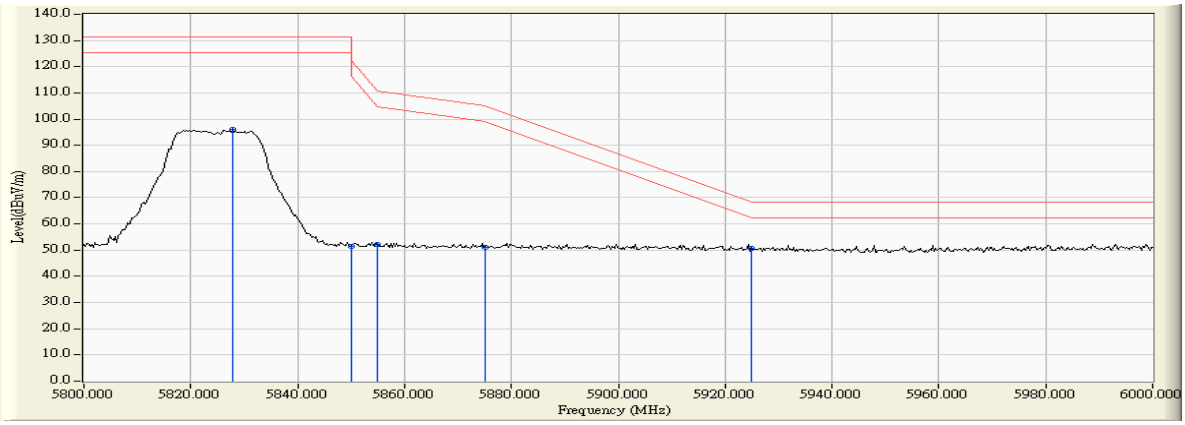
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5650.000	11.554	37.408	48.963	-19.257	68.220	Pass
Horizontal	5667.717	11.597	40.976	52.573	-28.750	81.323	Pass
Horizontal	5700.000	11.647	37.743	49.390	-55.810	105.200	Pass
Horizontal	5720.000	11.607	38.092	49.699	-61.101	110.800	Pass
Horizontal	5725.000	11.592	38.983	50.575	-71.625	122.200	Pass
Horizontal	5740.507	11.543	83.496	95.039	-36.161	131.200	Pass



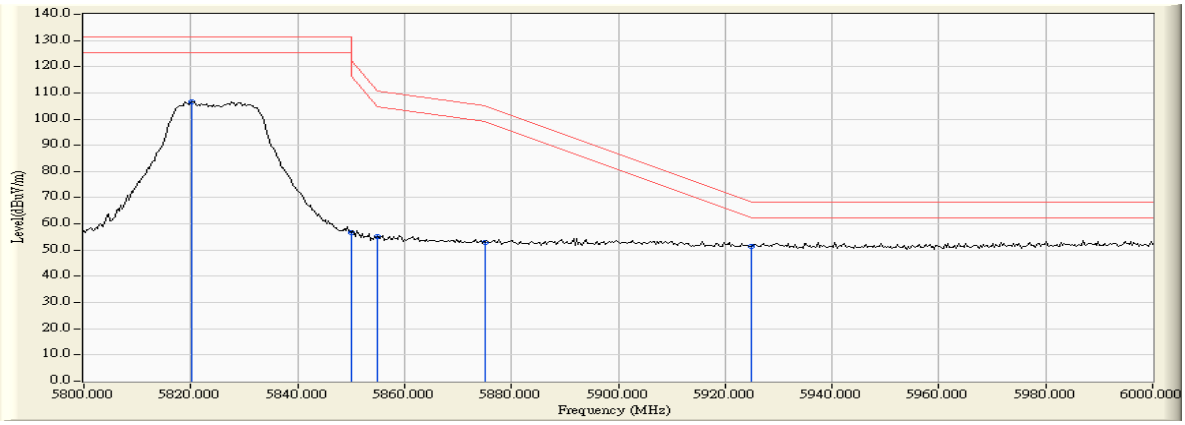
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5650.000	13.029	40.317	53.346	-14.874	68.220	Pass
Vertical	5667.971	13.026	46.325	59.351	-22.160	81.511	Pass
Vertical	5700.000	13.003	40.114	53.117	-52.083	105.200	Pass
Vertical	5720.000	12.947	42.536	55.483	-55.317	110.800	Pass
Vertical	5725.000	12.930	47.827	60.757	-61.443	122.200	Pass
Vertical	5749.130	12.846	93.343	106.189	-25.011	131.200	Pass

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 1: Transmit (802.11a-6Mbps) (5825MHz)

RF Radiated Measurement:



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5827.826	11.547	84.590	96.137	-35.063	131.200	Pass
Horizontal	5850.000	11.701	39.859	51.560	-70.640	122.200	Pass
Horizontal	5855.000	11.735	40.327	52.062	-58.738	110.800	Pass
Horizontal	5875.000	11.873	39.310	51.183	-54.017	105.200	Pass
Horizontal	5925.000	12.068	38.746	50.815	-17.385	68.200	Pass



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5820.290	12.712	93.927	106.638	-24.562	131.200	Pass
Vertical	5850.000	12.774	44.063	56.837	-65.363	122.200	Pass
Vertical	5855.000	12.784	42.378	55.162	-55.638	110.800	Pass
Vertical	5875.000	12.825	40.065	52.890	-52.310	105.200	Pass
Vertical	5925.000	12.911	38.525	51.436	-16.764	68.200	Pass

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/05/12
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (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)	5147.391	10.478	40.331	50.808	74.00	54.00	Pass
36 (Peak)	5150.000	10.470	38.735	49.206	74.00	54.00	Pass
36 (Peak)	5186.522	10.378	87.519	97.896	--	--	--
36 (Average)	5104.493	10.563	28.932	39.495	74.00	54.00	Pass
36 (Average)	5150.000	10.470	25.530	36.001	74.00	54.00	Pass
36 (Average)	5177.681	10.400	78.256	88.656	--	--	--

Figure Channel 36: Horizontal (Peak)

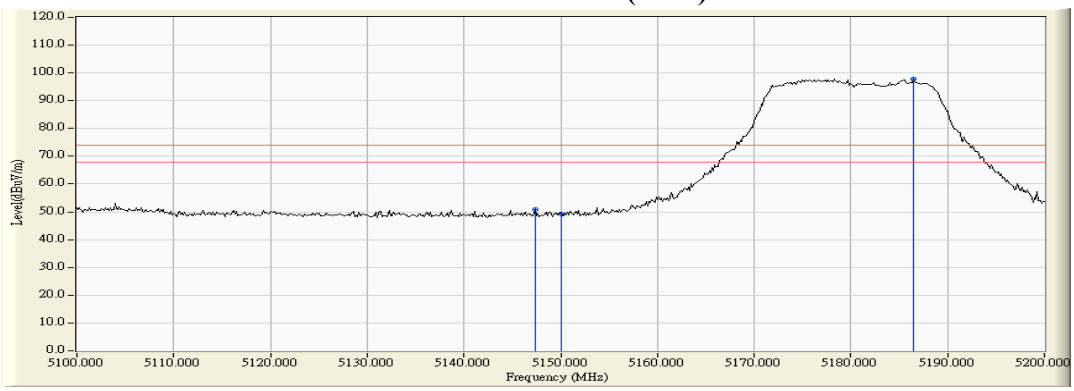
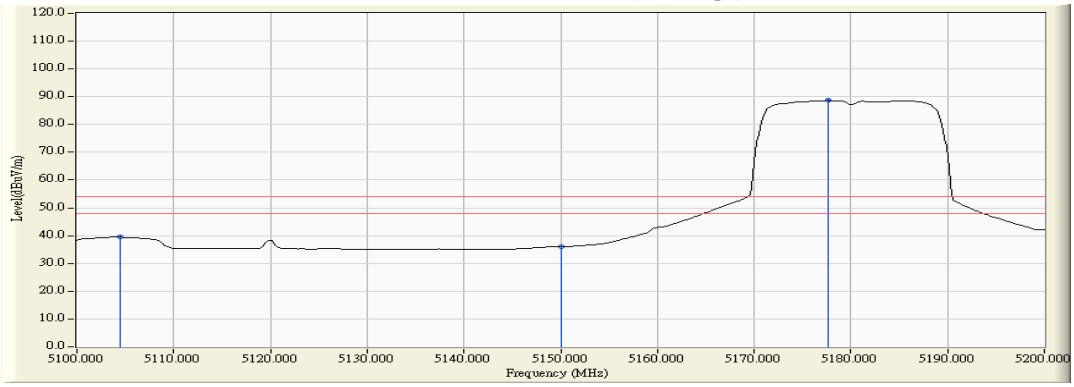


Figure Channel 36: Horizontal (Average)



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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (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)	5105.942	12.234	47.612	59.846	74.00	54.00	Pass
36 (Peak)	5150.000	12.390	45.138	57.528	74.00	54.00	Pass
36 (Peak)	5186.522	12.526	99.114	111.640	--	--	--
36 (Average)	5104.203	12.230	38.074	50.304	74.00	54.00	Pass
36 (Average)	5150.000	12.390	33.428	45.818	74.00	54.00	Pass
36 (Average)	5178.696	12.497	89.104	101.600	--	--	--

Figure Channel 36: Vertical (Peak)

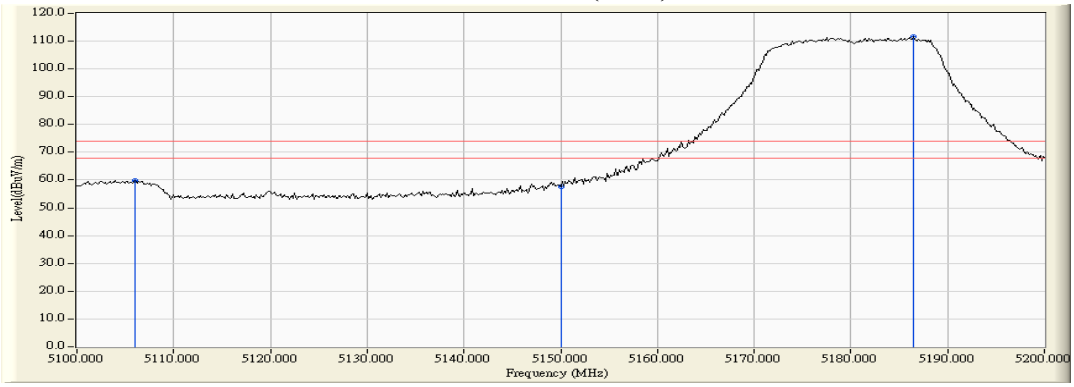
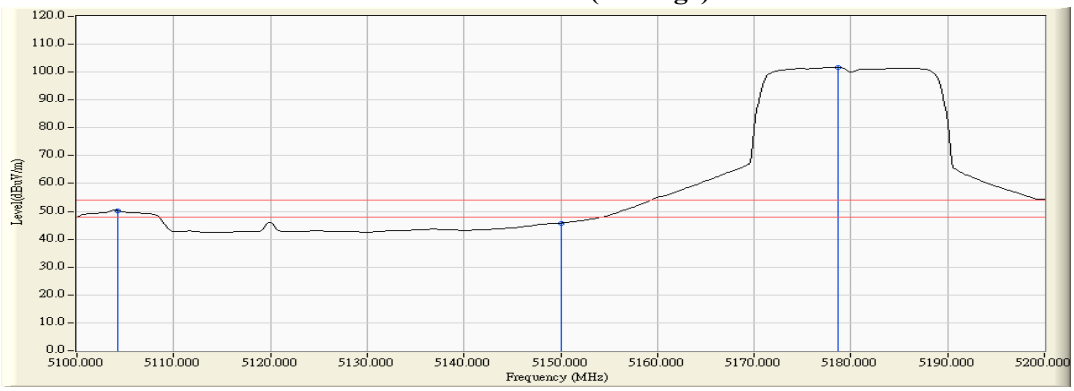


Figure Channel 36: Vertical (Average)



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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2017/05/12
Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5320MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
64 (Peak)	5324.638	11.088	91.106	102.195	--	--	--
64 (Peak)	5350.000	11.024	42.067	53.091	74.00	54.00	Pass
64 (Average)	5317.246	11.108	81.169	92.277	--	--	--
64 (Average)	5350.000	11.024	27.575	38.599	74.00	54.00	Pass

Figure Channel 64: Horizontal (Peak)

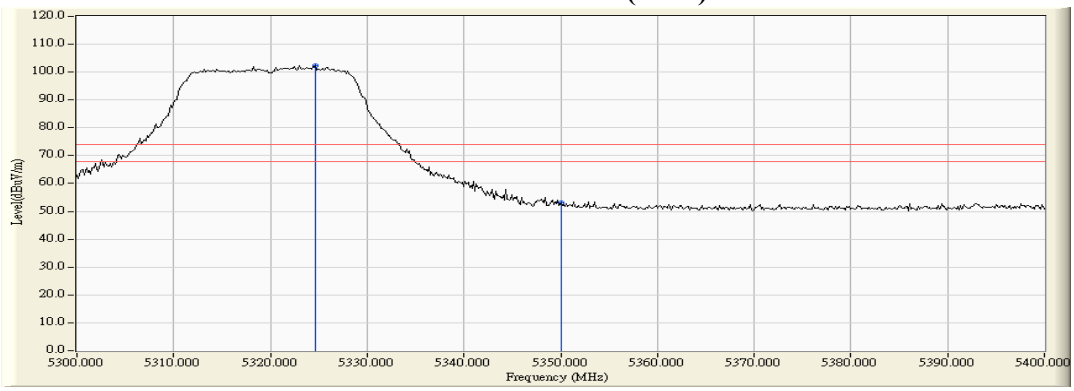
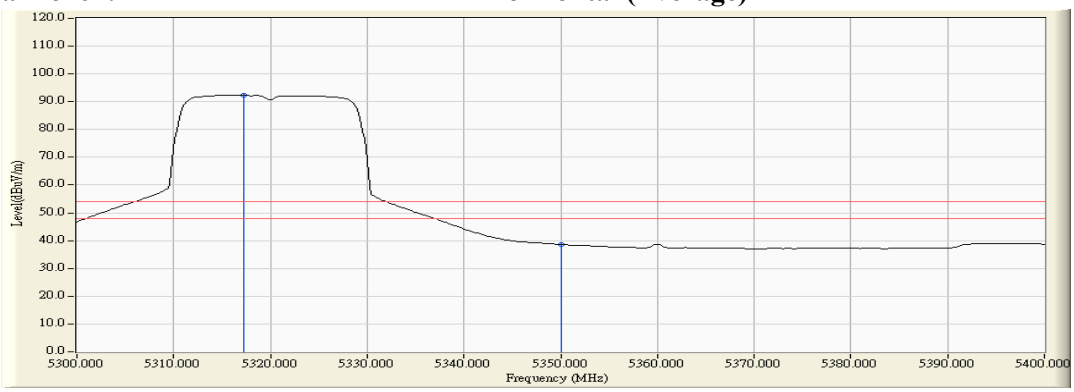


Figure Channel 64: Horizontal (Average)



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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/05/12
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5320MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
64 (Peak)	5315.797	13.021	100.858	113.878	--	--	--
64 (Peak)	5350.000	12.999	49.551	62.550	74.00	54.00	Pass
64 (Peak)	5351.159	12.999	52.186	65.185	74.00	54.00	Pass
64 (Average)	5316.232	13.020	91.395	104.415	--	--	--
64 (Average)	5350.000	12.999	35.331	48.330	74.00	54.00	Pass

Figure Channel 64: Vertical (Peak)

