FCC Test Report

Product Name	RUGGED TABLET COMPUTER
Model No	104961,104962,104963
FCC ID	S9E-7265NGW

Applicant	Trimble Navigation Limited
Address	345 SW Avery Ave, Corvallis, OR, United States

Date of Receipt	Apr. 14, 2015
Issued Date	Jun. 24, 2015
Report No.	1540296R-RFUSP58V00
Report Version	V1.0

Testing Laboratory
3023

Test Report

Issued Date: Jun. 24, 2015
Report No.: 1540296R-RFUSP58V00

Product Name	RUGGED TABLET COMPUTER
Applicant	Trimble Navigation Limited
Address	345 SW Avery Ave, Corvallis, OR, United States
Manufacturer	Ubiqconn Technology,Inc.
Model No.	104961,104962,104963
FCC ID.	S9E-7265NGW
EUT Rated Voltage	AC 100-240V, 50-60Hz
EUT Test Voltage	AC 120V/ 60Hz
Trade Name	Trimble
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E: 2014 ANSI C63.4: 2014, ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01
Test Result	Complied

Documented By : Genie Chang

(Senior Adm. Specialist / Genie Chang)

Tested By : Nick Chen

(Engineer / Nick Chen)

Approved By :

(Director / Vincent Lin)

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Description Page

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	RUGGED TABLET COMPUTER
Trade Name	Trimble
FCC ID.	S9E-7265NGW
MODEL NO.	104961,104962,104963
Frequency Range	802.11a/n-20MHz: 5180-5320MHz, 5500-5700MHz, 5745-5825MHz 802.11n-40MHz: 5190-5310, 5510-5670MHz, 5755-5795MHz 802.11ac-20MHz: 5720, 802.11ac-40MHz: 5710 802.11ac-80MHz: 5210-5290MHz, 5530-5690MHz, 5775MHz
Number of Channels	802.11a/n-20MHz: 24; 802.11n-40MHz: 11 802.11ac-20MHz: 1, 802.11ac-40MHz: 1, 802.11ac-80MHz: 6
Data Rate	802.11a: 6 - 54Mbps 802.11n: up to 300Mbps 802.11ac-80MHz: up to 866.7MHz
Channel Control	Auto
Type of Modulation	802.11a/n:OFDM, BPSK, QPSK, 16QAM, 64QAM, 256QAM
Antenna Type	PIFA Antenna
Antenna Gain	Refer to the table “Antenna List”
Power Adapter	MFR: FSP, M/N: FSP065-REB Input: 100-240V~1.5A 50-60 Hz Output: 19V, 3.42A Cable Out: Non-Shielded, 1.6m, with one ferrite core bonded.
Contain Module	Intel / 7265NGW

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Taiwan Anjie Electronics CO. LTD.	N/A (Main) N/A (Aux)	PIFA Antenna	1.93dBi For 5.15~5.25GHz 3.10dBi For 5.25~5.35GHz 3.42dBi For 5.47~5.725GHz 3.09dBi For 5.725~5.825GHz

Note: The antenna of EUT is conform to FCC 15.203

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

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

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		

802.11ac-20MHz Center Working Frequency of Each Channel:

Channel	Frequency
Channel 144:	5720 MHz

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

Channel	Frequency
Channel 142:	5710 MHz

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

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

Note:

1. This device is a RUGGED TABLET COMPUTER with a built-in 802.11a/b/g/n/ac WLAN transceiver.
2. The EUT is including three models for different marketing requirement.
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 and 802.11ac(80M-BW) is 65 Mbps)
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) Mode 4: Transmit (802.11ac-20BW-14.4Mbps) Mode 5: Transmit (802.11ac-40BW-30Mbps) Mode 6: Transmit (802.11ac-80BW-65Mbps)

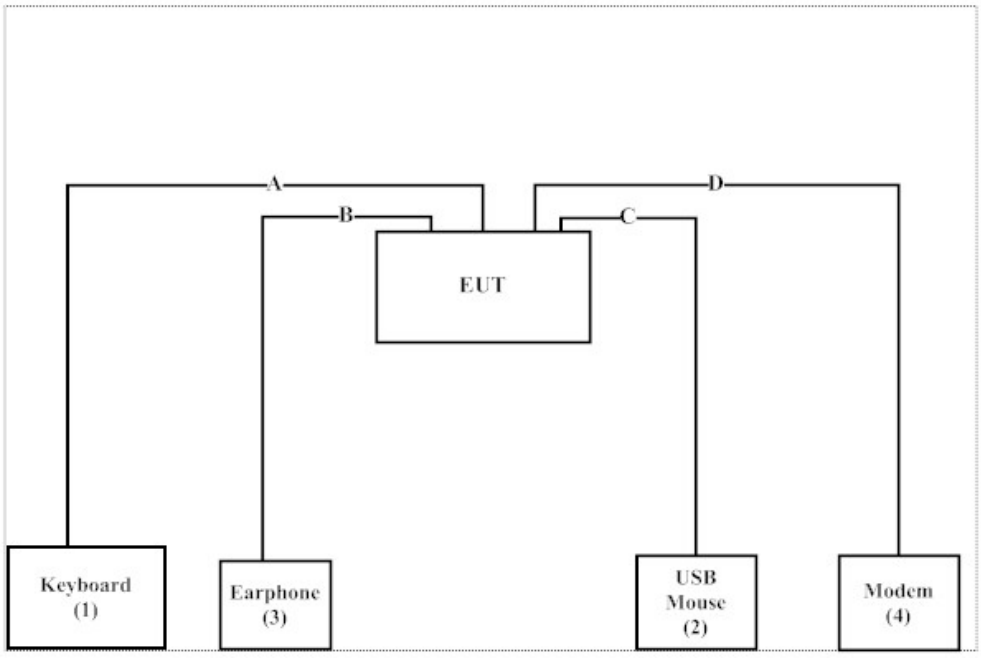
1.3. Tested System Datails

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)	Keyboard	Dell	SK-8175	MY-0W217F-71619-092-0459-A01	N/A
(2)	USB Mouse	Logitech	M-U0003	LZ024HR	N/A
(3)	Earphone	Dr.AV	CD-806B	N/A	N/A
(4)	Modem	ACEEX	DM-1414	0102027536	N/A

Signal Cable Type		Signal cable Description
A	USB Cable	Shielded, 1.8m
B	Earphone Cable	Non-Shielded, 1.0m
C	USB Cable	Shielded, 1.8m
D	Modem Cable	Shielded, 1.5m

1.4. Configuration of tested System



1.5. EUT Exercise Software

(1) Setup the EUT as shown on 1.4
(2) Execute software “DRTU V1.7.6-1091” on the EUT.
(3) Configure the test mode, the test channel, and the data rate.
(4) Start the continuous transmission.
(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 QuieTek Corporation's Web Site : http://www.quietek.com/chinese/about/certificates.aspx?bval=5

THE ADDRESS AND INTRODUCTION OF QUIETEK CORPORATION'S LABORATORIES CAN BE FOUNDED IN OUR WEB SITE : HTTP://WWW.QUIETEK.COM/

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 92195

Site Name: Quietek Corporation
Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,
Lin-Kou Shiang, Taipei,
Taiwan, R.O.C.
TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

FCC Accreditation Number: TW1014

2. Conducted Emission

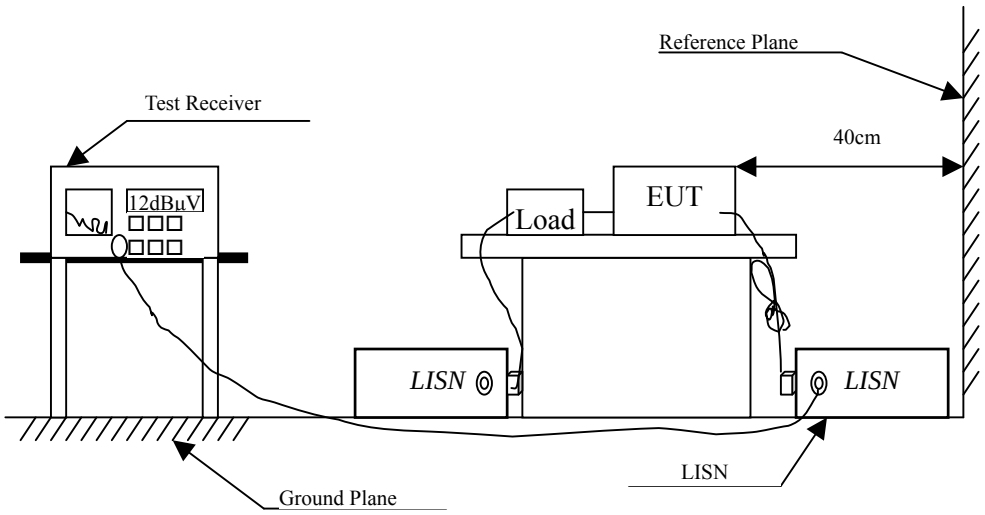
2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2014	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2015	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2015	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2015	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2015	
	No.1 Shielded Room				

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

2.2. Test Setup



2.3. 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.

2.4. 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.

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product : RUGGED TABLET COMPUTER
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 6: Transmit (802.11ac-80BW-65Mbps) (5210MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 1					
Quasi-Peak					
0.158	9.668	39.210	48.878	-16.893	65.771
0.173	9.664	35.840	45.504	-19.839	65.343
0.216	9.661	29.220	38.881	-25.233	64.114
14.084	9.998	20.220	30.218	-29.782	60.000
18.373	10.047	23.100	33.147	-26.853	60.000
20.861	10.055	17.770	27.825	-32.175	60.000
Average					
0.158	9.668	23.460	33.128	-22.643	55.771
0.173	9.664	18.600	28.264	-27.079	55.343
0.216	9.661	12.860	22.521	-31.593	54.114
14.084	9.998	14.660	24.658	-25.342	50.000
18.373	10.047	17.400	27.447	-22.553	50.000
20.861	10.055	12.110	22.165	-27.835	50.000

Note:

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

Product : RUGGED TABLET COMPUTER
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 6: Transmit (802.11ac-80BW-65Mbps) (5210MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 2					
Quasi-Peak					
0.170	9.665	38.390	48.055	-17.374	65.429
0.228	9.662	30.250	39.912	-23.859	63.771
0.279	9.665	23.390	33.055	-29.259	62.314
14.818	10.095	18.810	28.905	-31.095	60.000
18.470	10.168	23.150	33.318	-26.682	60.000
20.779	10.204	19.240	29.444	-30.556	60.000
Average					
0.170	9.665	25.540	35.205	-20.224	55.429
0.228	9.662	10.560	20.222	-33.549	53.771
0.279	9.665	10.080	19.745	-32.569	52.314
14.818	10.095	13.820	23.915	-26.085	50.000
18.470	10.168	18.430	28.598	-21.402	50.000
20.779	10.204	14.100	24.304	-25.696	50.000

Note:

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

Product : RUGGED TABLET COMPUTER
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 6: Transmit (802.11ac-80BW-65Mbps) (5290MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 1					
Quasi-Peak					
0.170	9.665	33.900	43.565	-21.864	65.429
0.240	9.663	29.970	39.633	-23.796	63.429
0.295	9.666	22.920	32.586	-29.271	61.857
0.377	9.670	16.030	25.700	-33.814	59.514
0.580	9.681	27.710	37.391	-18.609	56.000
0.697	9.688	31.270	40.958	-15.042	56.000
Average					
0.170	9.665	22.680	32.345	-23.084	55.429
0.240	9.663	16.480	26.143	-27.286	53.429
0.295	9.666	10.050	19.716	-32.141	51.857
0.377	9.670	6.790	16.460	-33.054	49.514
0.580	9.681	22.310	31.991	-14.009	46.000
0.697	9.688	10.650	20.338	-25.662	46.000

Note:

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

Product : RUGGED TABLET COMPUTER
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 6: Transmit (802.11ac-80BW-65Mbps) (5290MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 2					
Quasi-Peak					
0.173	9.664	38.300	47.964	-17.379	65.343
0.220	9.662	27.320	36.982	-27.018	64.000
0.310	9.666	20.970	30.636	-30.793	61.429
0.576	9.681	30.270	39.951	-16.049	56.000
0.697	9.688	29.950	39.638	-16.362	56.000
0.923	9.700	17.080	26.780	-29.220	56.000
Average					
0.173	9.664	26.310	35.974	-19.369	55.343
0.220	9.662	14.480	24.142	-29.858	54.000
0.310	9.666	9.100	18.766	-32.663	51.429
0.576	9.681	25.170	34.851	-11.149	46.000
0.697	9.688	10.340	20.028	-25.972	46.000
0.923	9.700	0.770	10.470	-35.530	46.000

Note:

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

Product : RUGGED TABLET COMPUTER
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 6: Transmit (802.11ac-80BW-65Mbps) (5610MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 1					
Quasi-Peak					
0.177	9.663	38.240	47.903	-17.326	65.229
0.263	9.664	23.330	32.994	-29.777	62.771
0.576	9.681	30.160	39.841	-16.159	56.000
0.740	9.690	30.430	40.120	-15.880	56.000
0.841	9.695	28.490	38.185	-17.815	56.000
1.287	9.720	29.570	39.290	-16.710	56.000
Average					
0.177	9.663	26.650	36.313	-18.916	55.229
0.263	9.664	11.130	20.794	-31.977	52.771
0.576	9.681	25.090	34.771	-11.229	46.000
0.740	9.690	10.060	19.750	-26.250	46.000
0.841	9.695	4.930	14.625	-31.375	46.000
1.287	9.720	21.280	31.000	-15.000	46.000

Note:

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

Product : RUGGED TABLET COMPUTER
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 6: Transmit (802.11ac-80BW-65Mbps) (5610MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 2					
Quasi-Peak					
0.173	9.664	38.160	47.824	-17.519	65.343
0.576	9.681	30.270	39.951	-16.049	56.000
0.744	9.690	30.450	40.140	-15.860	56.000
0.849	9.696	28.360	38.056	-17.944	56.000
0.904	9.699	24.410	34.109	-21.891	56.000
1.287	9.720	29.790	39.510	-16.490	56.000
Average					
0.173	9.664	26.510	36.174	-19.169	55.343
0.576	9.681	25.250	34.931	-11.069	46.000
0.744	9.690	9.110	18.800	-27.200	46.000
0.849	9.696	4.780	14.476	-31.524	46.000
0.904	9.699	3.640	13.339	-32.661	46.000
1.287	9.720	21.590	31.310	-14.690	46.000

Note:

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

Product : RUGGED TABLET COMPUTER
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 6: Transmit (802.11ac-80BW-65Mbps) (5775MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 1					
Quasi-Peak					
0.181	9.662	37.280	46.942	-18.172	65.114
0.228	9.662	28.300	37.962	-25.809	63.771
0.302	9.666	21.270	30.936	-30.721	61.657
0.412	9.672	17.760	27.432	-31.082	58.514
0.685	9.687	22.980	32.667	-23.333	56.000
0.830	9.695	28.910	38.605	-17.395	56.000
Average					
0.181	9.662	24.190	33.852	-21.262	55.114
0.228	9.662	15.750	25.412	-28.359	53.771
0.302	9.666	10.340	20.006	-31.651	51.657
0.412	9.672	7.220	16.892	-31.622	48.514
0.685	9.687	10.110	19.797	-26.203	46.000
0.830	9.695	4.630	14.325	-31.675	46.000