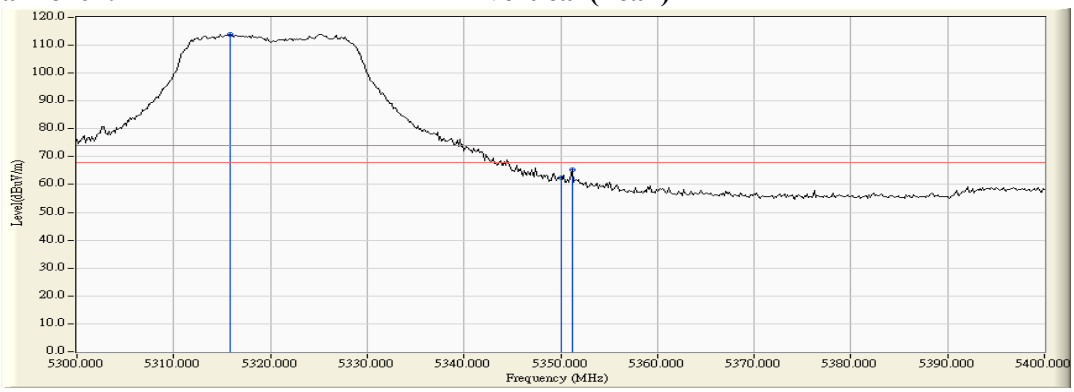
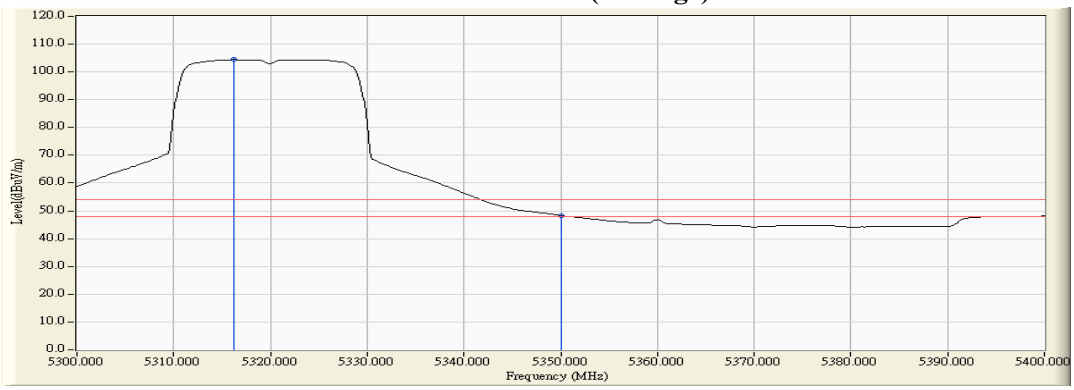


Figure Channel 64: Vertical (Average)



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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5500MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
100 (Peak)	5460.000	11.703	38.586	50.289	74.00	54.00	Pass
100 (Peak)	5494.493	12.130	84.931	97.061	--	--	--
100 (Average)	5455.942	11.648	25.605	37.253	74.00	54.00	Pass
100 (Average)	5460.000	11.703	24.459	36.162	74.00	54.00	Pass
100 (Average)	5496.522	12.144	74.778	86.922	--	--	--

Figure Channel 100: Horizontal (Peak)

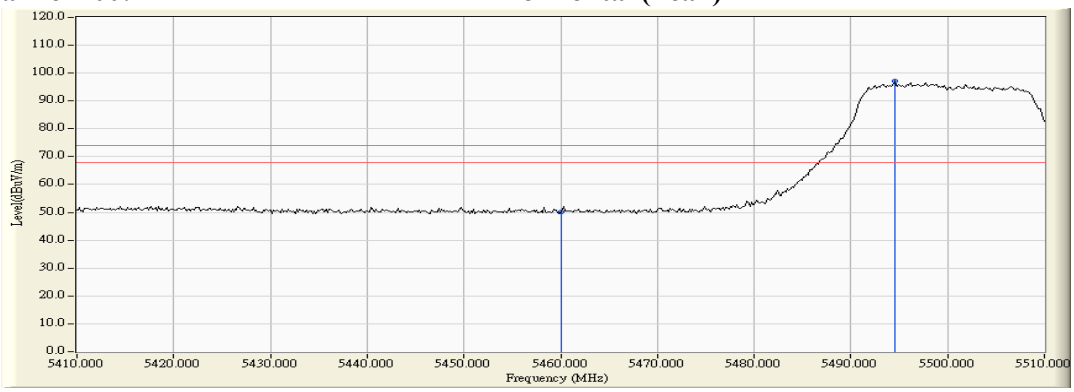
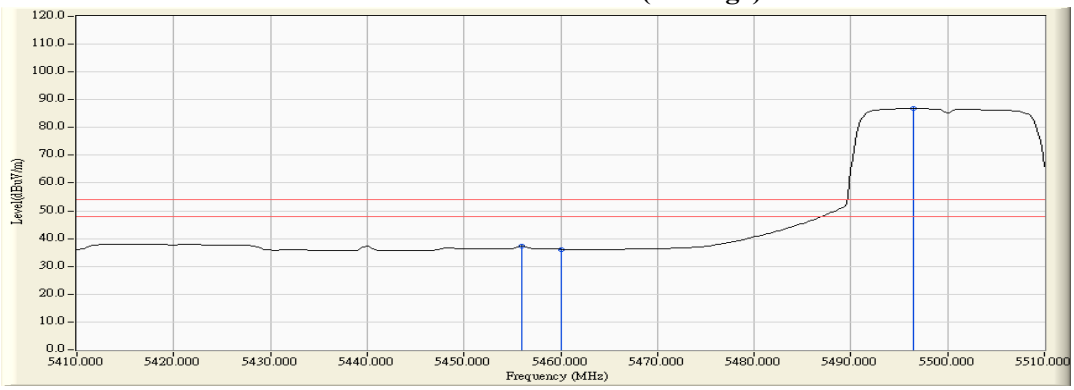


Figure Channel 100: Horizontal (Average)



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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2017/03/23
Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5500MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
100 (Peak)	5426.377	13.153	46.115	59.268	74.00	54.00	Pass
100 (Peak)	5460.000	13.390	41.347	54.737	74.00	54.00	Pass
100 (Peak)	5505.362	13.642	96.093	109.735	--	--	--
100 (Average)	5440.000	13.249	38.062	51.311	74.00	54.00	Pass
100 (Average)	5460.000	13.390	30.442	43.832	74.00	54.00	Pass
100 (Average)	5496.522	13.618	86.154	99.772	--	--	--

Figure Channel 100: Vertical (Peak)

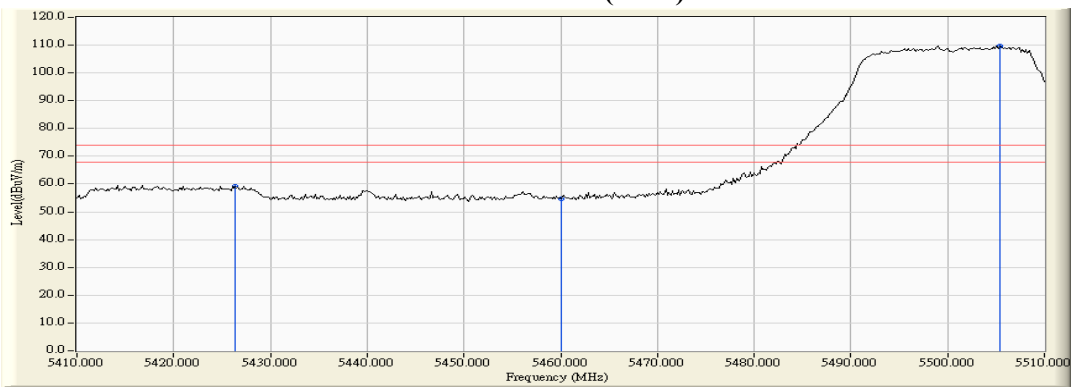
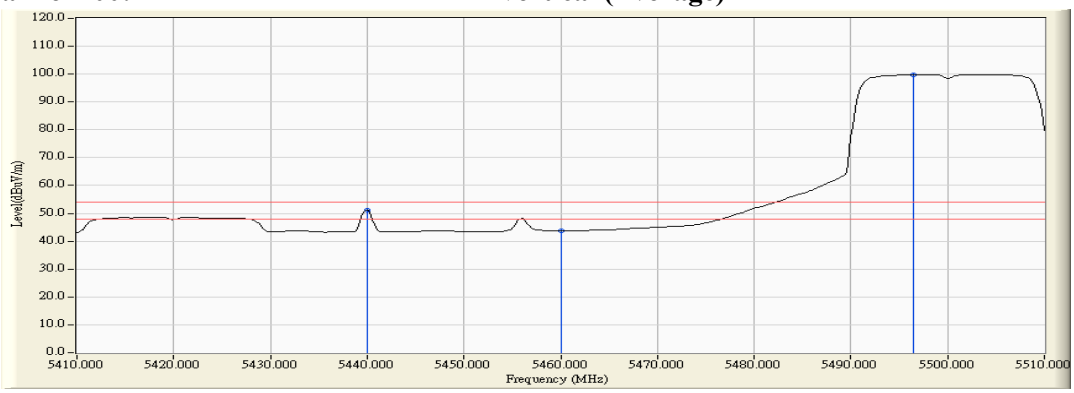


Figure Channel 100: Vertical (Average)

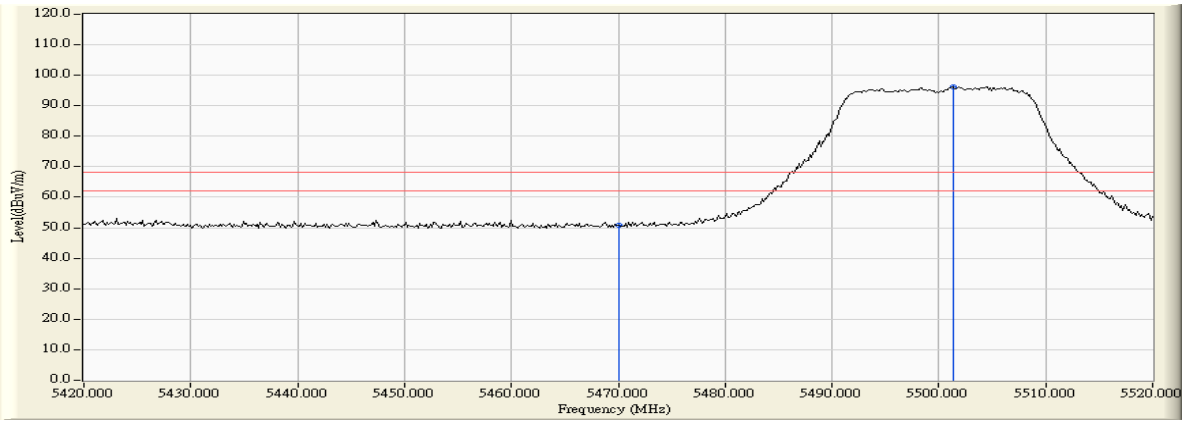


Note:

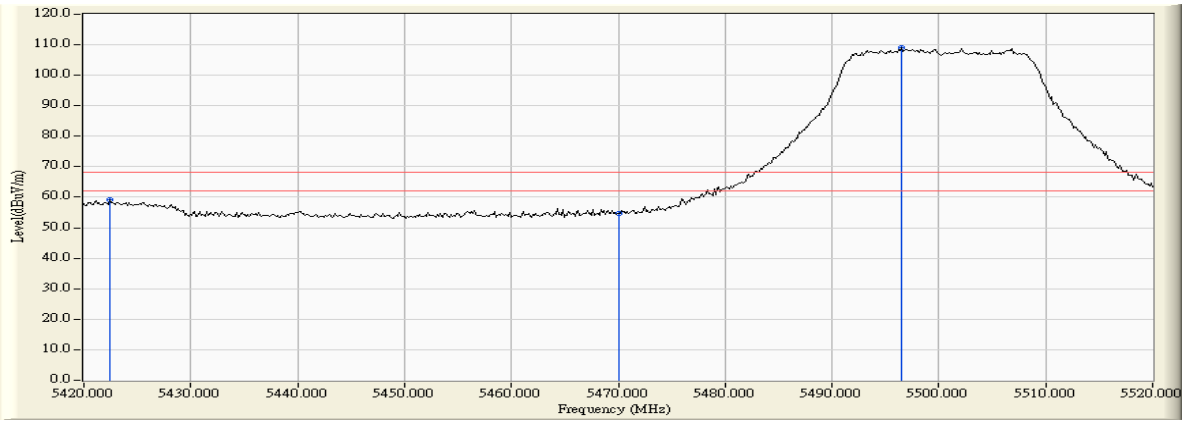
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading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

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/05/12
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5500MHz)

RF Radiated Measurement:



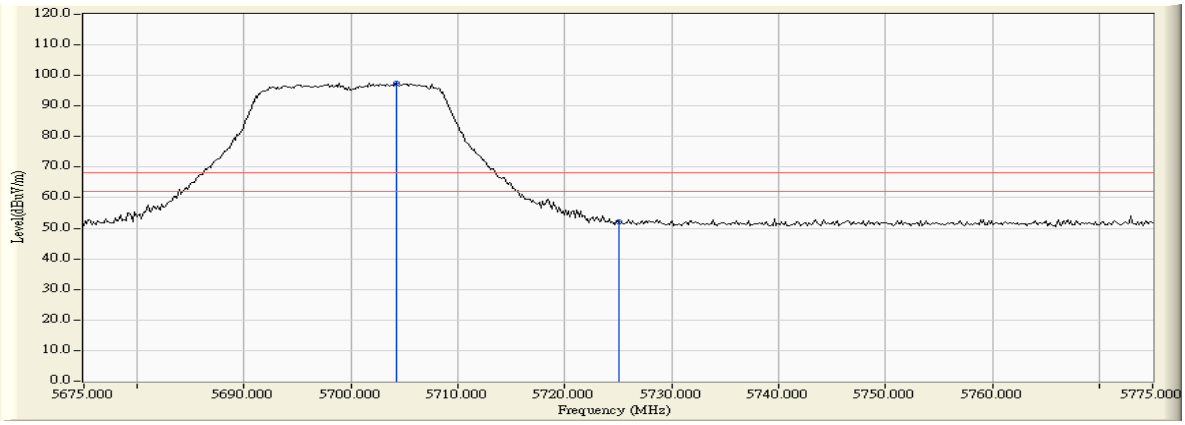
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5470.000	11.838	38.997	50.835	-17.385	68.220	Pass
Horizontal	5501.304	12.178	84.068	96.246	28.026	68.220	Pass



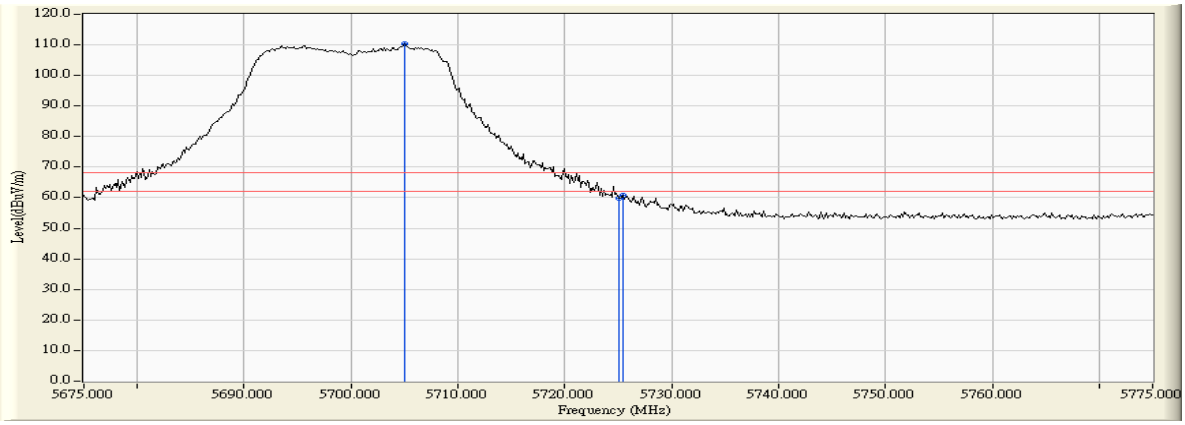
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5422.464	13.124	46.153	59.278	-8.942	68.220	Pass
Vertical	5470.000	13.462	41.189	54.651	-13.569	68.220	Pass
Vertical	5496.522	13.618	95.384	109.002	40.782	68.220	Pass

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5700MHz)

RF Radiated Measurement:



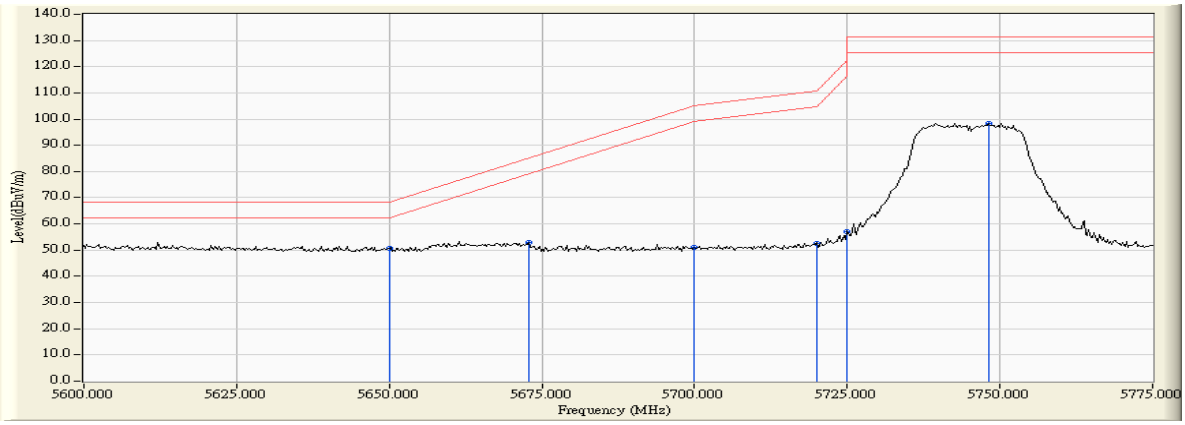
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5704.275	11.645	85.857	97.502	29.282	68.220	Pass
Horizontal	5725.000	11.592	40.510	52.102	-16.118	68.220	Pass



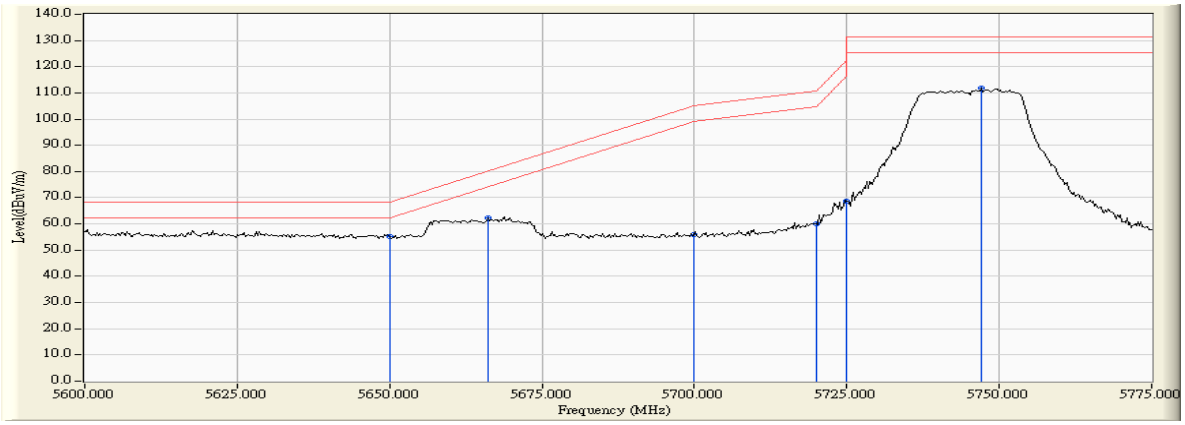
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5705.000	12.993	97.270	110.263	42.043	68.220	Pass
Vertical	5725.000	12.930	46.749	59.679	-8.541	68.220	Pass
Vertical	5725.435	12.929	47.933	60.862	-7.358	68.220	Pass

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5745MHz)

RF Radiated Measurement:



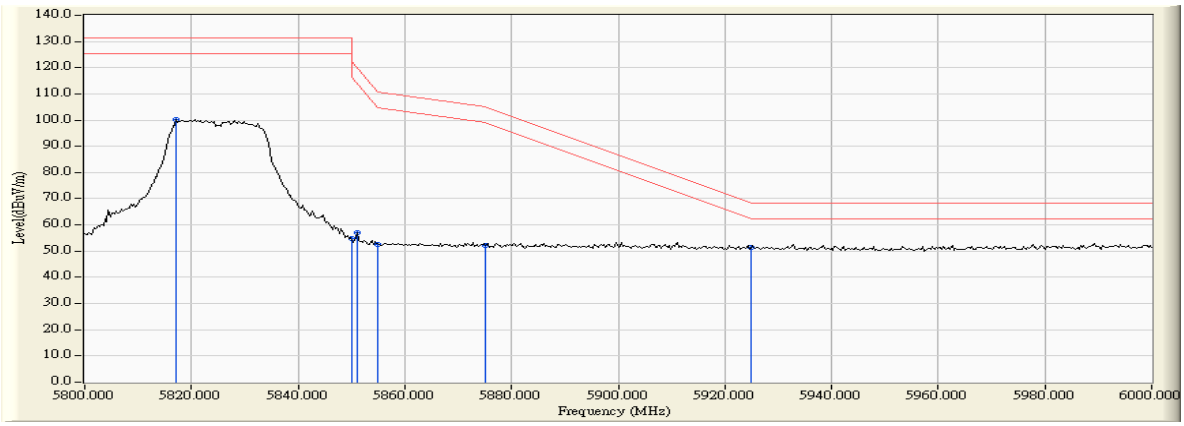
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5650.000	11.554	39.089	50.644	-17.576	68.220	Pass
Horizontal	5672.790	11.609	41.352	52.961	-32.114	85.075	Pass
Horizontal	5700.000	11.647	39.264	50.911	-54.289	105.200	Pass
Horizontal	5720.000	11.607	40.997	52.604	-58.196	110.800	Pass
Horizontal	5725.000	11.592	45.333	56.925	-65.275	122.200	Pass
Horizontal	5748.116	11.519	86.956	98.474	-32.726	131.200	Pass



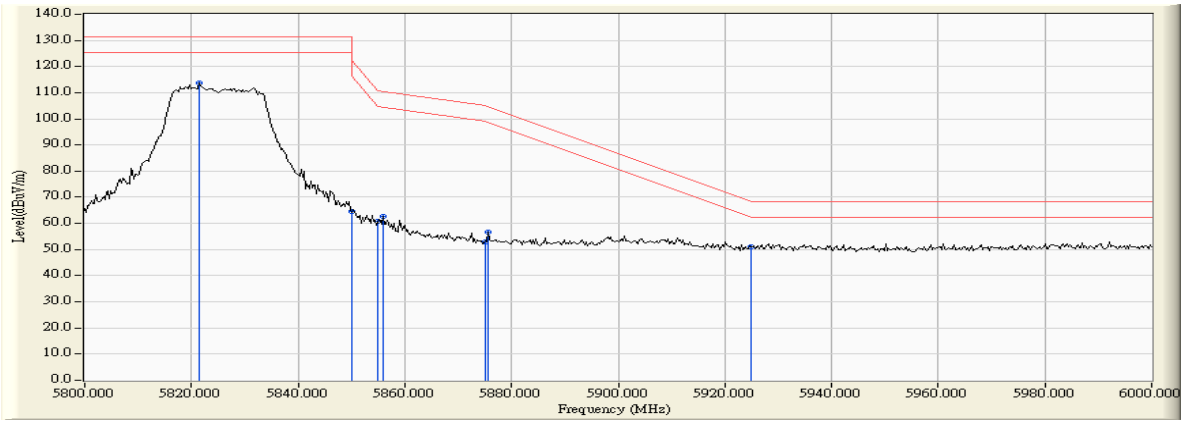
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5650.000	13.029	41.965	54.994	-13.226	68.220	Pass
Vertical	5666.196	13.026	49.396	62.422	-17.777	80.199	Pass
Vertical	5700.000	13.003	43.040	56.043	-49.157	105.200	Pass
Vertical	5720.000	12.947	47.070	60.017	-50.783	110.800	Pass
Vertical	5725.000	12.930	55.713	68.643	-53.557	122.200	Pass
Vertical	5747.101	12.853	98.867	111.720	-19.480	131.200	Pass

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 2: Transmit (802.11n-20BW 14.4Mbps) (5825MHz)

RF Radiated Measurement:



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5817.101	11.474	88.744	100.218	-30.982	131.200	Pass
Horizontal	5850.000	11.701	43.028	54.729	-67.471	122.200	Pass
Horizontal	5851.014	11.707	45.303	57.011	-62.877	119.888	Pass
Horizontal	5855.000	11.735	40.778	52.513	-58.287	110.800	Pass
Horizontal	5875.000	11.873	40.360	52.233	-52.967	105.200	Pass
Horizontal	5925.000	12.068	39.248	51.317	-16.883	68.200	Pass



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5821.449	12.713	101.128	113.842	-17.358	131.200	Pass
Vertical	5850.000	12.774	51.957	64.731	-57.469	122.200	Pass
Vertical	5855.000	12.784	48.131	60.915	-49.885	110.800	Pass
Vertical	5855.942	12.786	49.725	62.511	-48.025	110.536	Pass
Vertical	5875.000	12.825	40.274	53.099	-52.101	105.200	Pass
Vertical	5875.652	12.828	43.666	56.493	-48.225	104.718	Pass
Vertical	5925.000	12.911	38.199	51.110	-17.090	68.200	Pass

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/05/12
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5190MHz)

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
38 (Peak)	5150.000	10.470	39.275	49.746	74.00	54.00	Pass
38 (Peak)	5197.681	10.339	81.867	92.207	--	--	--
38 (Average)	5150.000	10.470	26.048	36.519	74.00	54.00	Pass
38 (Average)	5197.536	10.341	71.466	81.806	--	--	--

Figure Channel 38: Horizontal (Peak)

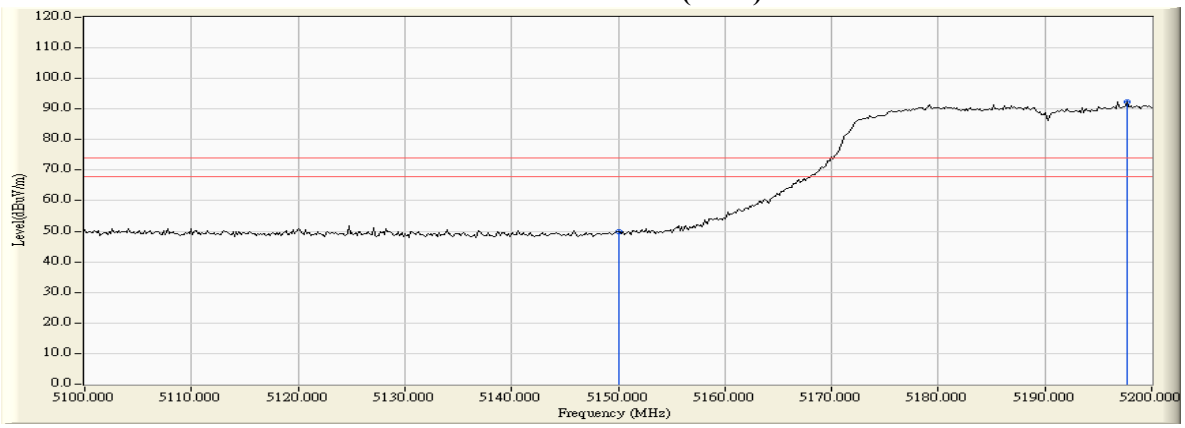
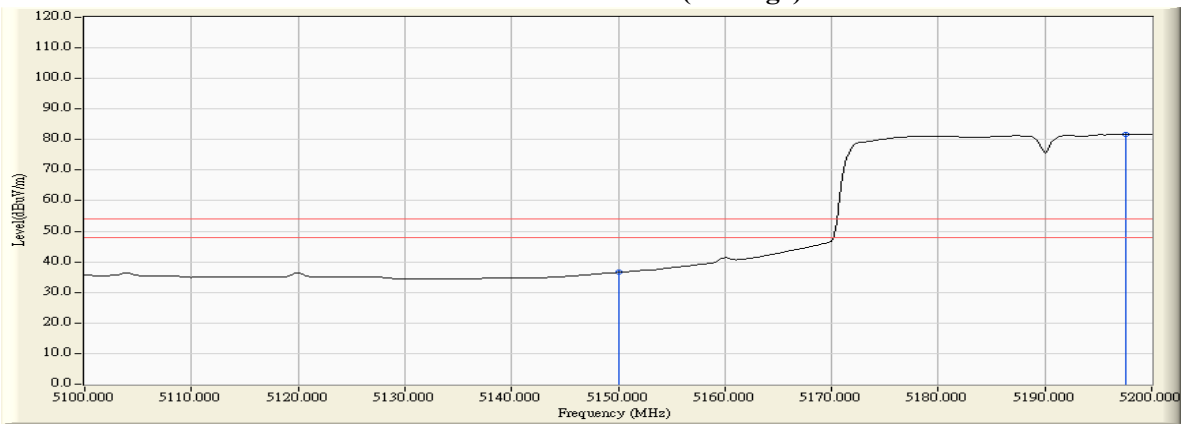


Figure Channel 38: Horizontal (Average)



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	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/05/12
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5190MHz)

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
38 (Peak)	5150.000	12.390	48.436	60.826	74.00	54.00	Pass
38 (Peak)	5195.652	12.553	91.486	104.039	--	--	--
38 (Average)	5150.000	12.390	35.420	47.810	74.00	54.00	Pass
38 (Average)	5197.681	12.558	81.619	94.177	--	--	--

Figure Channel 38: Vertical (Peak)

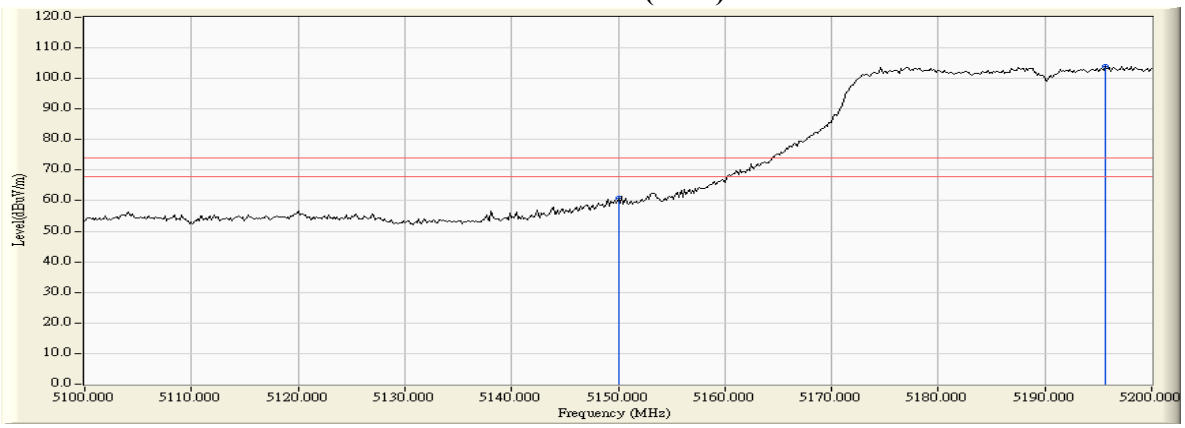
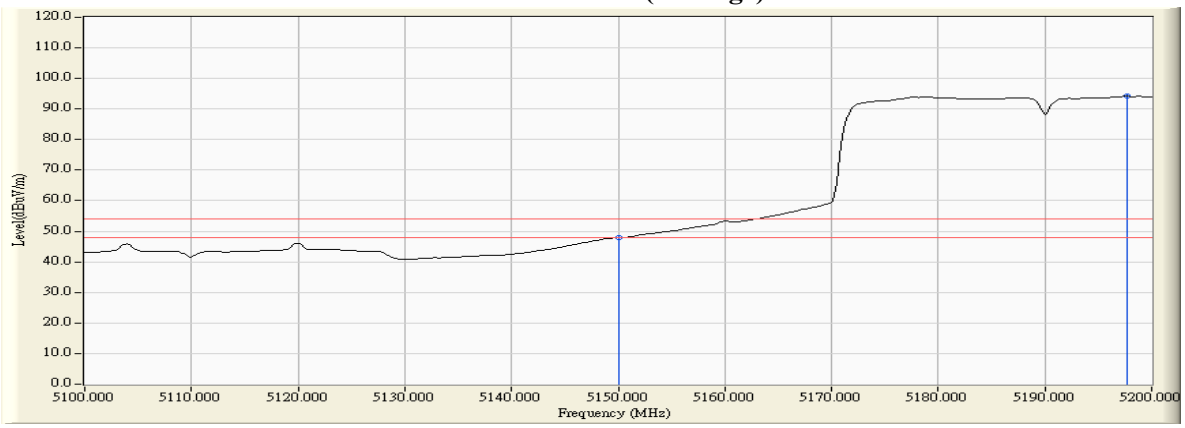