Note:

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

Product : RUGGED TABLET COMPUTER
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 6: Transmit (802.11ac-80BW-65Mbps) (5775MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 2					
Quasi-Peak					
0.177	9.663	37.830	47.493	-17.736	65.229
0.232	9.662	29.950	39.612	-24.045	63.657
0.295	9.666	23.180	32.846	-29.011	61.857
0.513	9.678	24.510	34.188	-21.812	56.000
0.724	9.689	30.870	40.559	-15.441	56.000
0.822	9.694	28.970	38.664	-17.336	56.000
Average					
0.177	9.663	26.650	36.313	-18.916	55.229
0.232	9.662	17.620	27.282	-26.375	53.657
0.295	9.666	11.120	20.786	-31.071	51.857
0.513	9.678	18.530	28.208	-17.792	46.000
0.724	9.689	10.720	20.409	-25.591	46.000
0.822	9.694	3.920	13.614	-32.386	46.000

Note:

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

3. Maximun conducted output power

3.1. Test Equipment

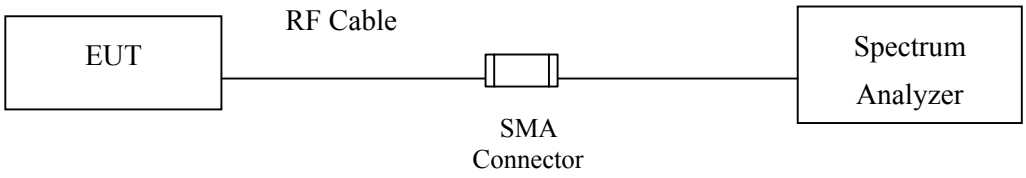
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2015
X	Power Sensor	Anritsu	MA2411B/0738448	Jun., 2015
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2015

Note:

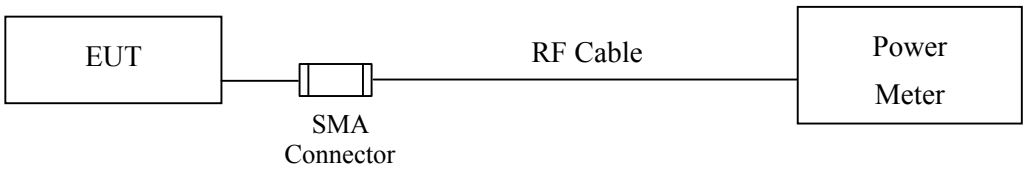
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with "X" are used to measure the final test results.

3.2. Test Setup

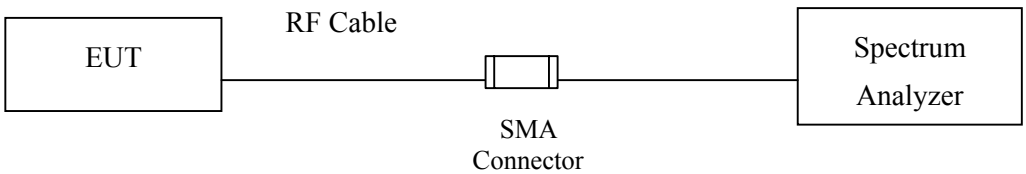
99% Occupied Bandwidth



Conduction Power Measurement (for 802.11an)



Conduction Power Measurement (for 802.11ac)



3.3. Limits

3.3.1. 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.

3.3.2. 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 99%emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.3. 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.

3.4. 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 D01 section F) procedure is used for measurements.

3.5. Uncertainty

± 1.27 dB

3.6. Test Result of Maximum conducted output power

Product : RUGGED TABLET COMPUTER
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	11.29	--	--	--	--	--	--	--	<24dBm
44	5220	12.23	12.19	12.13	12.11	12.05	12.03	11.99	11.95	<24dBm
48	5240	12.29	--	--	--	--	--	--	--	<24dBm
52	5260	12.69	--	--	--	--	--	--	--	<24dBm
60	5300	12.78	12.74	12.70	12.66	12.64	12.58	12.56	12.50	<24dBm
64	5320	10.65	--	--	--	--	--	--	--	<24dBm
100	5500	11.03	--	--	--	--	--	--	--	<24dBm
116	5580	13.36	13.30	13.22	13.18	13.12	13.09	13.00	12.94	<24dBm
140	5700	10.83	--	--	--	--	--	--	--	<24dBm
149	5745	13.54	--	--	--	--	--	--	--	<30dBm
157	5785	13.32	13.24	13.16	13.08	13.00	12.92	12.84	12.76	<30dBm
165	5825	13.05	--	--	--	--	--	--	--	<30dBm

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

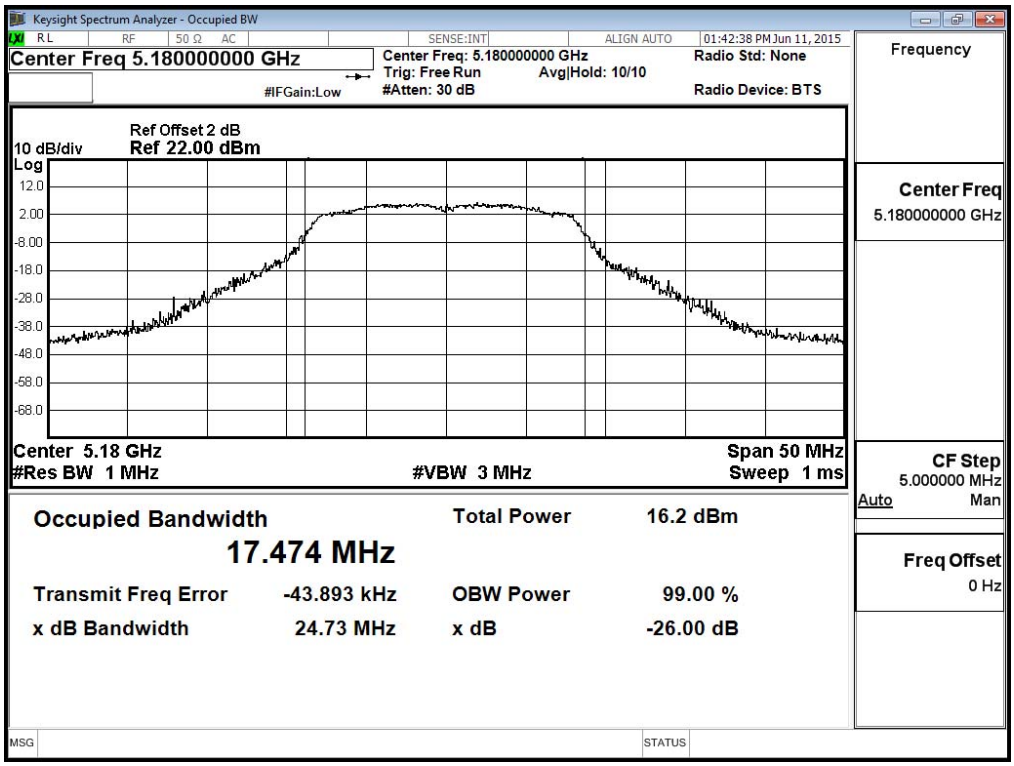
Maximum conducted output power Measurement:

CHAIN A

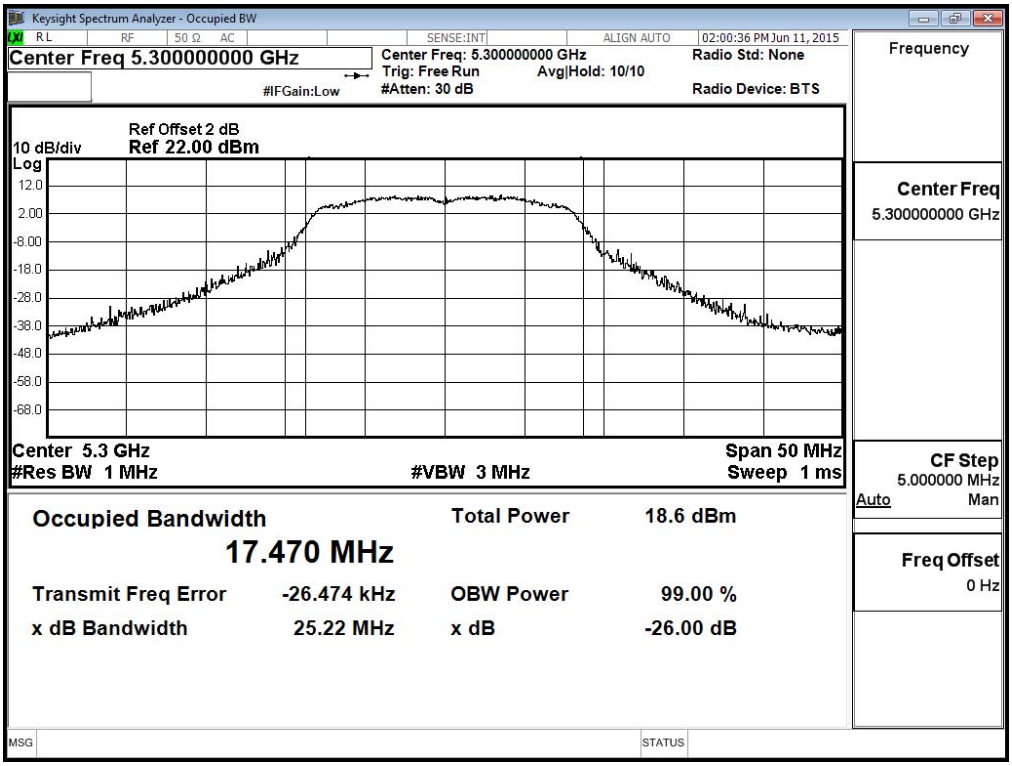
Channel No	Frequency Range (MHz)	99% Bandwidth (MHz)	Output Power (dBm)	Output Power Limit	
				(dBm)	dBm+10log(BW)
36	5180	--	11.29	24	--
44	5220	--	12.23	24	--
48	5240	--	12.29	24	--
52	5260	17.472	12.69	24	23.42
60	5300	17.470	12.78	24	23.42
64	5320	17.435	10.65	24	23.41
100	5500	17.412	11.03	24	23.41
116	5580	17.457	13.36	24	23.42
140	5700	17.396	10.83	24	23.40
149	5745	--	13.54	30	--
157	5785	--	13.32	30	--
165	5825	--	13.05	30	--

Note:
1. Power Output Value =Reading value on average power meter + cable loss
2. 99% bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.

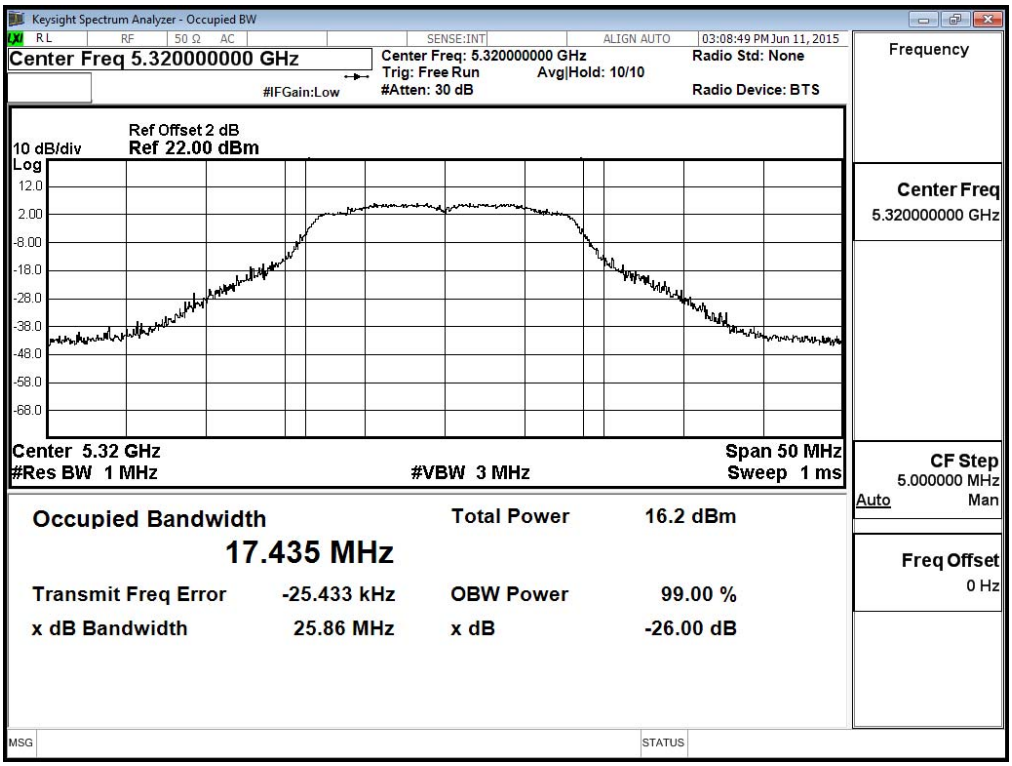
99% Occupied Bandwidth:
Channel 52:



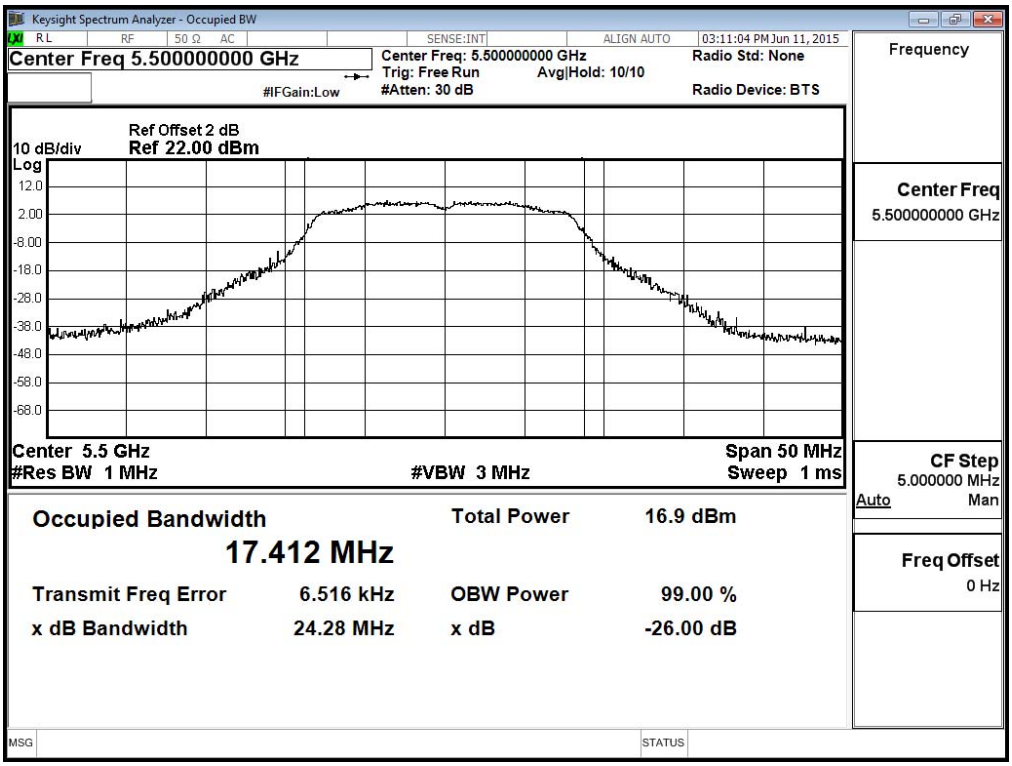
Channel 60:



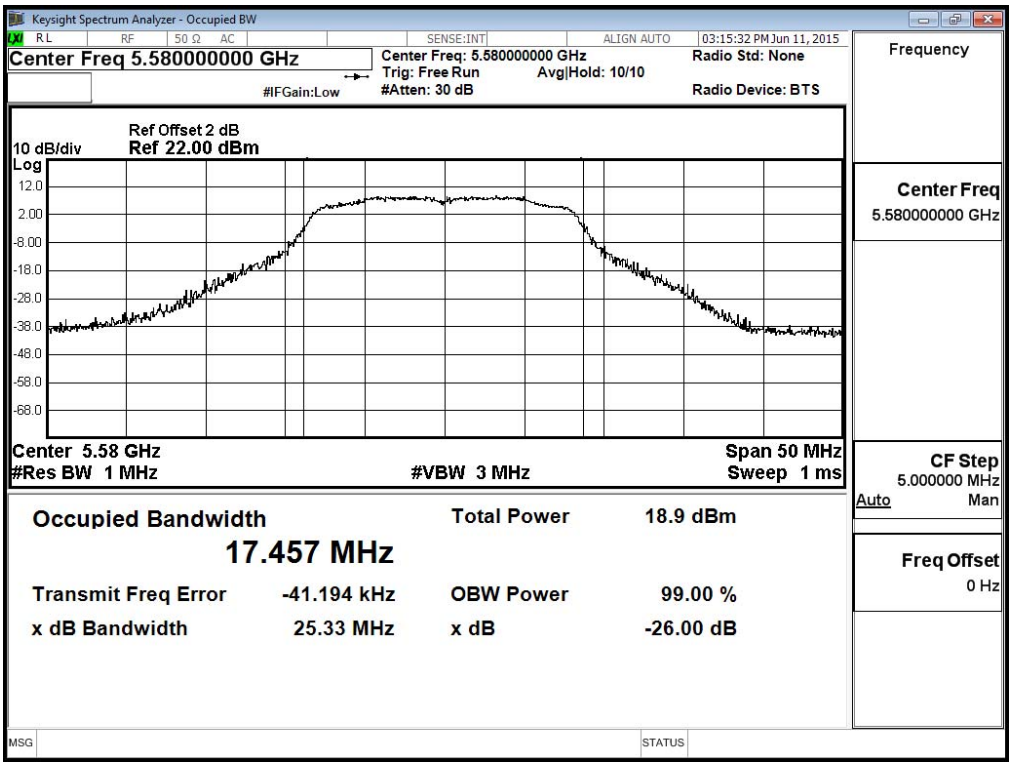
Channel 64:



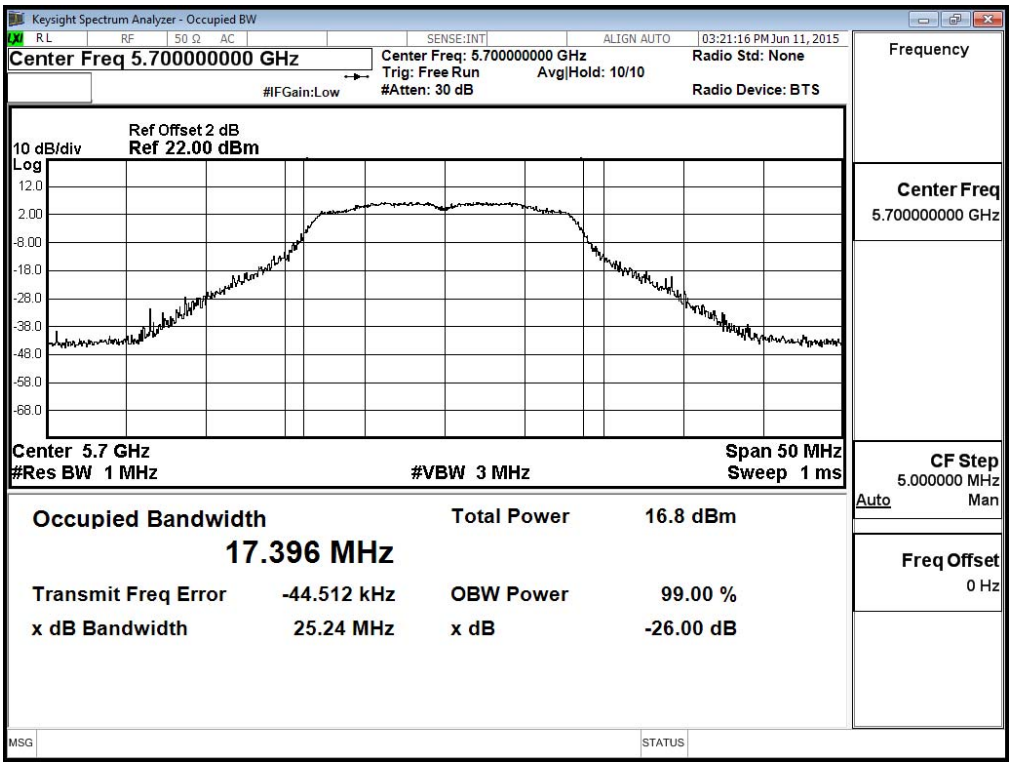
Channel 100:



Channel 116:



Channel 140:



Product : RUGGED TABLET COMPUTER
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	8.23	--	--	--	--	--	--	--	<24dBm
44	5220	8.20	8.13	8.09	8.03	7.98	7.92	7.87	7.81	<24dBm
48	5240	7.63	--	--	--	--	--	--	--	<24dBm
52	5260	9.62	--	--	--	--	--	--	--	<24dBm
60	5300	9.70	9.67	9.60	9.56	9.51	9.46	9.41	9.36	<24dBm
64	5320	7.86	--	--	--	--	--	--	--	<24dBm
100	5500	7.13	--	--	--	--	--	--	--	<24dBm
116	5580	10.03	9.95	9.89	9.82	9.75	9.68	9.61	9.54	<24dBm
140	5700	7.96	--	--	--	--	--	--	--	<24dBm
149	5745	10.82	--	--	--	--	--	--	--	<30dBm
157	5785	10.62	10.58	10.53	10.49	10.44	10.40	10.35	10.31	<30dBm
165	5825	10.78	--	--	--	--	--	--	--	<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	7.90	--	--	--	--	--	--	--	<24dBm
44	5220	8.44	8.39	8.31	8.25	8.19	8.12	8.06	7.99	<24dBm
48	5240	8.45	--	--	--	--	--	--	--	<24dBm
52	5260	9.74	--	--	--	--	--	--	--	<24dBm
60	5300	9.75	9.70	9.67	9.63	9.59	9.55	9.51	9.47	<24dBm
64	5320	8.30	--	--	--	--	--	--	--	<24dBm
100	5500	6.65	--	--	--	--	--	--	--	<24dBm
116	5580	10.82	10.79	10.76	10.73	10.70	10.67	10.64	10.61	<24dBm
140	5700	7.30	--	--	--	--	--	--	--	<24dBm
149	5745	10.04	--	--	--	--	--	--	--	<30dBm
157	5785	9.41	9.37	9.32	9.28	9.23	9.19	9.14	9.10	<30dBm
165	5825	10.01	--	--	--	--	--	--	--	<30dBm

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

Maximum conducted output power Measurement:

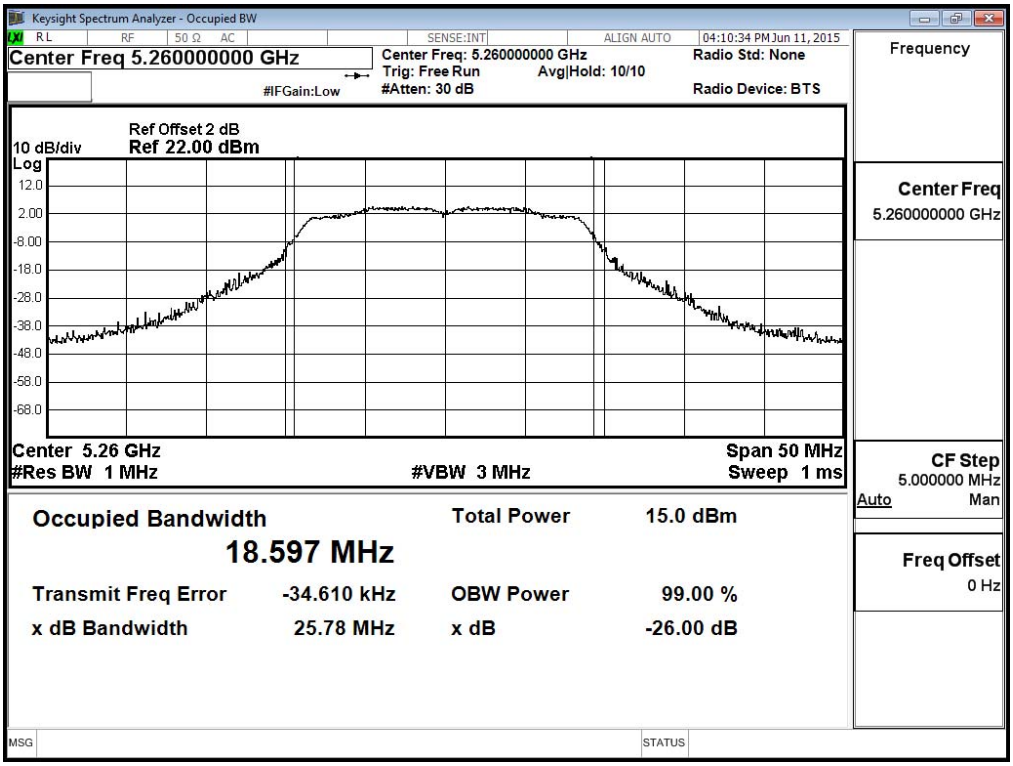
(CHAIN A+ B)

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	--	8.23	7.90	11.08	24	--
44	5220	--	8.20	8.44	11.33	24	--
48	5240	--	7.63	8.45	11.07	24	--
52	5260	18.359	9.62	9.74	12.69	24	23.64
60	5300	18.346	9.70	9.75	12.74	24	23.64
64	5320	18.383	7.86	8.30	11.10	24	23.64
100	5500	18.409	7.13	6.65	9.91	24	23.65
116	5580	18.354	10.03	10.82	13.45	24	23.64
140	5700	18.360	7.96	7.30	10.65	24	23.64
149	5745	--	10.82	10.04	13.46	30	--
157	5785	--	10.62	9.41	13.07	30	--
165	5825	--	10.78	10.01	13.42	30	--

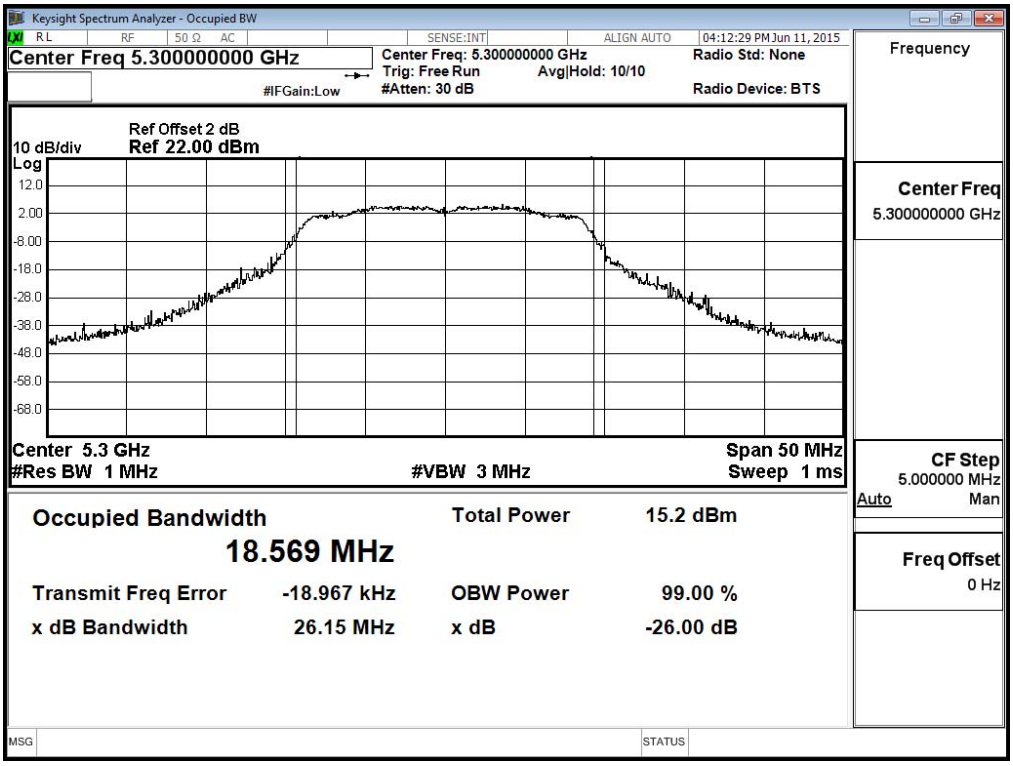
Note:

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. 99%Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.