Figure Channel 38: Vertical (Average)



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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2017/05/12
Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5310MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
62 (Peak)	5300.435	11.145	85.781	96.926	--	--	--
62 (Peak)	5350.000	11.024	40.161	51.185	74.00	54.00	Pass
62 (Average)	5303.333	11.144	75.880	87.023	--	--	--
62 (Average)	5350.000	11.024	28.932	39.956	74.00	54.00	Pass

Figure Channel 62: Horizontal (Peak)

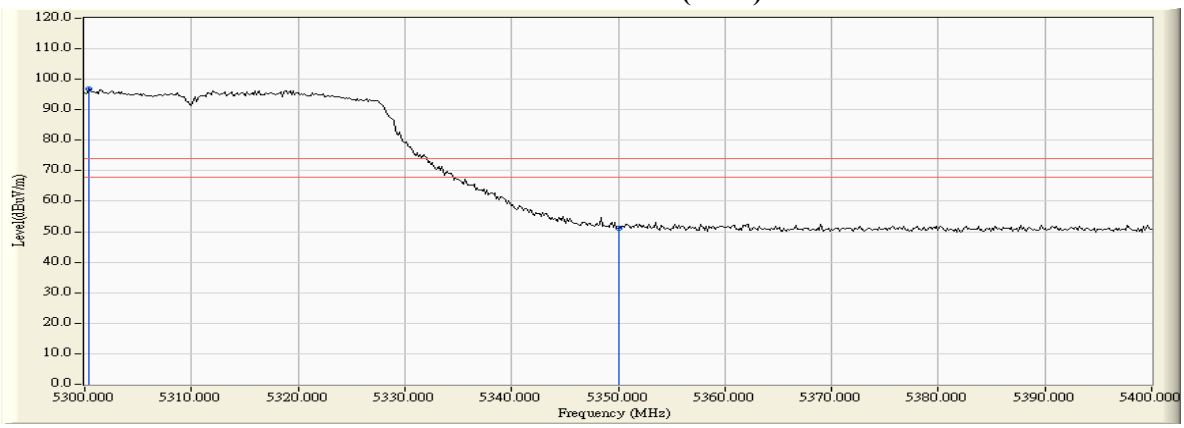
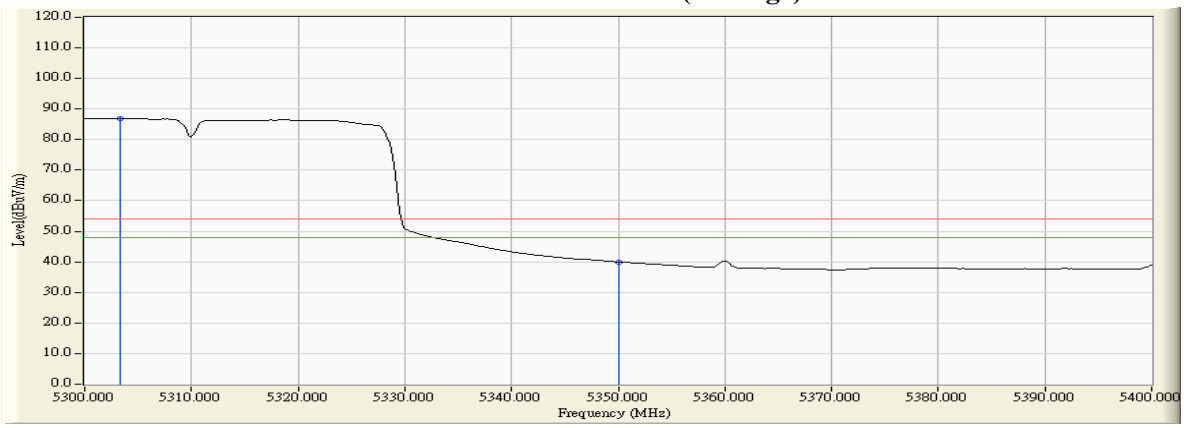


Figure Channel 62: Horizontal (Average)



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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2017/05/12
Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5310MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
62 (Peak)	5300.290	13.026	94.910	107.936	--	--	--
62 (Peak)	5350.000	12.999	47.101	60.100	74.00	54.00	Pass
62 (Average)	5321.304	13.017	84.664	97.681	--	--	--
62 (Average)	5350.000	12.999	36.187	49.186	74.00	54.00	Pass

Figure Channel 62: Vertical (Peak)

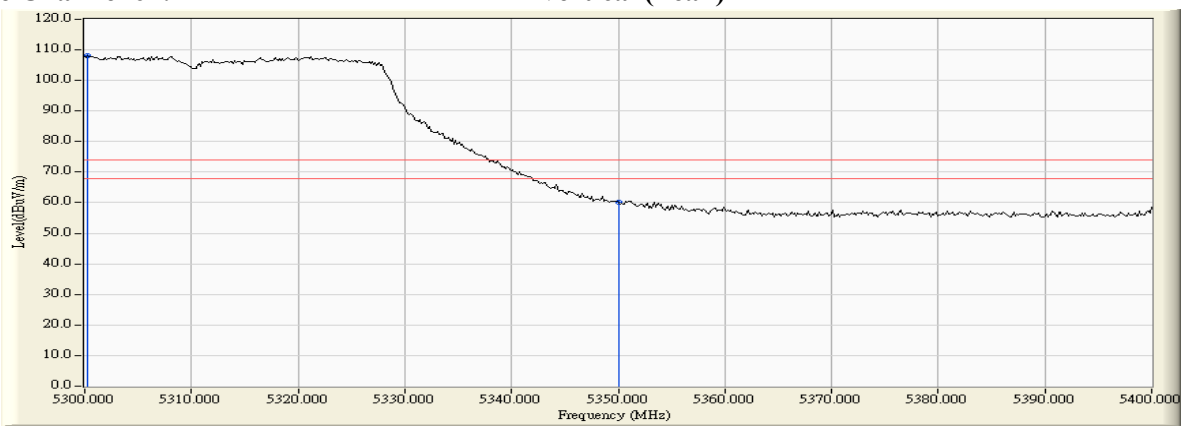
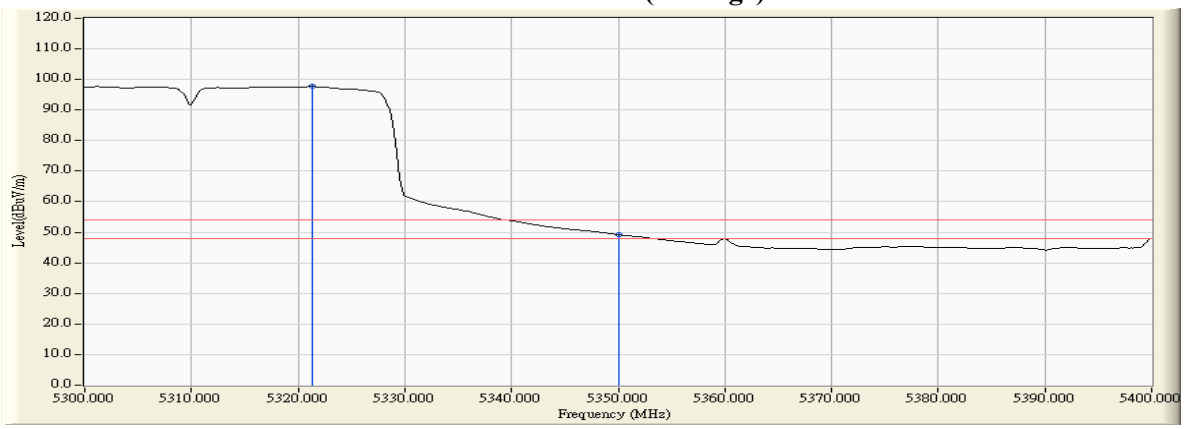


Figure Channel 62: Vertical (Average)



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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2017/05/12
Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5510MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
102 (Peak)	5459.565	11.697	39.830	51.527	74.00	54.00	Pass
102 (Peak)	5460.000	11.703	39.014	50.717	74.00	54.00	Pass
102 (Peak)	5500.145	12.170	79.244	91.414	--	--	--
102 (Average)	5440.145	11.437	26.864	38.301	74.00	54.00	Pass
102 (Average)	5460.000	11.703	24.436	36.139	74.00	54.00	Pass
102 (Average)	5501.014	12.176	68.827	81.003	--	--	--

Figure Channel 102: Horizontal (Peak)

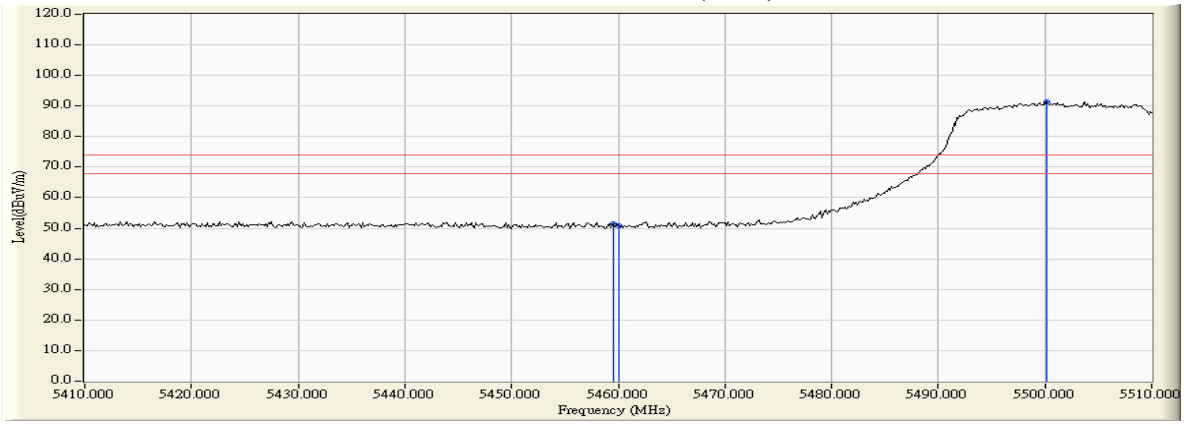
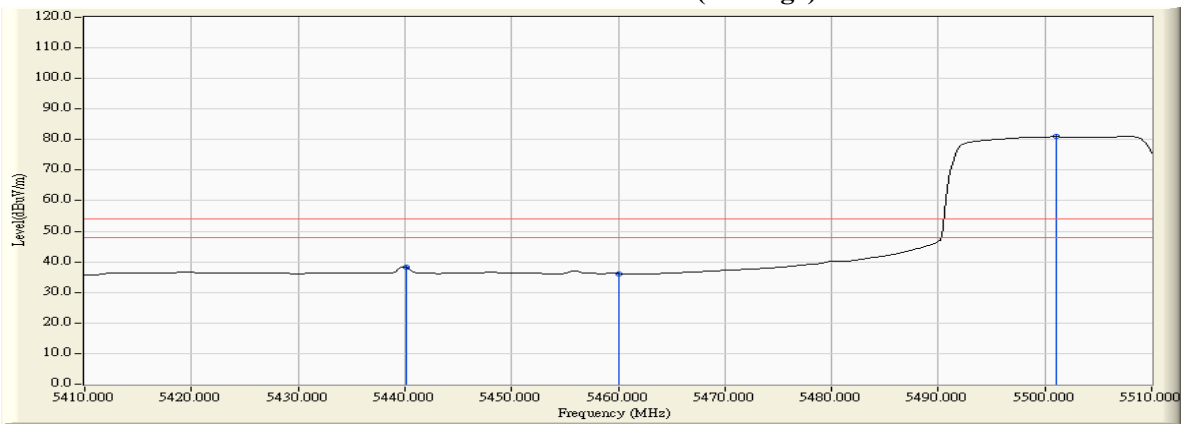


Figure Channel 102: Horizontal (Average)



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 : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Date : 2017/05/12
Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps) (5510MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Arerage Limit (dBμV/m)	Result
102 (Peak)	5440.000	13.249	44.807	58.056	74.00	54.00	Pass
102 (Peak)	5460.000	13.390	40.528	53.918	74.00	54.00	Pass
102 (Peak)	5497.246	13.621	91.073	104.694	--	--	--
102 (Average)	5440.000	13.249	38.066	51.315	74.00	54.00	Pass
102 (Average)	5460.000	13.390	30.286	43.676	74.00	54.00	Pass
102 (Average)	5498.696	13.625	81.124	94.749	--	--	--

Figure Channel 102: Vertical (Peak)

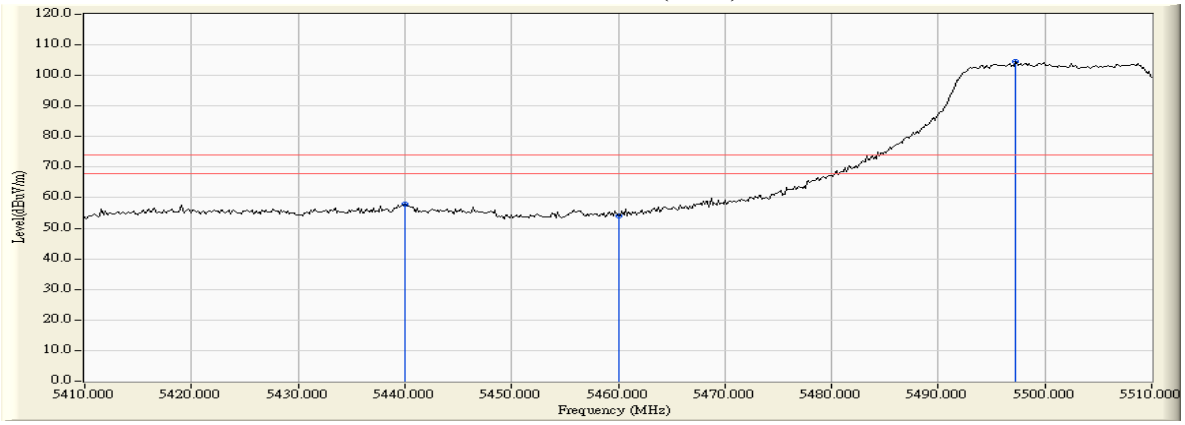
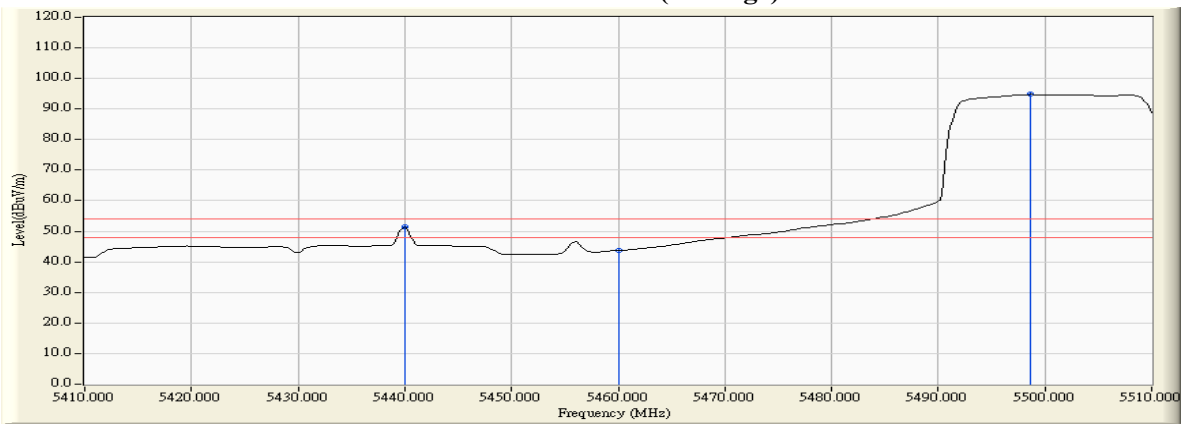


Figure Channel 102: Vertical (Average)

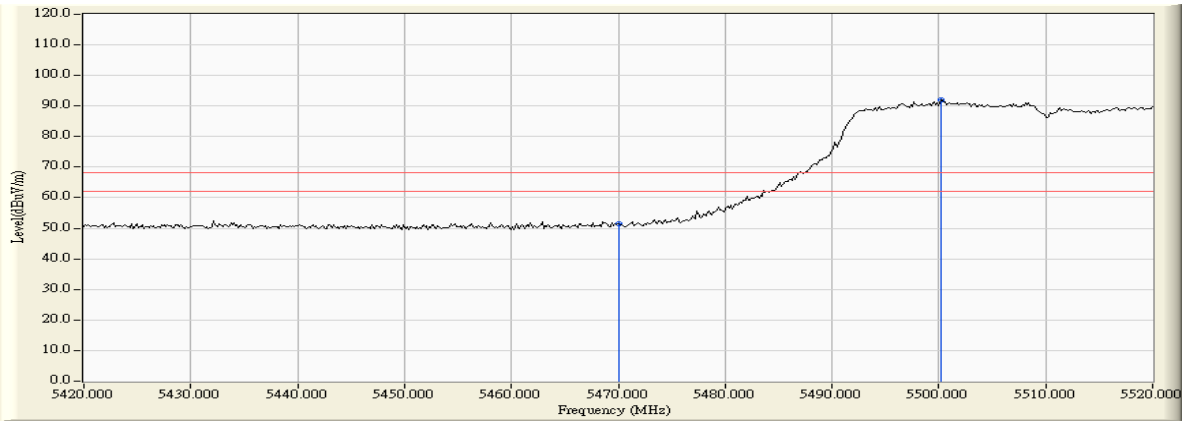


Note:

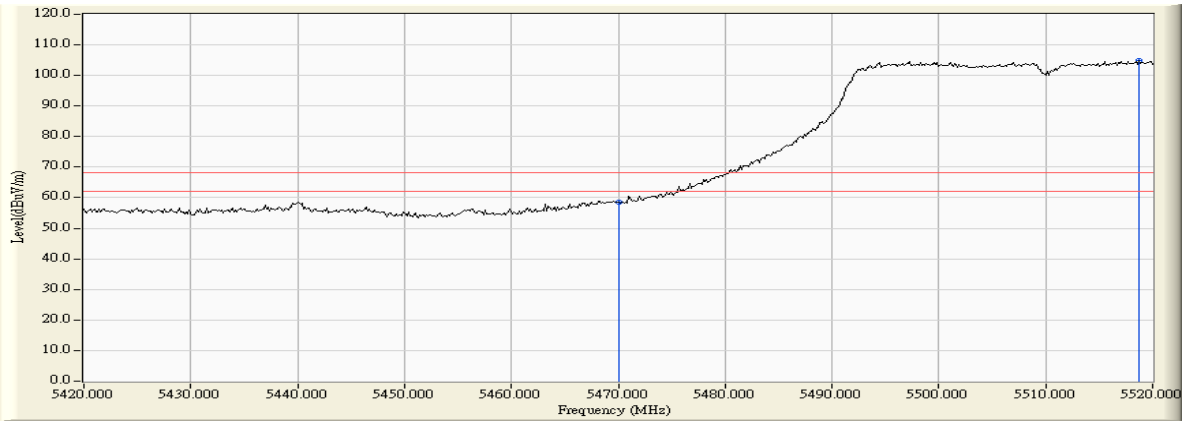
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading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

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5510MHz)

RF Radiated Measurement:



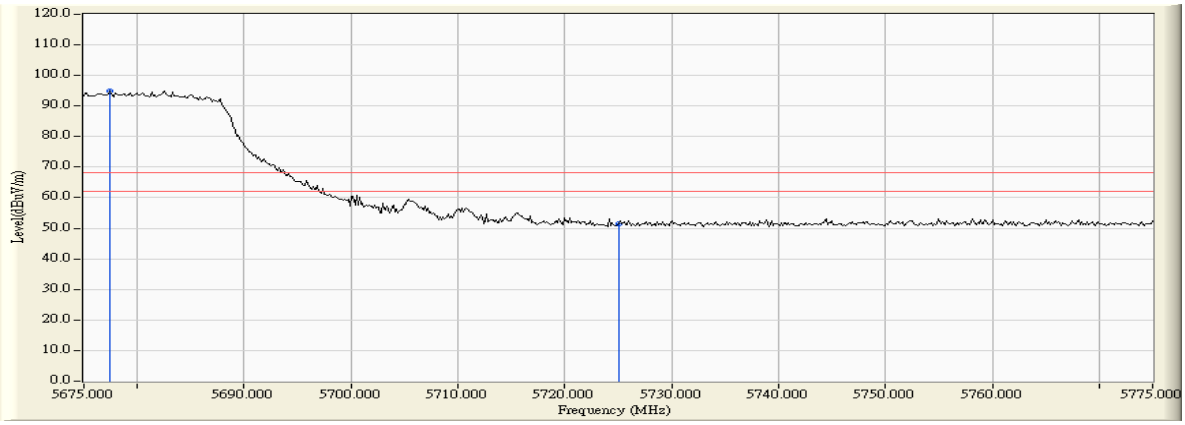
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Horizontal	5470.000	11.838	39.476	51.314	-16.906	68.220	Pass
Horizontal	5500.145	12.170	79.738	91.908	23.688	68.220	Pass



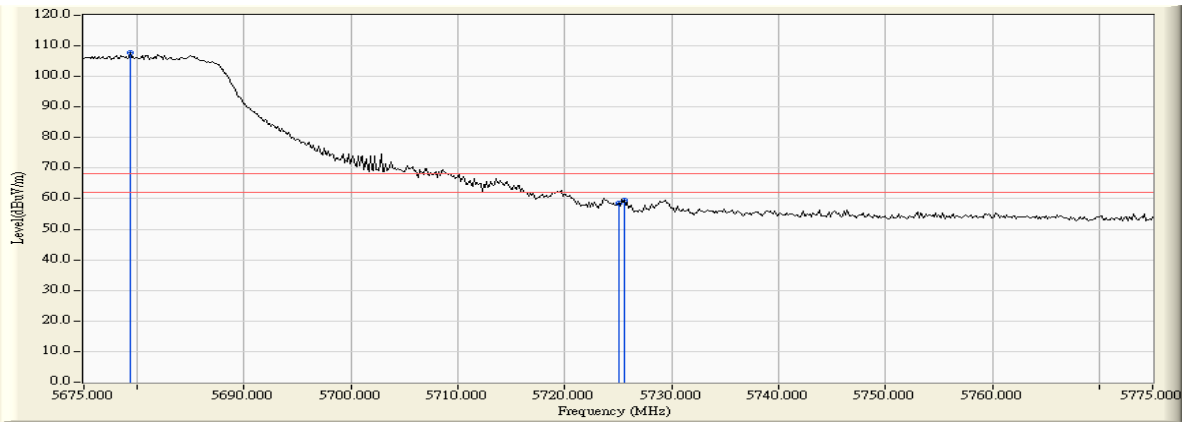
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Vertical	5470.000	13.462	44.993	58.455	-9.765	68.220	Pass
Vertical	5518.696	13.557	91.229	104.786	36.566	68.220	Pass

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5670MHz)

RF Radiated Measurement:



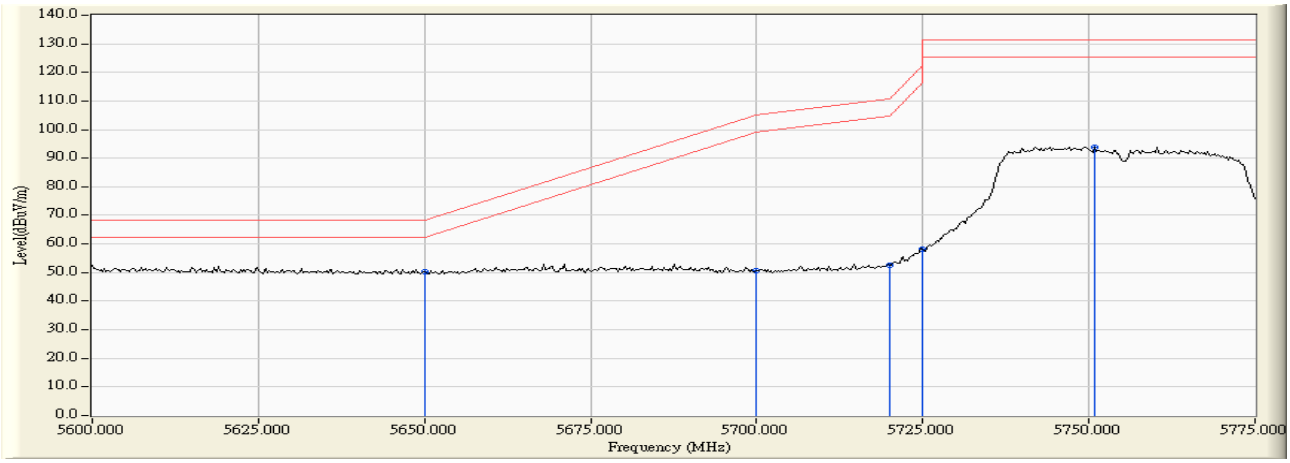
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Horizontal	5677.464	11.619	83.324	94.943	26.723	68.220	Pass
Horizontal	5725.000	11.592	39.808	51.400	-16.820	68.220	Pass



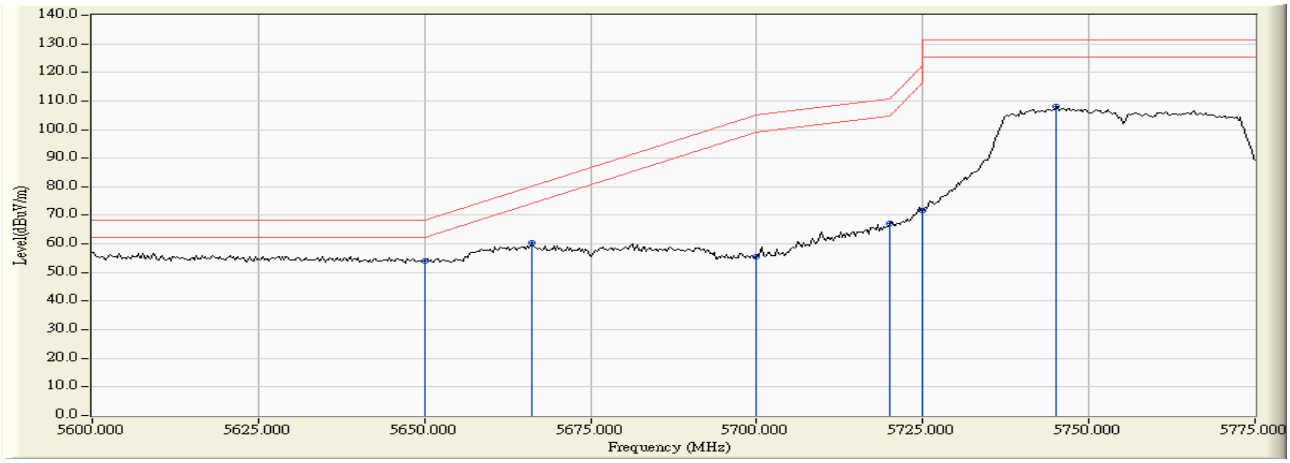
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Vertical	5679.348	13.022	94.636	107.658	39.438	68.220	Pass
Vertical	5725.000	12.930	45.769	58.699	-9.521	68.220	Pass
Vertical	5725.580	12.928	46.516	59.444	-8.776	68.220	Pass

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/03/23
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5755MHz)

RF Radiated Measurement :



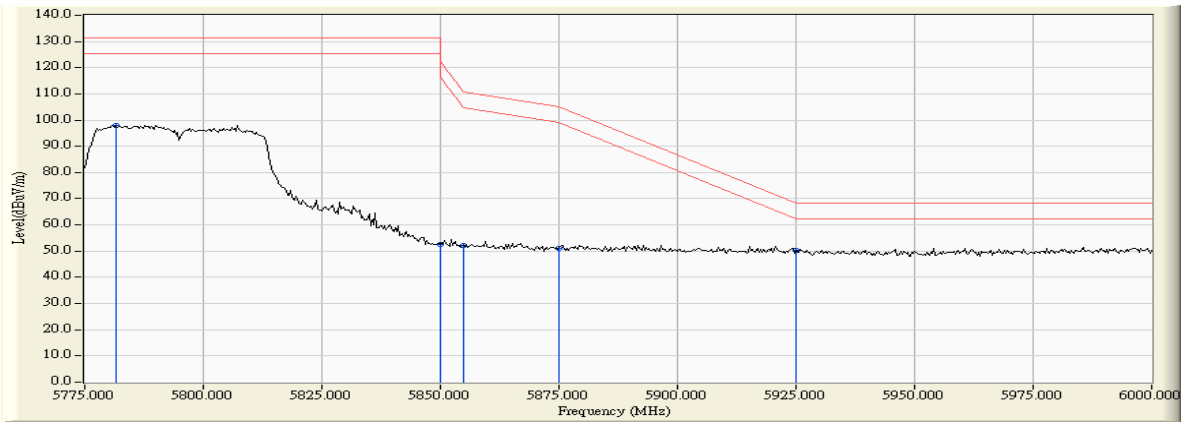
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Horizontal	5650.000	11.554	38.612	50.167	-18.053	68.220	Pass
Horizontal	5700.000	11.647	39.129	50.776	-54.424	105.200	Pass
Horizontal	5720.000	11.607	40.806	52.413	-58.387	110.800	Pass
Horizontal	5725.000	11.592	46.542	58.134	-64.066	122.200	Pass
Horizontal	5750.906	11.510	82.479	93.989	-37.211	131.200	Pass



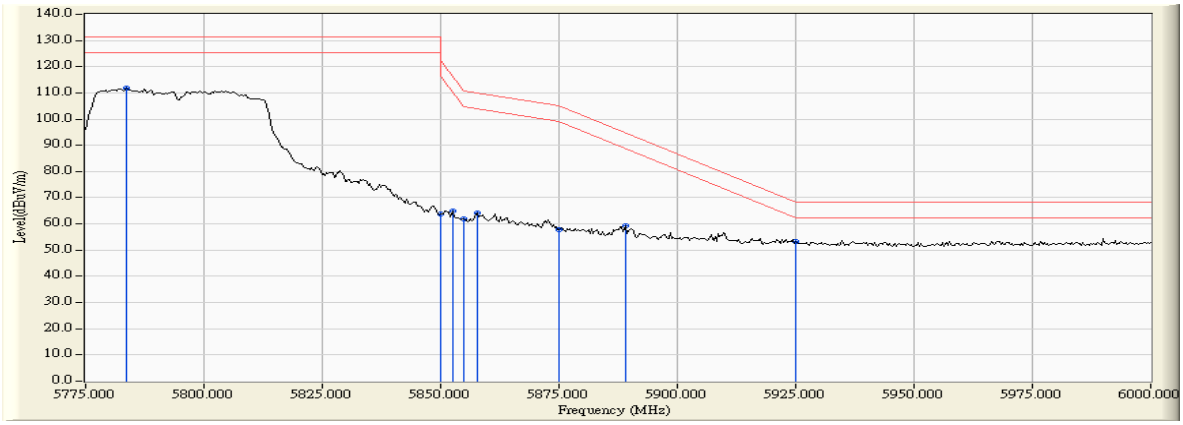
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV /m)	Margin (dB)	Limit (dBµV /m)	Result
Vertical	5650.000	13.029	41.029	54.058	-14.162	68.220	Pass
Vertical	5666.196	13.026	47.383	60.409	-19.790	80.199	Pass
Vertical	5700.000	13.003	42.435	55.438	-49.762	105.200	Pass
Vertical	5720.000	12.947	54.091	67.038	-43.762	110.800	Pass
Vertical	5725.000	12.930	58.576	71.506	-50.694	122.200	Pass
Vertical	5745.072	12.860	95.228	108.088	-23.112	131.200	Pass

Product	:	Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Date	:	2017/05/12
Test Mode	:	Mode 3: Transmit (802.11n-40BW 30Mbps) (5795MHz)

RF Radiated Measurement:



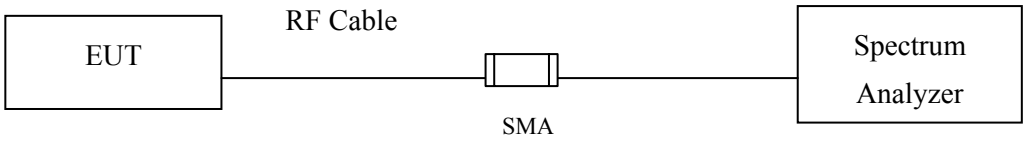
	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Horizontal	5781.522	11.412	86.626	98.038	-33.162	131.200	Pass
Horizontal	5850.000	11.701	40.886	52.587	-69.613	122.200	Pass
Horizontal	5855.000	11.735	40.266	52.001	-58.799	110.800	Pass
Horizontal	5875.000	11.873	39.152	51.025	-54.175	105.200	Pass
Horizontal	5925.000	12.068	38.125	50.194	-18.006	68.200	Pass



	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Measure Level (dBμV /m)	Margin (dB)	Limit (dBμV /m)	Result
Vertical	5783.478	12.725	99.077	111.802	-19.398	131.200	Pass
Vertical	5850.000	12.774	51.063	63.837	-58.363	122.200	Pass
Vertical	5852.609	12.779	51.967	64.746	-51.505	116.251	Pass
Vertical	5855.000	12.784	49.174	61.958	-48.842	110.800	Pass
Vertical	5857.826	12.790	51.370	64.160	-45.849	110.009	Pass
Vertical	5875.000	12.825	44.913	57.738	-47.462	105.200	Pass
Vertical	5889.130	12.856	46.504	59.360	-35.384	94.744	Pass
Vertical	5925.000	12.911	40.446	53.357	-14.843	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

± 681.6Hz

7.5. Test Result of Occupied Bandwidth

Product : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (802.11a-6Mbps)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745.00	16450	>500	Pass
157	5785.00	16450	>500	Pass
165	5825.00	16450	>500	Pass

Figure Channel 149:

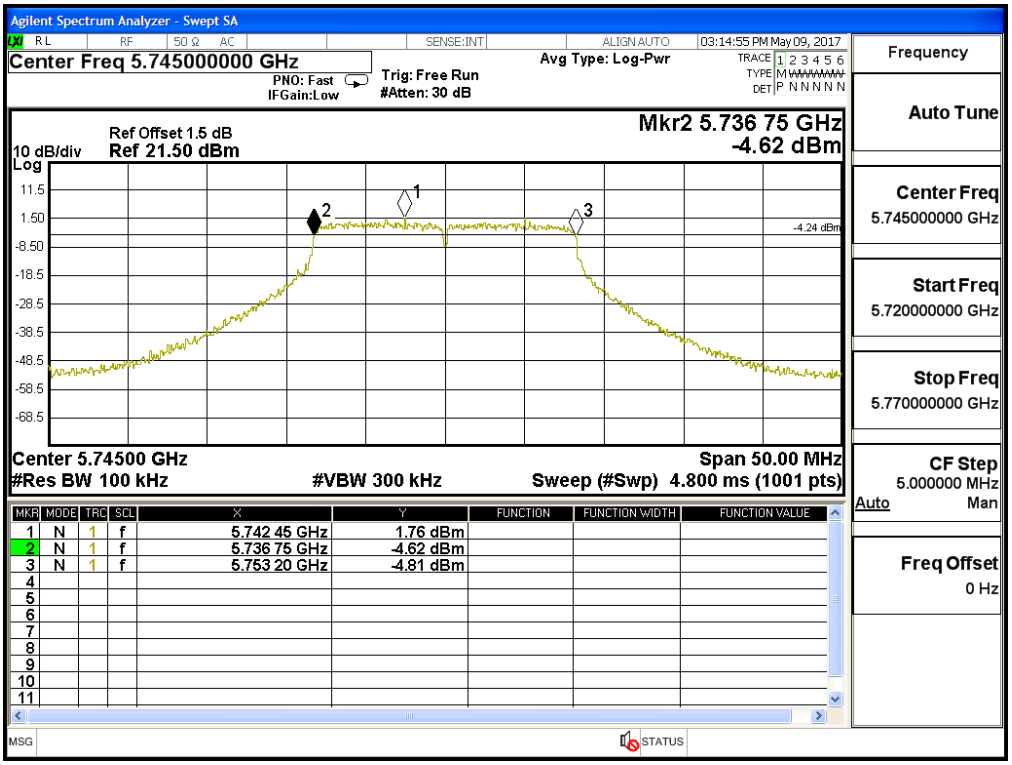


Figure Channel 157:

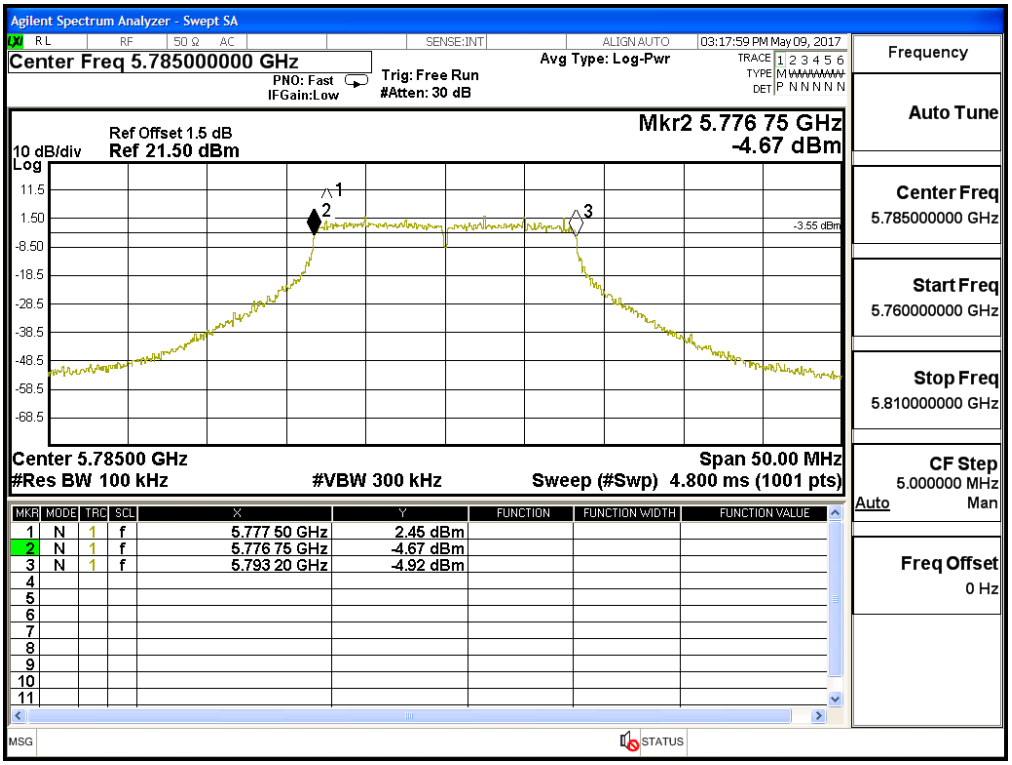
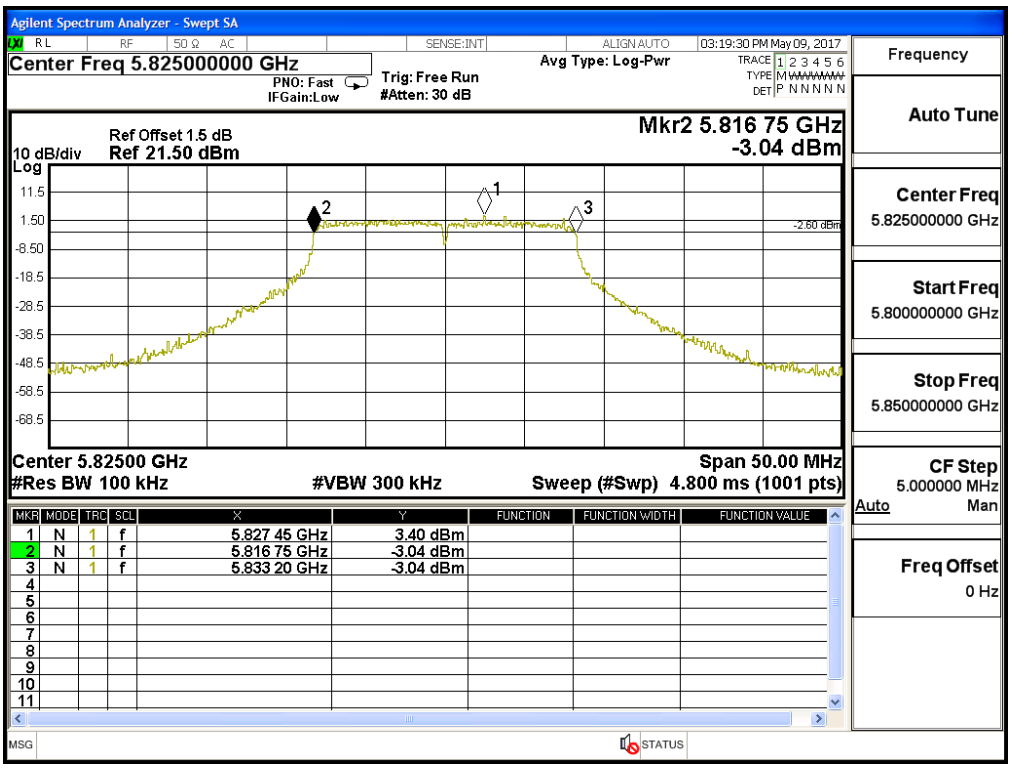


Figure Channel 165:



Product : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11n-20BW 14.4Mbps)

Channel No.	Chain	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	A	5745.00	16800	>500	Pass
157	A	5785.00	17400	>500	Pass
165	A	5825.00	17700	>500	Pass
149	B	5745.00	17650	>500	Pass
157	B	5785.00	17650	>500	Pass
165	B	5825.00	17700	>500	Pass

Figure Channel 149: (Chain A)

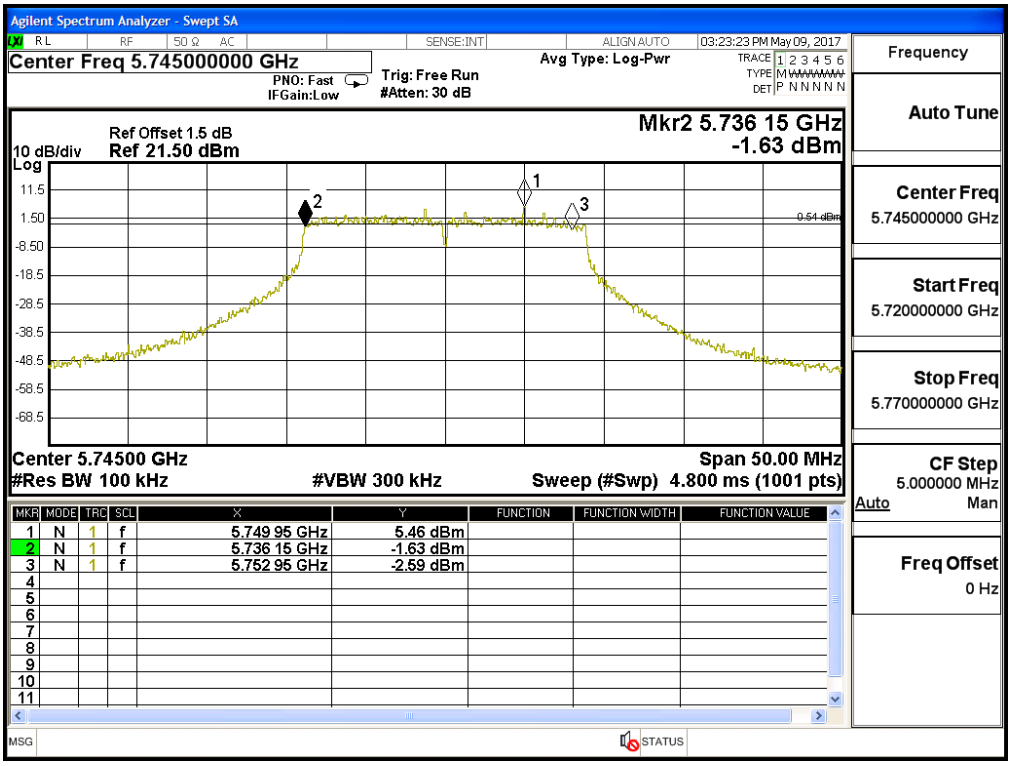


Figure Channel 149: (Chain B)

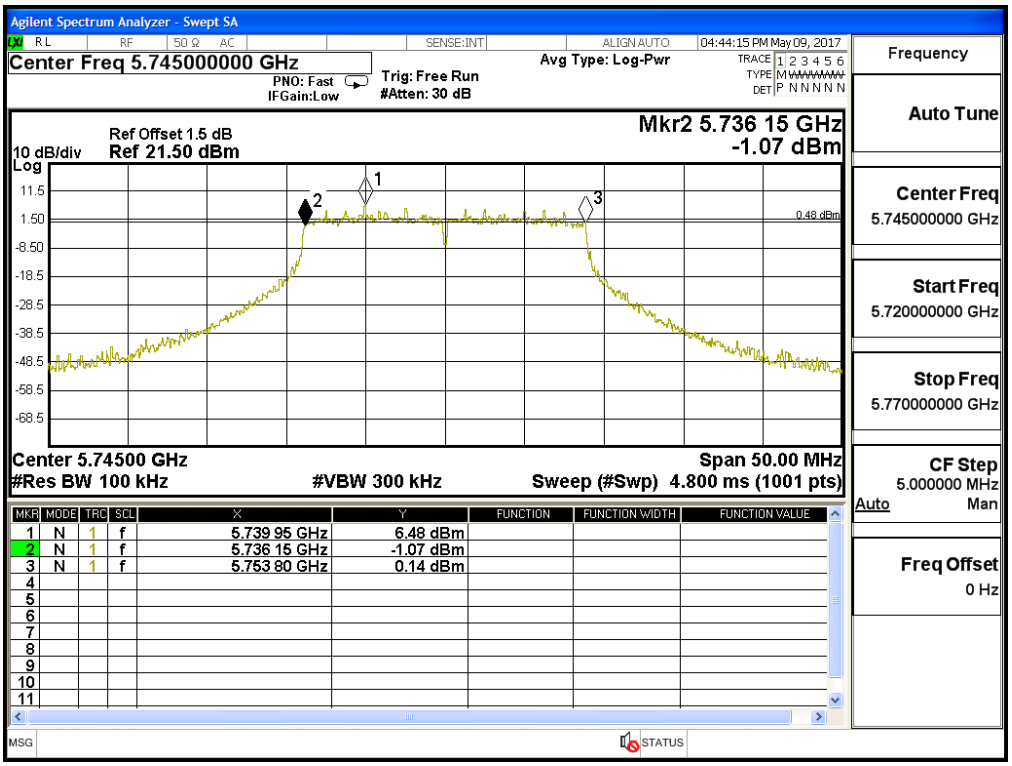


Figure Channel 157: (Chain A)