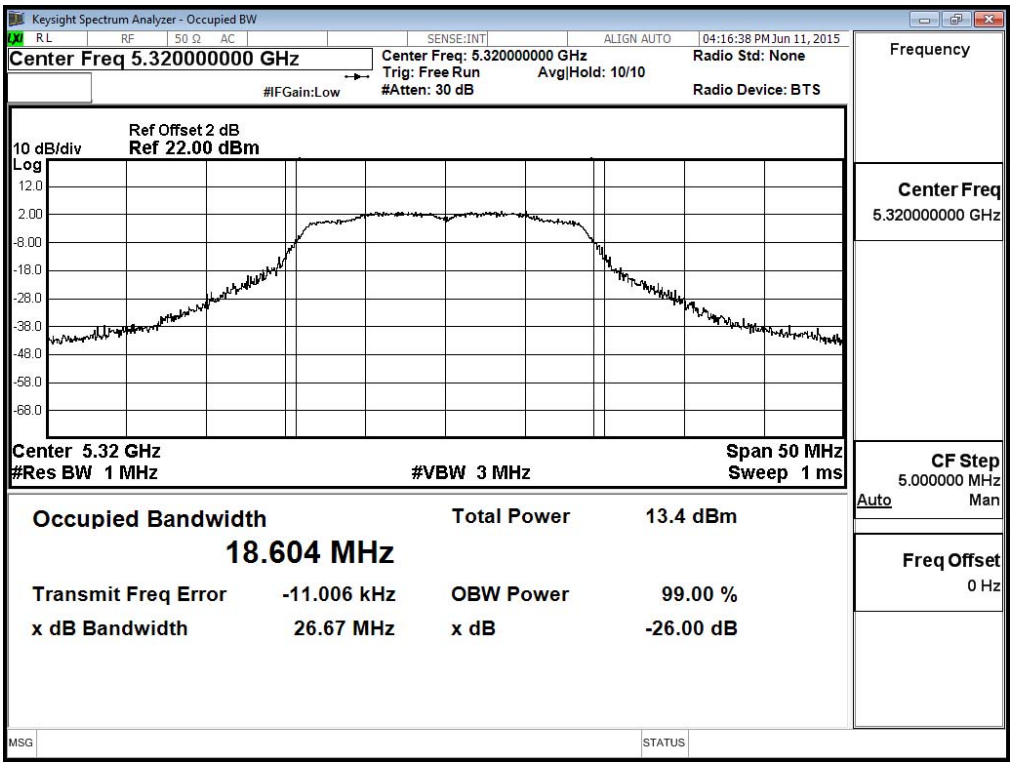
99% Occupied Bandwidth:
Channel 52 -Chain A



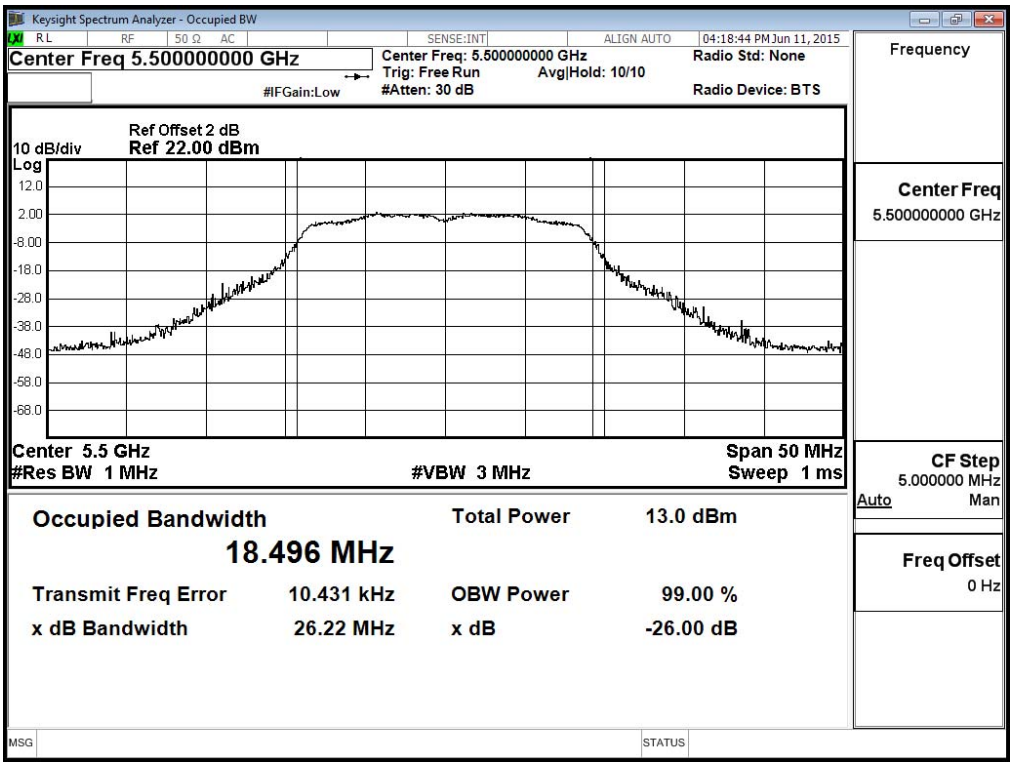
Channel 60 -Chain A



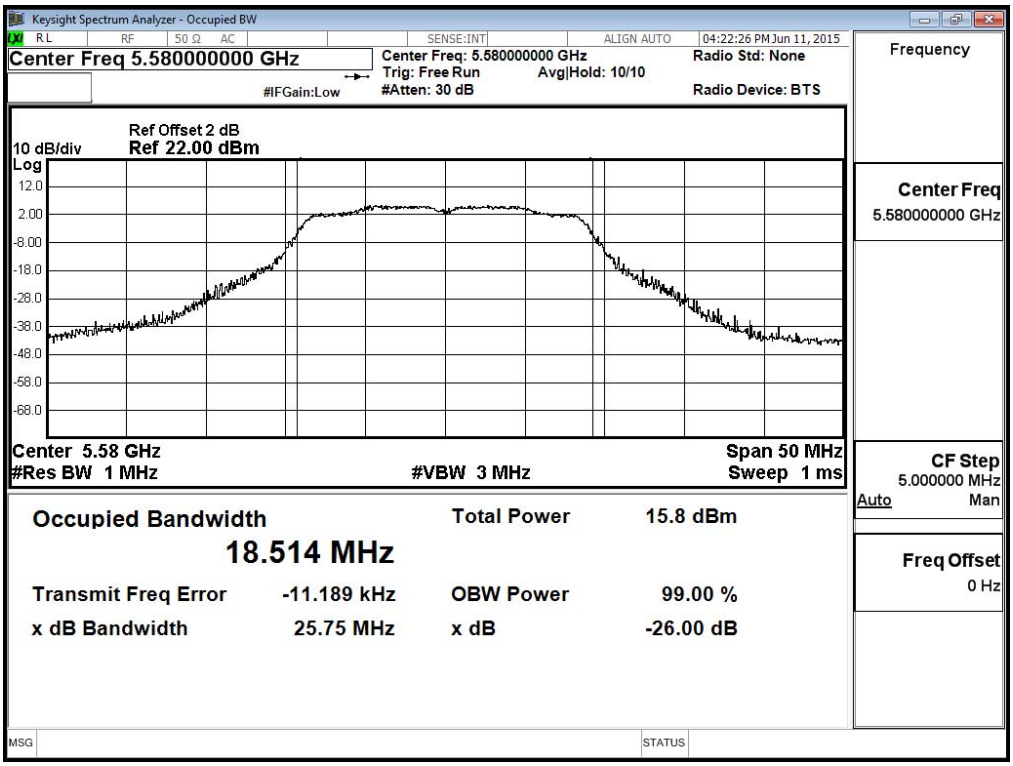
Channel 64 -Chain A



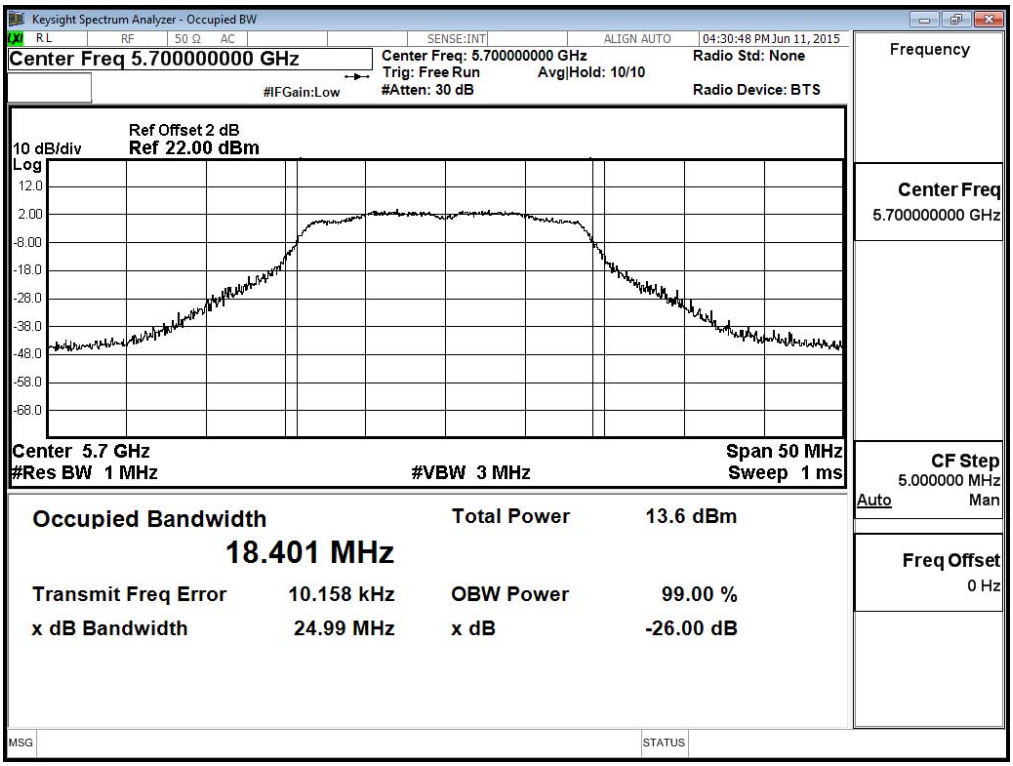
Channel 100 -Chain A



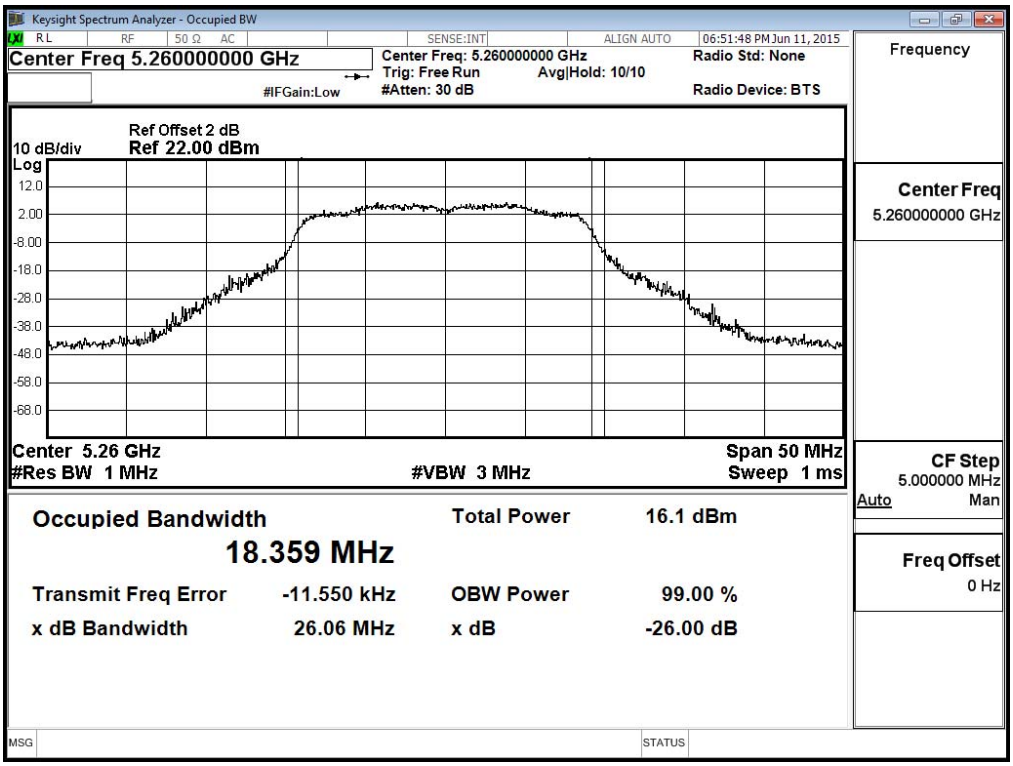
Channel 116 -Chain A



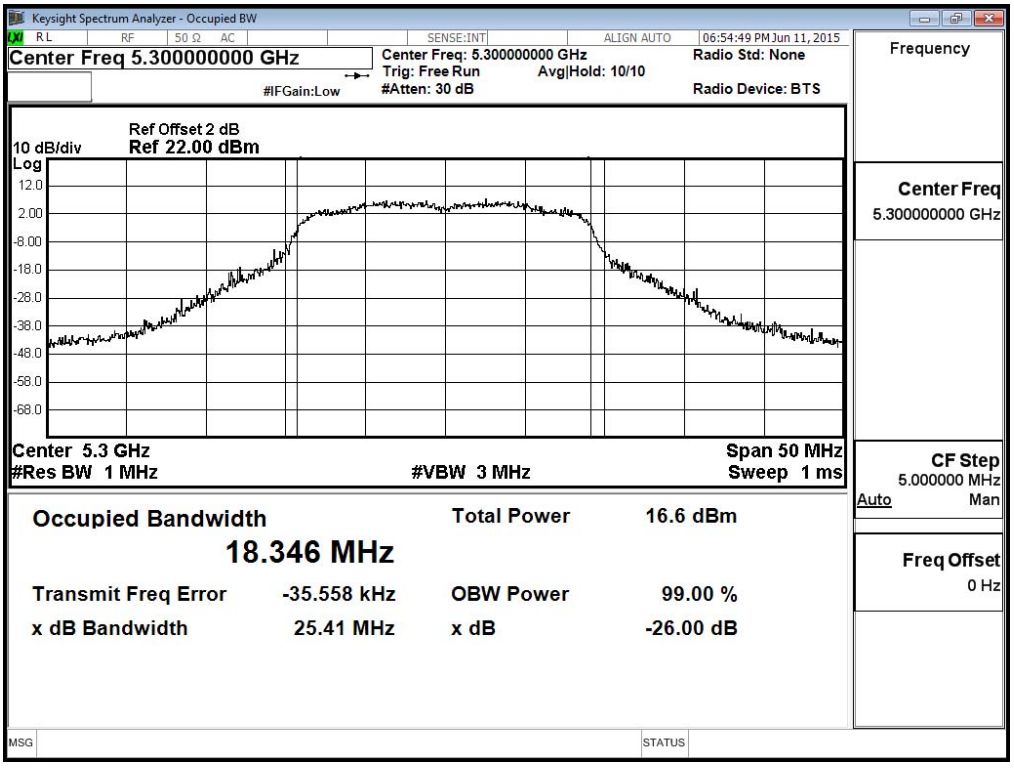
Channel 140 -Chain A



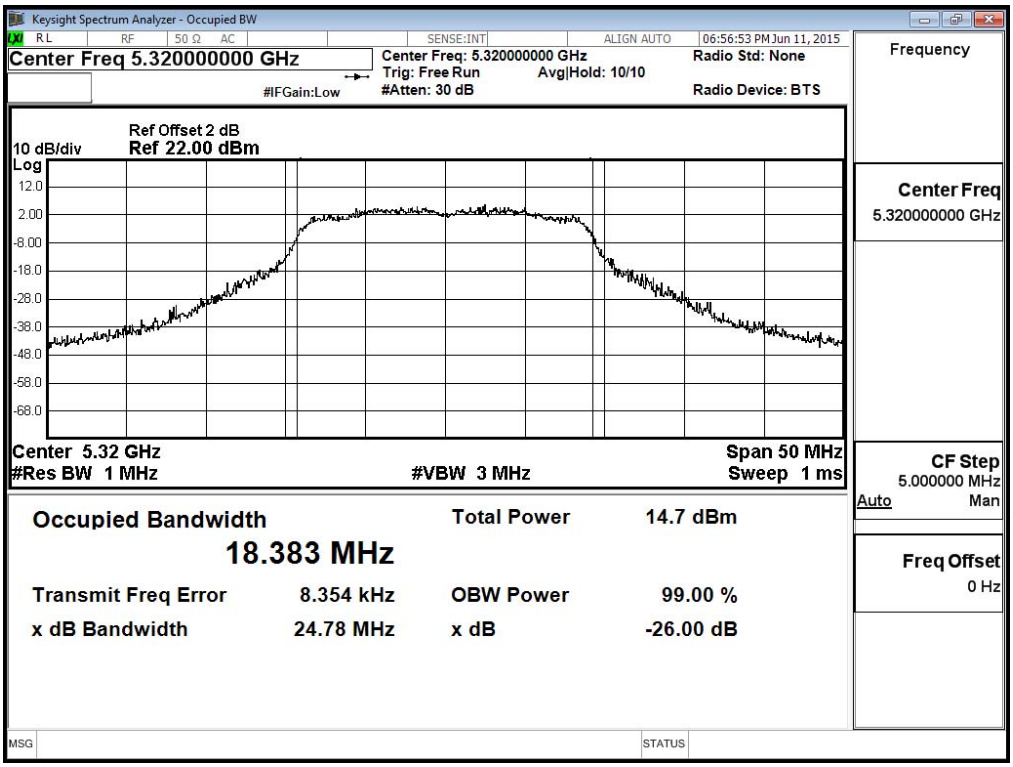
99% Occupied Bandwidth:
Channel 52 -Chain B



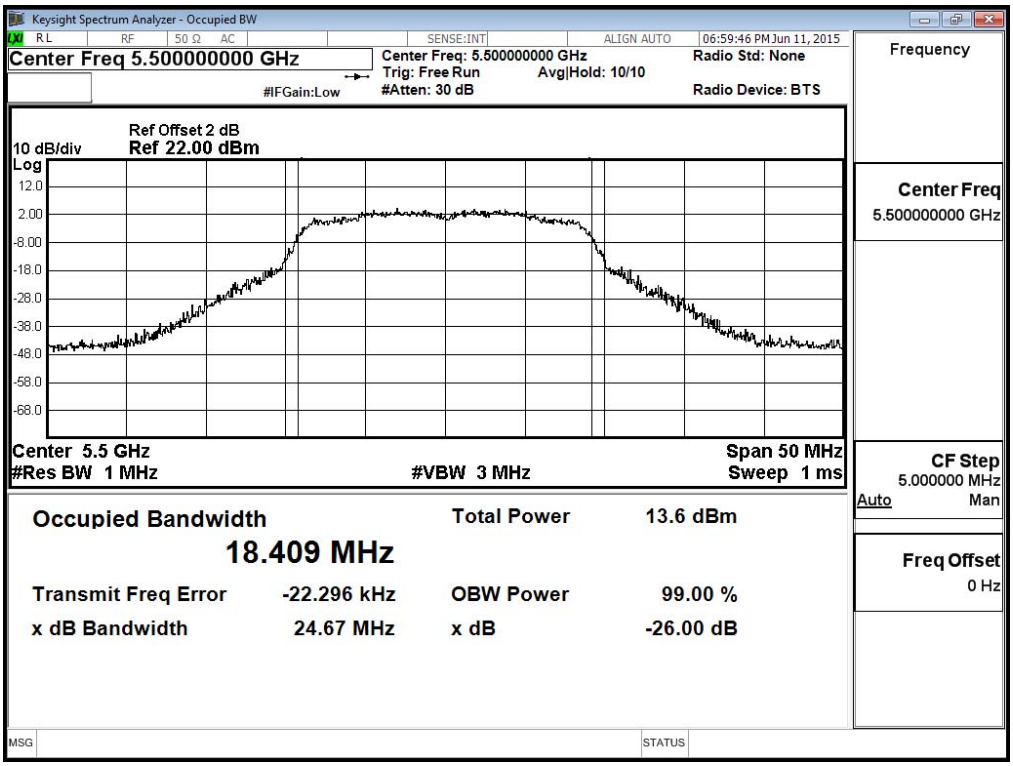
Channel 60 -Chain B



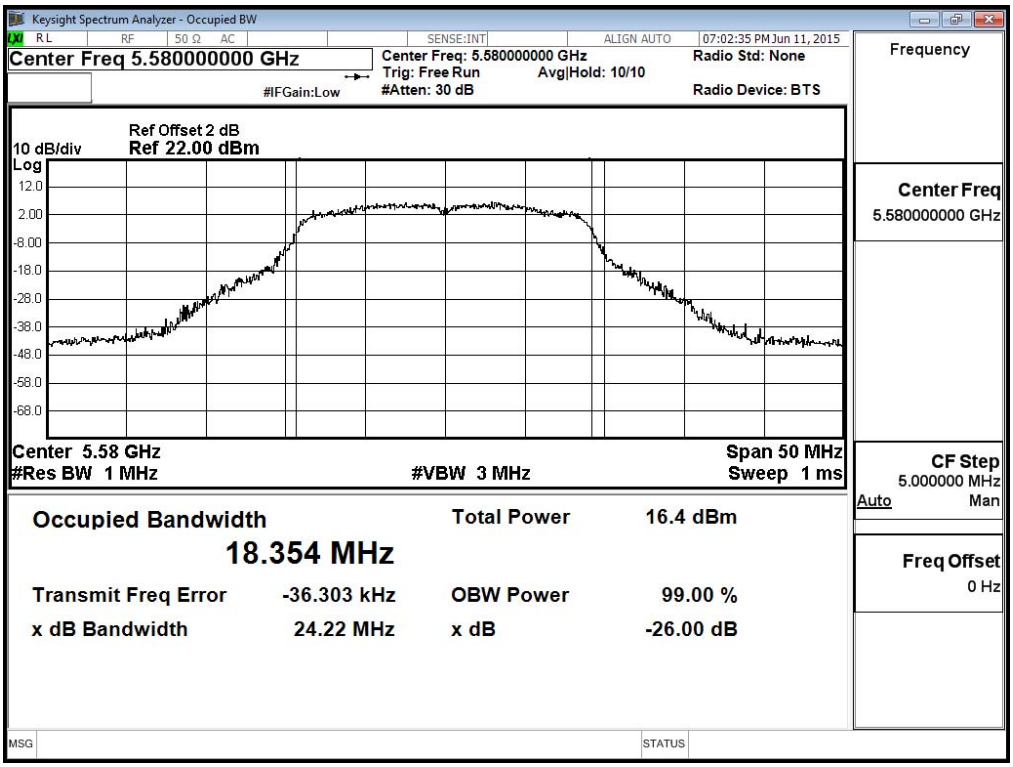
Channel 64 -Chain B



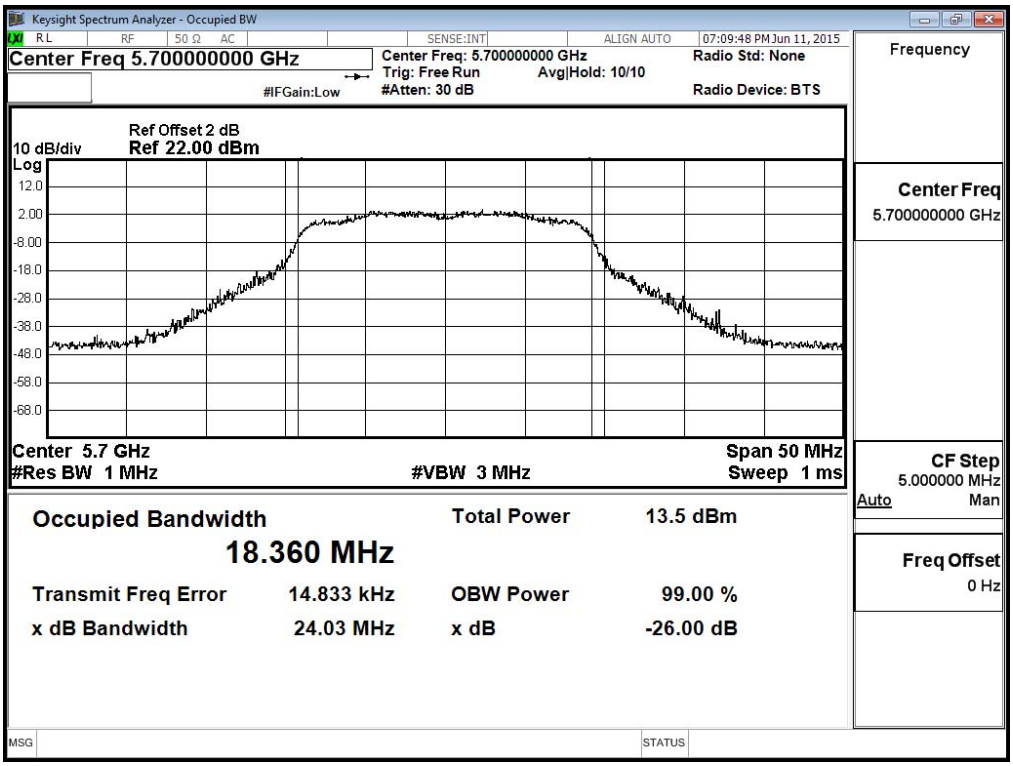
Channel 100 -Chain B



Channel 116 -Chain B



Channel 140 -Chain B



Product : RUGGED TABLET COMPUTER
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	6.70	--	--	--	--	--	--	--	<24dBm
46	5230	10.36	10.33	10.29	10.26	10.22	10.19	10.15	10.10	<24dBm
54	5270	10.33	--	--	--	--	--	--	--	<24dBm
62	5310	7.13	7.09	7.02	6.97	6.915	6.86	6.805	6.75	<24dBm
102	5510	7.76	--	--	--	--	--	--	--	<24dBm
110	5550	10.37	10.33	10.29	10.25	10.21	10.17	10.13	10.09	<24dBm
134	5670	10.62	--	--	--	--	--	--	--	<24dBm
151	5755	10.21	--	--	--	--	--	--	--	<30dBm
159	5795	10.53	10.49	10.44	10.42	10.37	10.33	10.29	10.27	<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	6.31	--	--	--	--	--	--	--	<24dBm
46	5230	10.46	10.42	10.39	10.35	10.31	10.27	10.24	10.22	<24dBm
54	5270	10.42	--	--	--	--	--	--	--	<24dBm
62	5310	7.71	7.68	7.64	7.61	7.58	7.55	7.51	7.49	<24dBm
102	5510	7.51	--	--	--	--	--	--	--	<24dBm
110	5550	10.54	10.5	10.48	10.45	10.42	10.39	10.37	10.33	<24dBm
134	5670	10.15	--	--	--	--	--	--	--	<24dBm
151	5755	9.02	--	--	--	--	--	--	--	<30dBm
159	5795	9.26	9.23	9.19	9.17	9.14	9.11	9.07	9.04	<30dBm

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

Maximum conducted output power Measurement:

(CHAIN A+ B)

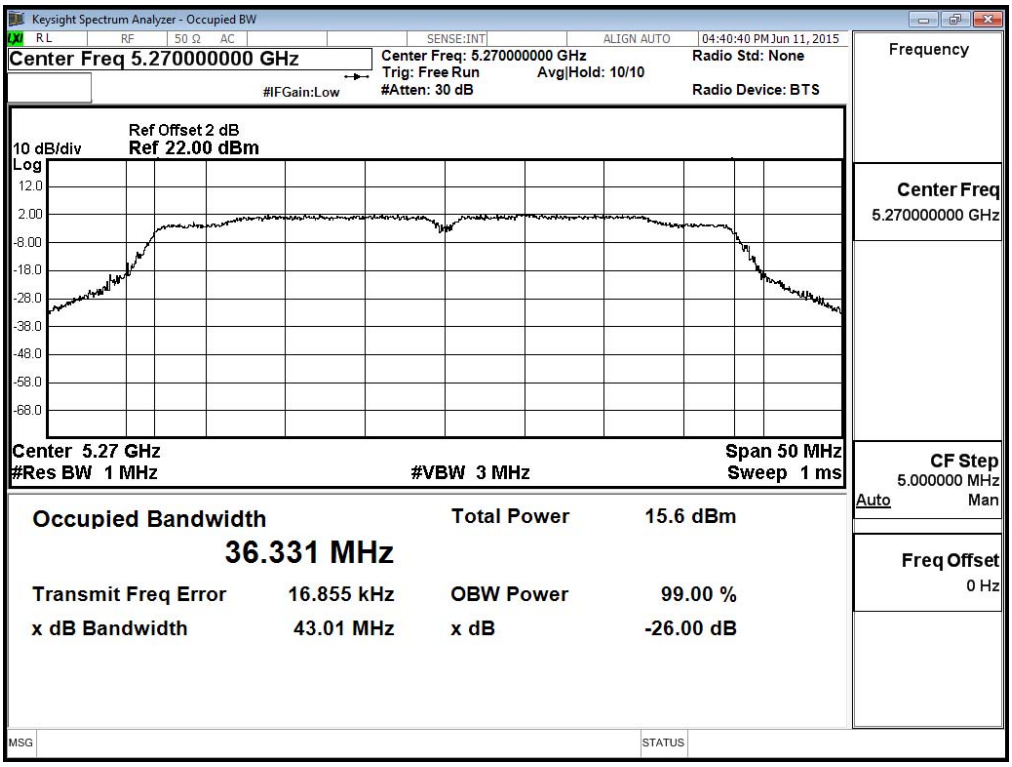
Channel Number	Frequency (MHz)	99% Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit	
						(dBm)	dBm+10log(BW)
38	5190	--	6.70	6.31	9.52	24	--
46	5230	--	10.36	10.46	13.42	24	--
54	5270	36.260	10.33	10.42	13.39	24	26.59
62	5310	36.327	7.13	7.71	10.44	24	26.60
102	5510	36.265	7.76	7.51	10.65	24	26.59
110	5550	36.264	10.37	10.54	13.47	24	26.59
134	5670	36.286	10.62	10.15	13.40	24	26.60
151	5755	--	10.21	9.02	12.67	30	--
159	5795	--	10.53	9.26	12.95	30	--

Note:

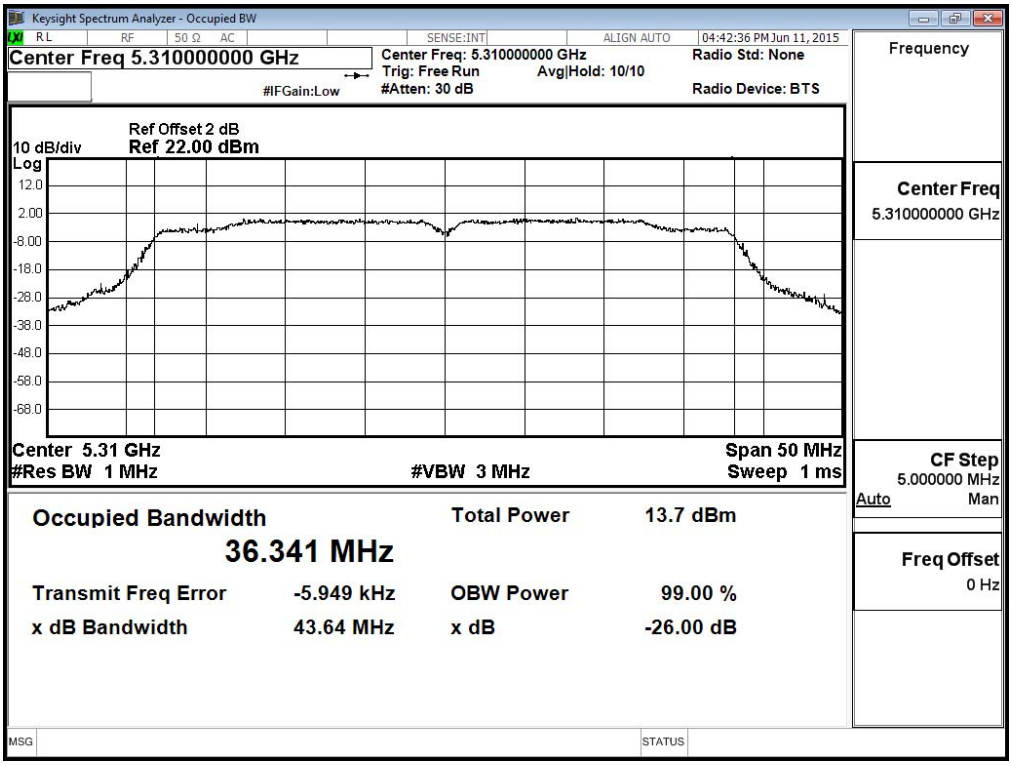
1. Power Output Value =Reading value on average power meter + cable loss
2. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW))
3. 99%Bandwidth is the bandwidth of chain A or chain B whichever is less bandwidth, output power limitation is more stringent.

99% Occupied Bandwidth:

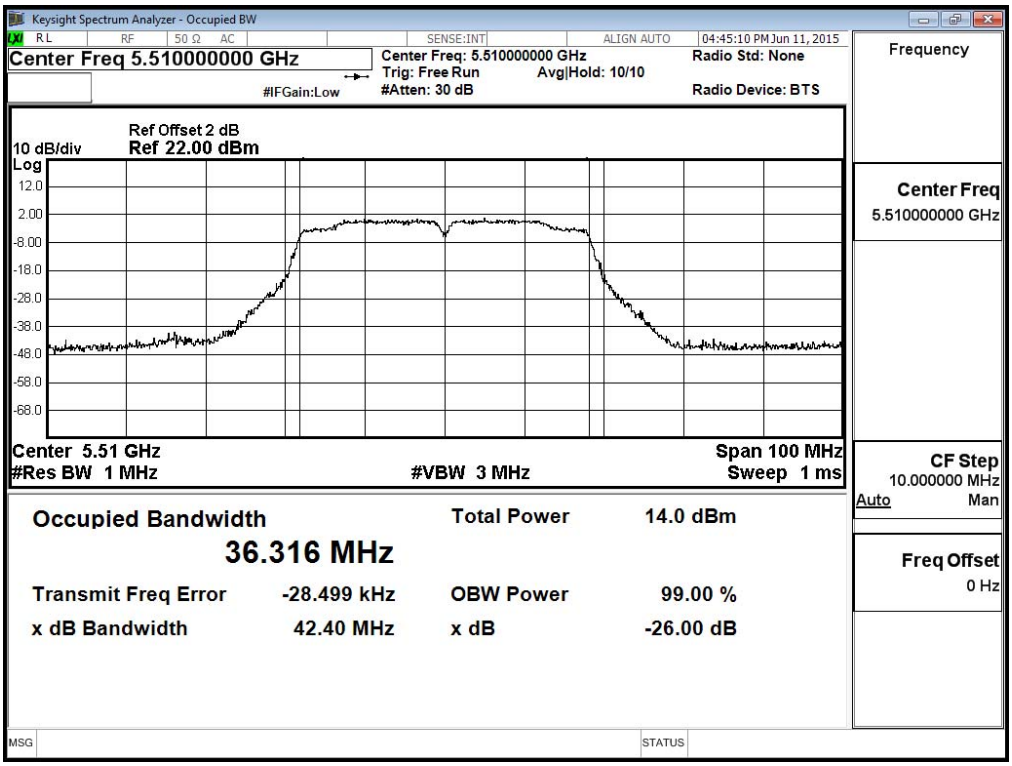
Channel 54 – Chain A



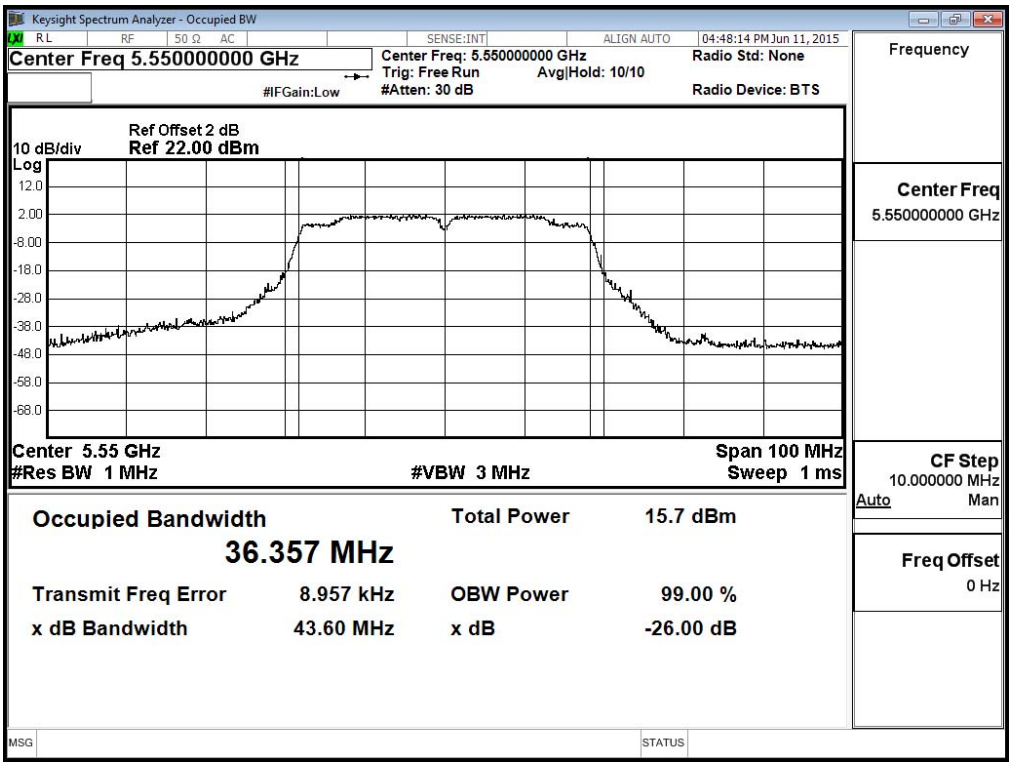
Channel 62 – Chain A



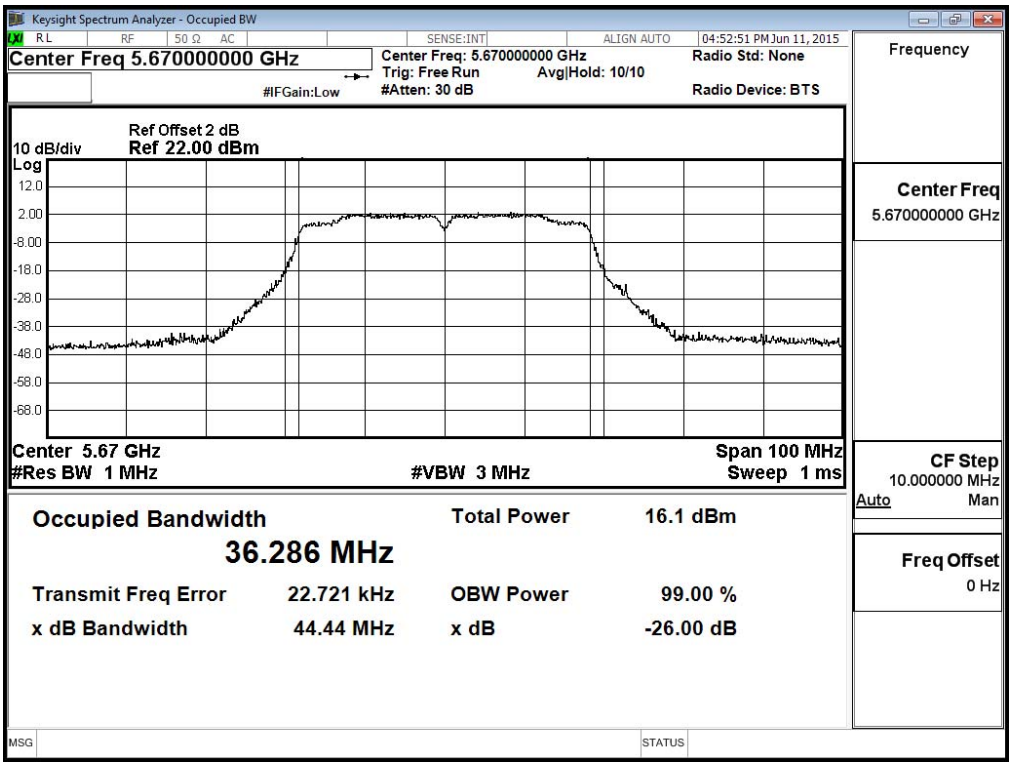
Channel 102 – Chain A



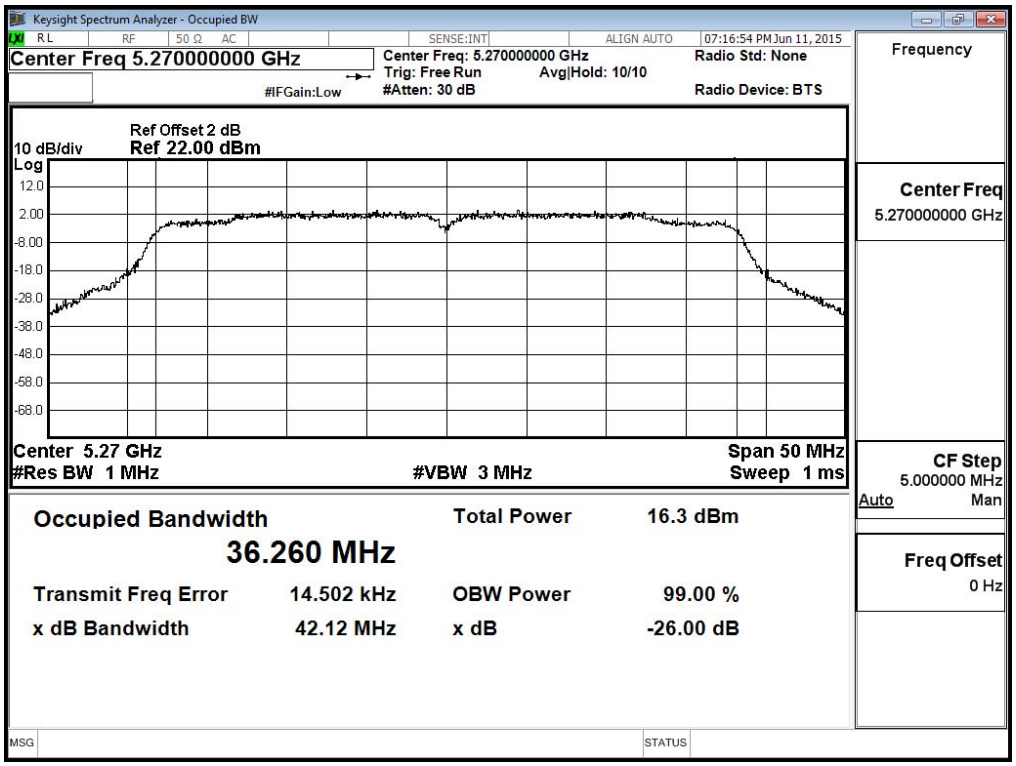
Channel 110 – Chain A



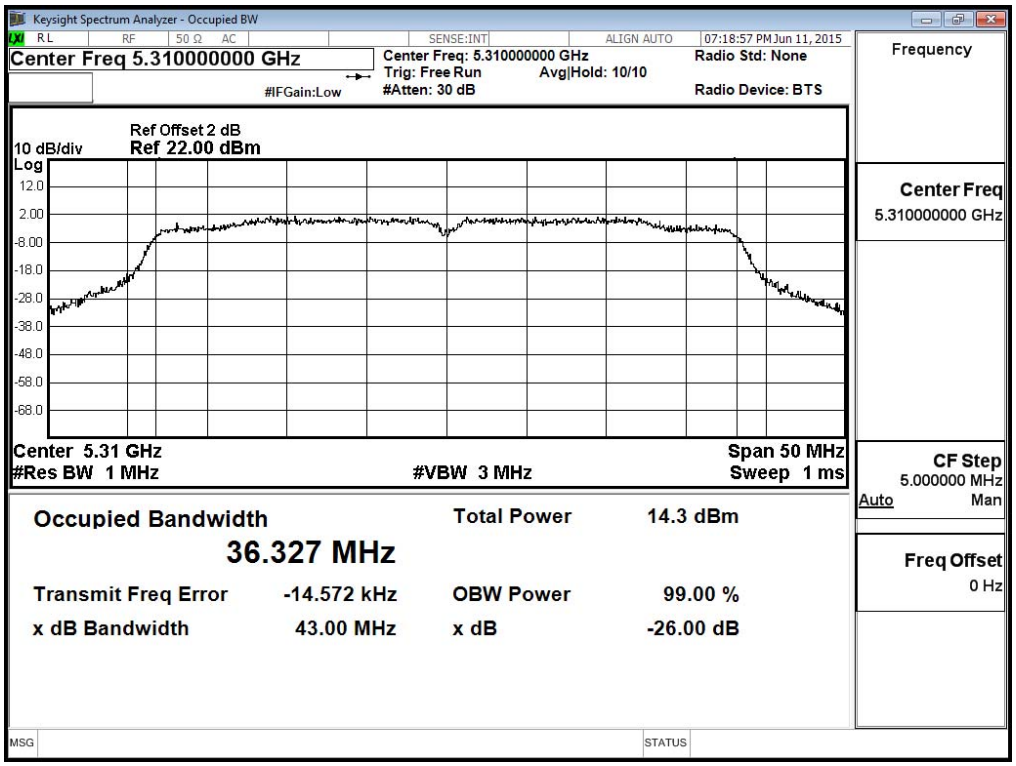
Channel 134 – Chain A



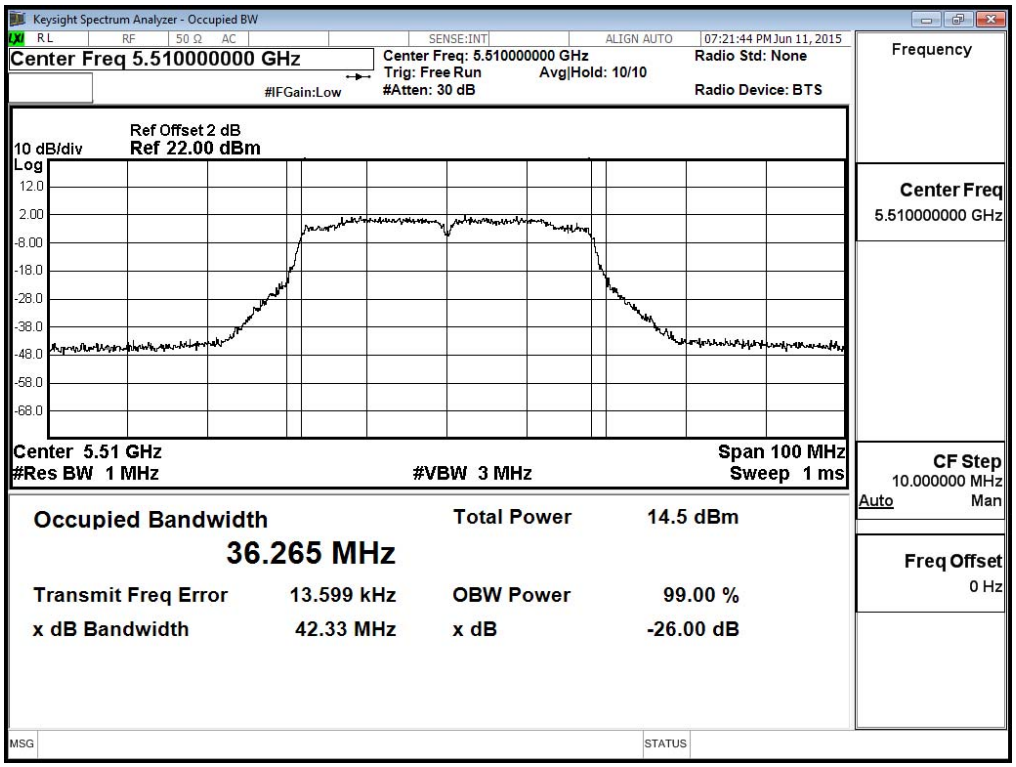
99% Occupied Bandwidth:
Channel 54 – Chain B



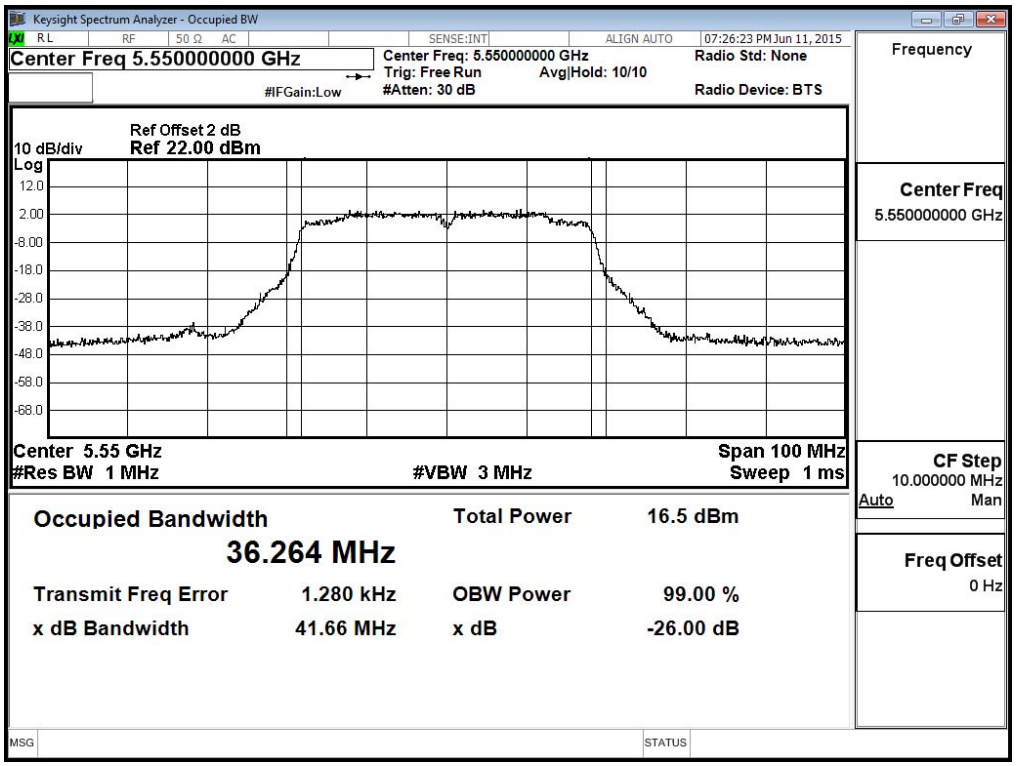
Channel 62 – Chain B



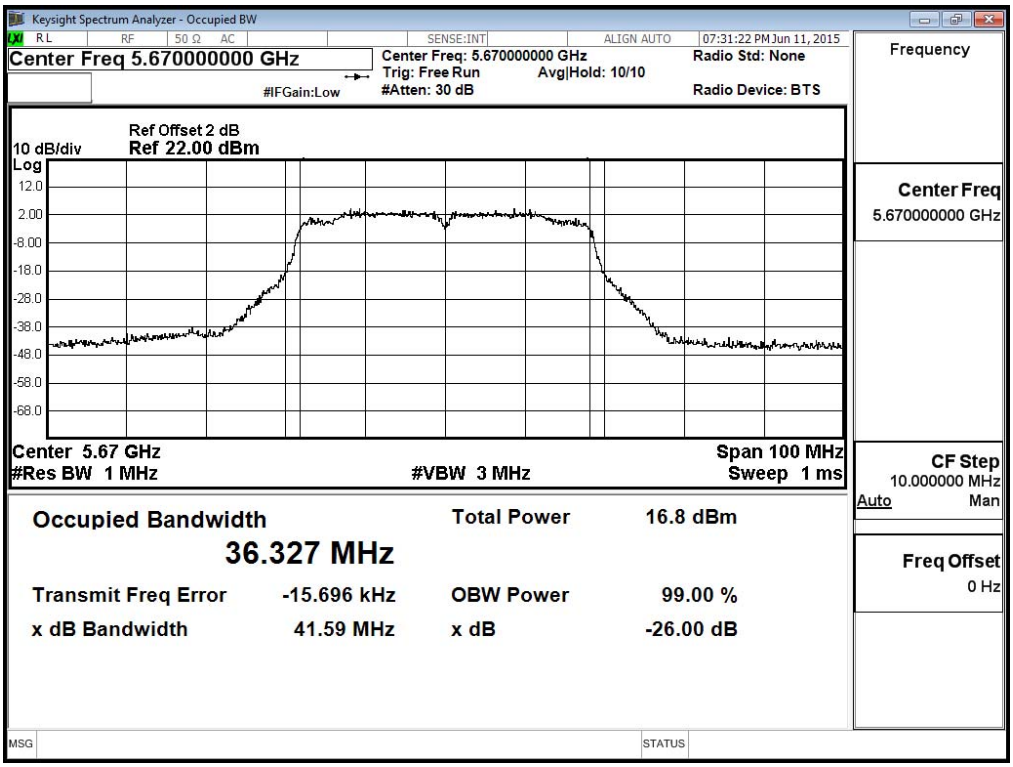
Channel 102 – Chain B



Channel 110 – Chain B



Channel 134 – Chain B



Product : RUGGED TABLET COMPUTER
Test Item : Maximum conducted output power
Test Site : No.3 OATS
Test Mode : Mode 4: Transmit (802.11ac-20BW-14.4Mbps)

Chain A

Cable loss=1dB		Maximum conducted output power									
Channel No.	Frequency (MHz)	Data Rate (Mbps)									Required Limit
		VTH0	VTH1	VTH2	VTH3	VTH4	VTH5	VTH6	VTH7	VTH8	
		Measurement Level (dBm)									
144 (Band3)	5720	10.47	10.39	10.31	10.22	10.16	10.09	10.02	9.96	9.87	<24dBm
144 (Band4)	5720	3.07	2.98	2.91	2.86	2.79	2.7	2.61	2.53	2.47	<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
		VTH0	VTH1	VTH2	VTH3	VTH4	VTH5	VTH6	VTH7	VTH8	
		Measurement Level (dBm)									
144 (Band3)	5720	8.48	8.39	8.32	8.24	8.16	8.09	8.01	7.93	7.87	<24dBm
144 (Band4)	5720	0.45	0.39	0.31	0.22	0.15	0.07	-0.09	-0.15	-0.23	<30dBm

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

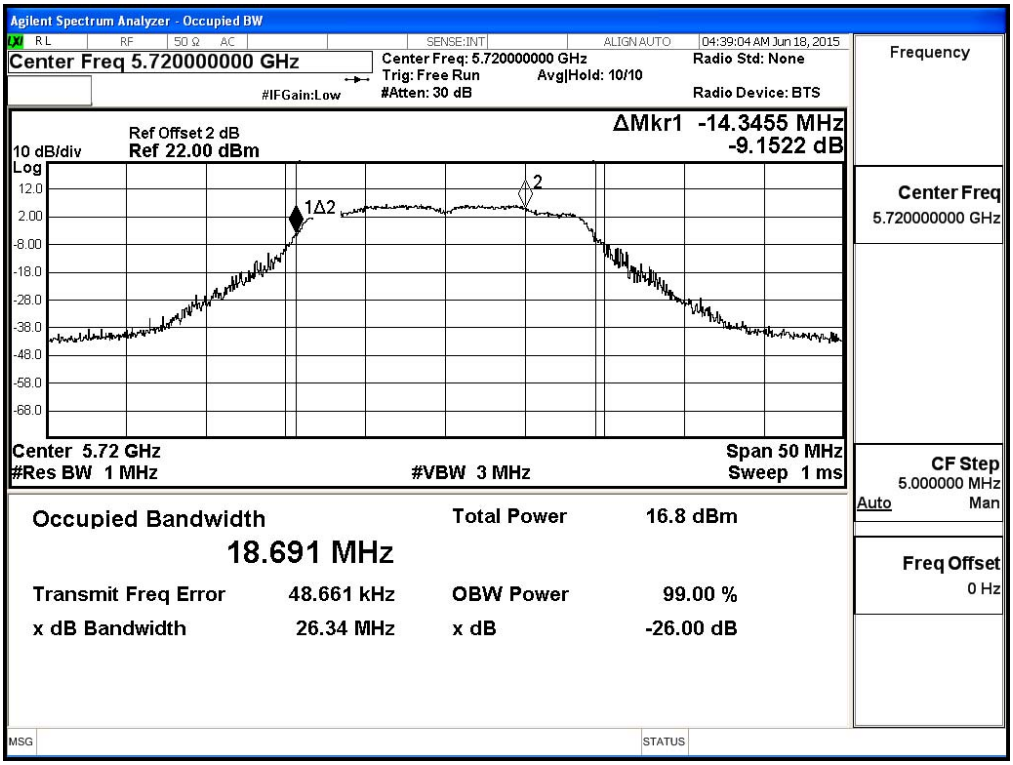
Maximum conducted output power Measurement:

Channel No	Frequency Range (MHz)	99% Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit		Result
						(dBm)	dBm+10log(BW)	
144(Band3)	5720	14.263	10.47	8.48	12.60	24	22.54	Pass
144(Band4)	5720	4.263	3.07	0.45	4.96	30	--	Pass

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

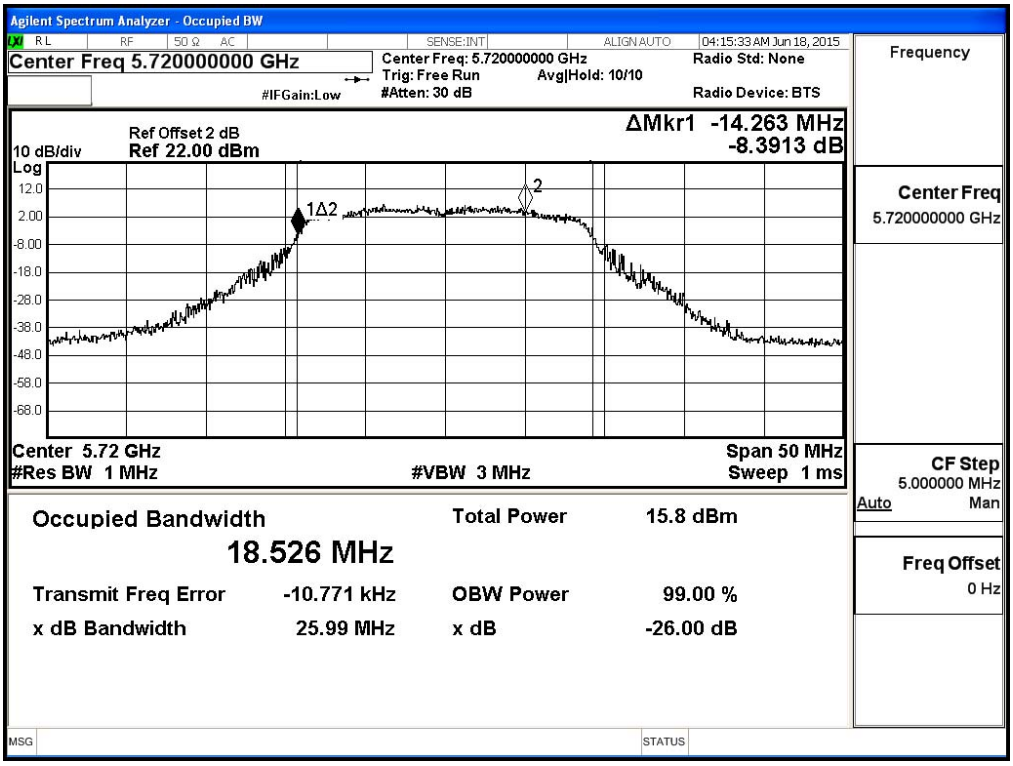
99% Occupied Bandwidth:

Channel 144 – Chain A



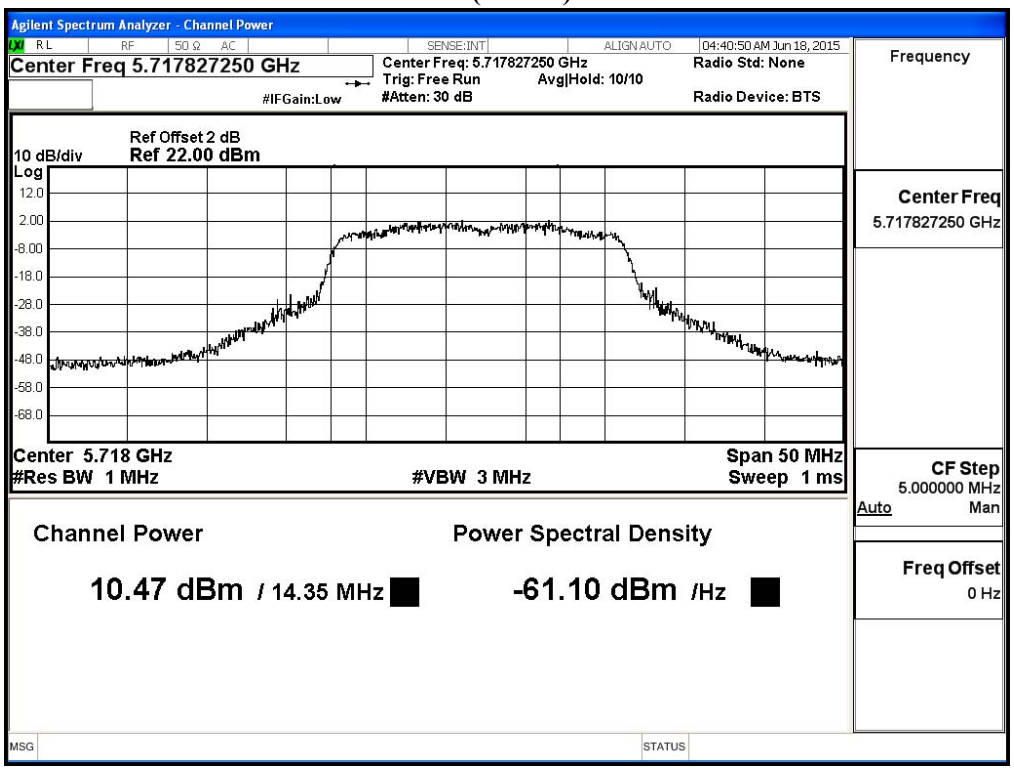
99% Occupied Bandwidth:

Channel 144 – Chain B

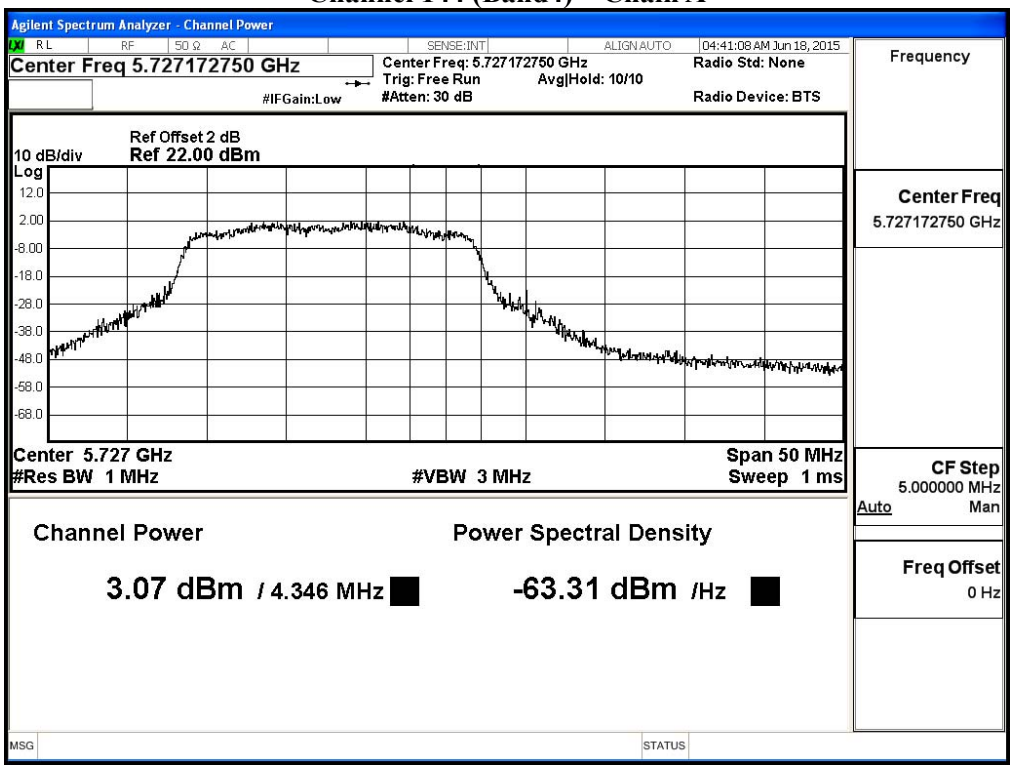


Maximum conducted output power:

Channel 144 (Band3) – Chain A

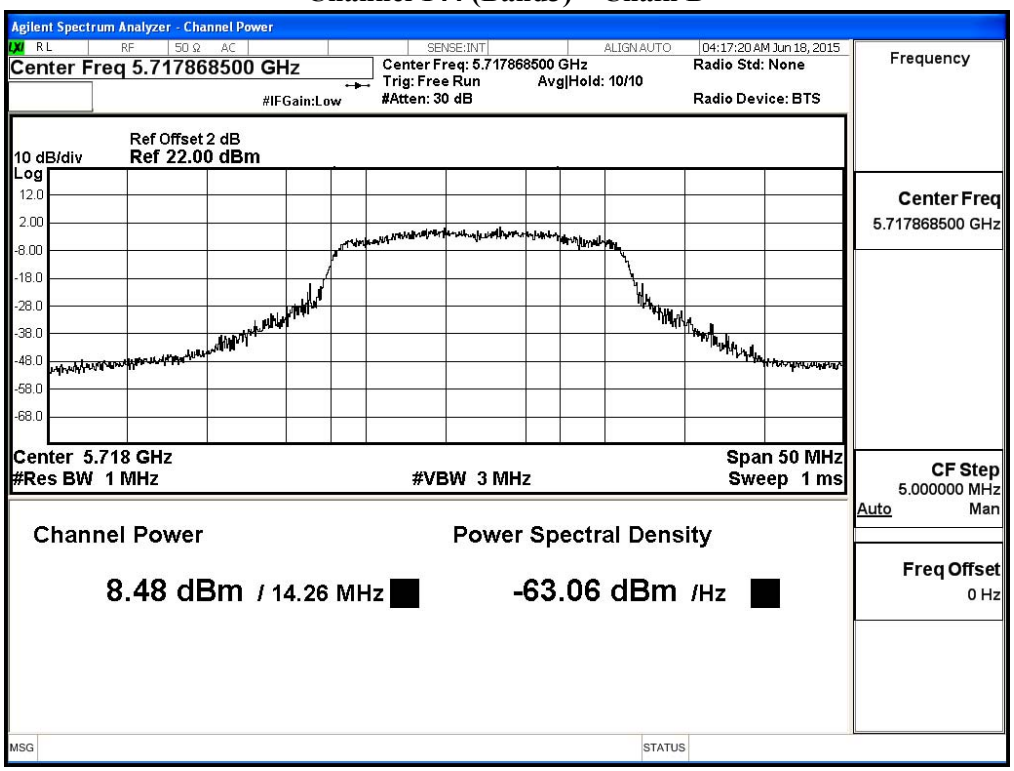


Channel 144 (Band4) – Chain A

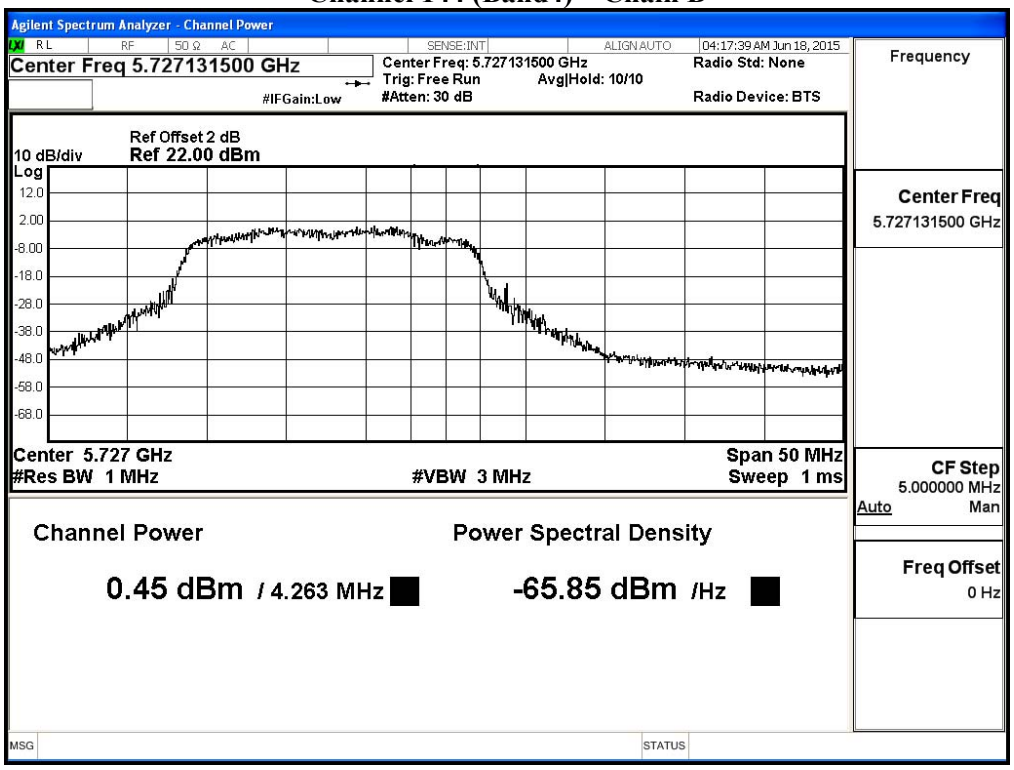


Maximum conducted output power:

Channel 144 (Band3) – Chain B



Channel 144 (Band4) – Chain B



Product : RUGGED TABLET COMPUTER
Test Item : Maximum conducted output power
Test Site : No.3 OATS
Test Mode : Mode 5: Transmit (802.11ac-40BW-30Mbps)

Chain A

Cable loss=1dB		Maximum conducted output power										
Channel No	Frequency (MHz)	Data Rate (Mbps)										Required Limit
		VTH0	VTH1	VTH2	VTH3	VTH4	VTH5	VTH6	VTH7	VTH8	VTH9	
142F(Band3)	5710	10.86	10.78	10.69	10.61	10.53	10.47	10.4	10.33	10.27	10.19	<24dBm
142F(Band4)	5710	-1.87	-1.95	-2.03	-2.1	-2.16	-2.23	-2.31	-2.38	-2.43	-2.51	<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
		VTH0	VTH1	VTH2	VTH3	VTH4	VTH5	VTH6	VTH7	VTH8	VTH9	
142F(Band3)	5710	9.73	9.67	9.59	9.52	9.45	9.38	9.31	9.24	9.18	9.11	<24dBm
142F(Band4)	5710	-3.40	-3.48	-3.56	-3.61	-3.67	-3.75	-3.83	-3.91	-4.03	-4.11	<30dBm

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

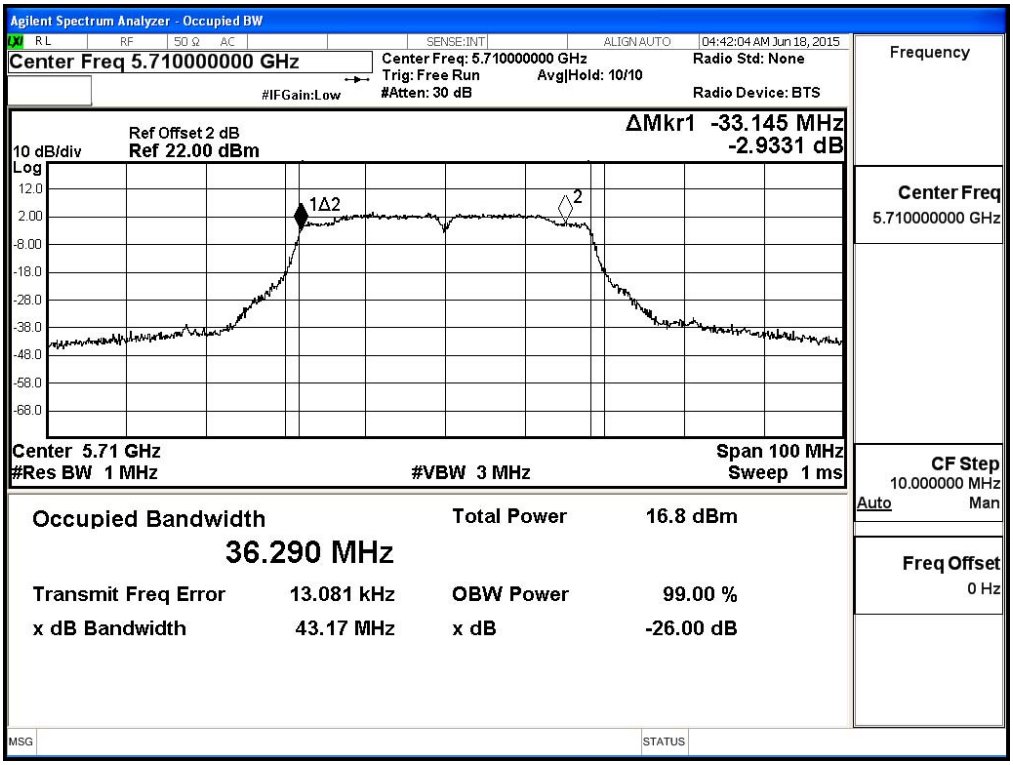
Maximum conducted output power Measurement:

Channel No	Frequency Range (MHz)	99% Bandwidth (MHz)	Chain A Power (dBm)	Chain B Power (dBm)	Output Power (dBm)	Output Power Limit		Result
						(dBm)	dBm+10log(BW)	
142F(Band3)	5710	33.145	10.86	9.73	13.34	24	26.20	Pass
142F(Band4)	5710	3.145	-1.87	-3.40	0.44	30	--	Pass

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

99% Occupied Bandwidth:

Channel 142 – Chain A



99% Occupied Bandwidth:

Channel 142 – Chain B