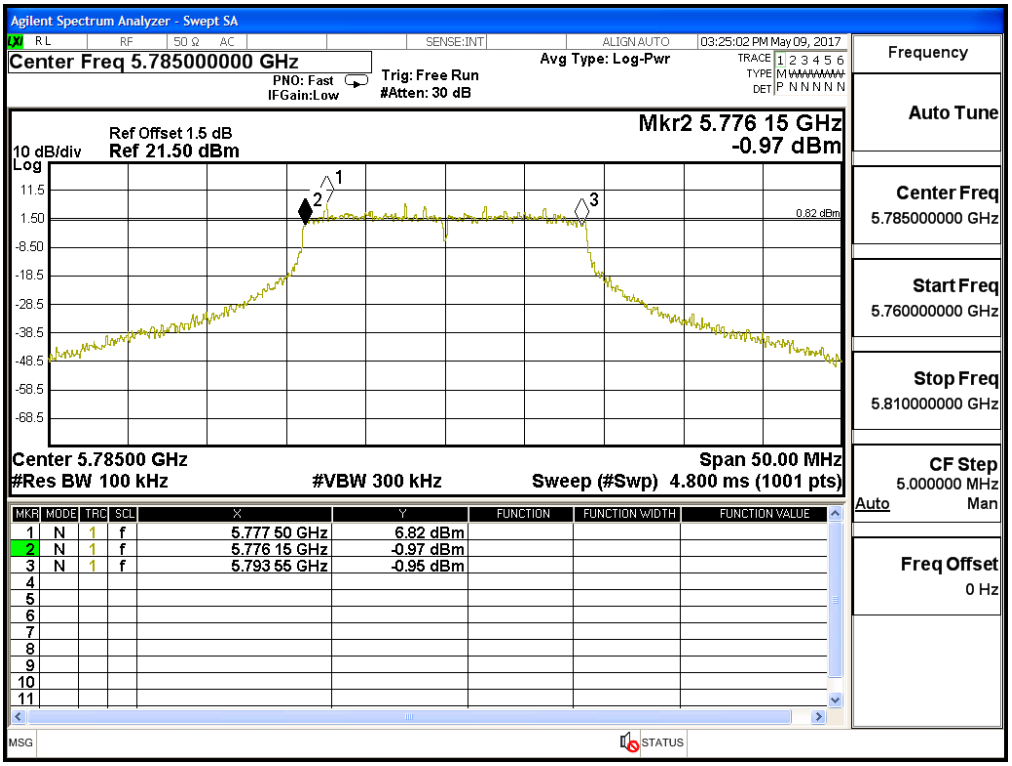


Figure Channel 157: (Chain B)

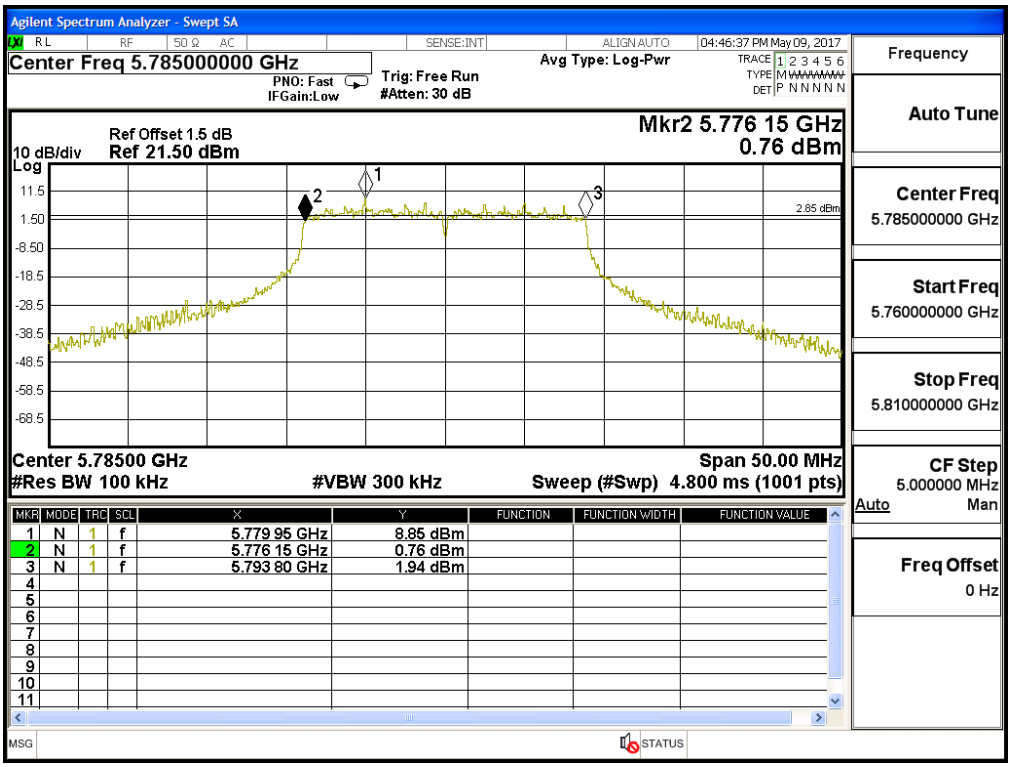


Figure Channel 165: (Chain A)

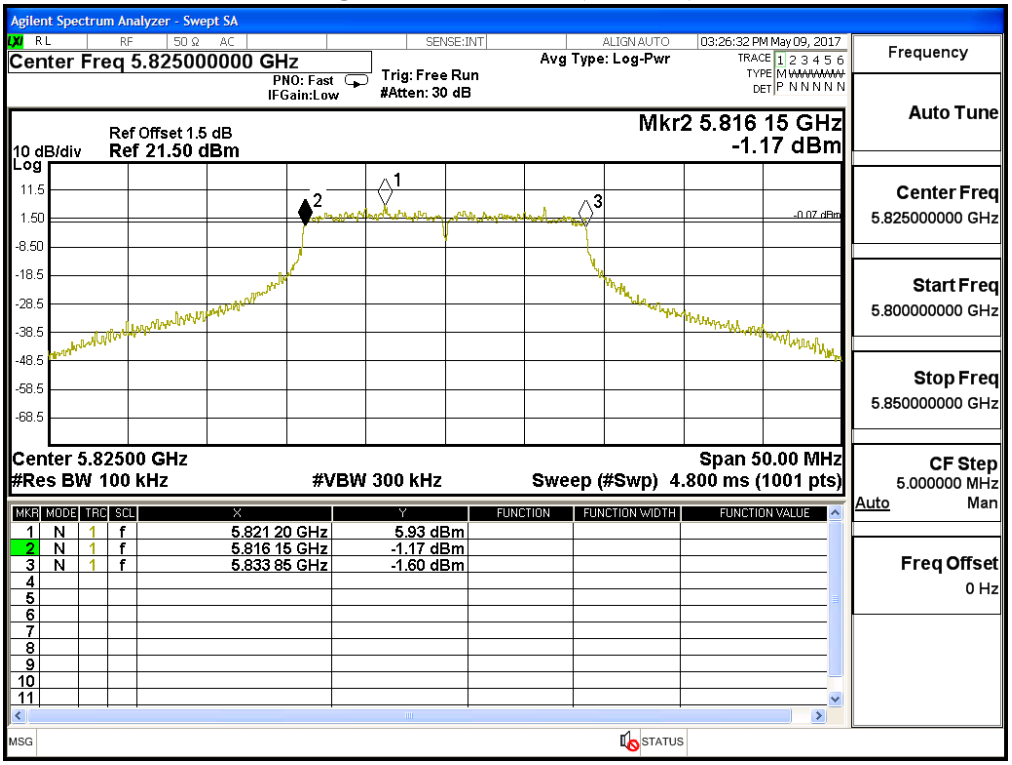
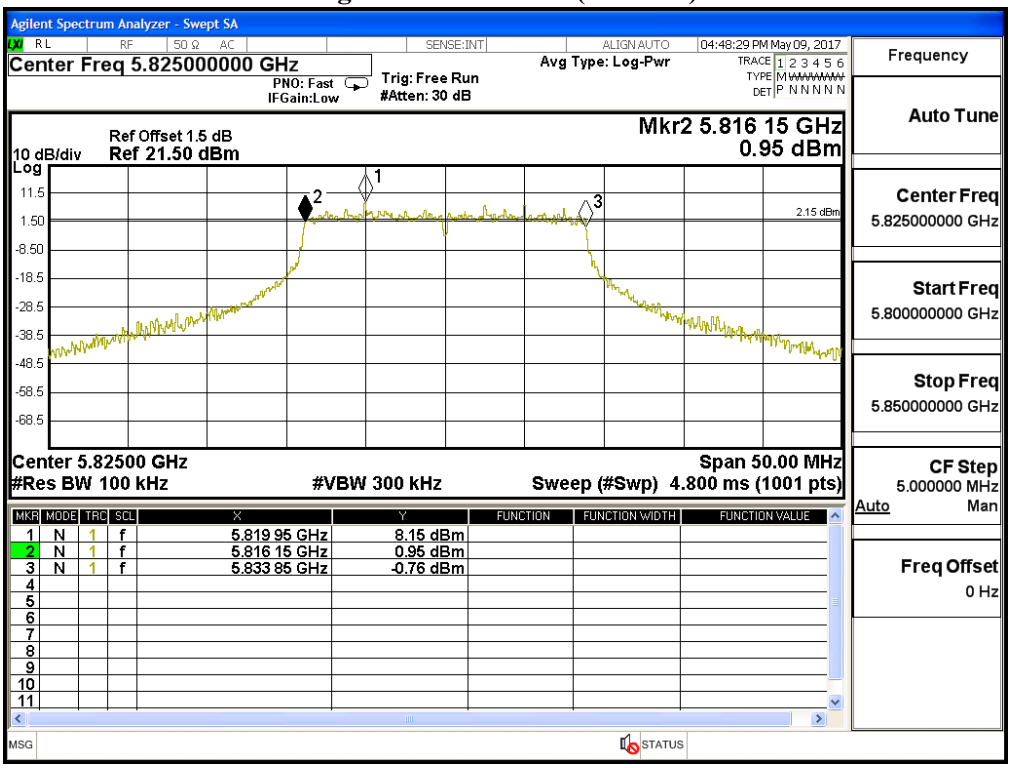


Figure Channel 165: (Chain B)



Product : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit (802.11n-40BW 30Mbps)

Channel No.	Chain	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
151	A	5755.00	35600	>500	Pass
159	A	5795.00	34400	>500	Pass
151	B	5755.00	36300	>500	Pass
159	B	5795.00	35600	>500	Pass

Figure Channel 151: (Chain A)

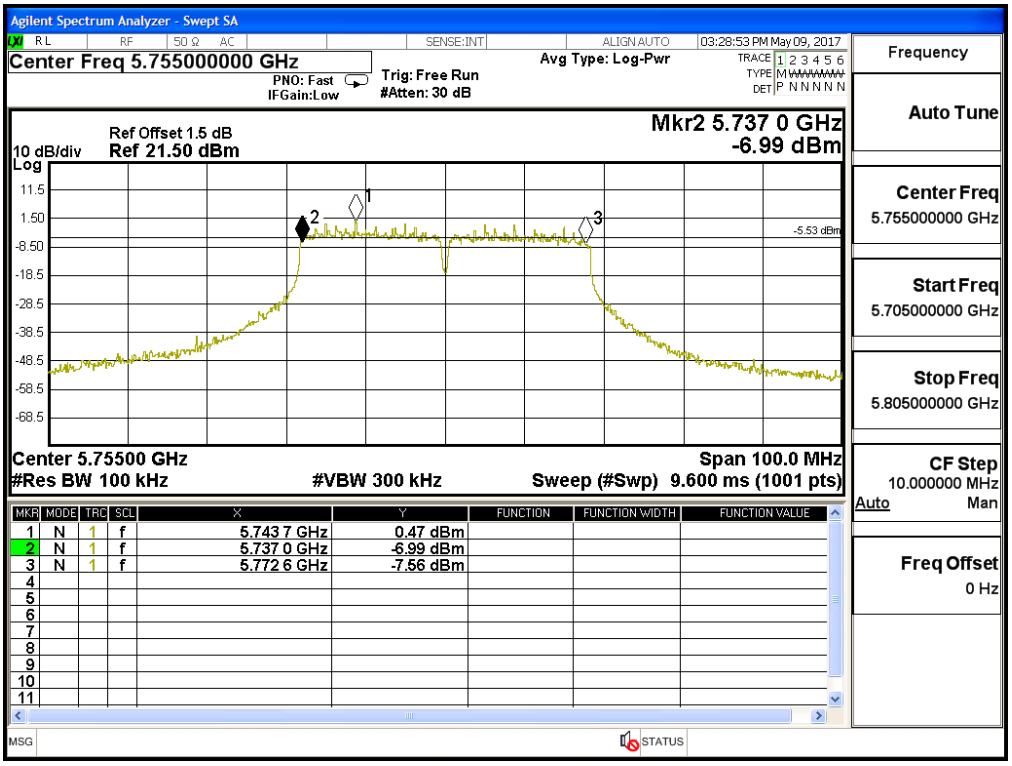


Figure Channel 151: (Chain B)

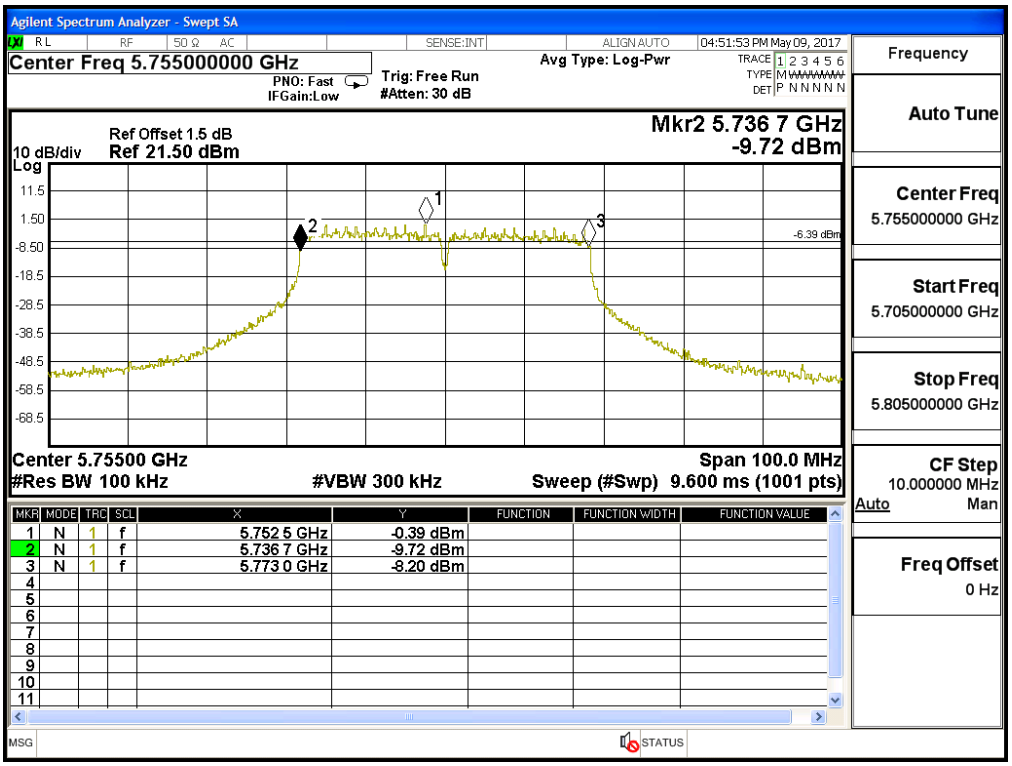


Figure Channel 159: (Chain A)

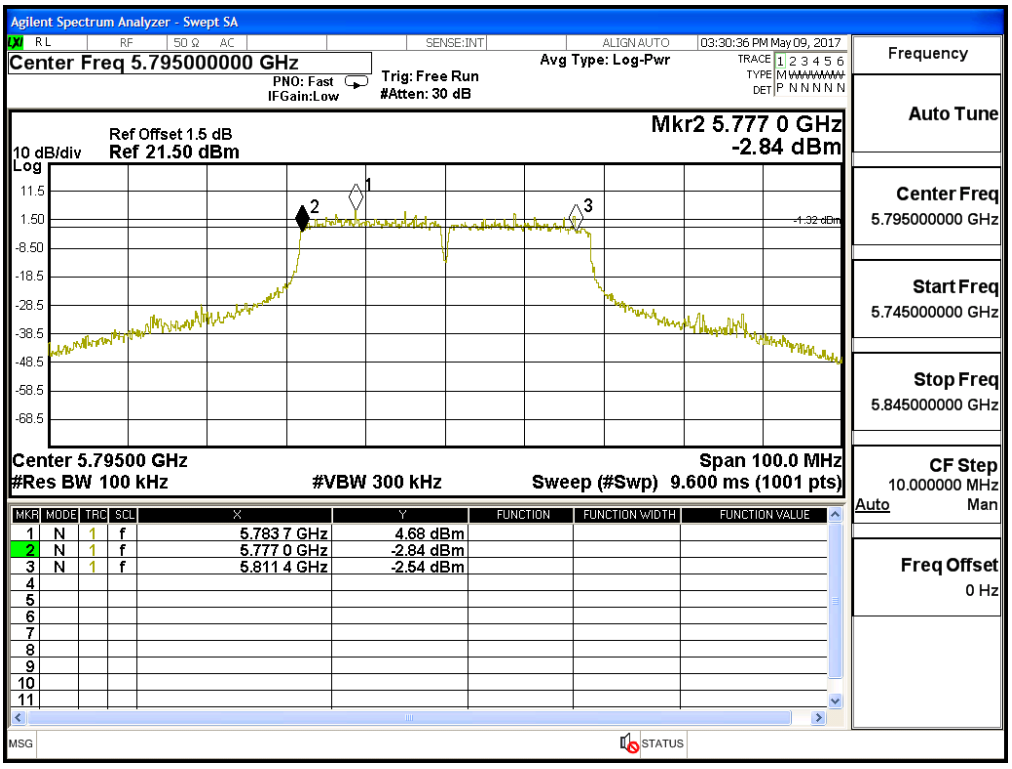
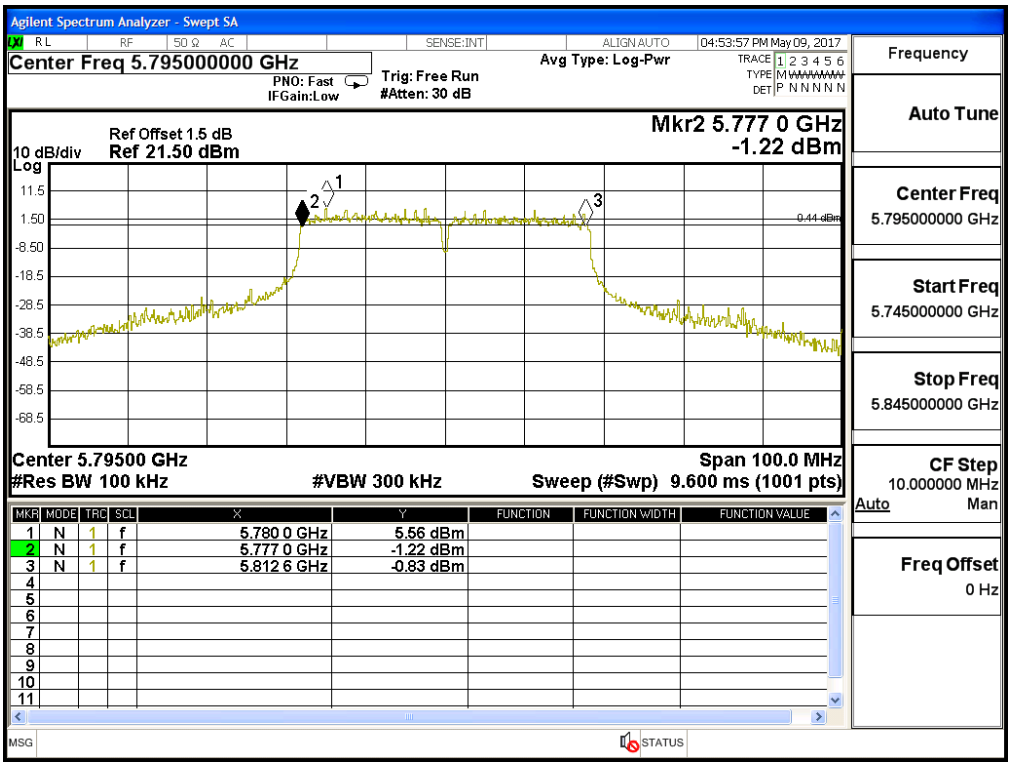
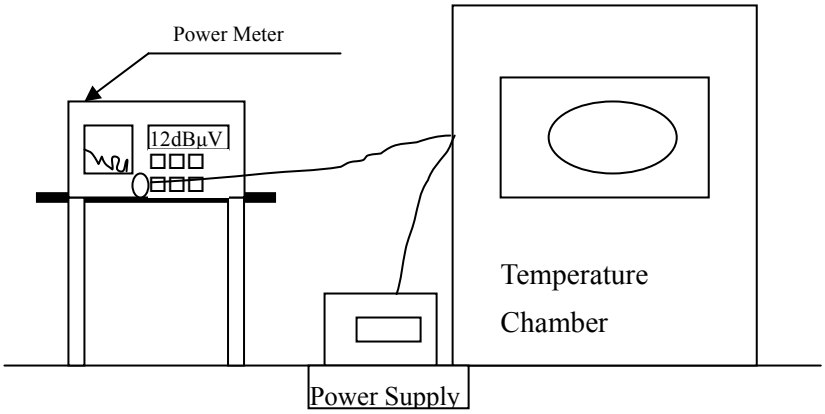


Figure Channel 159: (Chain B)



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

± 681.6 Hz

8.5. Test Result of Frequency Stability

Product : Industrial 802.11a/b/g/n Serial/Ethernet to Wireless Client
Test Item : Frequency Stability
Test Site : Temperature C1hamber
Test Date : 2017/05/15
Test Mode : Carrier Wave

Chain A

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	△F (MHz)
Tnom (20)℃	Vnom (24)V	36	5180.0000	5180.0025	-0.0025
		38	5190.0000	5190.0024	-0.0024
		44	5220.0000	5220.0019	-0.0019
		46	5230.0000	5230.0071	-0.0071
		48	5240.0000	5240.0087	-0.0087
		52	5260.0000	5260.0034	-0.0034
		54	5270.0000	5270.0027	-0.0027
		60	5300.0000	5300.0089	-0.0089
		62	5310.0000	5310.0042	-0.0042
		64	5320.0000	5320.0029	-0.0029
		100	5500.0000	5500.0061	-0.0061
		102	5510.0000	5510.0041	-0.0041
		110	5550.0000	5550.0063	-0.0063
		116	5580.0000	5580.0042	-0.0042
		134	5670.0000	5670.0034	-0.0034
		140	5700.0000	5700.0041	-0.0041
		149	5745.0000	5745.0063	-0.0063
		151	5755.0000	5755.0046	-0.0046
		157	5785.0000	5785.0072	-0.0072
		159	5795.0000	5795.0029	-0.0029
		165	5825.0000	5825.0076	-0.0076

Chain A

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	△F (MHz)
Tmax (50)℃	Vmax (26.4)V	36	5180.0000	5180.0081	-0.0081
		38	5190.0000	5190.0056	-0.0056
		44	5220.0000	5220.0042	-0.0042
		46	5230.0000	5230.0078	-0.0078
		48	5240.0000	5240.0059	-0.0059
		52	5260.0000	5260.0045	-0.0045
		54	5270.0000	5270.0063	-0.0063
		60	5300.0000	5300.0043	-0.0043
		62	5310.0000	5310.0081	-0.0081
		64	5320.0000	5320.0076	-0.0076
		100	5500.0000	5500.0057	-0.0057
		102	5510.0000	5510.0051	-0.0051
		110	5550.0000	5550.0042	-0.0042
		116	5580.0000	5580.0032	-0.0032
		134	5670.0000	5670.0089	-0.0089
		140	5700.0000	5700.0052	-0.0052
		149	5745.0000	5745.0037	-0.0037
		151	5755.0000	5755.0071	-0.0071
		157	5785.0000	5785.0034	-0.0034
		159	5795.0000	5795.0051	-0.0051
		165	5825.0000	5825.0021	-0.0021

Chain A

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	△F (MHz)
Tmax (50)℃	Vmin (21.6)V	36	5180.0000	5180.0032	-0.0032
		38	5190.0000	5190.0058	-0.0058
		44	5220.0000	5220.0061	-0.0061
		46	5230.0000	5230.0029	-0.0029
		48	5240.0000	5240.0039	-0.0039
		52	5260.0000	5260.0059	-0.0059
		54	5270.0000	5270.0028	-0.0028
		60	5300.0000	5300.0071	-0.0071
		62	5310.0000	5310.0038	-0.0038
		64	5320.0000	5320.0062	-0.0062
		100	5500.0000	5500.0049	-0.0049
		102	5510.0000	5510.0069	-0.0069
		110	5550.0000	5550.0063	-0.0063
		116	5580.0000	5580.0046	-0.0046
		134	5670.0000	5670.0029	-0.0029
		140	5700.0000	5700.0052	-0.0052
		149	5745.0000	5745.0069	-0.0069
		151	5755.0000	5755.0049	-0.0049
		157	5785.0000	5785.0051	-0.0051
		159	5795.0000	5795.0071	-0.0071
		165	5825.0000	5825.0029	-0.0029

Chain A

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	△F (MHz)
Tnom (0)℃	Vnom (26.4)V	36	5180.0000	5180.0032	-0.0032
		38	5190.0000	5190.0058	-0.0058
		44	5220.0000	5220.0061	-0.0061
		46	5230.0000	5230.0071	-0.0071
		48	5240.0000	5240.0063	-0.0063
		52	5260.0000	5260.0054	-0.0054
		54	5270.0000	5270.0023	-0.0023
		60	5300.0000	5300.0051	-0.0051
		62	5310.0000	5310.0049	-0.0049
		64	5320.0000	5320.0078	-0.0078
		100	5500.0000	5500.0021	-0.0021
		102	5510.0000	5510.0034	-0.0034
		110	5550.0000	5550.0034	-0.0034
		116	5580.0000	5580.0013	-0.0013
		134	5670.0000	5670.0089	-0.0089
		140	5700.0000	5700.0054	-0.0054
		149	5745.0000	5745.0059	-0.0059
		151	5755.0000	5755.0027	-0.0027
		157	5785.0000	5785.0061	-0.0061
		159	5795.0000	5795.0046	-0.0046
		165	5825.0000	5825.0069	-0.0069

Chain A

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	△F (MHz)
Tmax (0)℃	Vmax (21.6)V	36	5180.0000	5180.0032	-0.0032
		38	5190.0000	5190.0058	-0.0058
		44	5220.0000	5220.0061	-0.0061
		46	5230.0000	5230.0071	-0.0071
		48	5240.0000	5240.0063	-0.0063
		52	5260.0000	5260.0054	-0.0054
		54	5270.0000	5270.0023	-0.0023
		60	5300.0000	5300.0051	-0.0051
		62	5310.0000	5310.0049	-0.0049
		64	5320.0000	5320.0078	-0.0078
		100	5500.0000	5500.0021	-0.0021
		102	5510.0000	5510.0034	-0.0034
		110	5550.0000	5550.0034	-0.0034
		116	5580.0000	5580.0013	-0.0013
		134	5670.0000	5670.0089	-0.0089
		140	5700.0000	5700.0054	-0.0054
		149	5745.0000	5745.0059	-0.0059
		151	5755.0000	5755.0027	-0.0027
		157	5785.0000	5785.0061	-0.0061
		159	5795.0000	5795.0046	-0.0046
		165	5825.0000	5825.0069	-0.0069

Chain B

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	△F (MHz)
Tnom (20)℃	Vnom (24)V	36	5180.0000	5180.0061	-0.0061
		38	5190.0000	5190.0042	-0.0042
		44	5220.0000	5220.0032	-0.0032
		46	5230.0000	5230.0047	-0.0047
		48	5240.0000	5240.0051	-0.0051
		52	5260.0000	5260.0029	-0.0029
		54	5270.0000	5270.0072	-0.0072
		60	5300.0000	5300.0027	-0.0027
		62	5310.0000	5310.0041	-0.0041
		64	5320.0000	5320.0052	-0.0052
		100	5500.0000	5500.0071	-0.0071
		102	5510.0000	5510.0046	-0.0046
		110	5550.0000	5550.0079	-0.0079
		116	5580.0000	5580.0052	-0.0052
		134	5670.0000	5670.0054	-0.0054
		140	5700.0000	5700.0028	-0.0028
		149	5745.0000	5745.0049	-0.0049
		151	5755.0000	5755.0063	-0.0063
		157	5785.0000	5785.0075	-0.0075
		159	5795.0000	5795.0058	-0.0058
		165	5825.0000	5825.0074	-0.0074

Chain B

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	△F (MHz)
Tmax (50)℃	Vmax (26.4)V	36	5180.0000	5180.0046	-0.0046
		38	5190.0000	5190.0032	-0.0032
		44	5220.0000	5220.0072	-0.0072
		46	5230.0000	5230.0043	-0.0043
		48	5240.0000	5240.0052	-0.0052
		52	5260.0000	5260.0072	-0.0072
		54	5270.0000	5270.0061	-0.0061
		60	5300.0000	5300.0043	-0.0043
		62	5310.0000	5310.0072	-0.0072
		64	5320.0000	5320.0049	-0.0049
		100	5500.0000	5500.0027	-0.0027
		102	5510.0000	5510.0072	-0.0072
		110	5550.0000	5550.0038	-0.0038
		116	5580.0000	5580.0061	-0.0061
		134	5670.0000	5670.0072	-0.0072
		140	5700.0000	5700.0091	-0.0091
		149	5745.0000	5745.0062	-0.0062
		151	5755.0000	5755.0029	-0.0029
		157	5785.0000	5785.0075	-0.0075
		159	5795.0000	5795.0049	-0.0049
		165	5825.0000	5825.0056	-0.0056

Chain B

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	△F (MHz)
Tmax (50)℃	Vmin (21.6)V	36	5180.0000	5180.0071	-0.0071
		38	5190.0000	5190.0038	-0.0038
		44	5220.0000	5220.0056	-0.0056
		46	5230.0000	5230.0042	-0.0042
		48	5240.0000	5240.0052	-0.0052
		52	5260.0000	5260.0043	-0.0043
		54	5270.0000	5270.0051	-0.0051
		60	5300.0000	5300.0062	-0.0062
		62	5310.0000	5310.0071	-0.0071
		64	5320.0000	5320.0038	-0.0038
		100	5500.0000	5500.0029	-0.0029
		102	5510.0000	5510.0071	-0.0071
		110	5550.0000	5550.0027	-0.0027
		116	5580.0000	5580.0046	-0.0046
		134	5670.0000	5670.0061	-0.0061
		140	5700.0000	5700.0059	-0.0059
		149	5745.0000	5745.0041	-0.0041
		151	5755.0000	5755.0032	-0.0032
		157	5785.0000	5785.0049	-0.0049
		159	5795.0000	5795.0051	-0.0051
		165	5825.0000	5825.0062	-0.0062

Chain B

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	△F (MHz)
Tnom (0)℃	Vnom (26.4)V	36	5180.0000	5180.0047	-0.0047
		38	5190.0000	5190.0065	-0.0065
		44	5220.0000	5220.0071	-0.0071
		46	5230.0000	5230.0058	-0.0058
		48	5240.0000	5240.0064	-0.0064
		52	5260.0000	5260.0049	-0.0049
		54	5270.0000	5270.0043	-0.0043
		60	5300.0000	5300.0061	-0.0061
		62	5310.0000	5310.0052	-0.0052
		64	5320.0000	5320.0023	-0.0023
		100	5500.0000	5500.0071	-0.0071
		102	5510.0000	5510.0054	-0.0054
		110	5550.0000	5550.0037	-0.0037
		116	5580.0000	5580.0049	-0.0049
		134	5670.0000	5670.0071	-0.0071
		140	5700.0000	5700.0012	-0.0012
		149	5745.0000	5745.0062	-0.0062
		151	5755.0000	5755.0074	-0.0074
		157	5785.0000	5785.0051	-0.0051
		159	5795.0000	5795.0049	-0.0049
		165	5825.0000	5825.0056	-0.0056

Chain B

Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	△F (MHz)
Tmax (0)℃	Vmax (21.6)V	36	5180.0000	5180.0046	-0.0046
		38	5190.0000	5190.0057	-0.0057
		44	5220.0000	5220.0024	-0.0024
		46	5230.0000	5230.0061	-0.0061
		48	5240.0000	5240.0028	-0.0028
		52	5260.0000	5260.0061	-0.0061
		54	5270.0000	5270.0087	-0.0087
		60	5300.0000	5300.0073	-0.0073
		62	5310.0000	5310.0049	-0.0049
		64	5320.0000	5320.0082	-0.0082
		100	5500.0000	5500.0078	-0.0078
		102	5510.0000	5510.0061	-0.0061
		110	5550.0000	5550.0082	-0.0082
		116	5580.0000	5580.0052	-0.0052
		134	5670.0000	5670.0061	-0.0061
		140	5700.0000	5700.0042	-0.0042
		149	5745.0000	5745.0075	-0.0075
		151	5755.0000	5755.0063	-0.0063
		157	5785.0000	5785.0048	-0.0048
		159	5795.0000	5795.0068	-0.0068
		165	5825.0000	5825.0052	-0.0052

9. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs