FCC/IC RADIO TEST REPORT
FCC ID: LNQSBWD100B

Product：	ScreenBeam Pro Wireless Display Receiver, ScreenBeam Pro - Education Edition 2, ScreenBeam Pro - Business Edition, ScreenBeam Kit, ScreenBeam Pro
Trade Name：	Actiontec
Model Name：	SBWD100B
Serial Model：	N/A
Report No.：	NTEK-2014NT0515718F1-02

Prepared for

Actiontec Electronics, Inc.

760 North Mary Ave., Sunnyvale, California 94085 United States

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street
Bao'an District, Shenzhen P.R. China
Tel.: +86-0755-61156588 Fax.: +86-0755-61156599
Website:www.ntek.org.cn

TEST RESULT CERTIFICATION

Applicant's name ..... Actiontec Electronics, Inc.

Address ..... 760 North Mary Ave., Sunnyvale, California 94085 United States

Manufacture's Name... Actiontec Electronics, Inc.

Address ..... 760 North Mary Ave., Sunnyvale, California 94085 United States

Product description

Product name ..... ScreenBeam Pro Wireless Display Receiver,
ScreenBeam Pro - Education Edition 2,
ScreenBeam Pro - Business Edition,
ScreenBeam Kit,
ScreenBeam Pro

Model and/or type reference SBWD100B

Serial Model ..... N/A

Standards ..... FCC Part15.407: 01 Oct. 2015

Test procedure ..... ANSI C63.10-2013 and KDB 789033 D01 v01r04

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements/ the Industry Canada requirements.. And it is applicable only to the tested sample identified in the report.

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Date of Test .....

Date (s) of performance of tests ..... 20 Nov. 2015 ~18 Jan. 2016

Date of Issue..... 18 Jan. 2016

Test Result..... **Pass**

Testing Engineer : Jason chen

(Jason Chen)

Technical Manager : Brown Lu

(Brown Lu)

Authorized Signatory : Sam . chen

(Sam Chen)

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.407) , Subpart E			
Standard Section	Test Item	Judgment	Remark
FCC §15.207	AC Power Line Conducted Emissions	PASS	
FCC §15.209(a),	Spurious Radiated Emissions	PASS	
FCC §15.407(a)	26 dB and 99% Emission Bandwidth	PASS	
FCC §15.407(e)	Minimum 6 dB bandwidth	PASS	
FCC §407(a)(3)	Peak Output Power Measurement	PASS	
FCC §2.1051, §15.407(b)	Band Edges	PASS	
FCC §15.407(a)(3)	Power Spectral Density	PASS	
FCC §2.1051, §15.407(b)	Spurious Emissions at Antenna Terminals	PASS	
FCC §15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd
Add.:1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.
FCC Registration No.:238937; IC Registration No.:9270A-1
CNAS Registration No.:L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	ScreenBeam Pro Wireless Display Receiver, ScreenBeam Pro - Education Edition 2, ScreenBeam Pro - Business Edition, ScreenBeam Kit, ScreenBeam Pro	
Trade Name	Actiontec	
Model Name	SBWD100B	
Product Description	The EUT is a ScreenBeam Pro Wireless Display Receiver, ScreenBeam Pro - Education Edition 2, ScreenBeam Pro - Business Edition, ScreenBeam Kit, ScreenBeam Pro	
	Number Of Channel	802.11a/n20MHz: 5CH 802.11n40MHz: 4CH
	Operation Frequency:	5725 MHz ~ 5850 MHz; 5180 MHz ~ 5240 MHz;
	Modulation Type:	OFDM(64QAM, 16QAM, QPSK, BPSK)
	Antenna Designation:	Please see Note 3.
	Antenna Gain (dBi)	Please see Note 3.
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
Channel List	Please refer to the Note 2.	
Ratings	DC 5V	
Adapter	Adapter 1 Mode: KSAS0120500200HU Input: 100-240V~, 50/60Hz, 0.4A Output: 5.0V⎓, 2.0A Adapter 2 Mode: MU05BS050100-A1 Input: 100-240V~, 50/60Hz, 0.18A Output: 5V⎓, 1A Adapter 3 Mode: WB-10E05FU Input: 100-240V~, 50/60Hz, 0.4A Output: 5V⎓, 2A	
Battery	N/A	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. 5.2GHz

802.11a/n(20)Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	40	5200	42	5210
44	5220	46	5230	48	5240	-	-

802.11n (BW40MHz) Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	40	5200	42	5210	44	5220
46	5230	-	-	-	-	-	-

5.8GHz

802.11a/n20 MHz Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	153	5765	157	5785	161	5805
165	5825	-	-	-	-	-	-

802.11n 40MHz Carrier Frequency Channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	155	5775	159	5795	163	5815

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Gain (dBi)	NOTE
A	N/A	N/A	PCB antenna	2.4G/5G:3.6	Wifi Antenna
B	N/A	N/A	PCB antenna	2.4G/5G:3.6	Wifi Antenna

4. Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

For 5GHz Band

Power Parameters of IEEE 802.11n MCS8 20MHz

Test Software Version	Realtek 11n Dual MAC 92D USB WLAN MP Diagnostic Program 0.0019.0307.2012		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0 20MHz	50	50	50

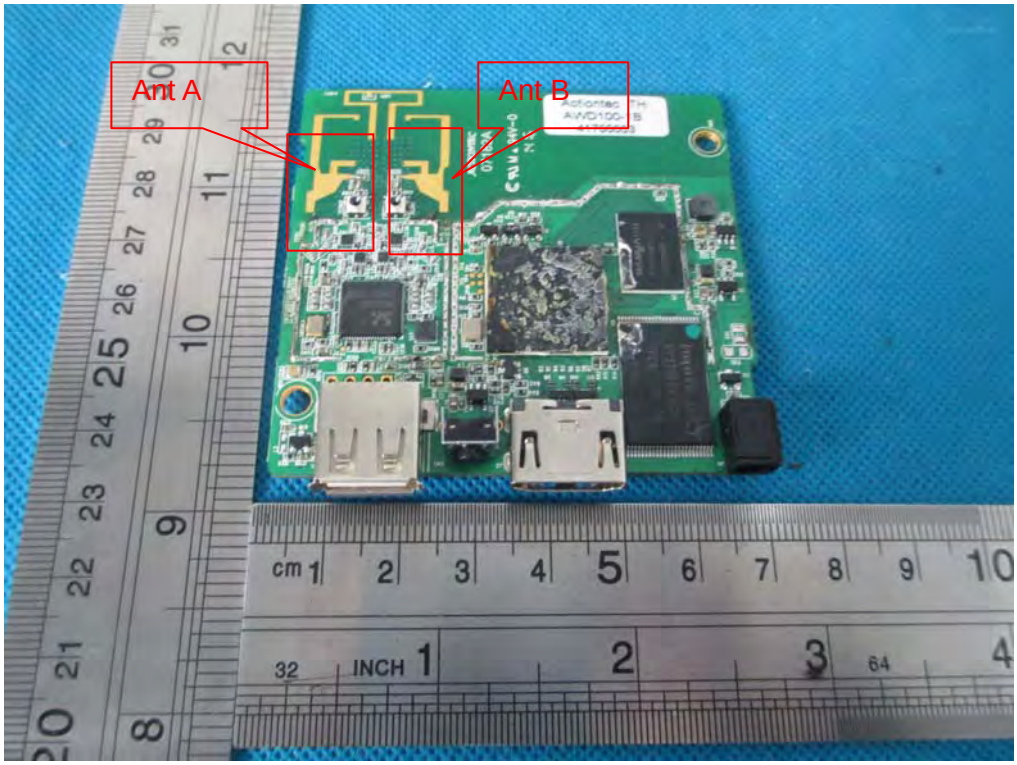
Power Parameters of IEEE 802.11a

Test Software Version	Realtek 11n Dual MAC 92D USB WLAN MP Diagnostic Program 0.0019.0307.2012		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	50	50	50

Power Parameters of IEEE 802.11n MCS8 40MHz

Test Software Version	Realtek 11n Dual MAC 92D USB WLAN MP Diagnostic Program 0.0019.0307.2012		
Frequency	5755 MHz	5775 MHz	5815 MHz
MCS0 40MHz	55	55	50

During the test, “Realtek 11n Dual MAC 92D USB WLAN MP Diagnostic Program 0.0019.0307.2012” under WIN XP was executed the test program to control the EUT continuously transmit RF signal.



The Control software(tool_WIFI.exe) can control antenna A/ B ,

For 2.4GHz mode, antenna A/ B are transmitting, two antennas simultaneously transmit. And the data is recorded for radiated emission and band edge.

For 5GHz mode,antenna A B are transmitting ,Two antennas simultaneously transmit. And the data is recorded for radiated emission, and band edge.

For MIMO mode , Directional gain=GANT +10log(N)dbi =6.61dbi in 2.4GHz

Directional gain=GANT +10log(N)dbi =6.61dbi in 5GHz

802.11a/b/g/n 2.4GHz & 5GHz has MIMO mode.

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Link Mode
Mode 2	802.11a /n 20 CH149/ CH157/ CH 165
Mode 3	802.11n40 CH 151 / CH 155/163

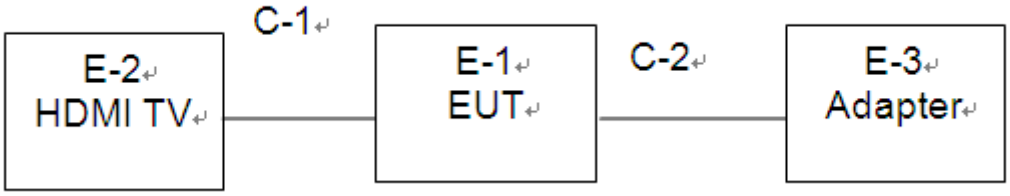
For Radiated Emission	
Final Test Mode	Description
Mode 1	Link Mode
Mode 2	802.11a /n 20 CH149/ CH157/ CH 165
Mode 3	802.11n40 CH 151 / CH 155/163

Note:

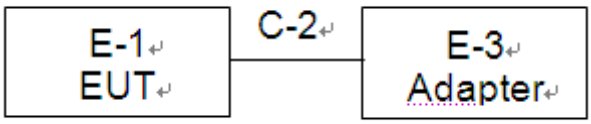
(1) The measurements are performed at the highest, middle, lowest available channels.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission Test



Radiated Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	ScreenBeam Pro Wireless Display Receiver, ScreenBeam Pro - Education Edition 2, ScreenBeam Pro-Business Edition, ScreenBeam Kit, ScreenBeam Pro	Actiontec	SBWD100B	N/A	EUT
E-2	TV	SONY	KDL-24EX520	N/A	
E-3	Adapter 1	Ktec	KSAS0120500200HU	N/A	
E-3	Adapter 2	Actiontec	MU05BS050100-A1	N/A	
E-3	Adapter 3	APD	WB-10E05FU	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	Metal wire	NO	100cm	HDMI Line
C-2	Unshielded	NO	80cm	DC Line

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2015.07.06	2016.07.05	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2015.07.06	2016.07.05	1 year
3	Test Receiver	R&S	ESPI	101318	2015.06.06	2016.06.05	1 year
4	Bilog Antenna	TESEQ	CBL6111D	31216	2015.07.06	2016.07.05	1 year
5	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2015.06.06	2016.06.05	1 year
6	Spectrum Analyzer	ADVANTEST	R3132	150900201	2015.06.06	2016.06.05	1 year
7	Horn Antenna	EM	EM-AH-10180	2011071402	2015.07.06	2016.07.05	1 year
8	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2015.07.06	2016.07.05	1 year
9	Amplifier	EM	EM-30180	060538	2014.12.22	2015.12.21	1 year
10	Loop Antenna	ARA	PLA-1030/B	1029	2015.06.06	2016.06.05	1 year
11	Power Meter	R&S	NRVS	100696	2015.07.06	2016.07.05	1 year
12	Power Sensor	R&S	URV5-Z4	0395.1619.05	2015.07.06	2016.07.05	1 year

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2015.06.06	2016.06.05	1 year
2	LISN	R&S	ENV216	101313	2015.08.24	2016.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2015.06.06	2016.06.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2015.06.06	2016.06.05	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2015.06.06	2016.06.05	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2015.06.06	2016.06.05	1 year

1	Attenuation	MCE	24-10-34	BN9258	2015.06.06	2016.06.05	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC/ RSS-247
0.50 -5.0	73.00	60.00	56.00	46.00	FCC/ RSS-247
5.0 -30.0	73.00	60.00	60.00	50.00	FCC/ RSS-247

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

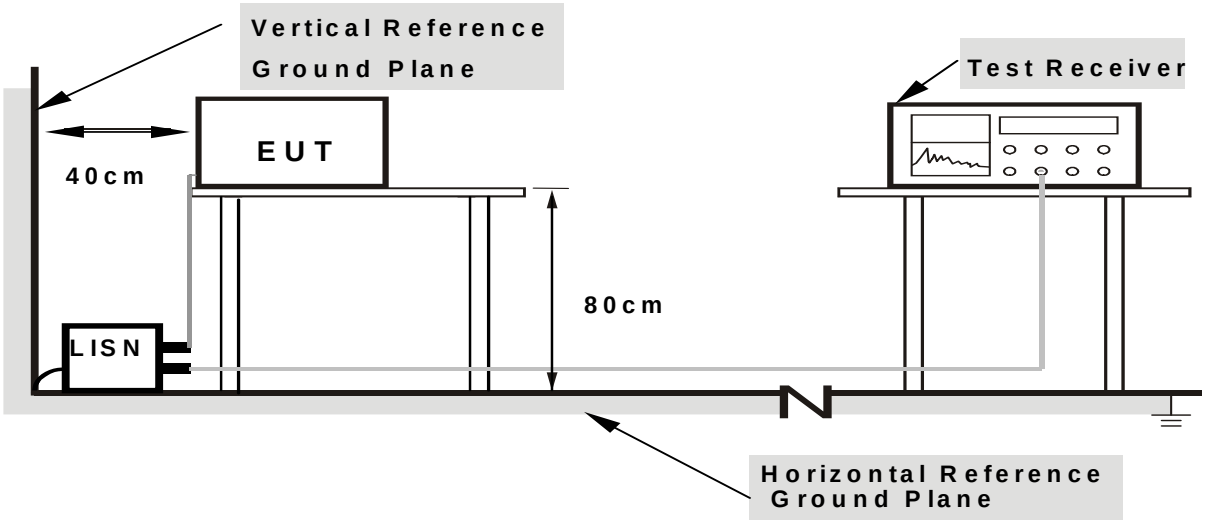
3.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

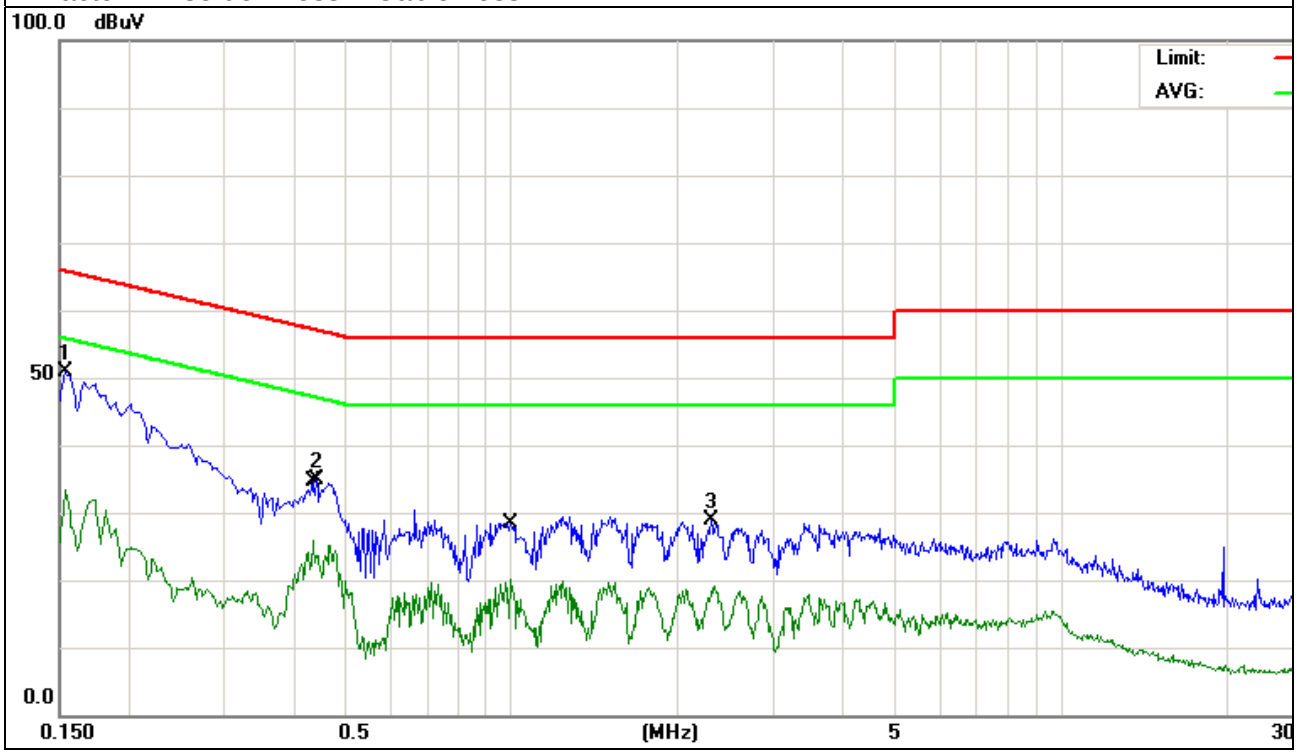
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

EUT：	Refer to Page 6	Model Name. ：	SBWD100B
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V From adapter AC120V/60Hz	Test Mode：	Mode 5-Adapter 1

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1539	41.17	9.63	50.80	65.78	-14.98	QP
0.4420	25.43	9.53	34.96	57.02	-22.06	QP
2.3060	19.11	9.66	28.77	56.00	-27.23	QP
0.1539	23.81	9.63	33.44	55.78	-22.34	AVG
0.4340	16.49	9.50	25.99	47.18	-21.19	AVG
0.9900	10.38	9.73	20.11	46.00	-25.89	AVG

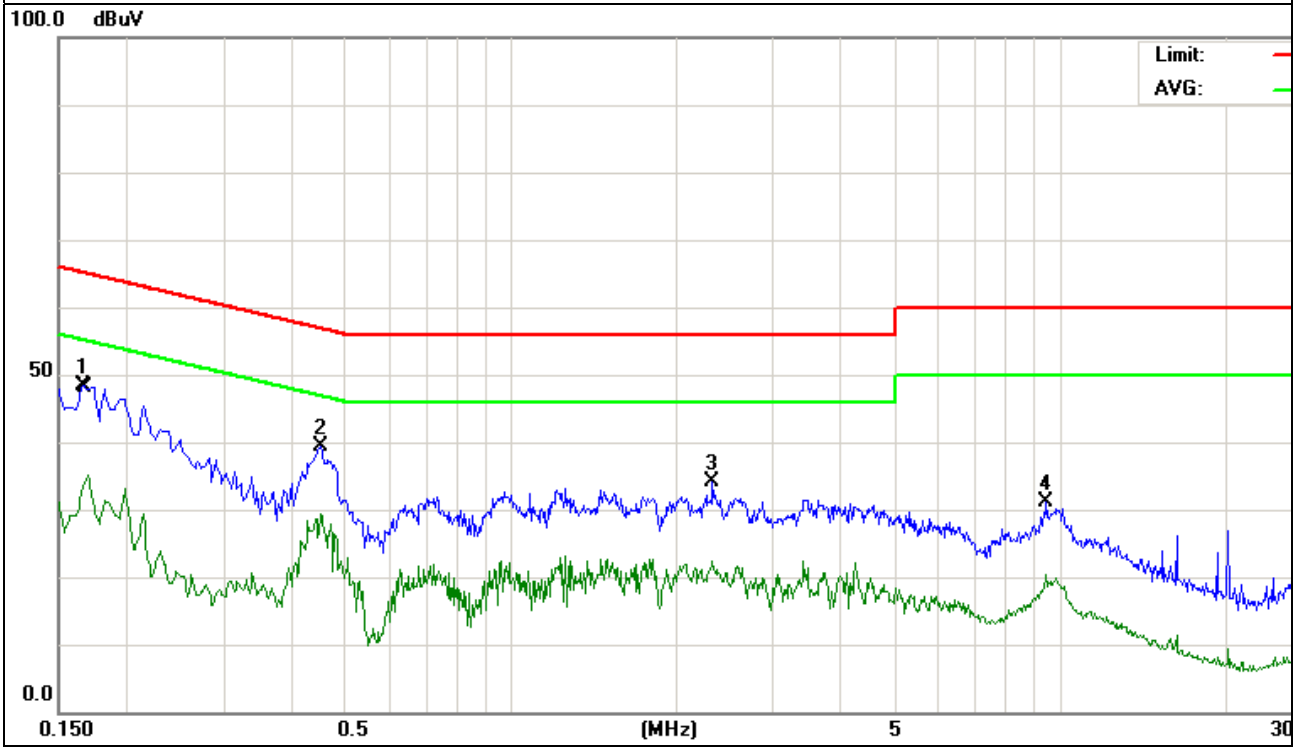
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Refer to Page 6	Model Name. ：	SBWD100B
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V From adapter AC120V/60Hz	Test Mode：	Mode 5-Adapter 1

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1660	38.90	9.60	48.50	65.15	-16.65	QP
0.4500	29.84	9.66	39.50	56.87	-17.37	QP
2.3300	24.67	9.53	34.20	56.00	-21.80	QP
9.4339	21.50	9.63	31.13	60.00	-28.87	QP
0.1700	25.39	9.61	35.00	54.96	-19.96	AVG
0.4500	19.77	9.66	29.43	46.87	-17.44	AVG
9.4339	10.66	9.63	20.29	50.00	-29.71	AVG

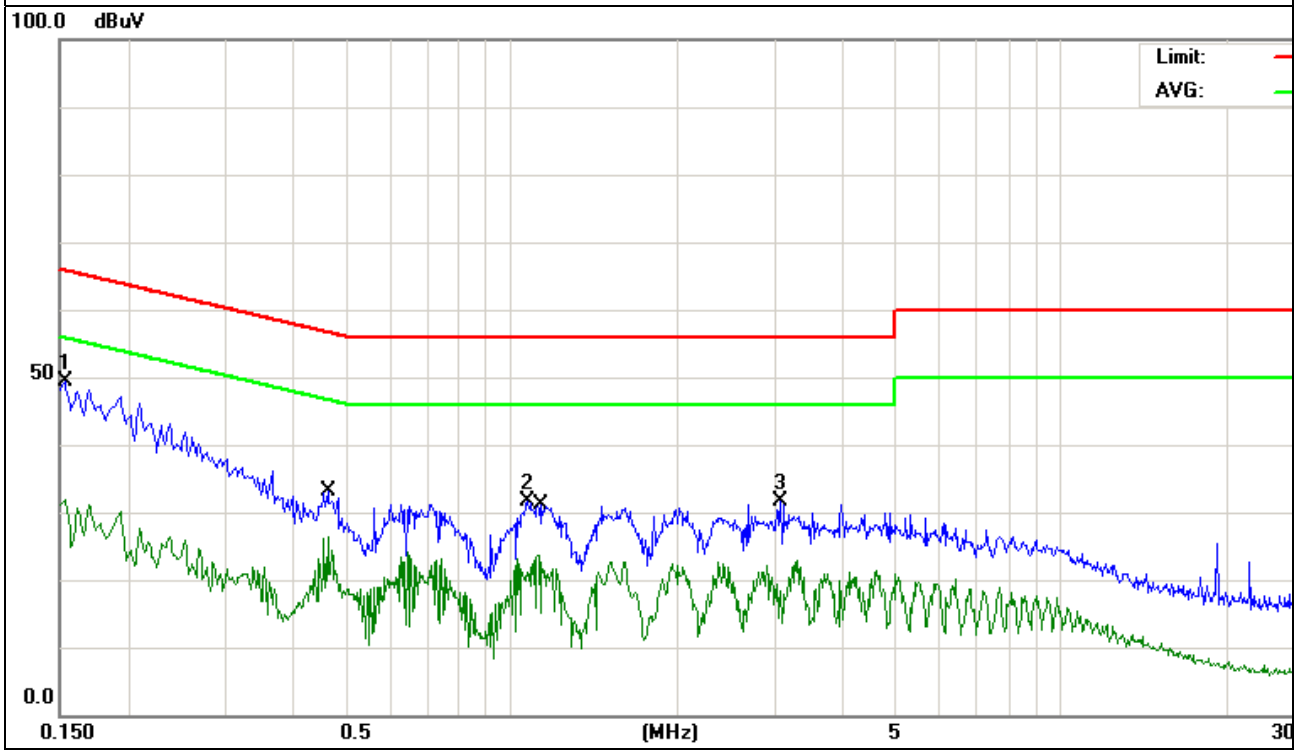
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Refer to Page 6	Model Name. ：	SBWD100B
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V From adapter AC240V/60Hz	Test Mode：	Mode 5-Adapter 1

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1539	39.67	9.63	49.30	65.78	-16.48	QP
1.0660	21.87	9.73	31.60	56.00	-24.40	QP
3.0860	21.90	9.67	31.57	56.00	-24.43	QP
28.3660	27.07	9.98	37.05	60.00	-22.95	QP
0.1539	22.27	9.63	31.90	55.78	-23.88	AVG
0.4620	16.84	9.61	26.45	46.66	-20.21	AVG
1.1220	14.01	9.72	23.73	46.00	-22.27	AVG
28.3660	7.20	9.98	17.18	50.00	-32.82	AVG

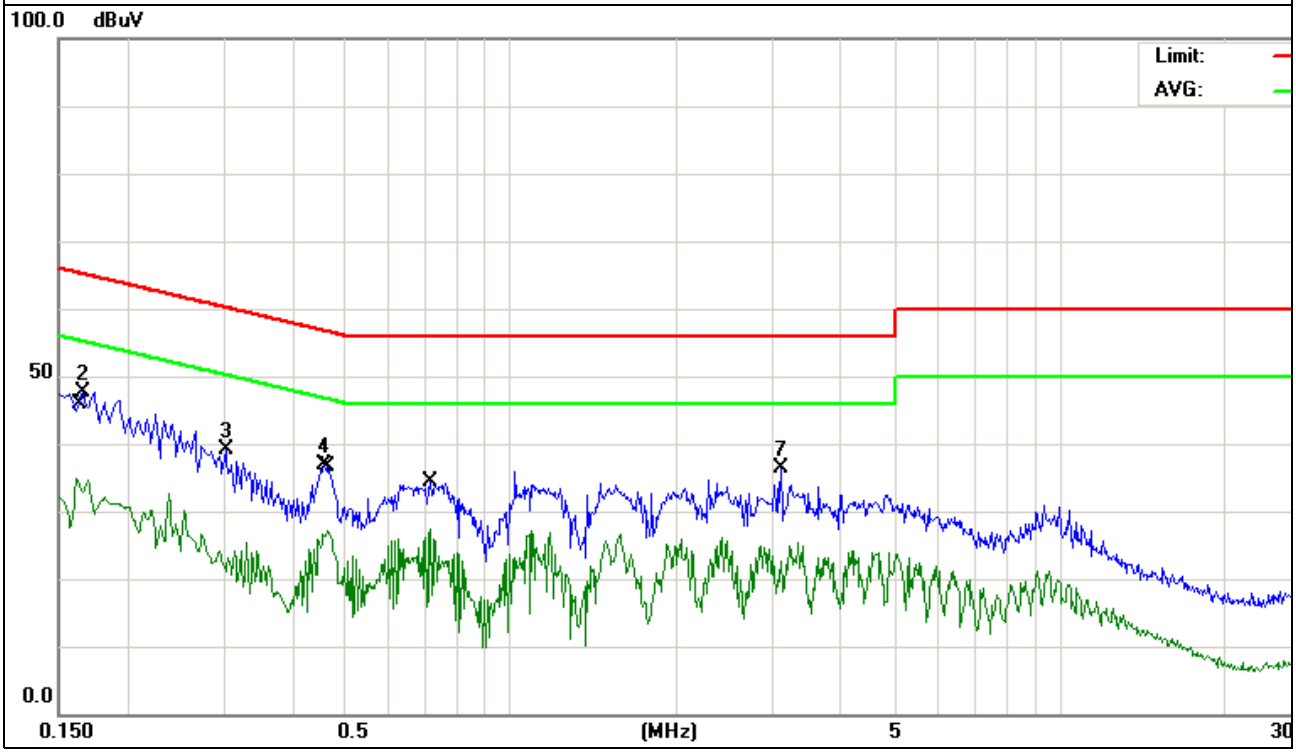
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Refer to Page 6	Model Name. ：	SBWD100B
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V From adapter AC240V/60Hz	Test Mode：	Mode 5-Adapter 1

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1620	25.27	9.60	34.87	55.36	-20.49	AVG
0.1660	38.09	9.60	47.69	65.15	-17.46	QP
0.3020	29.45	9.62	39.07	60.19	-21.12	QP
0.4580	27.25	9.66	36.91	56.73	-19.82	QP
0.4660	17.36	9.66	27.02	46.58	-19.56	AVG
0.7140	17.72	9.64	27.36	46.00	-18.64	AVG
3.0980	26.98	9.52	36.50	56.00	-19.50	QP

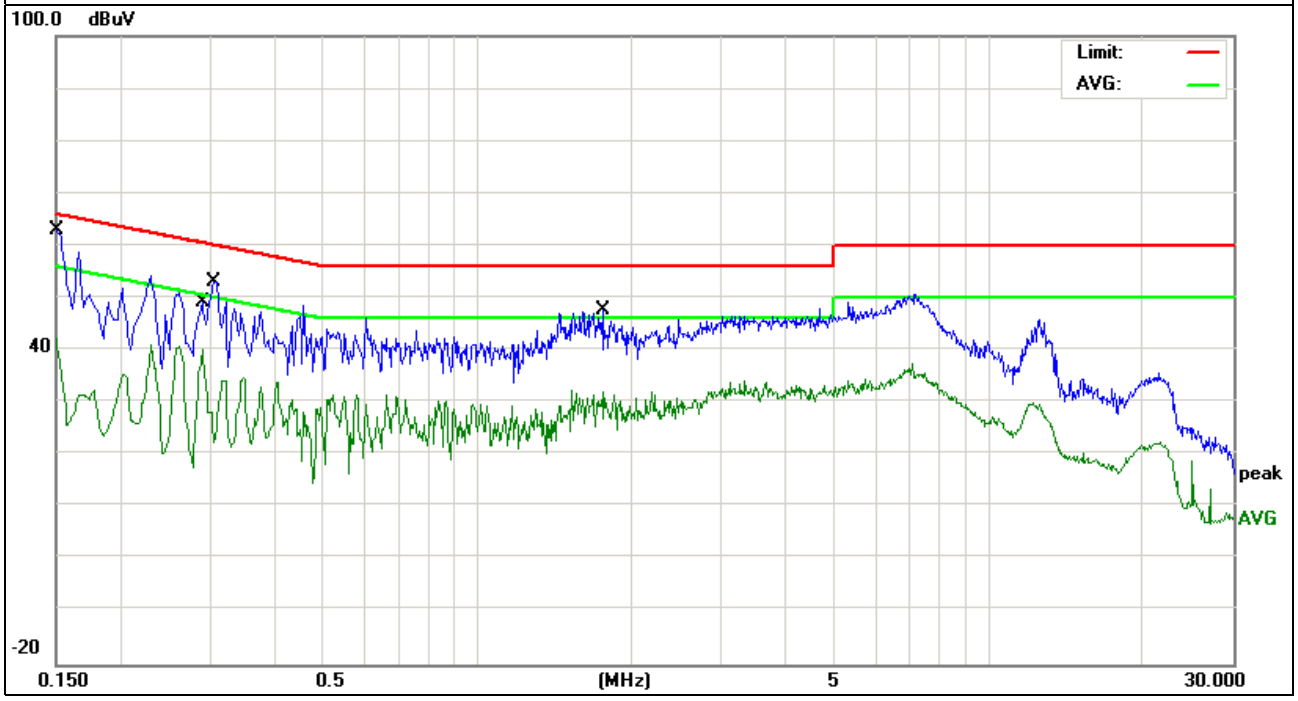
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Refer to Page 6	Model Name. ：	SBWD100B
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V From adapter AC120V/60Hz	Test Mode：	Mode 5-Adapter 2

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1500	53.41	9.49	62.90	65.99	-3.09	QP
0.1500	32.68	9.49	42.17	55.99	-13.82	AVG
0.2900	30.46	9.56	40.02	50.52	-10.50	AVG
0.3060	43.58	9.54	53.12	60.08	-6.96	QP
1.7580	38.13	9.57	47.70	56.00	-8.30	QP
1.7580	22.56	9.57	32.13	46.00	-13.87	AVG

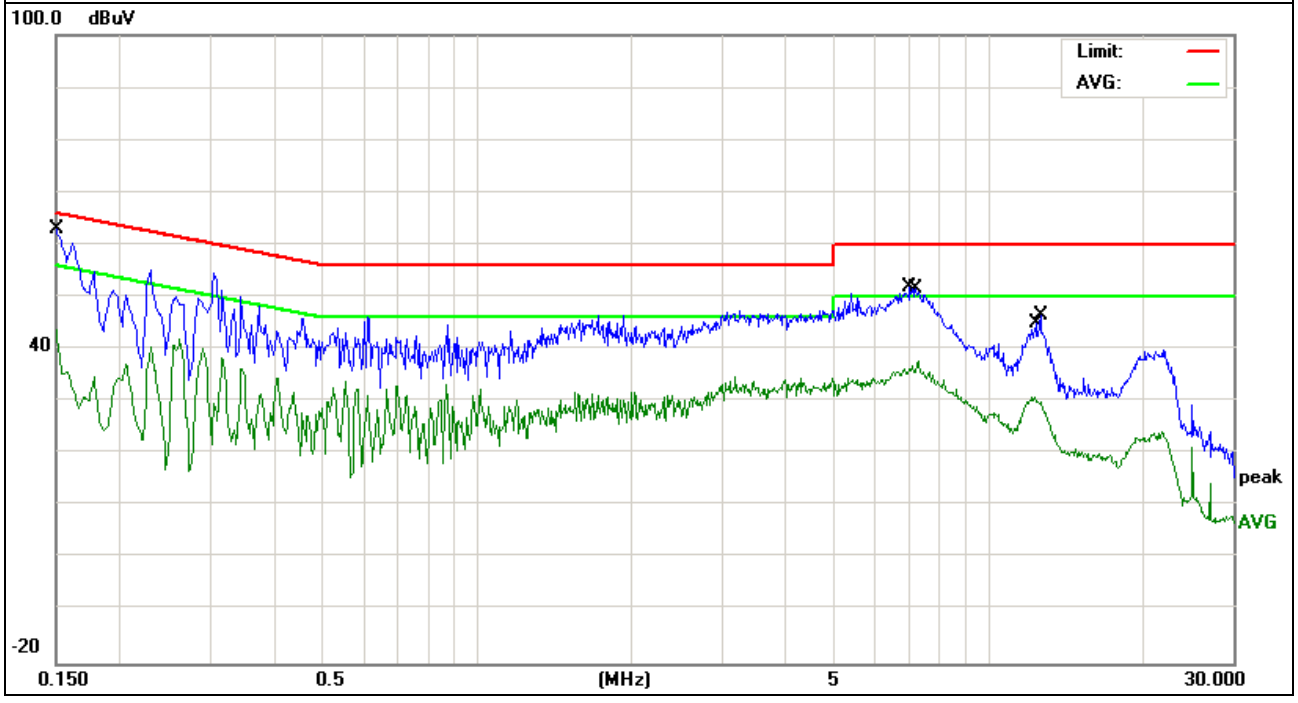
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Refer to Page 6	Model Name. ：	SBWD100B
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V From adapter AC120V/60Hz	Test Mode：	Mode 5-Adapter 2

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1499	53.34	9.49	62.83	66.00	-3.17	QP
0.1499	34.36	9.49	43.85	56.00	-12.15	AVG
7.0140	42.18	9.70	51.88	60.00	-8.12	QP
7.2780	27.93	9.70	37.63	50.00	-12.37	AVG
12.2860	21.20	9.78	30.98	50.00	-19.02	AVG
12.6220	36.73	9.78	46.51	60.00	-13.49	QP

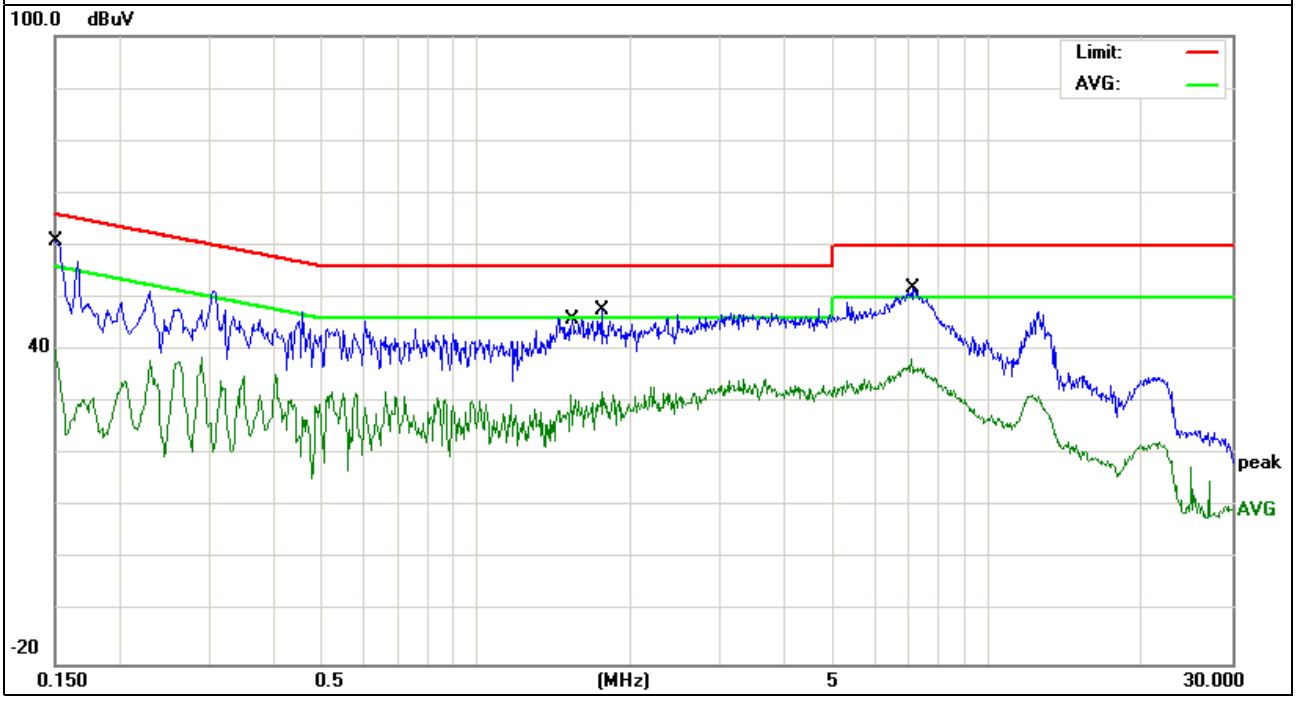
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Refer to Page 6	Model Name. ：	SBWD100B
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V From adapter AC240V/60Hz	Test Mode：	Mode 5-Adapter 2

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1499	30.68	9.49	40.17	56.00	-15.83	AVG
0.1500	51.41	9.49	60.90	65.99	-5.09	QP
1.5339	21.86	9.56	31.42	46.00	-14.58	AVG
1.7580	38.13	9.57	47.70	56.00	-8.30	QP
7.0979	28.70	9.70	38.40	50.00	-11.60	AVG
7.1379	42.05	9.70	51.75	60.00	-8.25	QP

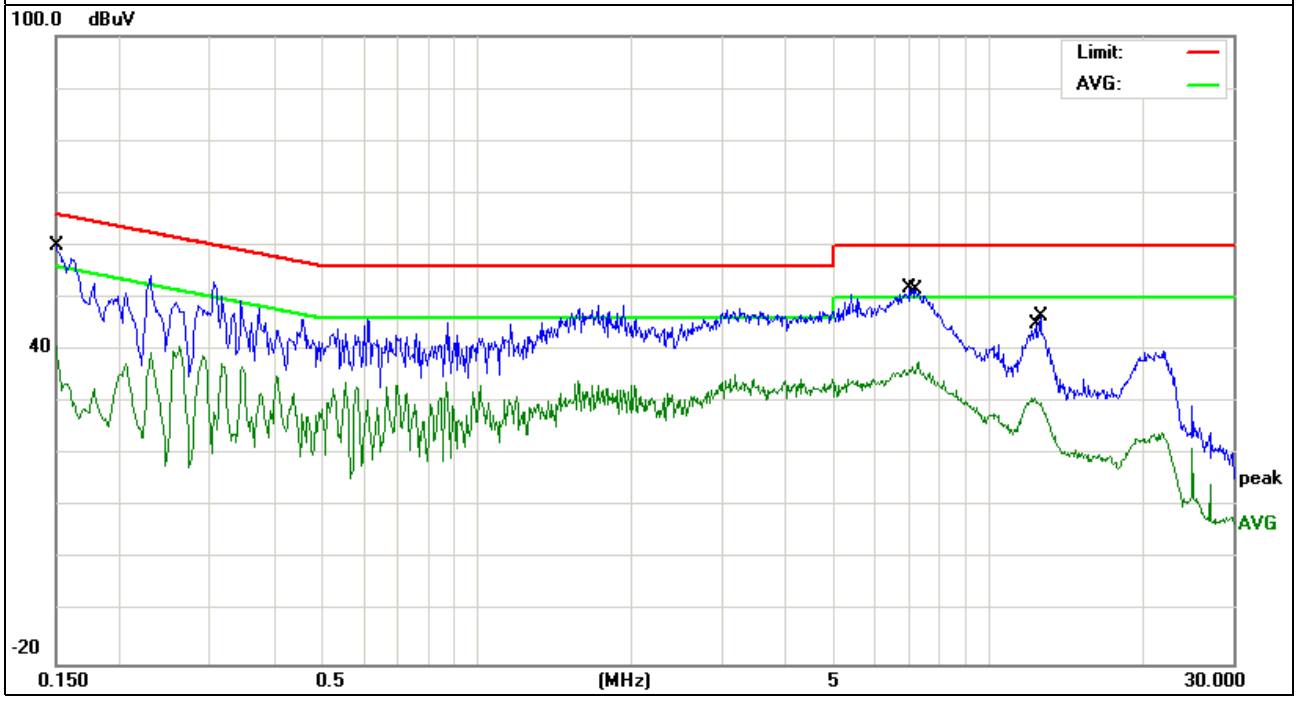
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Refer to Page 6	Model Name. ：	SBWD100B
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V From adapter AC240V/60Hz	Test Mode：	Mode 5-Adapter 2

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1500	50.34	9.49	59.83	65.99	-6.16	QP
0.1500	31.36	9.49	40.85	55.99	-15.14	AVG
7.0140	42.18	9.70	51.88	60.00	-8.12	QP
7.2780	27.93	9.70	37.63	50.00	-12.37	AVG
12.2860	21.20	9.78	30.98	50.00	-19.02	AVG
12.6220	36.73	9.78	46.51	60.00	-13.49	QP

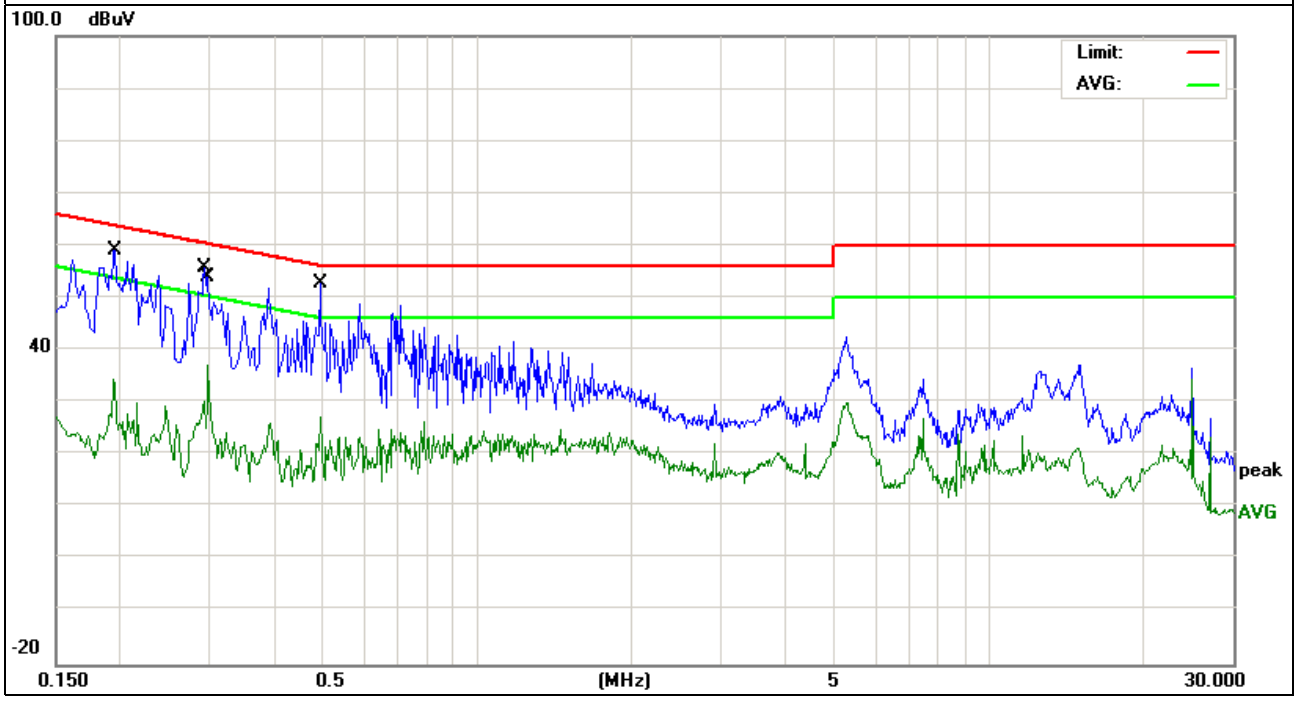
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Refer to Page 6	Model Name. ：	SBWD100B
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V From adapter AC120V/60Hz	Test Mode：	Mode 5-Adapter 3

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1943	25.52	9.45	34.97	53.85	-18.88	AVG
0.1955	50.25	9.45	59.70	63.80	-4.10	QP
0.2923	46.24	9.56	55.80	60.46	-4.66	QP
0.2977	27.65	9.57	37.22	50.30	-13.08	AVG
0.4939	43.25	9.53	52.78	56.10	-3.32	QP
0.4939	17.87	9.53	27.40	46.10	-18.70	AVG

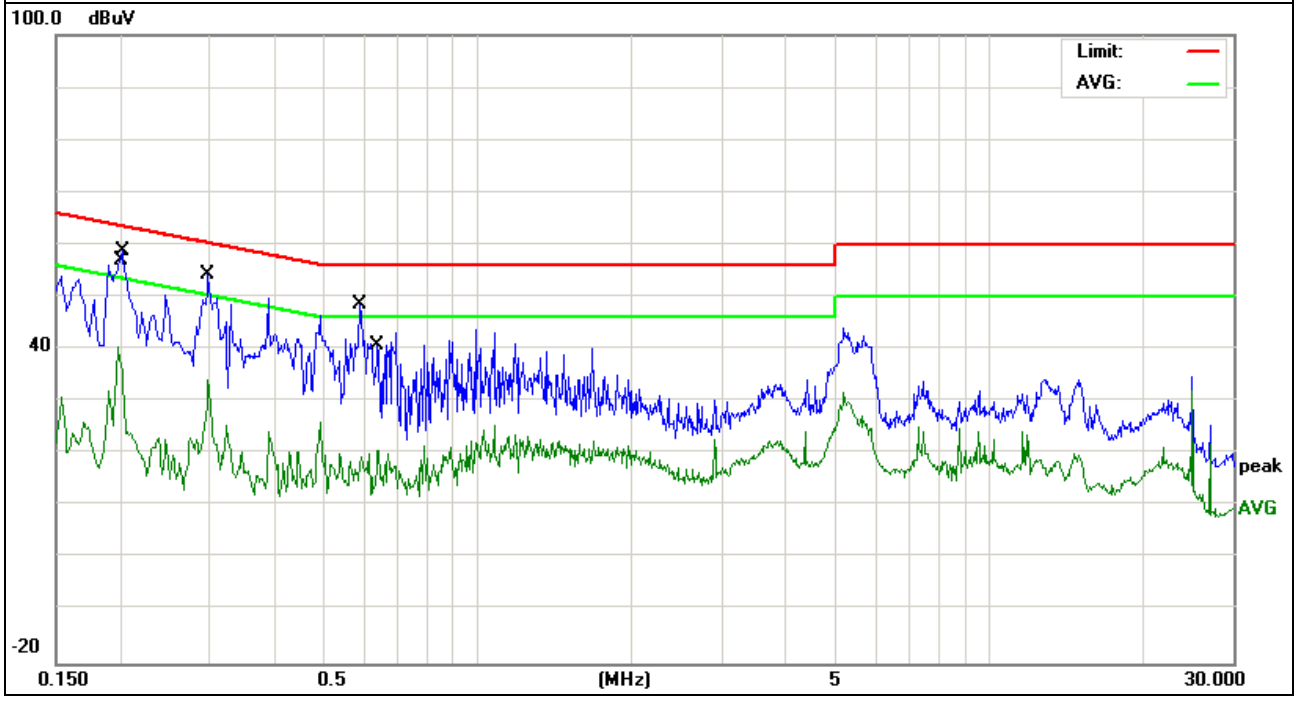
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Refer to Page 6	Model Name. ：	SBWD100B
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V From adapter AC120V/60Hz	Test Mode：	Mode 5-Adapter 3

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1980	33.03	9.45	42.48	53.69	-11.21	AVG
0.2020	50.55	9.45	60.00	63.52	-3.52	QP
0.2977	46.63	9.57	56.20	60.30	-4.10	QP
0.2977	26.66	9.57	36.23	50.30	-14.07	AVG
0.5897	39.90	9.56	49.46	56.00	-6.54	QP
0.6419	12.10	9.56	21.66	46.00	-24.34	AVG

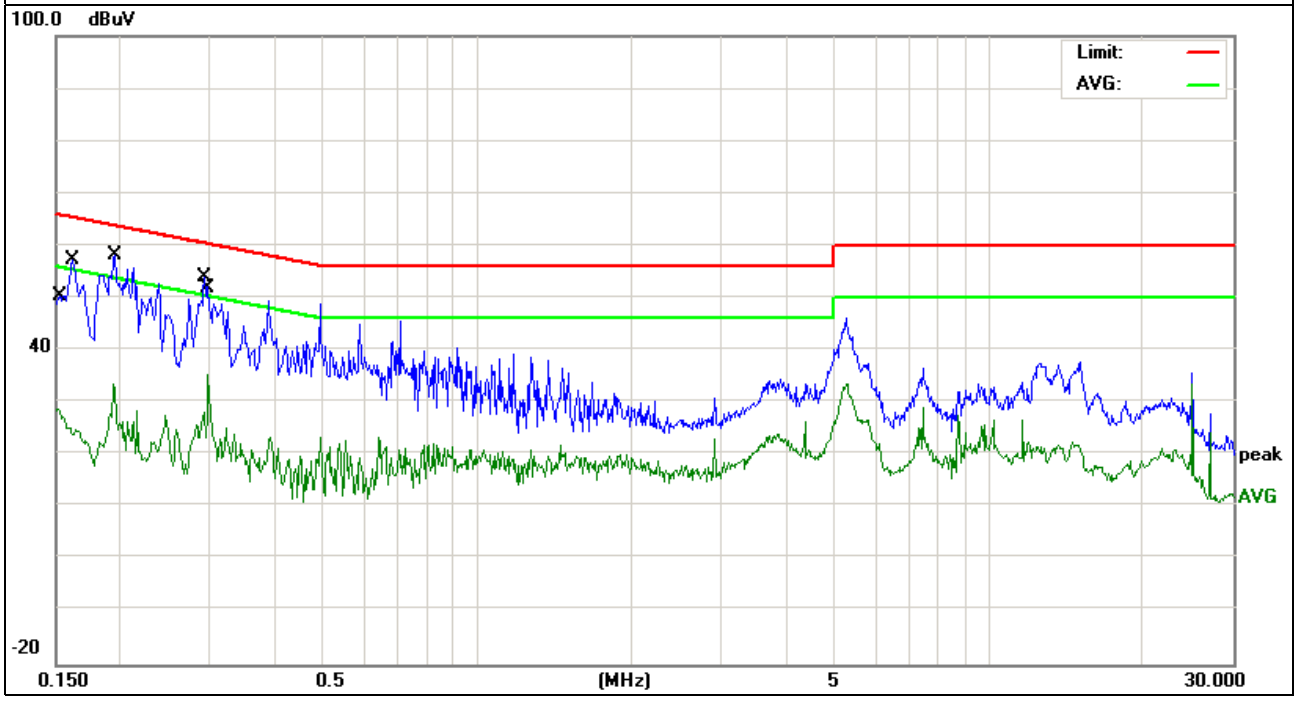
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Refer to Page 6	Model Name. ：	SBWD100B
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V From adapter AC240V/60Hz	Test Mode：	Mode 5-Adapter 3

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1516	18.14	9.49	27.63	55.91	-28.28	AVG
0.1620	48.83	9.48	58.31	65.36	-7.05	QP
0.1943	25.02	9.45	34.47	53.85	-19.38	AVG
0.1955	49.75	9.45	59.20	63.80	-4.60	QP
0.2923	45.74	9.56	55.30	60.46	-5.16	QP
0.2977	27.15	9.57	36.72	50.30	-13.58	AVG

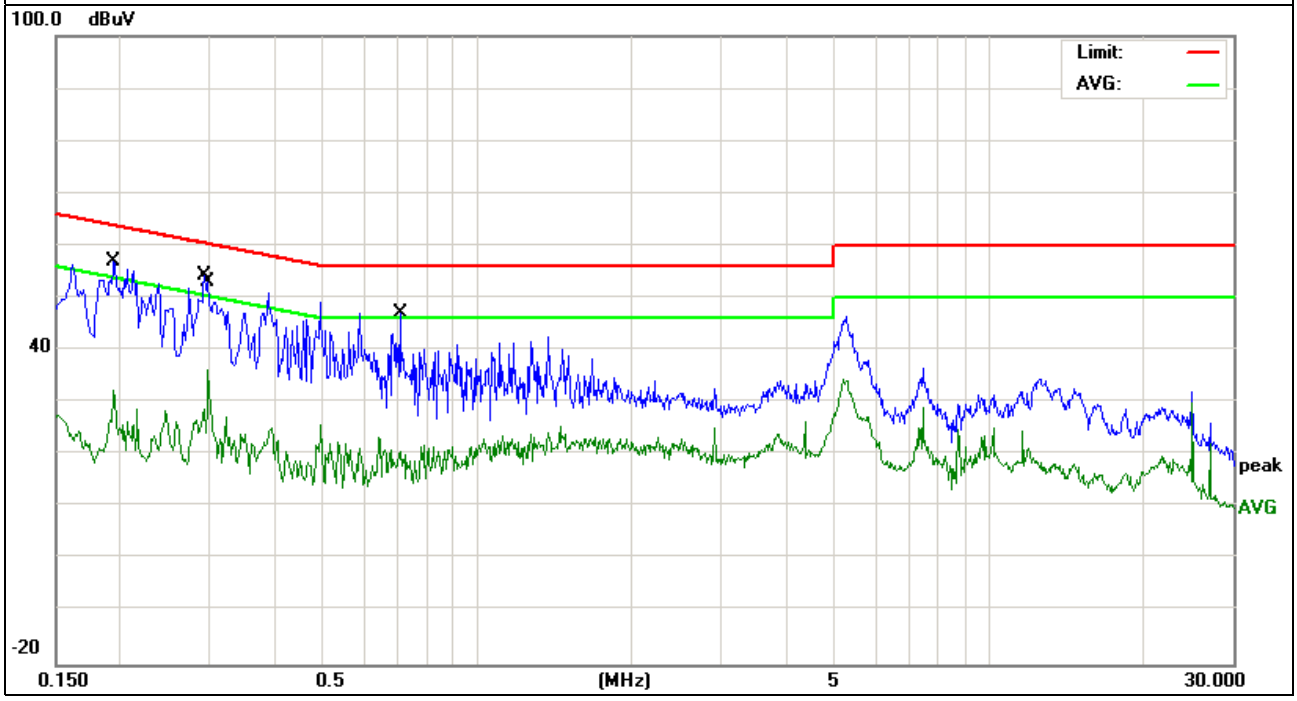
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



EUT：	Refer to Page 6	Model Name. ：	SBWD100B
Temperature：	26 ℃	Relative Humidity：	56%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V From adapter AC240V/60Hz	Test Mode：	Mode 5-Adapter 3

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1943	49.05	9.45	58.50	63.85	-5.35	QP
0.1943	24.52	9.45	33.97	53.85	-19.88	AVG
0.2923	45.74	9.56	55.30	60.46	-5.16	QP
0.2977	27.65	9.57	37.22	50.30	-13.08	AVG
0.7056	39.10	9.57	48.67	56.00	-7.33	QP
0.7096	11.54	9.57	21.11	46.00	-24.89	AVG

Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a)/ RSS 247§6.2, then the 15.209(a)/ RSS-Gen limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3M)		Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C/ RSS-Gen.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / *10Hz* for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

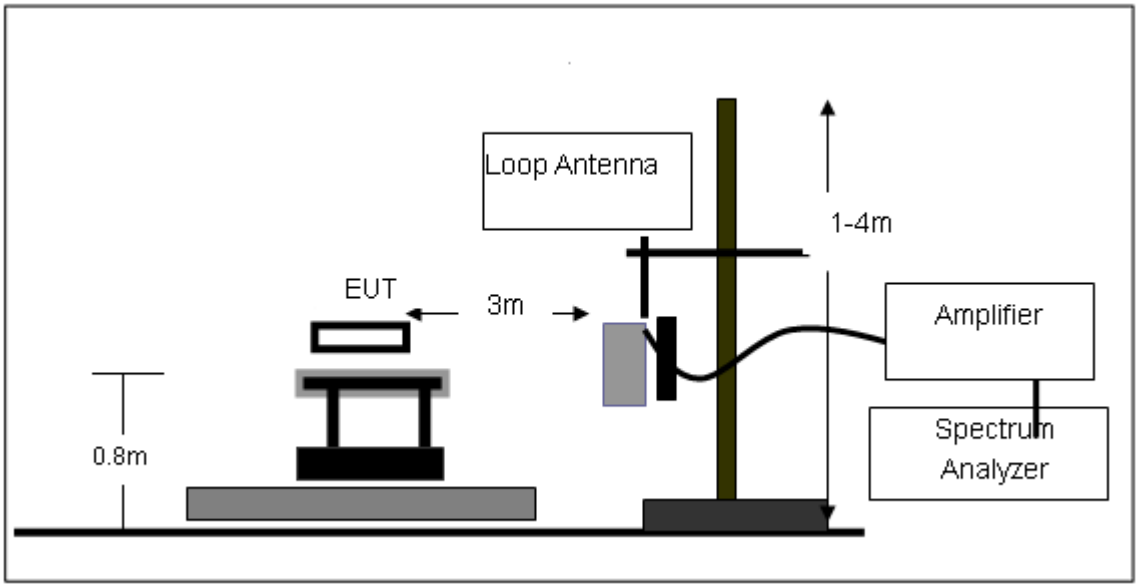
Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Peak	1 MHz	10 Hz

3.2.3 DEVIATION FROM TEST STANDARD

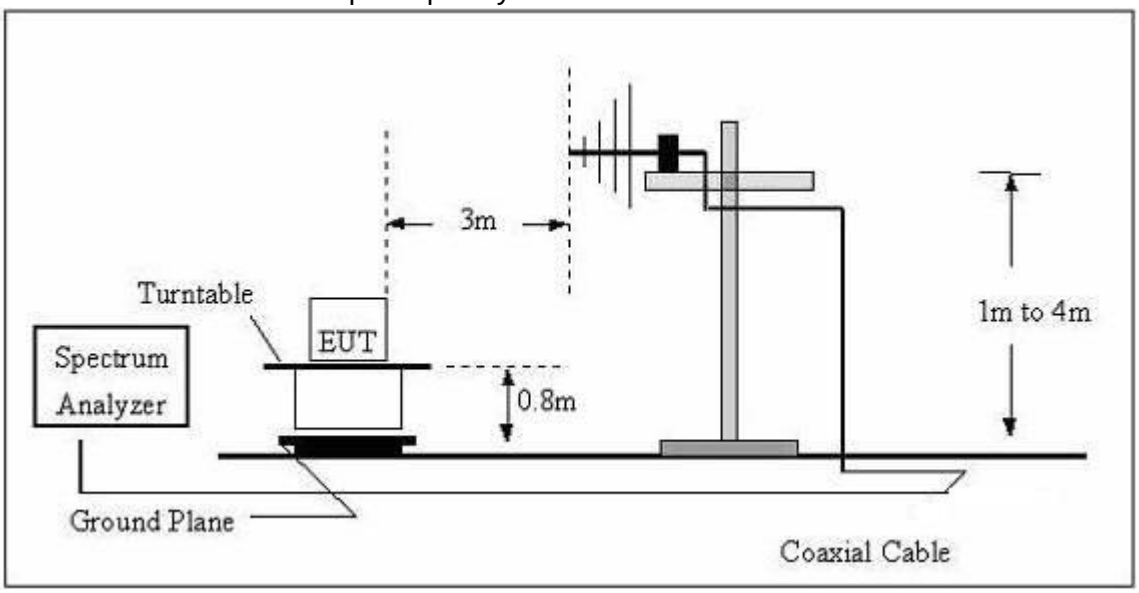
No deviation

3.2.4 TEST SETUP

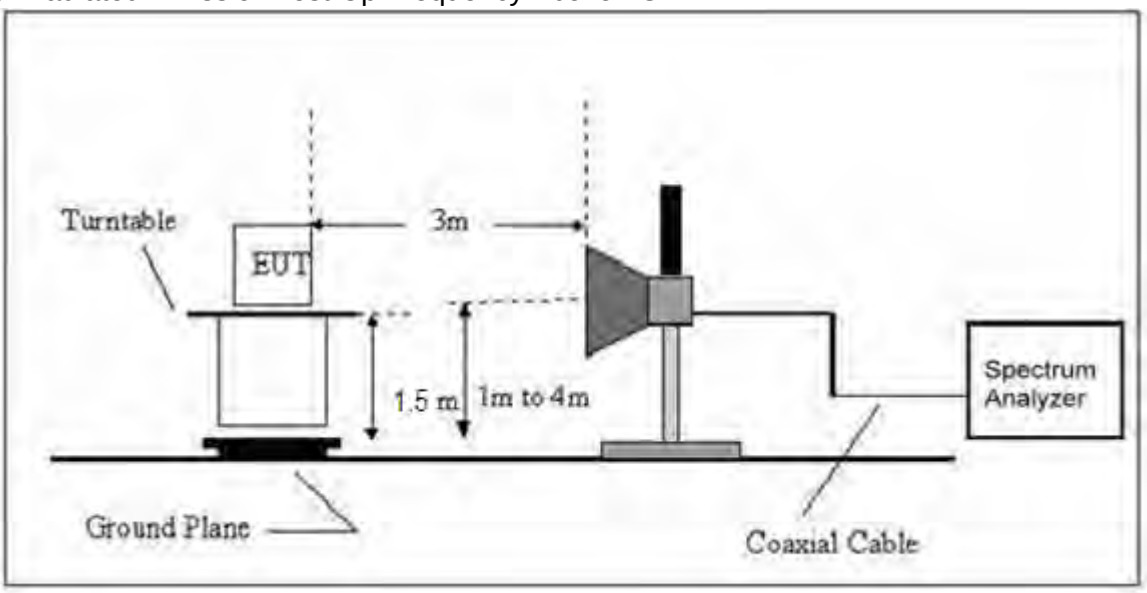
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT：	Refer to Page 6	Model Name. ：	SBWD100B
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5V From adapter AC120V/60Hz
Test Mode ：	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	N/A
--	--	--	--	N/A

NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

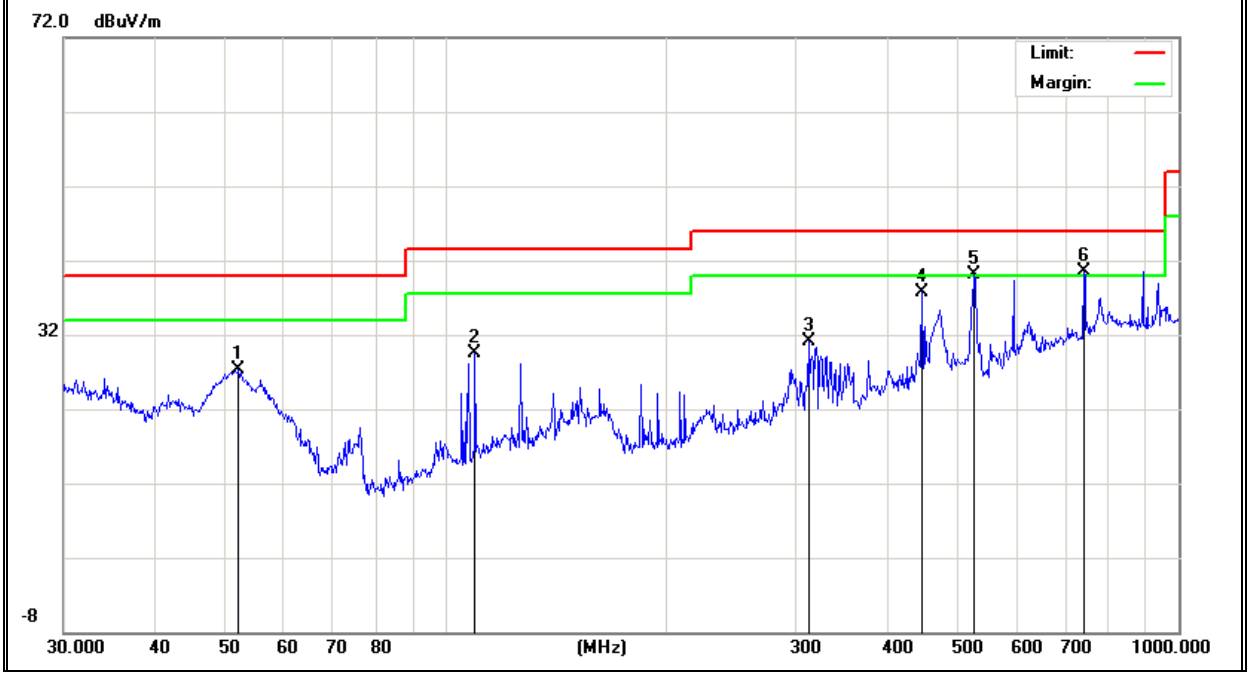
3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT：	Refer to Page 6	Model Name ：	SBWD100B
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5V From adapter AC120V/60Hz
Test Mode ：	TX(5.0G) -Adapter 1		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
V	52.0251	17.16	10.11	27.27	40.00	-12.73	QP
V	109.4116	19.66	9.89	29.55	43.50	-13.95	QP
V	312.1792	16.49	14.66	31.15	46.00	-14.85	QP
V	446.4141	18.45	19.23	37.68	46.00	-8.32	QP
V	526.3967	19.28	20.84	40.12	46.00	-5.88	QP
V	742.2586	14.66	25.90	40.56	46.00	-5.44	QP

Remark:

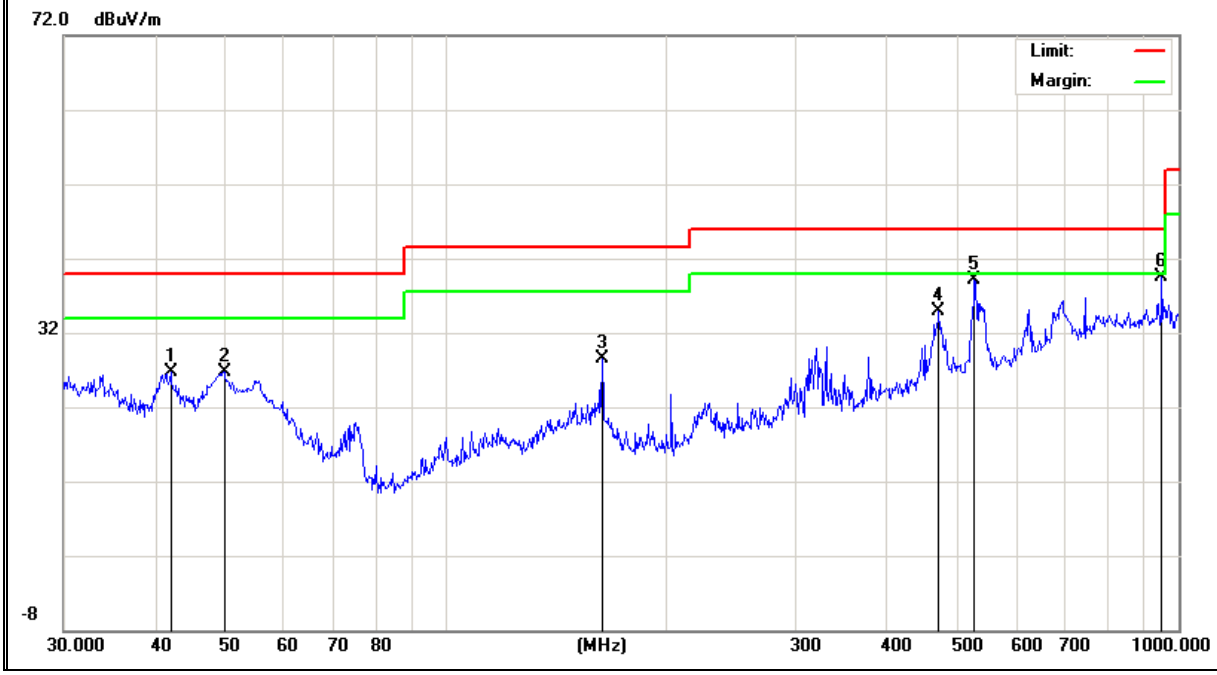
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
H	42.0065	13.86	12.90	26.76	40.00	-13.24	QP
H	49.7068	15.87	10.77	26.64	40.00	-13.36	QP
H	163.1818	18.06	10.51	28.57	43.50	-14.93	QP
H	470.5230	15.25	19.70	34.95	46.00	-11.05	QP
H	526.3967	18.25	20.84	39.09	46.00	-6.91	QP
H	948.7608	12.18	27.32	39.50	46.00	-6.50	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

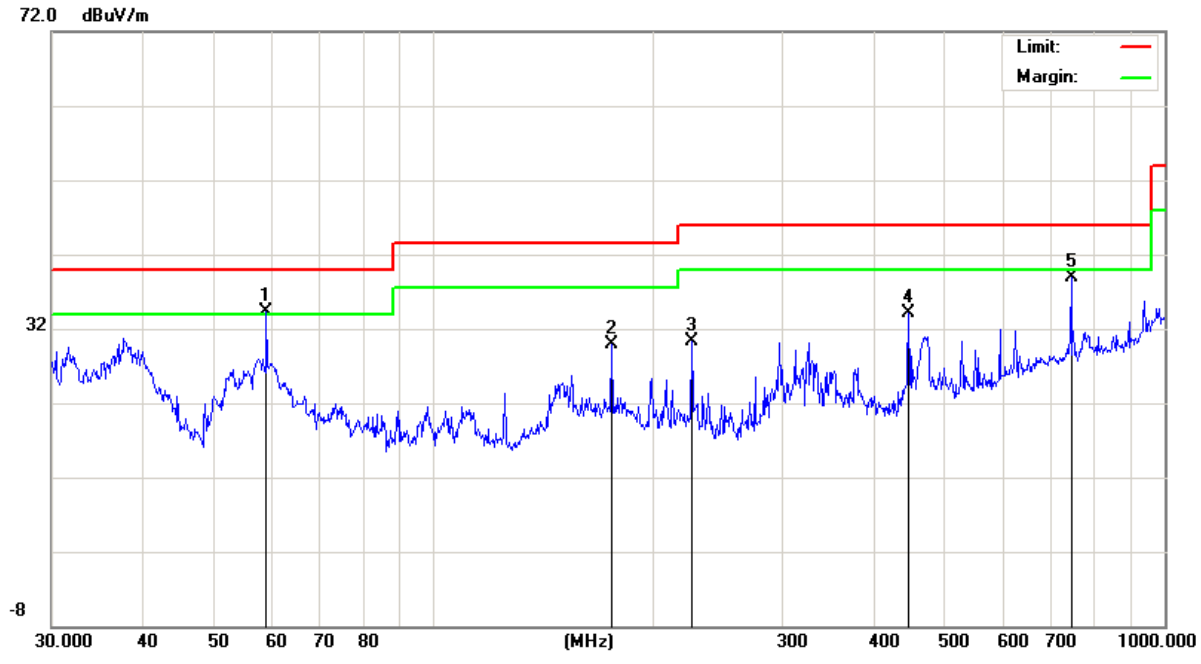


EUT：	Refer to Page 6	Model Name ：	SBWD100B
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5V From adapter AC120V/60Hz
Test Mode ：	TX(5.0G) -Adapter 2		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
V	59.0251	28.10	6.16	34.26	40.00	-5.74	QP
V	175.0364	17.54	12.31	29.85	43.50	-13.65	QP
V	225.3077	19.46	10.92	30.38	46.00	-15.62	QP
V	446.4141	18.27	15.91	34.18	46.00	-11.82	QP
V	744.8659	16.77	22.04	38.81	46.00	-7.19	QP

Remark:

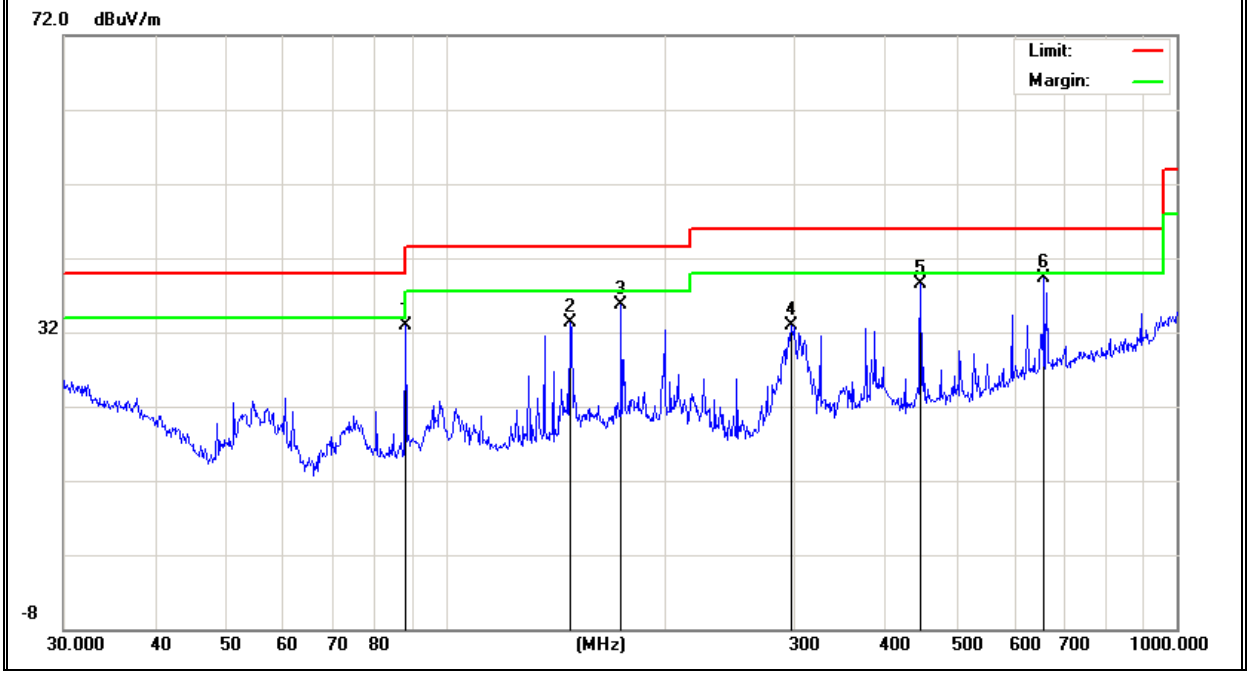
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
H	88.0328	23.22	9.64	32.86	43.50	-10.64	QP
H	147.9214	21.77	11.53	33.30	43.50	-10.20	QP
H	173.8135	23.25	12.37	35.62	43.50	-7.88	QP
H	297.2241	20.47	12.51	32.98	46.00	-13.02	QP
H	446.4141	22.52	15.91	38.43	46.00	-7.57	QP
H	658.8360	18.70	20.59	39.29	46.00	-6.71	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

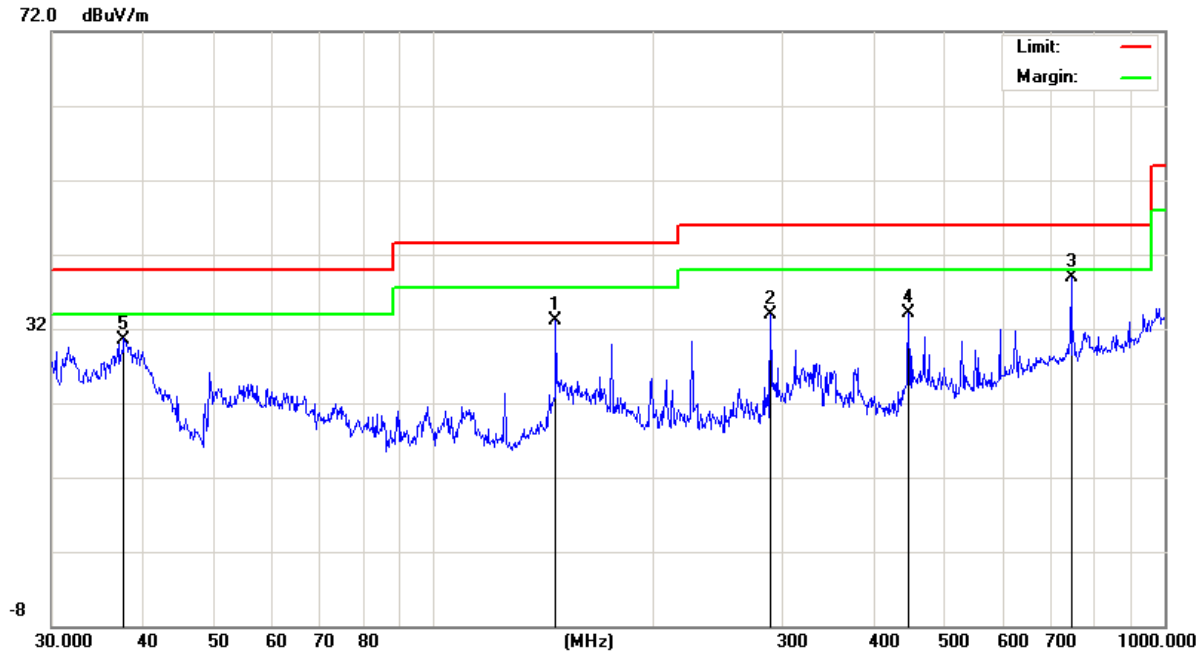


EUT：	Refer to Page 6	Model Name ：	SBWD100B
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5V From adapter AC120V/60Hz
Test Mode ：	TX(5.0G) -Adapter 3		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
V	146.8874	21.67	11.43	33.10	43.50	-10.40	QP
V	289.0020	21.82	12.18	34.00	46.00	-12.00	QP
V	744.8659	16.77	22.04	38.81	46.00	-7.19	QP
V	446.4141	18.27	15.91	34.18	46.00	-11.82	QP
V	37.6798	14.67	15.93	30.60	40.00	-9.40	QP

Remark:

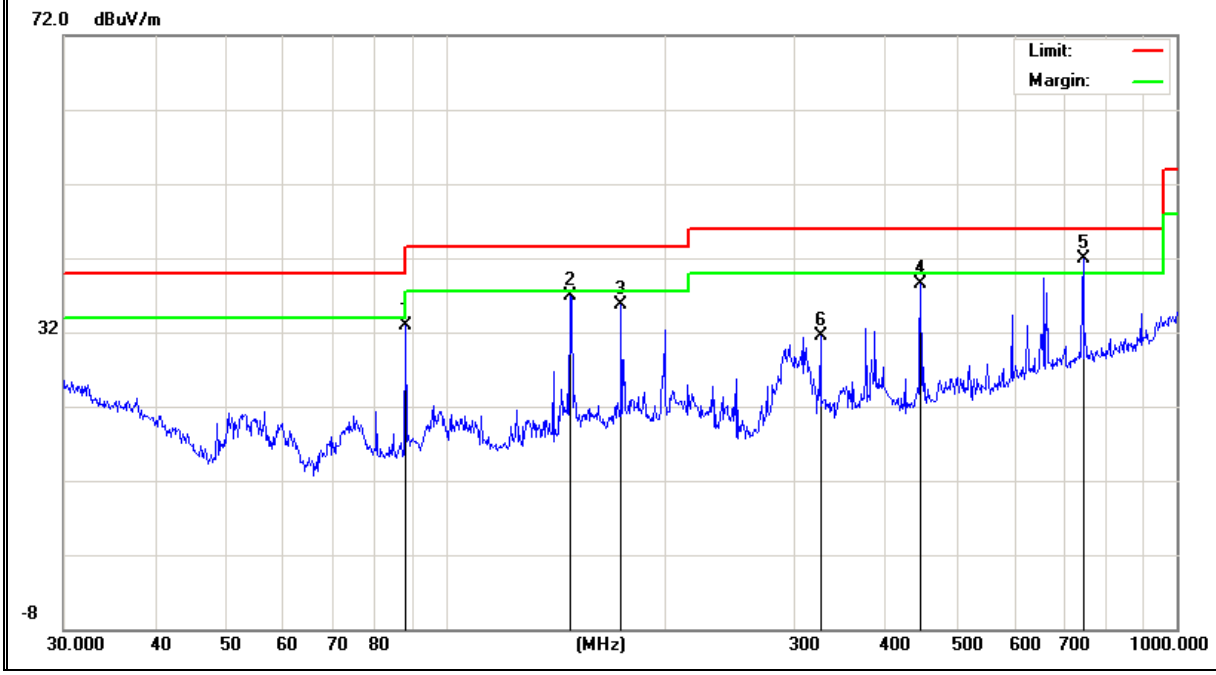
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
H	88.0327	23.22	9.64	32.86	43.50	-10.64	QP
H	147.9214	25.47	11.53	37.00	43.50	-6.50	QP
H	173.8135	23.25	12.37	35.62	43.50	-7.88	QP
H	446.4141	22.52	15.91	38.43	46.00	-7.57	QP
H	744.8659	19.95	22.04	41.99	46.00	-4.01	QP
H	325.5957	18.11	13.46	31.57	46.00	-14.43	QP

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



3.2.8 TEST RESULTS (ABOVE 1000 MHZ)

EUT：	Refer to Page 6	Model Name ：	SBWD100B
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5V From adapter AC120V/60Hz
Test Mode ：	TX (5.0G)		

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Low Channel (5745 MHz)-Above 1G							
Vertical	11490.000	35.77	14.21	49.98	74	-24.02	Pk
Vertical	17235.000	32.14	16.09	48.23	74	-25.77	Pk
Horizontal	11490.000	35.47	14.21	49.68	74	-24.32	Pk
Horizontal	17235.000	33.38	16.09	49.47	74	-24.53	Pk
middle Channel (5785 MHz)-Above 1G							
Vertical	11570.000	34.76	14.51	49.27	74	-24.73	Pk
Vertical	17355.000	36.89	16.15	53.04	74	-20.96	Pk
Horizontal	11570.000	35.42	14.51	49.93	74	-24.07	Pk
Horizontal	17355.000	35.18	16.15	51.33	74	-22.67	Pk
High Channel (5825 MHz)-Above 1G							
Vertical	11590.000	36.53	14.55	51.08	74	-22.92	Pk
Vertical	17385.000	34.64	16.18	50.82	74	-23.18	Pk
Vertical	11590.000	35.72	14.55	50.27	74	-23.73	Av
Horizontal	17385.000	36.62	16.18	52.8	74	-21.2	Pk
Horizontal	11590.000	36.53	14.55	51.08	74	-22.92	Pk

Note:"802.11N(20)(5G)" mode is the worst mode. PK value is lower than the Average value limit, So average didn't record.

4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(a)(3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used,

4.2 TEST PROCEDURE

For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

4.3 DEVIATION FROM STANDARD

No deviation.

4.4 TEST SETUP

4.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.6 TEST RESULTS

EUT：	Refer to Page 6	Model Name ：	SBWD100B
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1010 hPa	Test Voltage ：	DC 5V From adapter AC120V/60Hz
Test Mode ：	TX		

Mode	Frequency	Power Density A (dBm)	Power Density B (dBm)	Total power density (dBm)	Calculate power density (dBm)(Note 1)	Limit (dBm)	Result
802.11 a	5745 MHz	3.28	4.194	6.771	6.771	30.00	PASS
	5785 MHz	2.937	4.033	6.530	6.530	30.00	PASS
	5825 MHz	1.869	3.28	5.642	5.642	30.00	PASS
802.11 n20	5745 MHz	1.386	3.145	5.364	5.364	30.00	PASS
	5785 MHz	1.496	3.074	5.367	5.367	30.00	PASS
	5825 MHz	-0.118	3.608	5.143	5.143	30.00	PASS
802.11 n40	5755 MHz	-3.457	0.727	2.131	2.131	30.00	PASS
	5775 MHz	-3.267	-2.054	0.392	0.392	30.00	PASS
	5815 MHz	-3.418	-1.693	0.540	0.540	30.00	PASS

Note:

(1) Calculate power density= Measured Power Density+10log(1MHz/RBW)
RBW=1MHz

802.11 a Mode
Antenna A
TX CH 149

TX CH 157

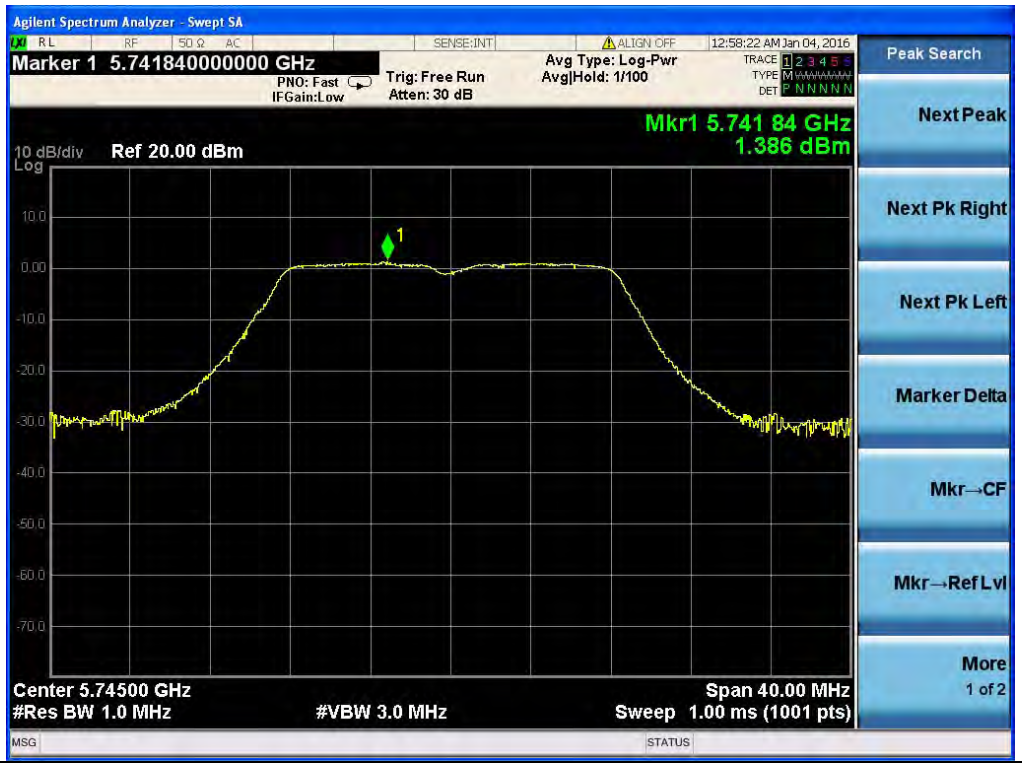
TX CH 165


802.11 a Mode
Antenna B
TX CH 149

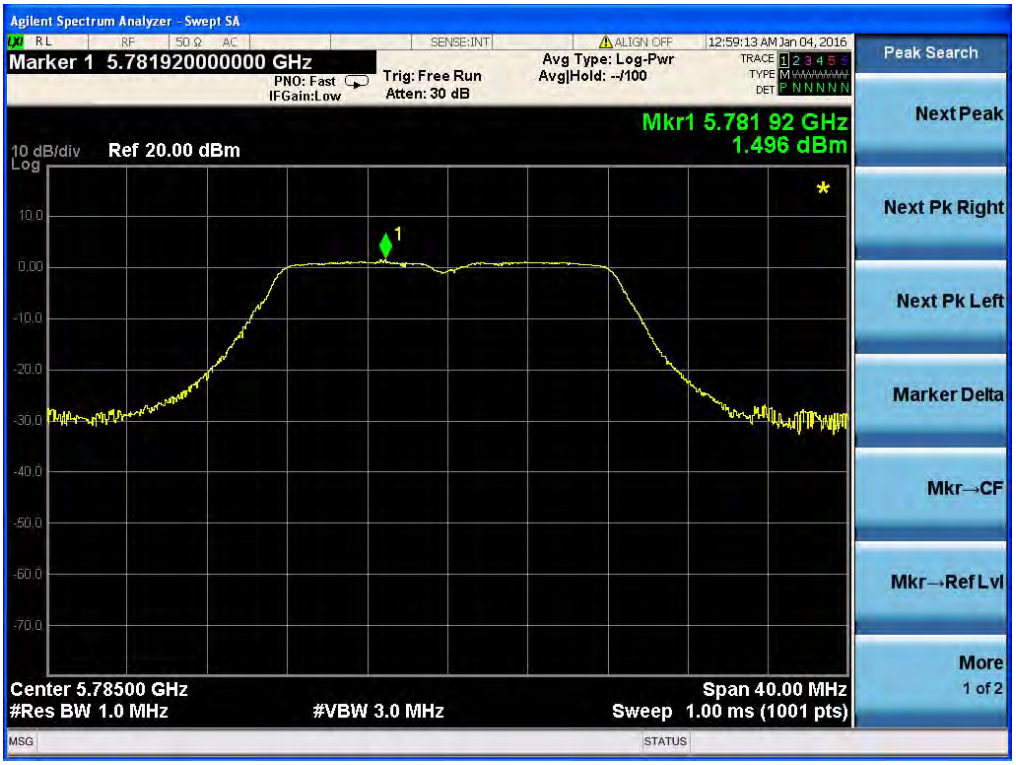

TX CH 157

TX CH 165

802.11 n20 Mode
Antenna A
TX CH 149



TX CH 157



TX CH 165


802.11 n20 Mode
Antenna B
TX CH 149


TX CH 157

TX CH 165

802.11 n40 Mode
Antenna A
TX CH 151

TX CH 155

TX CH 163


802.11 n40 Mode
Antenna B
TX CH 151


TX CH 155

TX CH 163

5. 26 DB & 99% EMISSION BANDWIDTH

5.1 APPLIED PROCEDURES / LIMIT

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements In the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device,

5.2 TEST PROCEDURE

a) Set RBW = approximately 1% of the emission bandwidth.

b) Set the VBW > RBW.

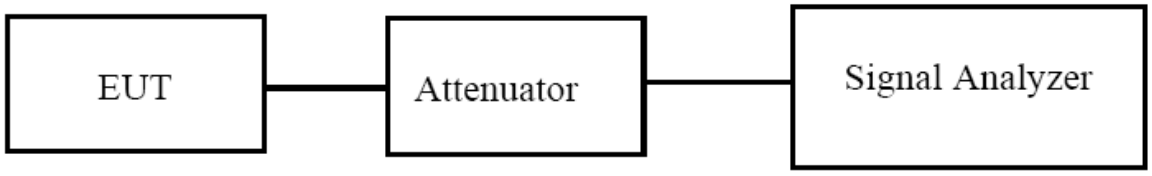
c) Detector = Peak.

d) Trace mode = max hold.

e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 · RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.



5.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.4 TEST RESULTS

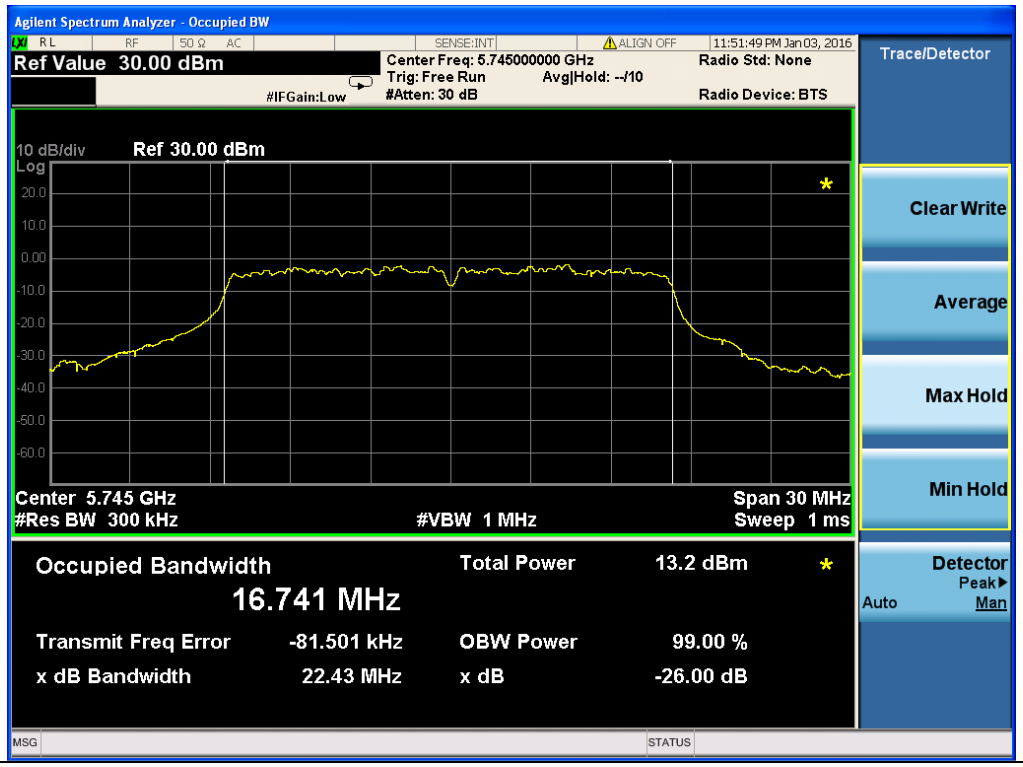
EUT：	Refer to Page 6	Model Name ：	SBWD100B
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1010 hPa	Test Voltage ：	DC 5V From adapter AC120V/60Hz
Test Mode ：	TX		

Mode	Channel	Frequency (MHz)	99% bandwidth (MHz)		26dB bandwidth (MHz)		Result
			ANT A	ANT B	ANT A	ANT B	
802.11a	149	5745	16.741	16.737	22.43	22.15	Pass
	157	5785	16.743	16.727	22.28	22.13	Pass
	165	5825	16.734	16.744	22.36	22.39	Pass
802.11 n20	149	5745	17.973	18.219	23.66	26.74	Pass
	157	5785	17.939	17.999	23.38	23.85	Pass
	165	5825	17.964	17.985	23.56	23.63	Pass
802.11 n40	151	5755	36.036	36.059	39.68	40.07	Pass
	155	5775	36.050	36.056	39.80	40.00	Pass
	163	5815	36.018	36.115	39.82	46.67	Pass

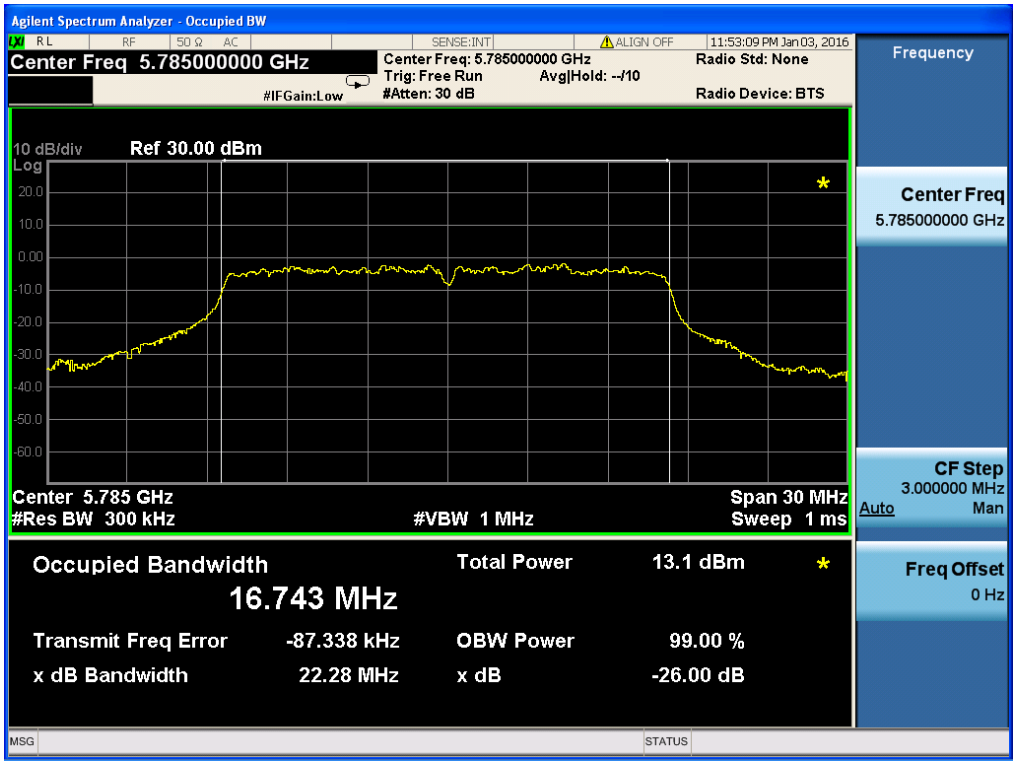
802.11 a Mode

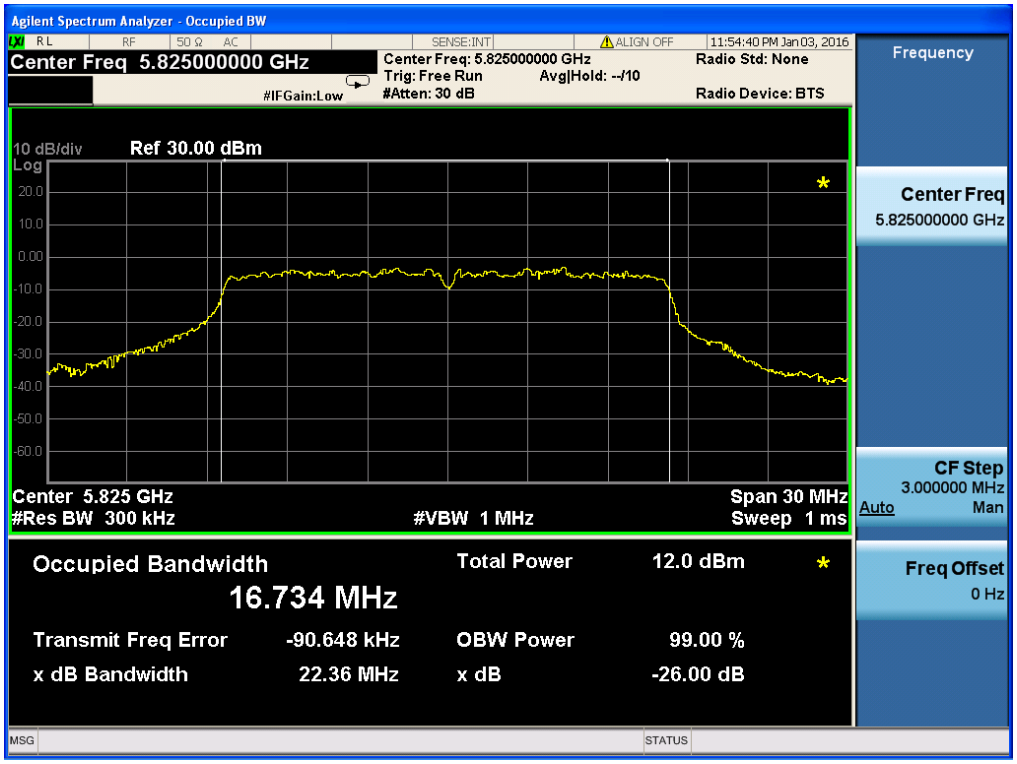
Antenna A

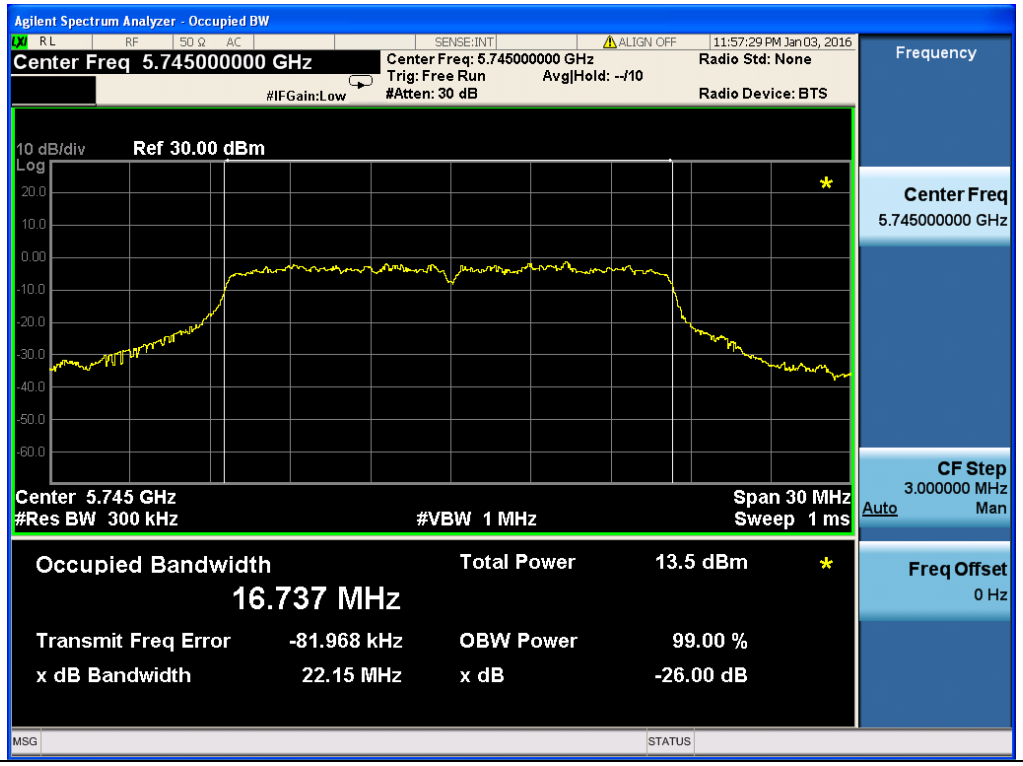
TX CH 149



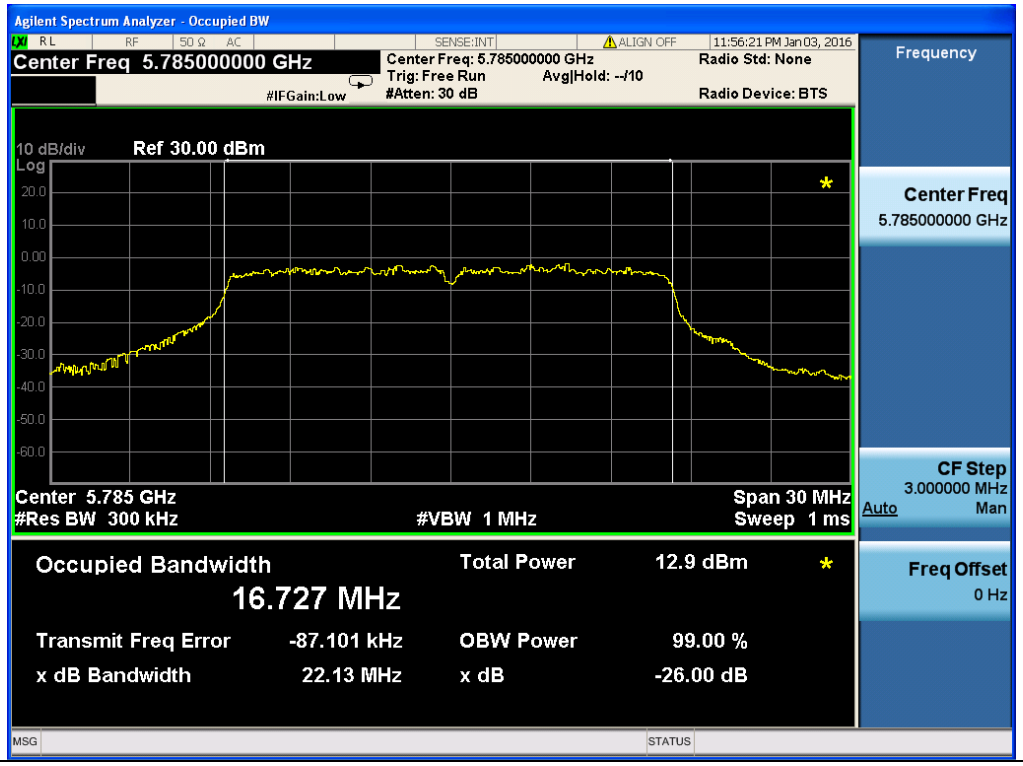
TX CH 157



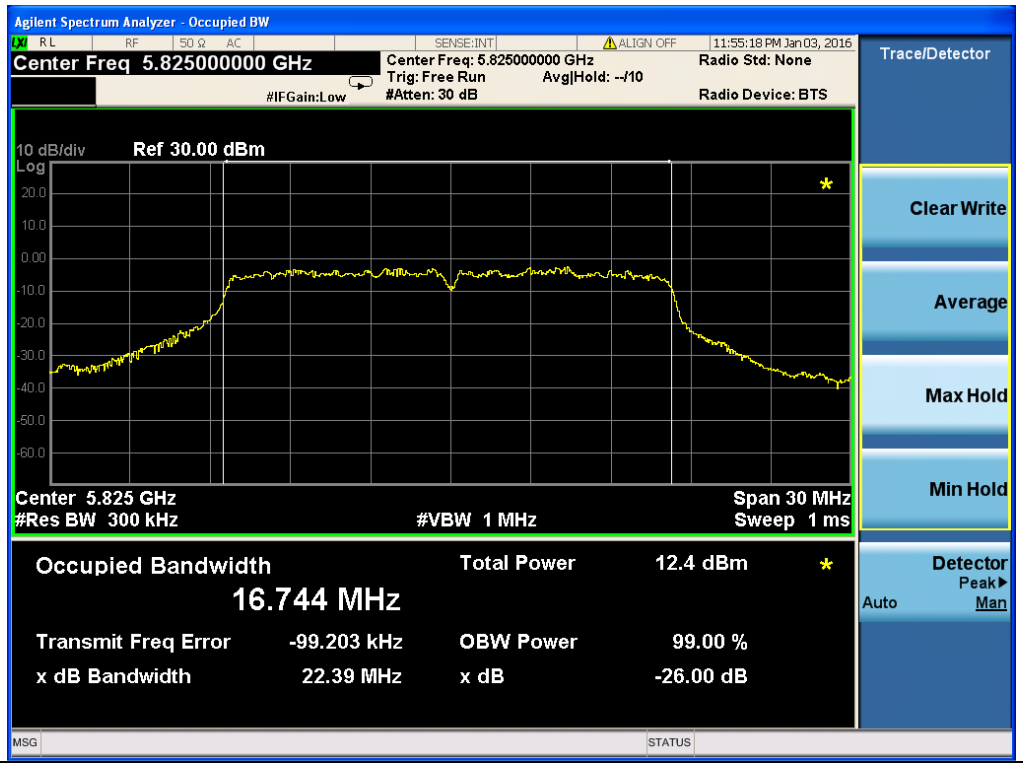
TX CH 165


802.11 a Mode
Antenna B
TX CH 149


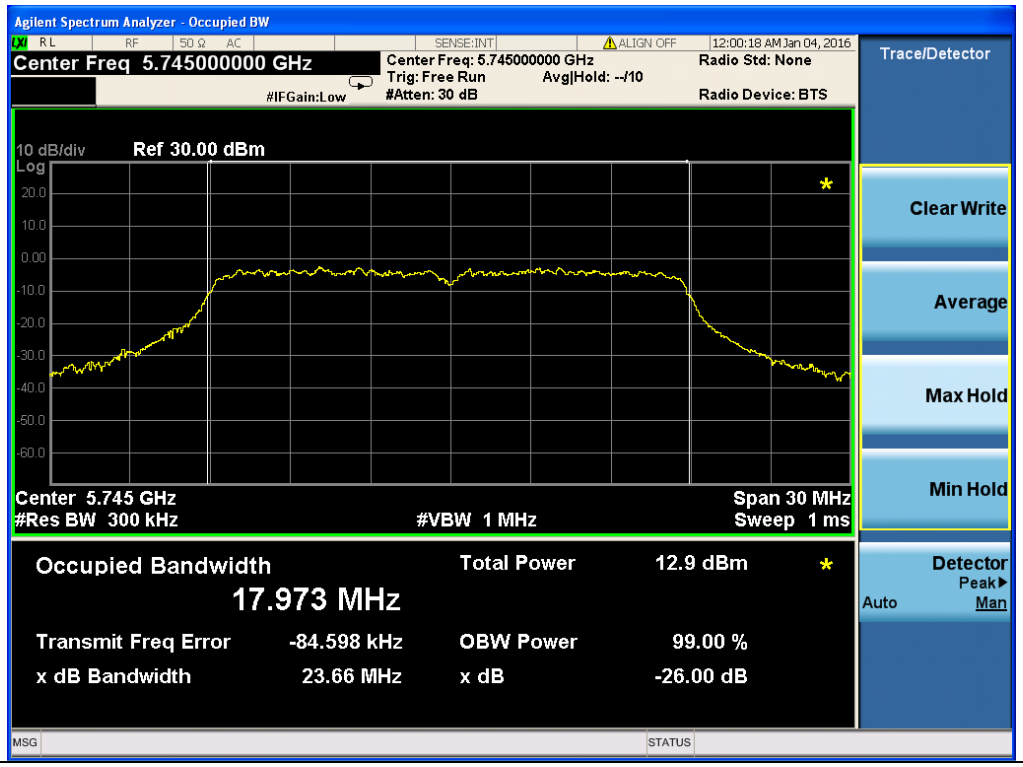
TX CH 157



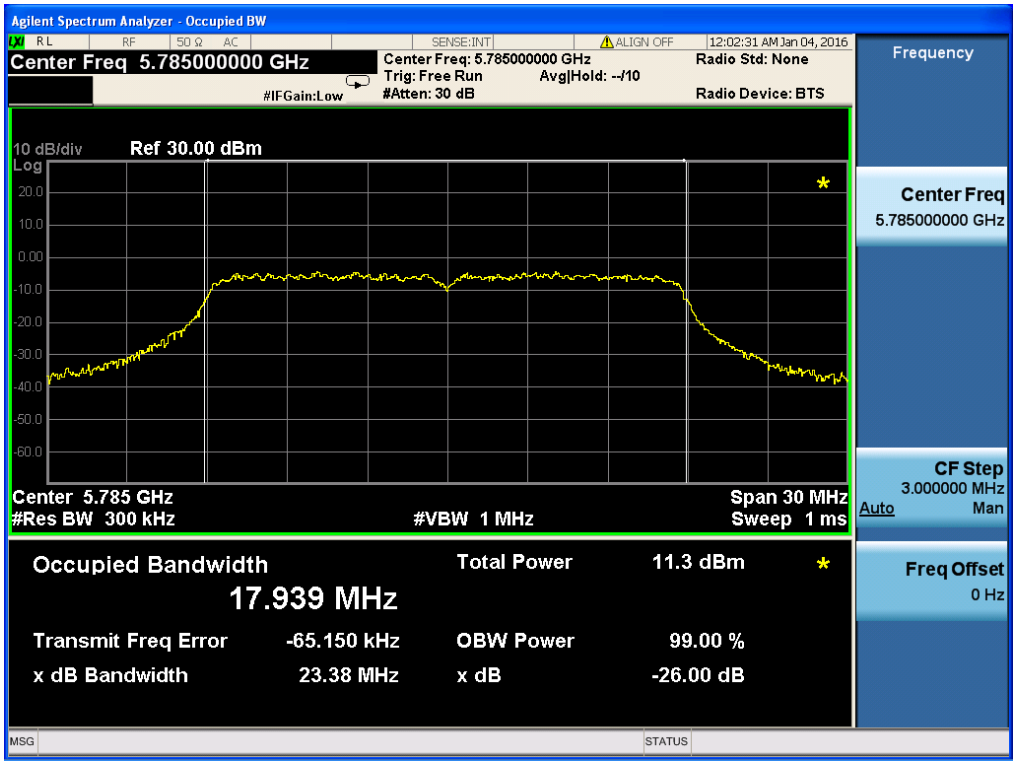
TX CH 165

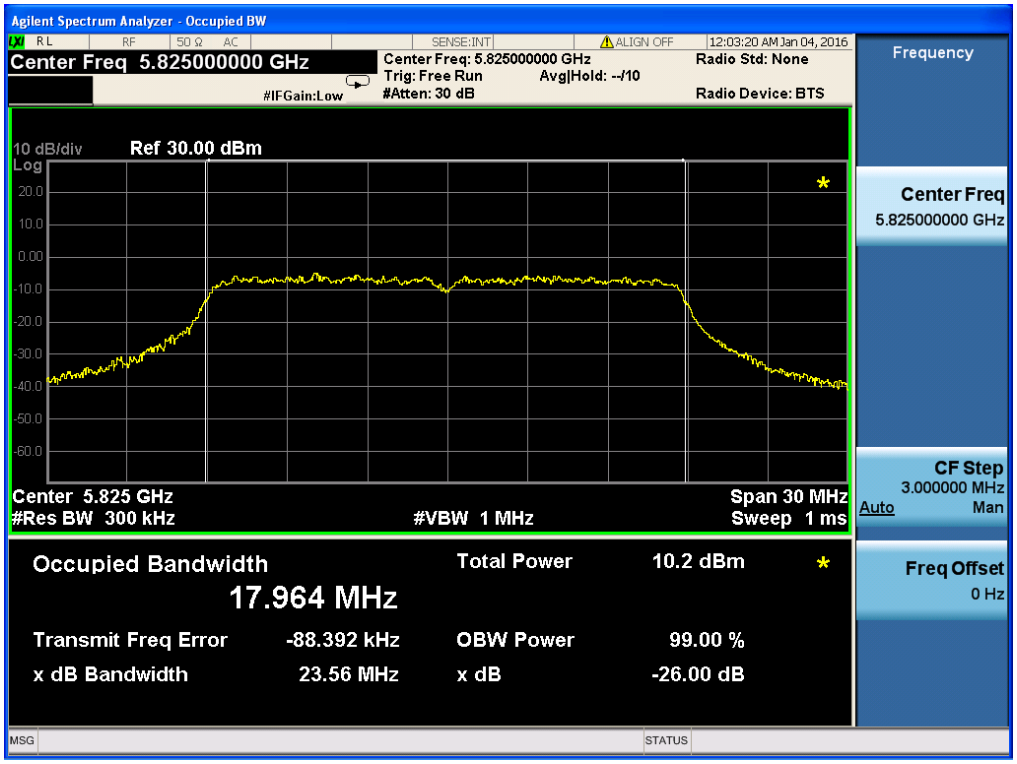


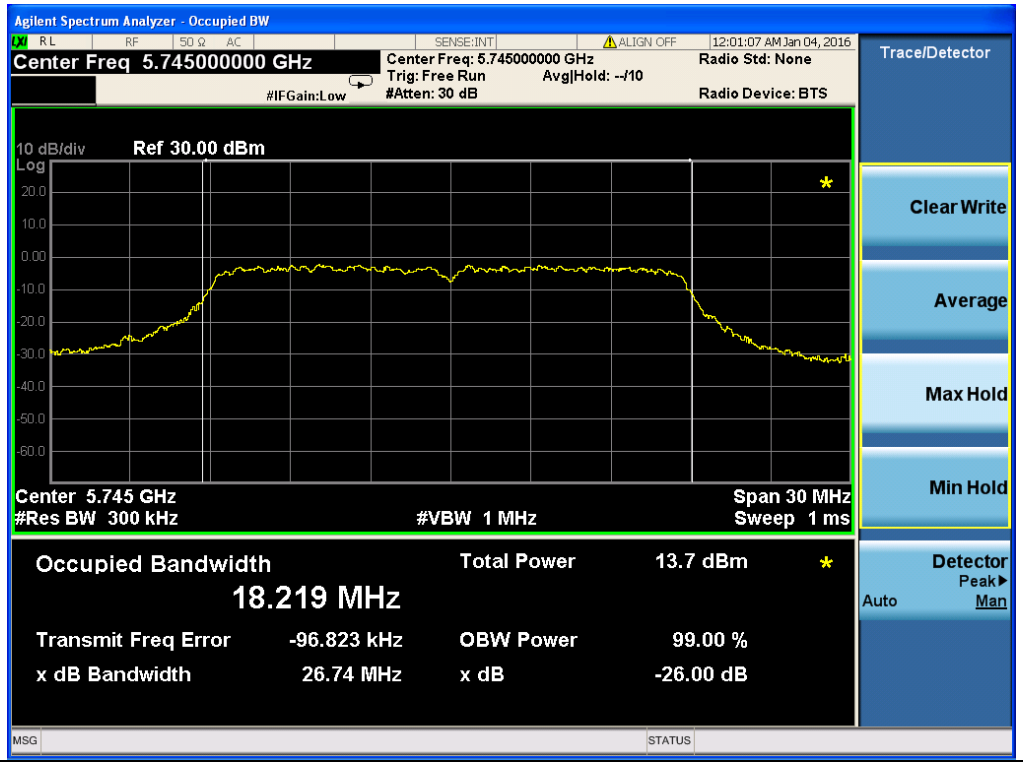
802.11 n20 Mode
Antenna A
TX CH 149



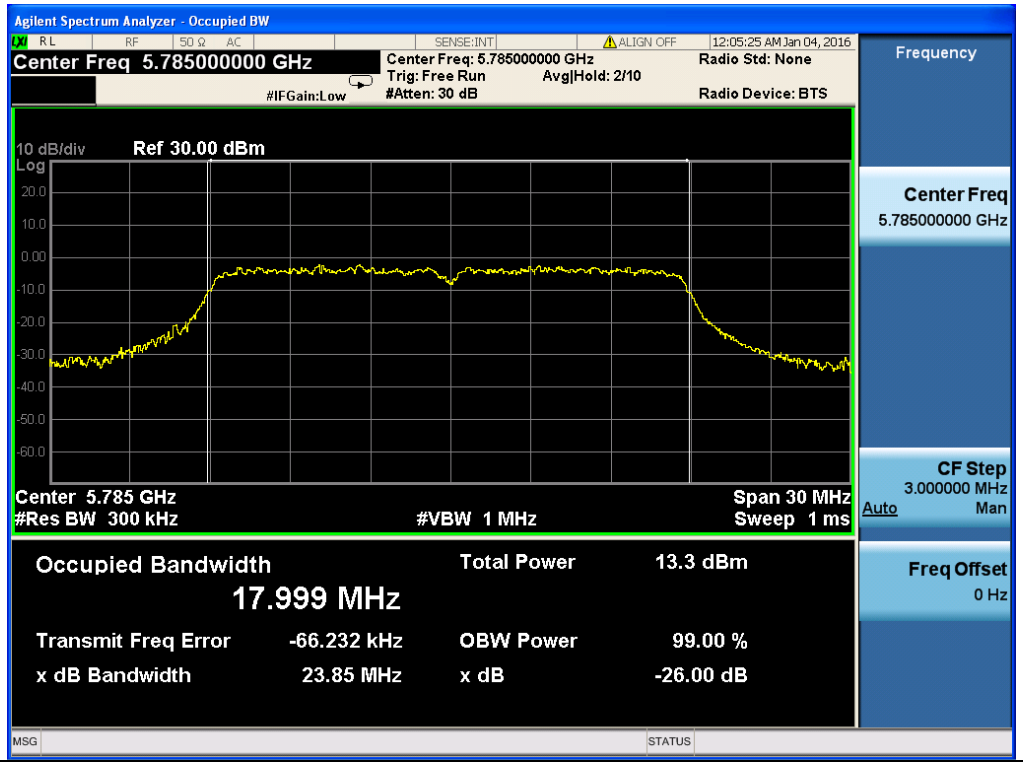
TX CH 157



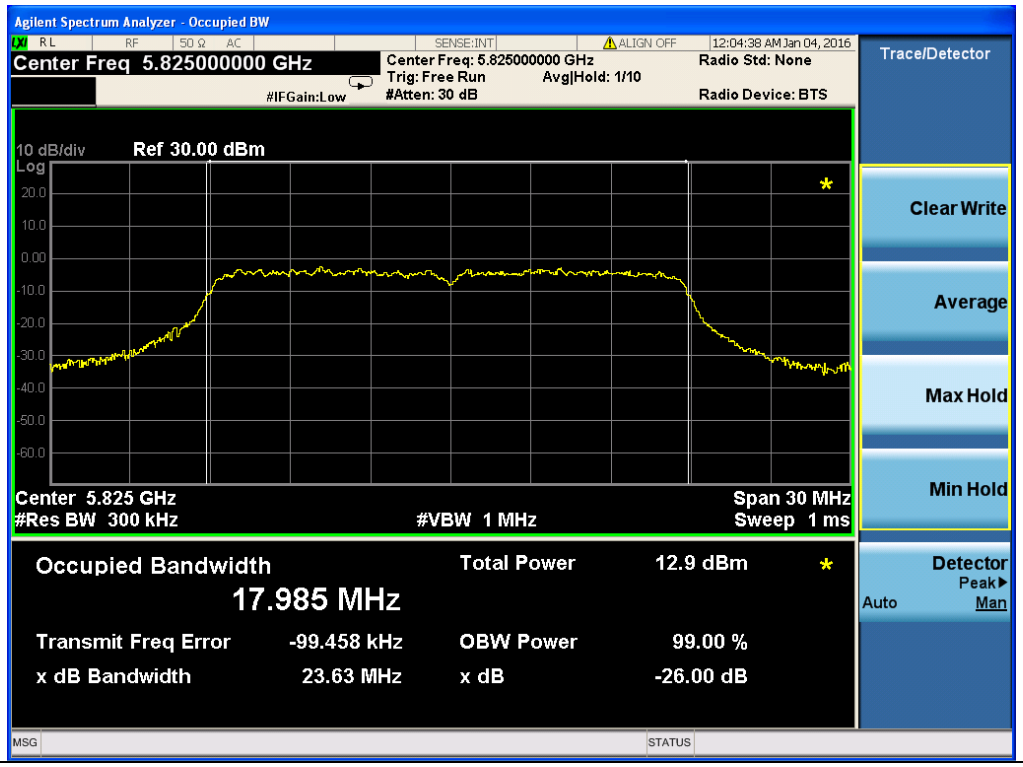
TX CH 165


802.11 n20 Mode
Antenna B
TX CH 149


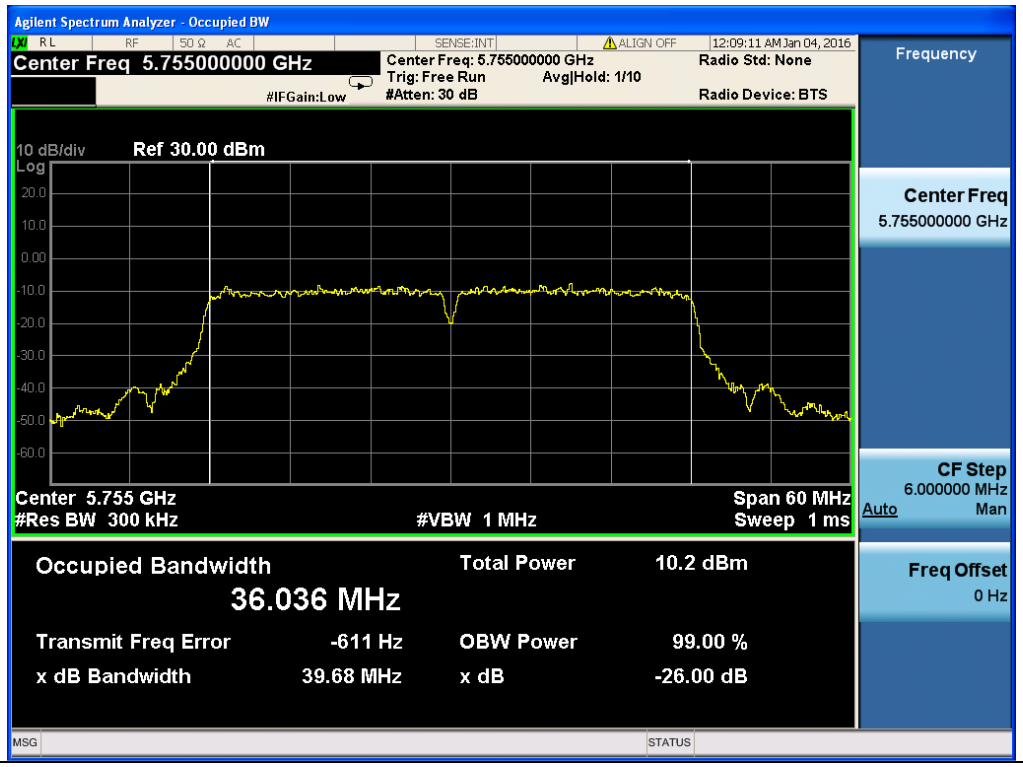
TX CH 157



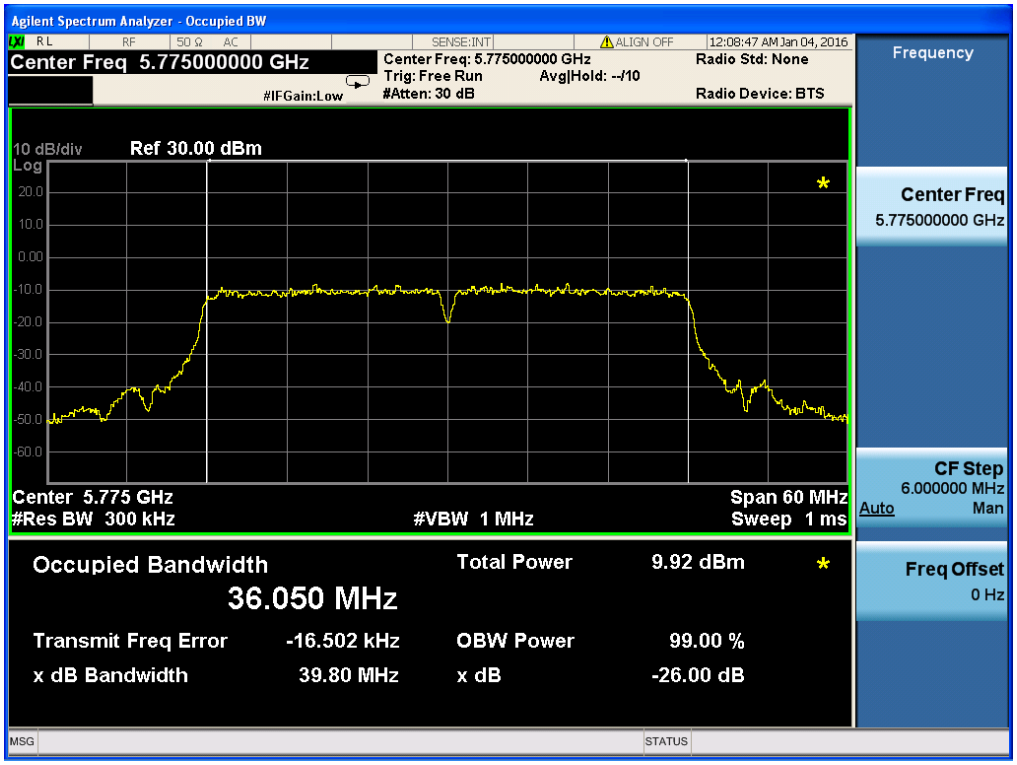
TX CH 165

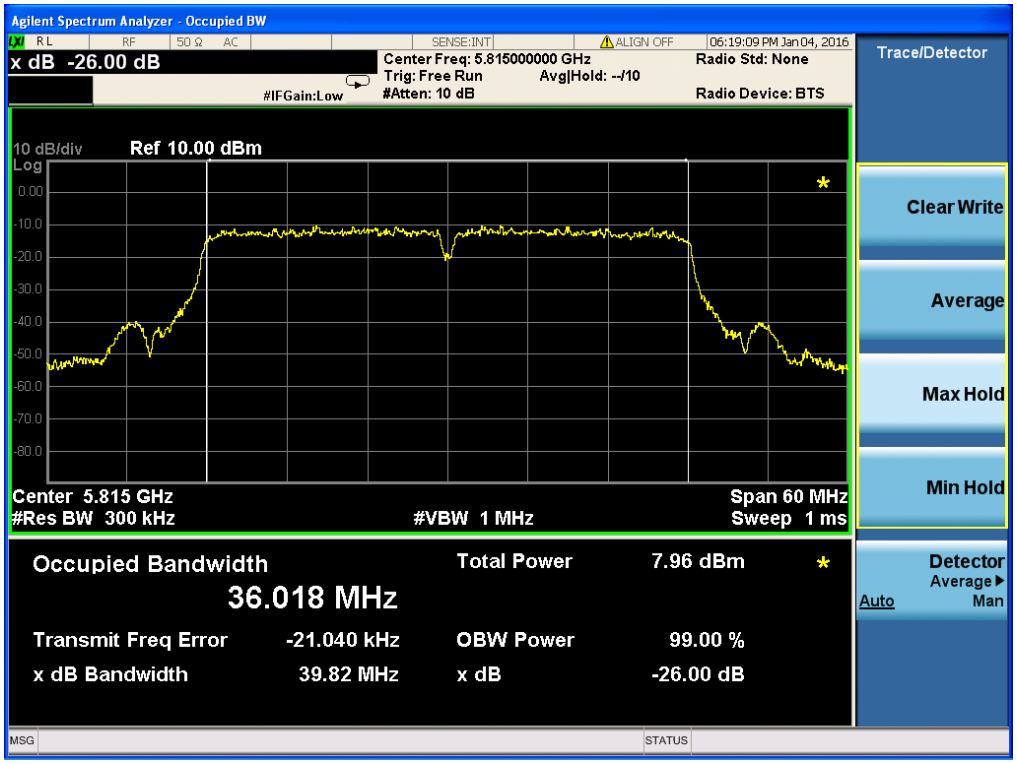


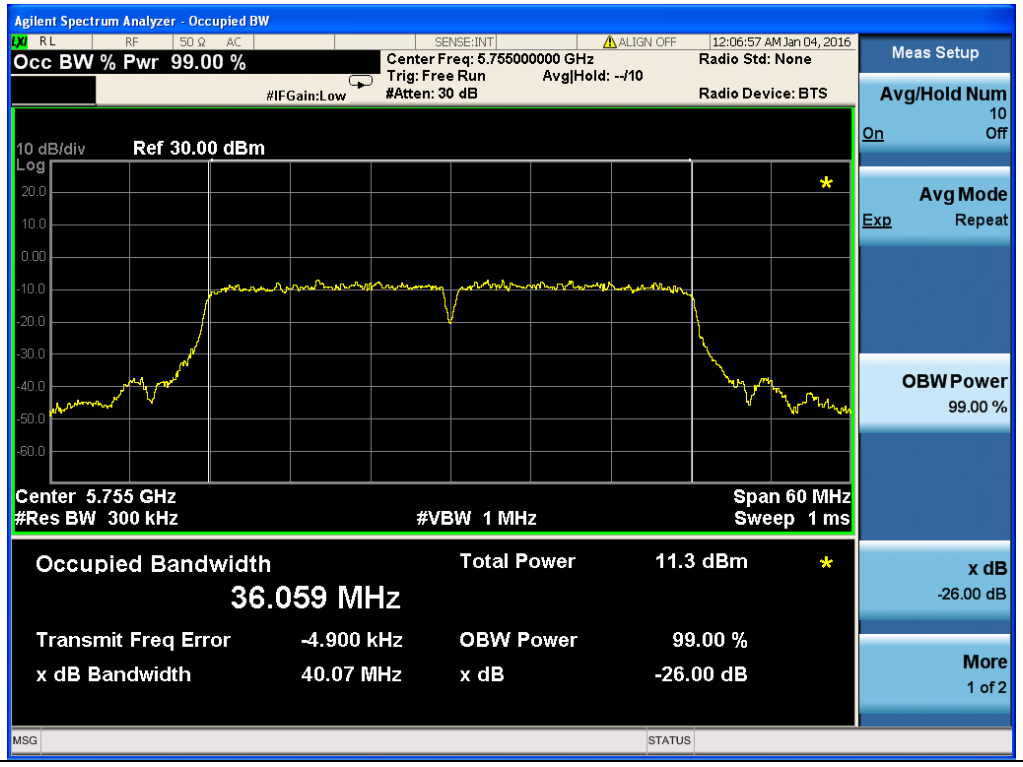
802.11 n40 Mode
Antenna A
TX CH 151



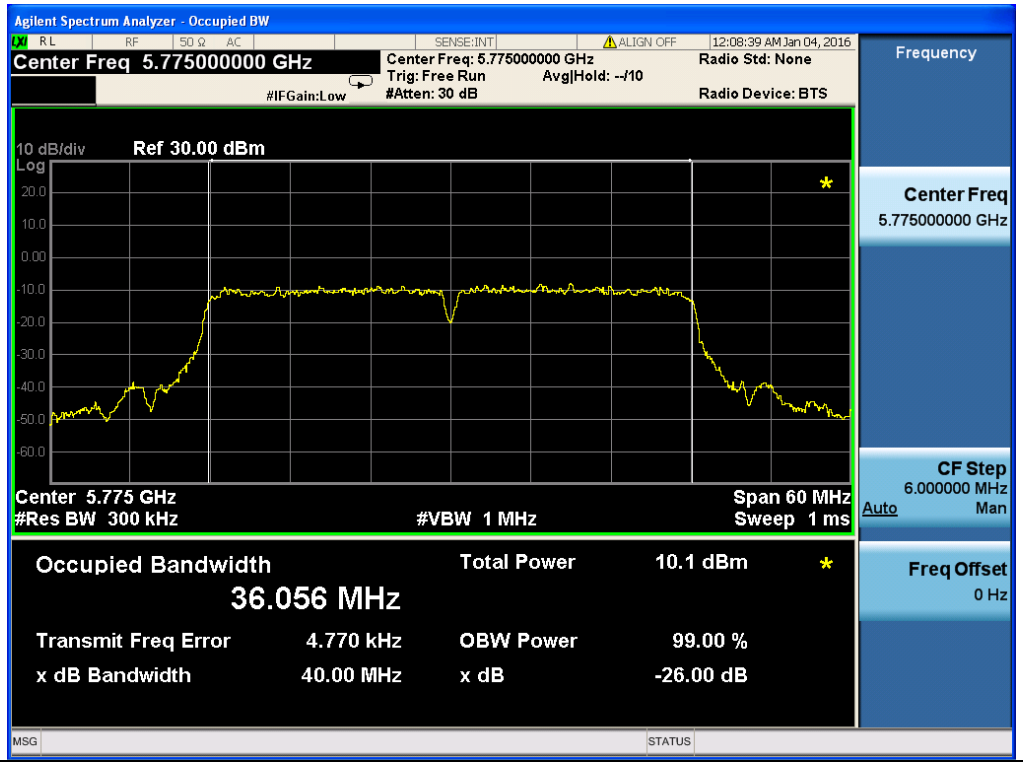
TX CH 155



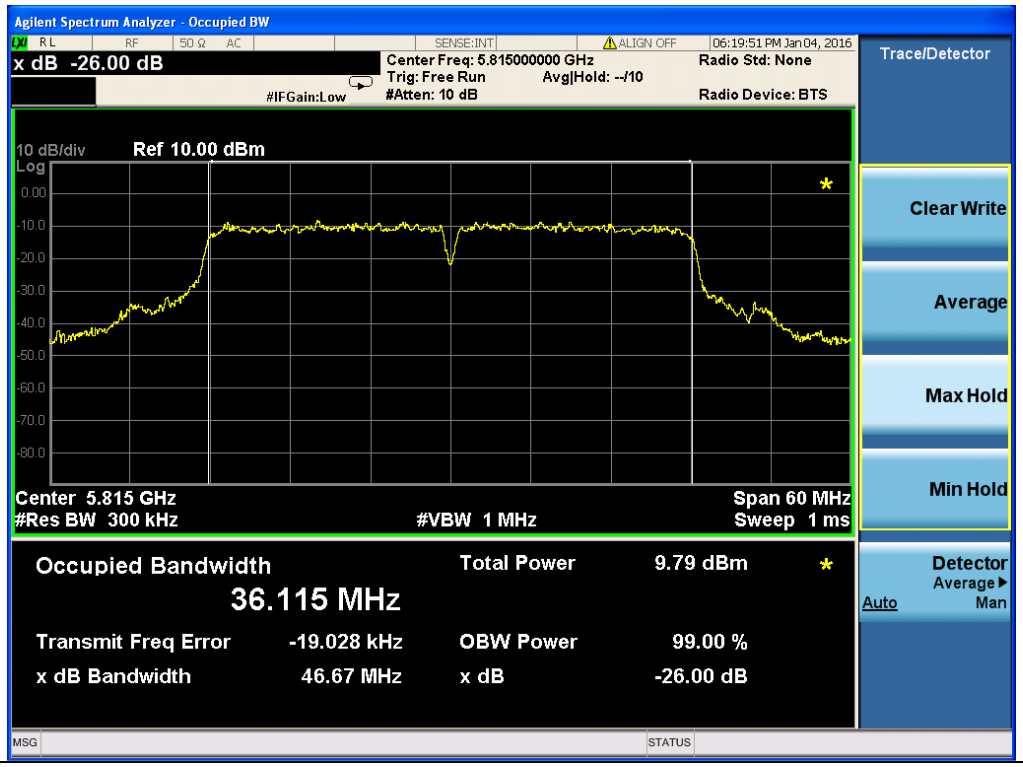
TX CH 163


802.11 n40 Mode
Antenna B
TX CH 151


TX CH 155



TX CH 163



6. MINIMUM 6 DB BANDWIDTH

6.1 APPLIED PROCEDURES / LIMIT

According to FCC §15.407(e)
(e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

6.2 TEST PROCEDURE

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW) ≥ 3 × RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Sweep = auto couple.

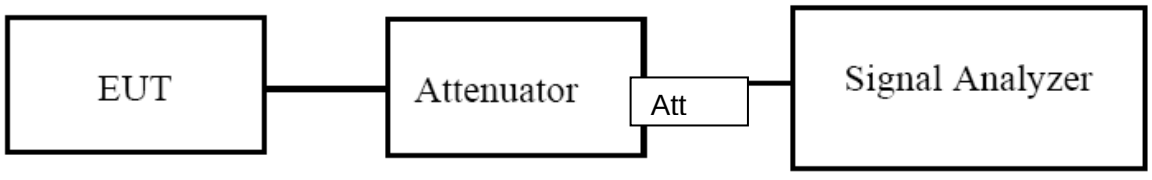
f) Allow the trace to stabilize.

g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

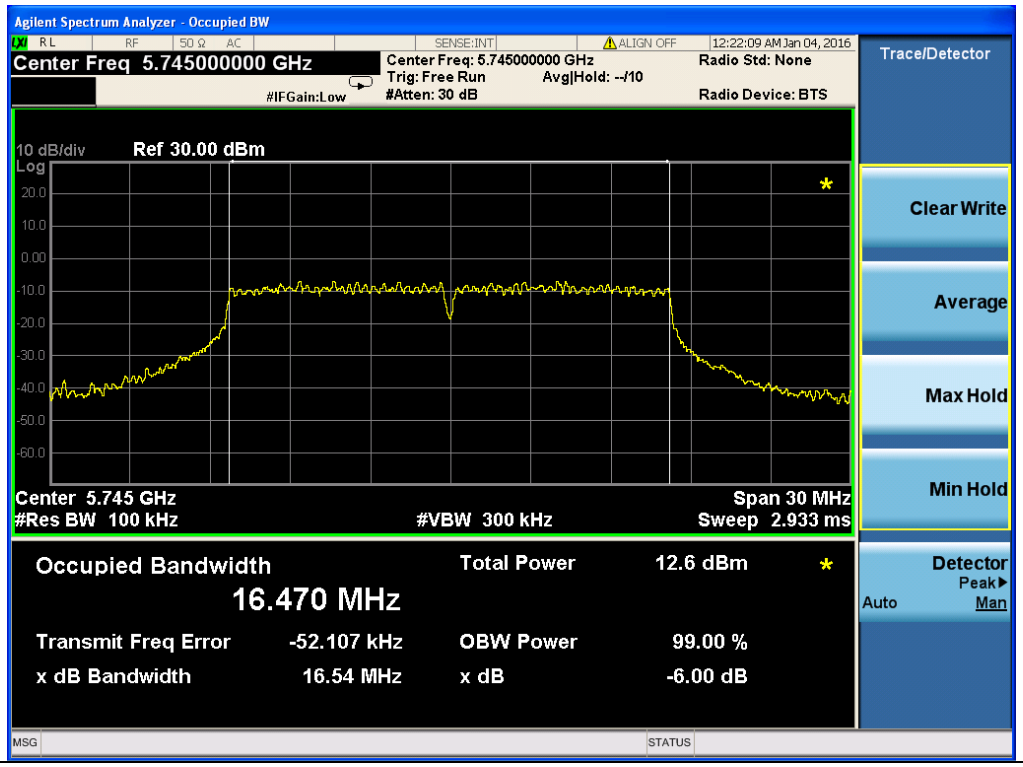
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.6 TEST RESULTS

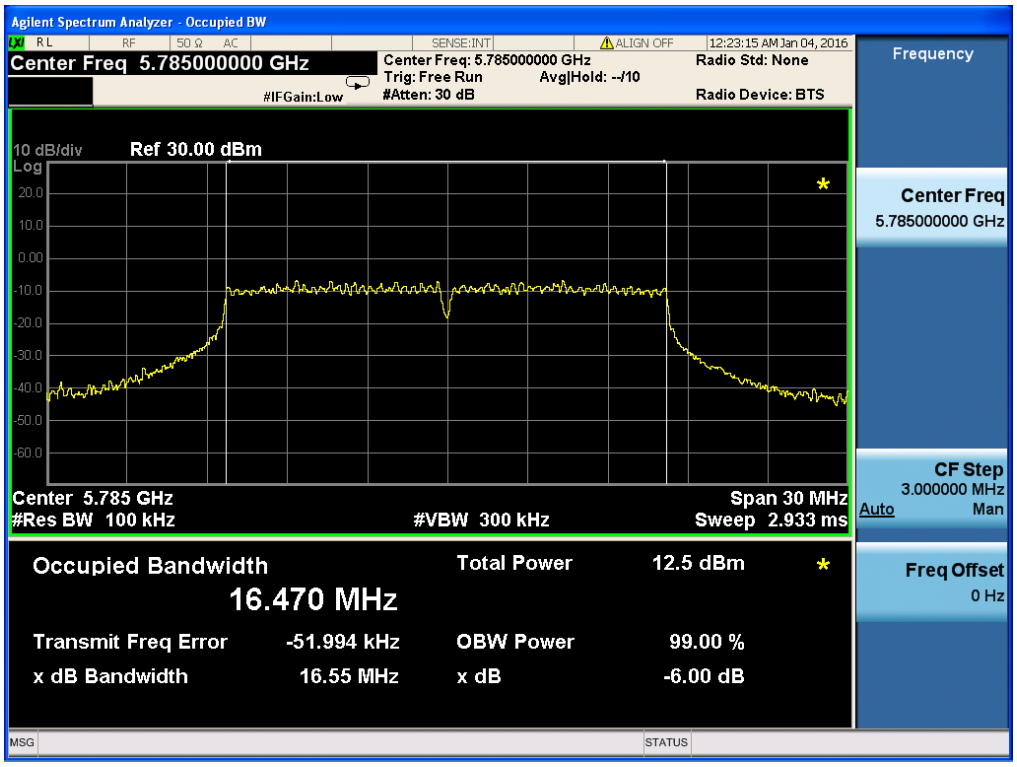
EUT：	Refer to Page 6	Model Name ：	SBWD100B
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1010 hPa	Test Voltage ：	DC 5V From adapter AC120V/60Hz
Test Mode ：	TX (5G) Mode		

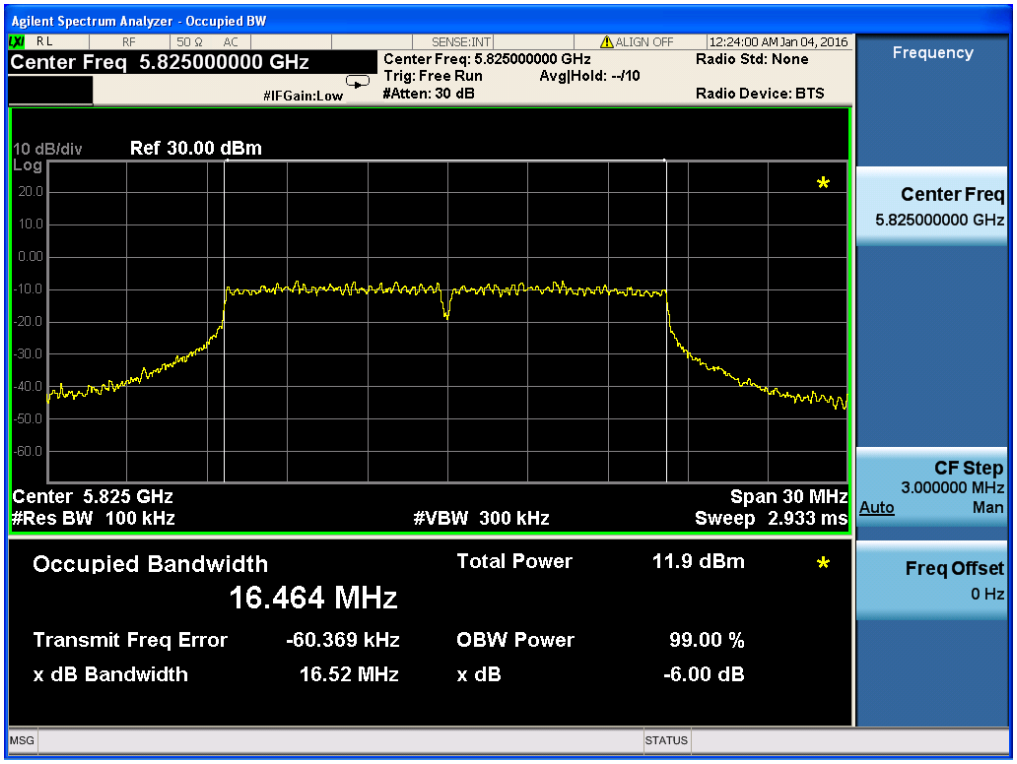
Mode	Channel	Frequency (MHz)	-6dB bandwidth (MHz)		Result
			ANT A	ANT B	
802.11a	149	5745	16.54	16.54	Pass
	157	5785	16.55	16.55	Pass
	165	5825	16.52	16.53	Pass
802.11 n20	149	5745	17.81	17.77	Pass
	157	5785	17.76	17.76	Pass
	165	5825	17.74	17.74	Pass
802.11 n40	151	5755	36.44	36.43	Pass
	155	5775	36.42	36.44	Pass
	163	5815	36.38	36.37	Pass

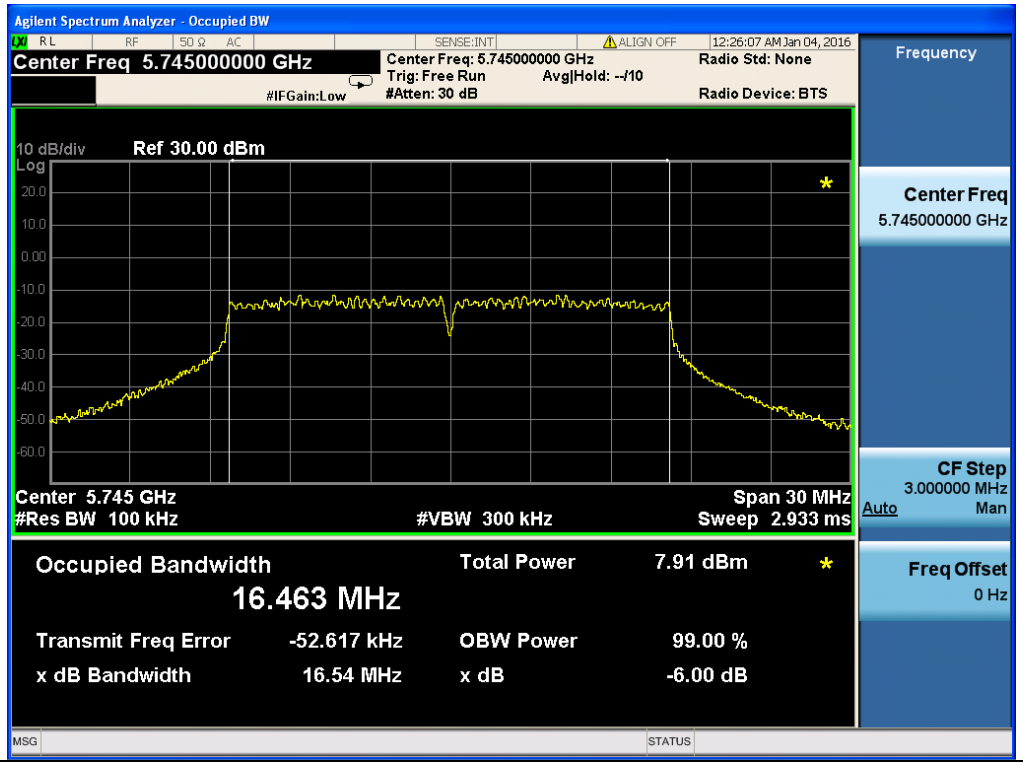
802.11 a Mode
Antenna A
TX CH 149



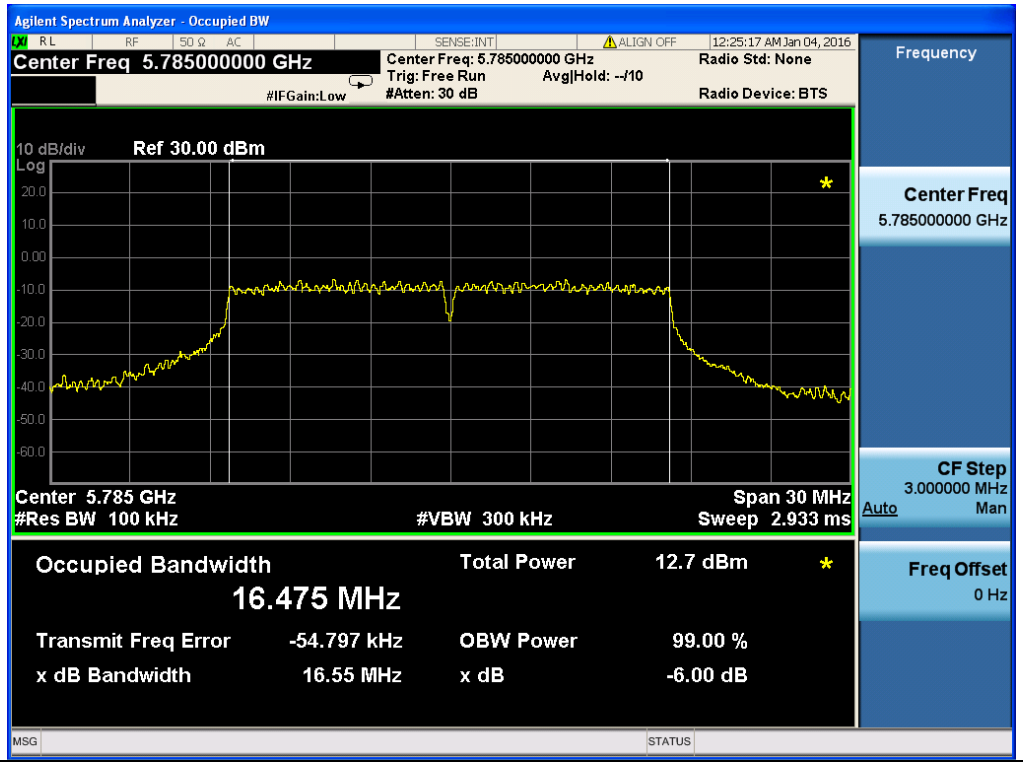
TX CH 157



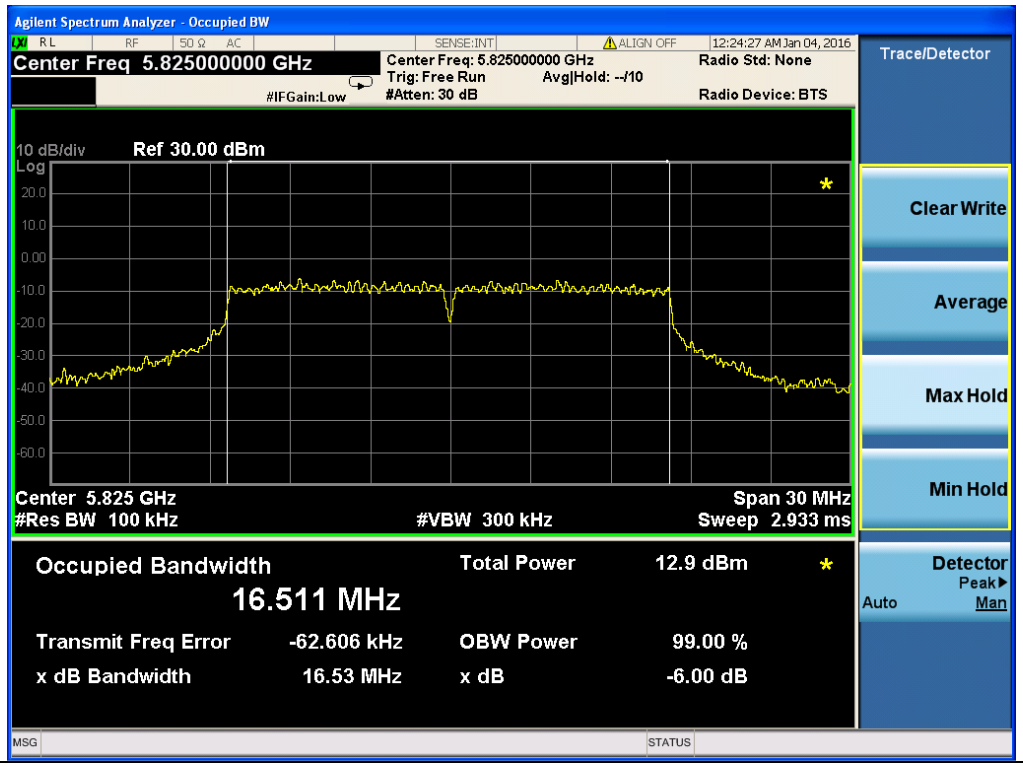
TX CH 165


802.11 a Mode
Antenna B
TX CH 149


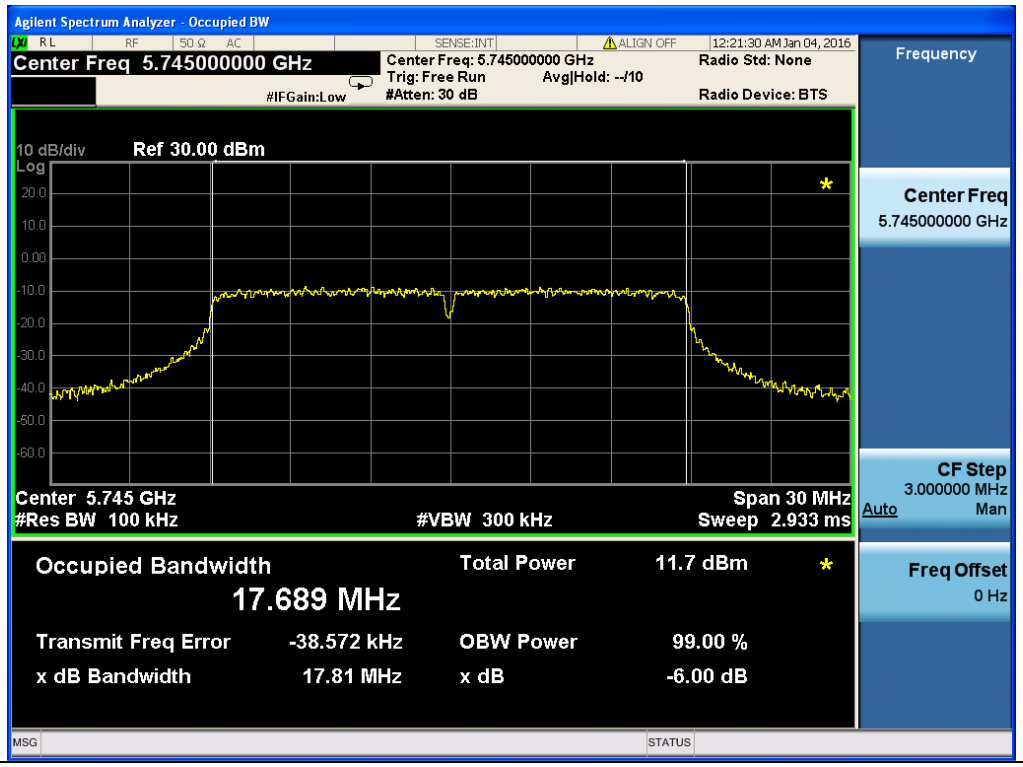
TX CH 157



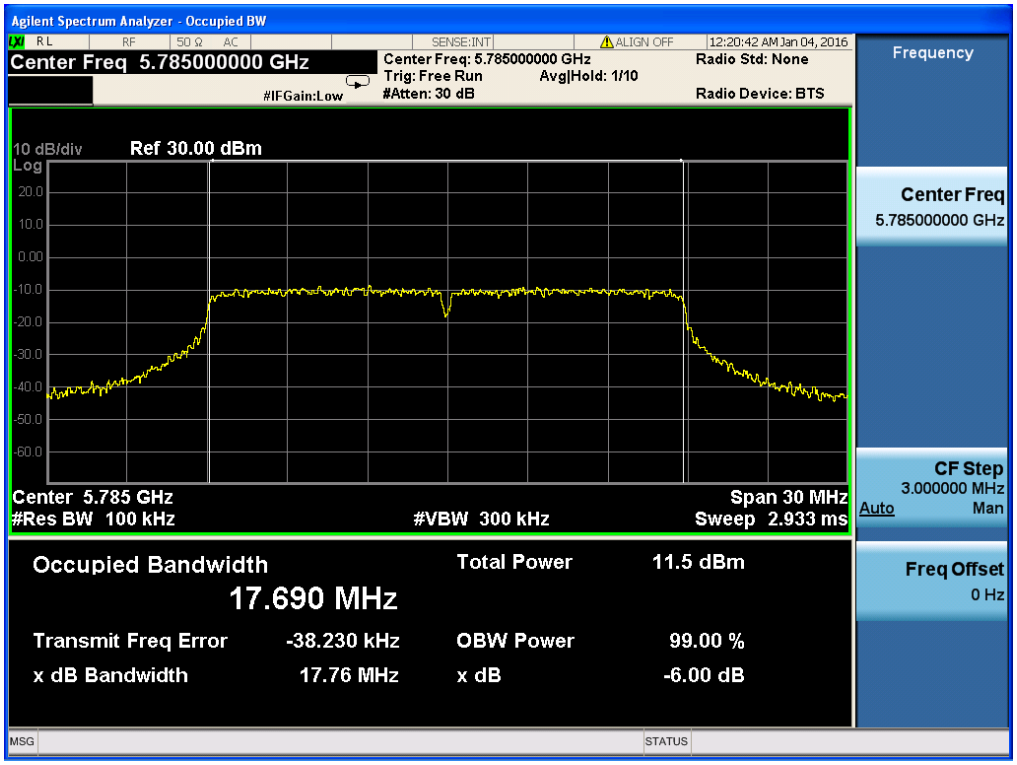
TX CH 165



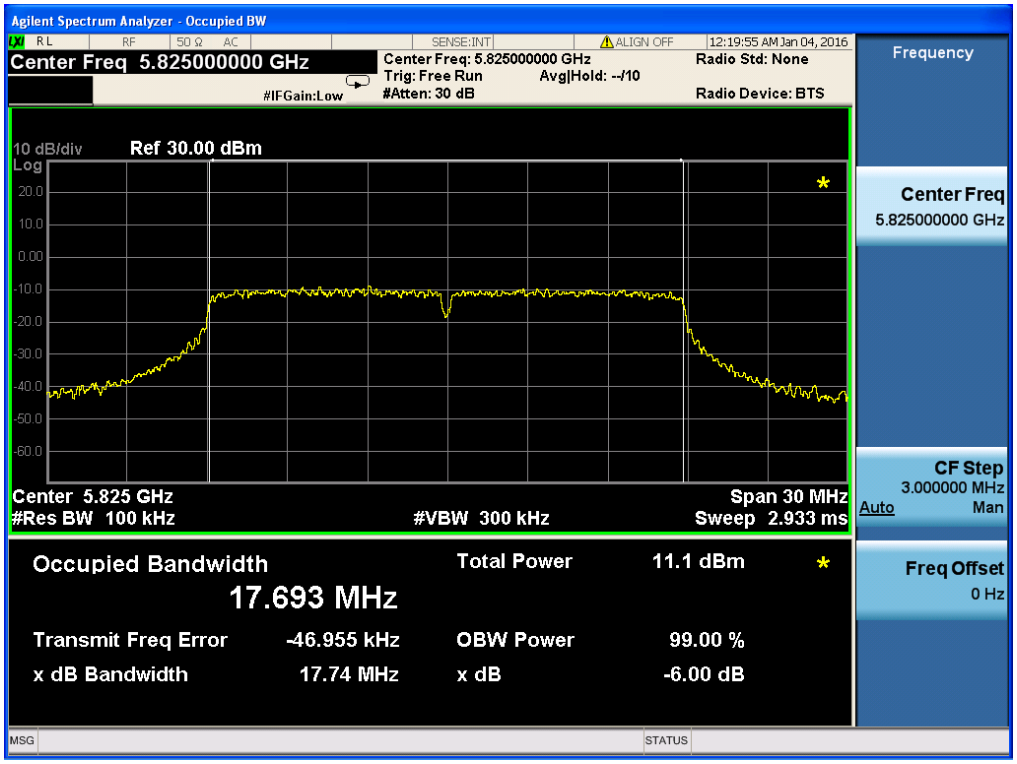
802.11 n20 Mode
Antenna A
TX CH 149



TX CH 157



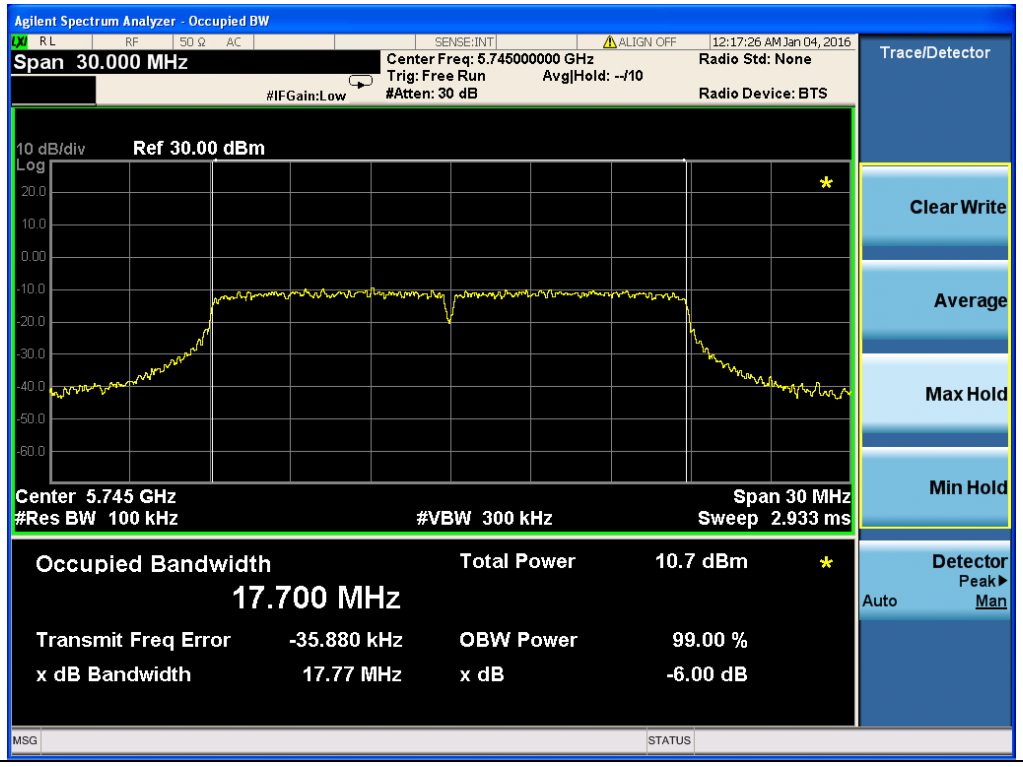
TX CH 165



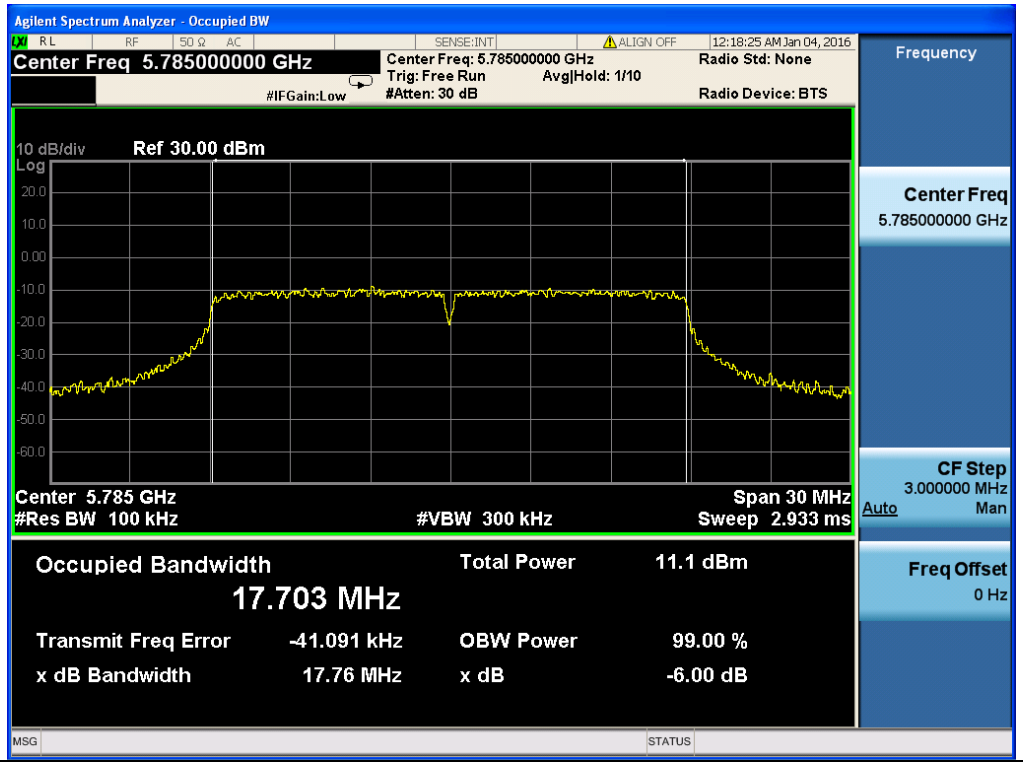
802.11 n20 Mode

Antenna B

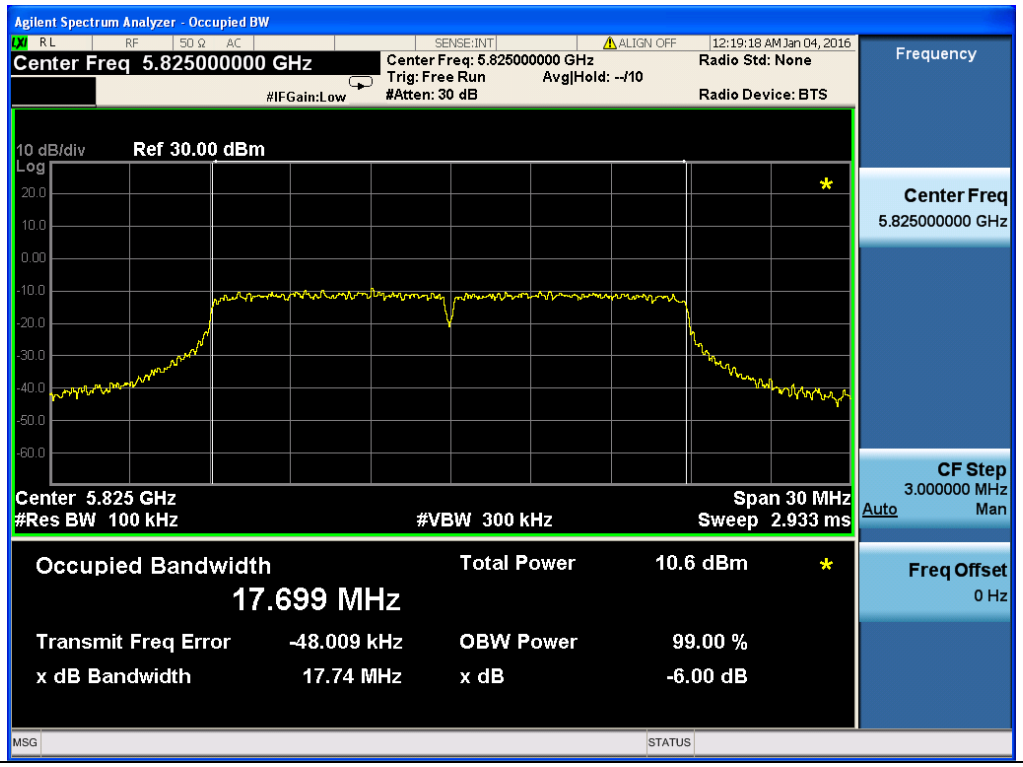
TX CH 149



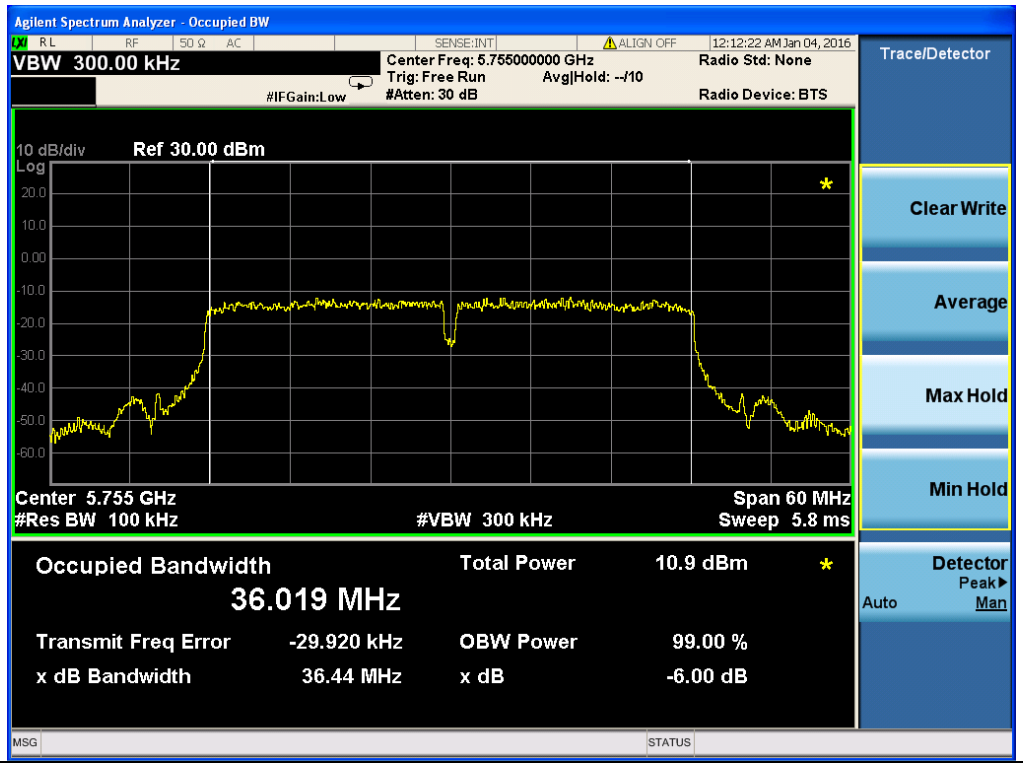
TX CH 157



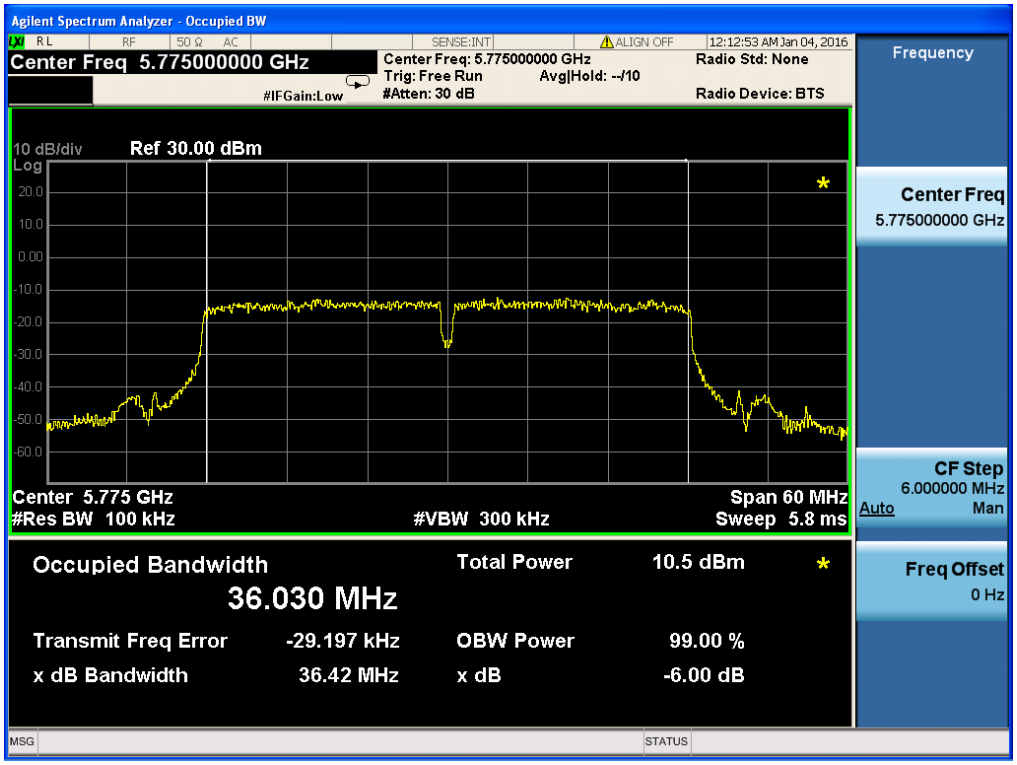
TX CH 165

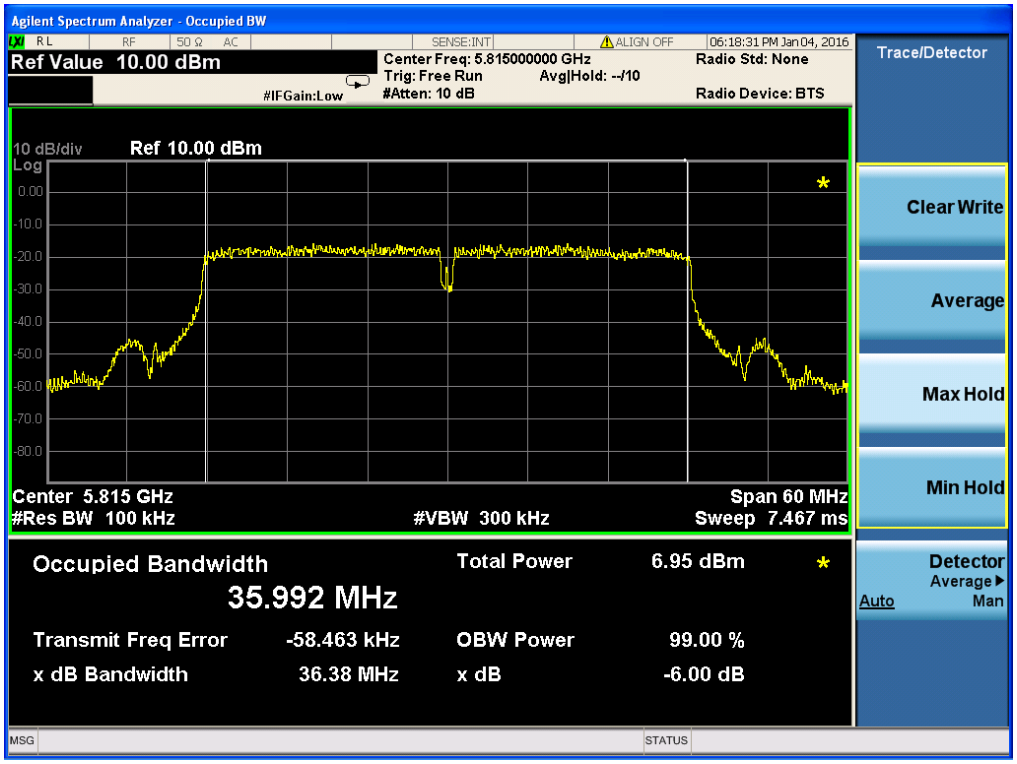


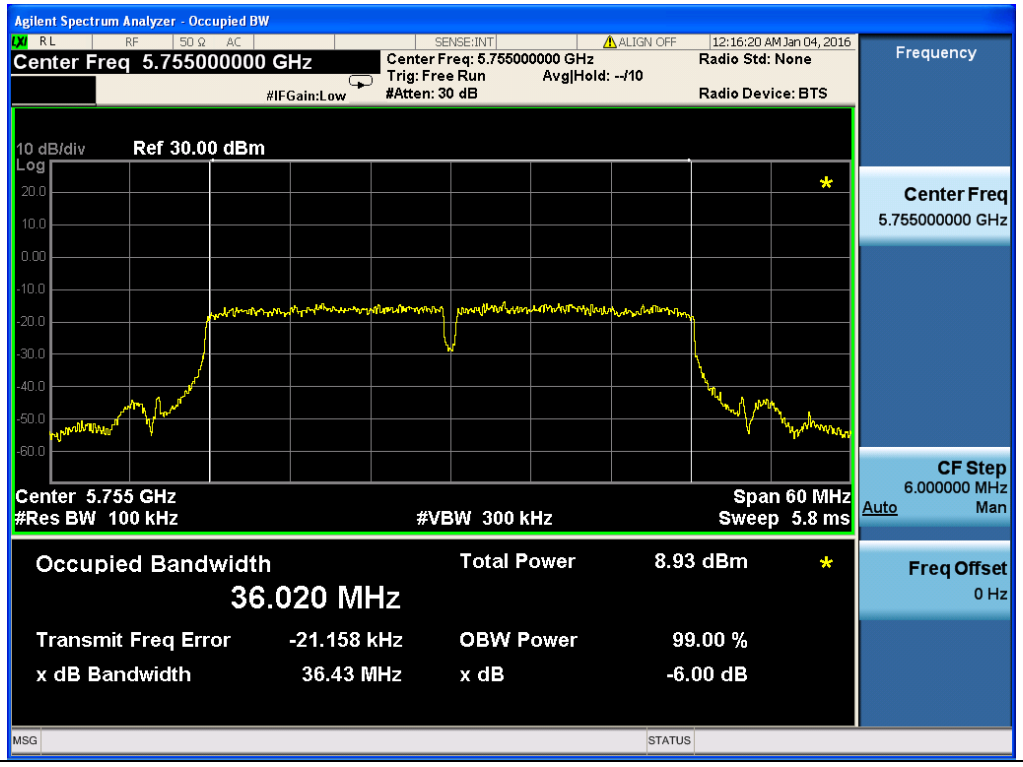
802.11 n40 Mode
Antenna A
TX CH 151



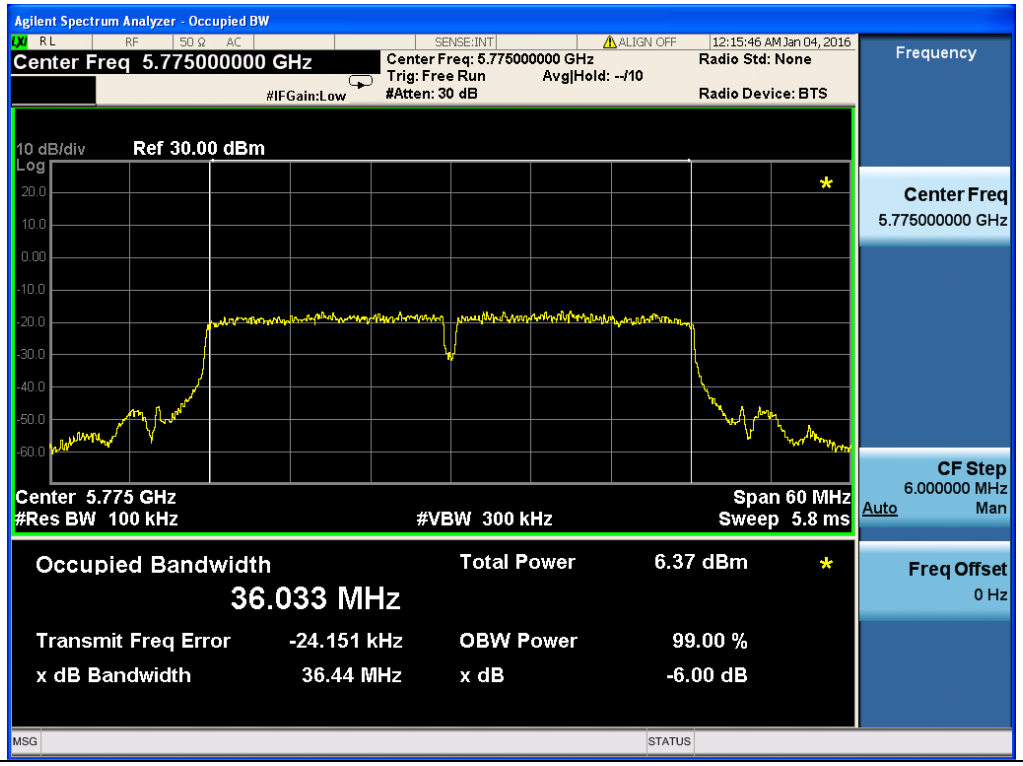
TX CH 155



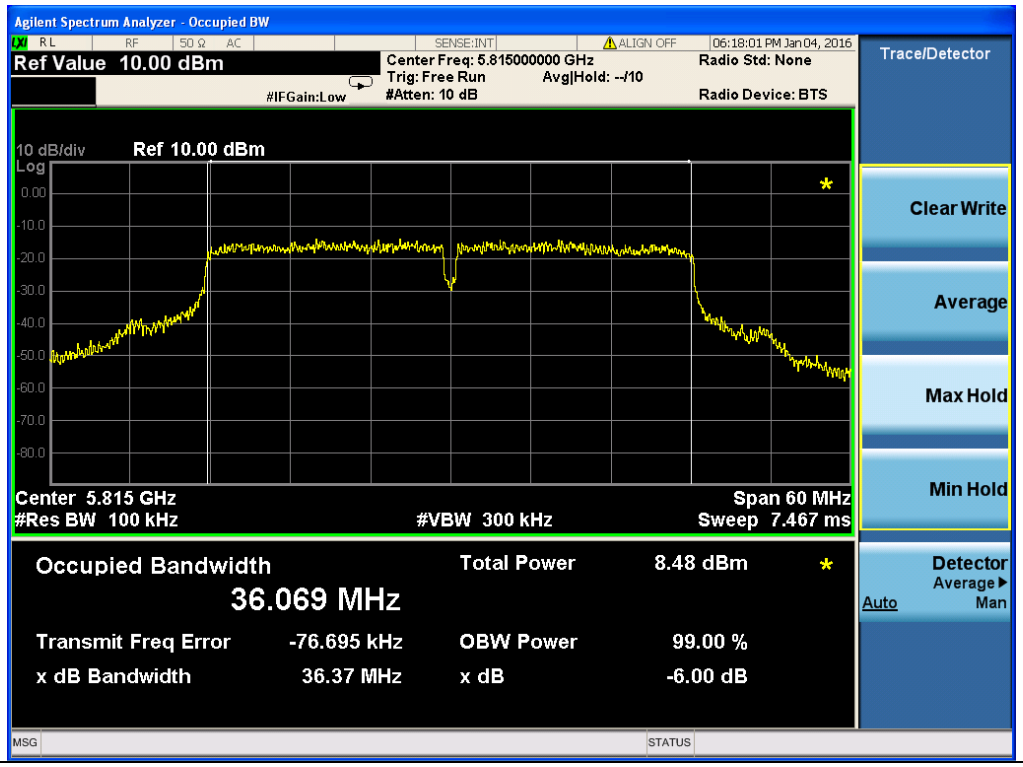
TX CH 163


802.11 n40 Mode
Antenna B
TX CH 151


TX CH 155



TX CH 163



7. MAXIMUM CONDUCTED OUTPUT POWER

7.1 PPLIED PROCEDURES / LIMIT

According to FCC §15.407

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

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

(iv) For 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, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz

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

7.2 TEST PROCEDURE

· Maximum conducted output power may be measured using a spectrum analyzer/EMI receiver or an RF power meter.

1. Device Configuration

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

a) The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)

Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal.1 However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

• The EUT transmits continuously (or with a duty cycle ≥ 98 percent).

• Sweep triggering or gating can be implemented in a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ± 2 percent.

(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

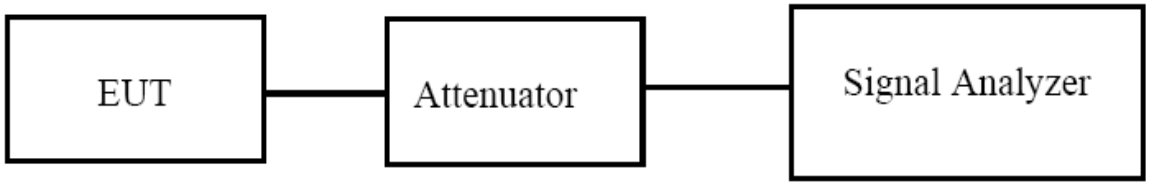
(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

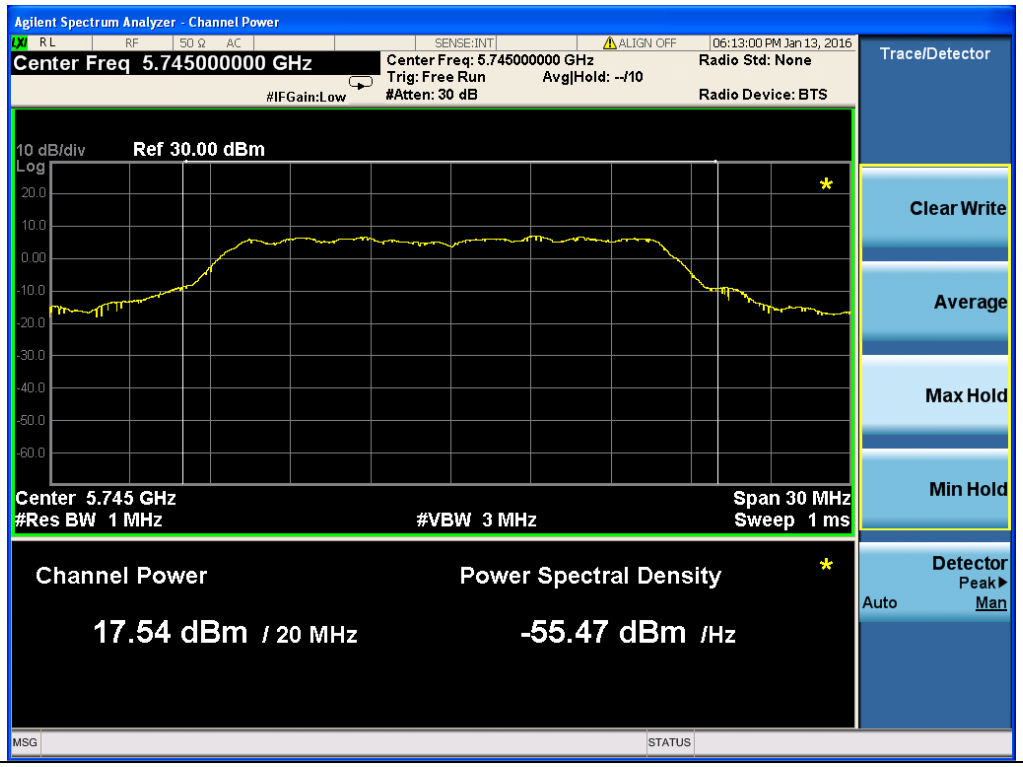
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.6 TEST RESULTS

EUT：	Refer to Page 6	Model Name ：	SBWD100B
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1010 hPa	Test Voltage ：	DC 5V From adapter AC120V/60Hz
Test Mode ：	TX (5G) Mode		

Test Channe	Frequency	Maximum output power. Antenna port				Total Power		LIMIT
		(PK) (dBm)		(AV) (dBm)		(PK)	(AV)	
	(MHz)	ANT A	ANT B	ANT A	ANT B	dBm	dBm	dBm
TX 802.11a Mode								
CH149	5745	17.54	17.13	15.26	14.31	20.35	17.82	30.00
CH157	5785	17.05	17.35	14.62	14.69	20.21	17.67	30.00
CH165	5825	16.65	17.12	14.71	14.36	19.90	17.55	30.00
TX 802.11 n20M Mode								
CH149	5745	17.34	17.62	14.85	14.92	20.49	17.90	30.00
CH157	5785	17.02	17.19	14.44	14.60	20.12	17.53	30.00
CH165	5825	17.08	17.04	14.42	14.31	20.07	17.38	30.00
TX 802.11 n40M Mode								
CH151	5755	17.44	17.40	14.75	14.67	20.43	17.72	30.00
CH155	5775	17.83	17.41	15.03	14.98	20.64	18.02	30.00
CH163	5815	17.23	17.16	14.68	14.21	20.21	17.46	30.00

802.11 a Mode
Antenna A
TX CH 149-PK

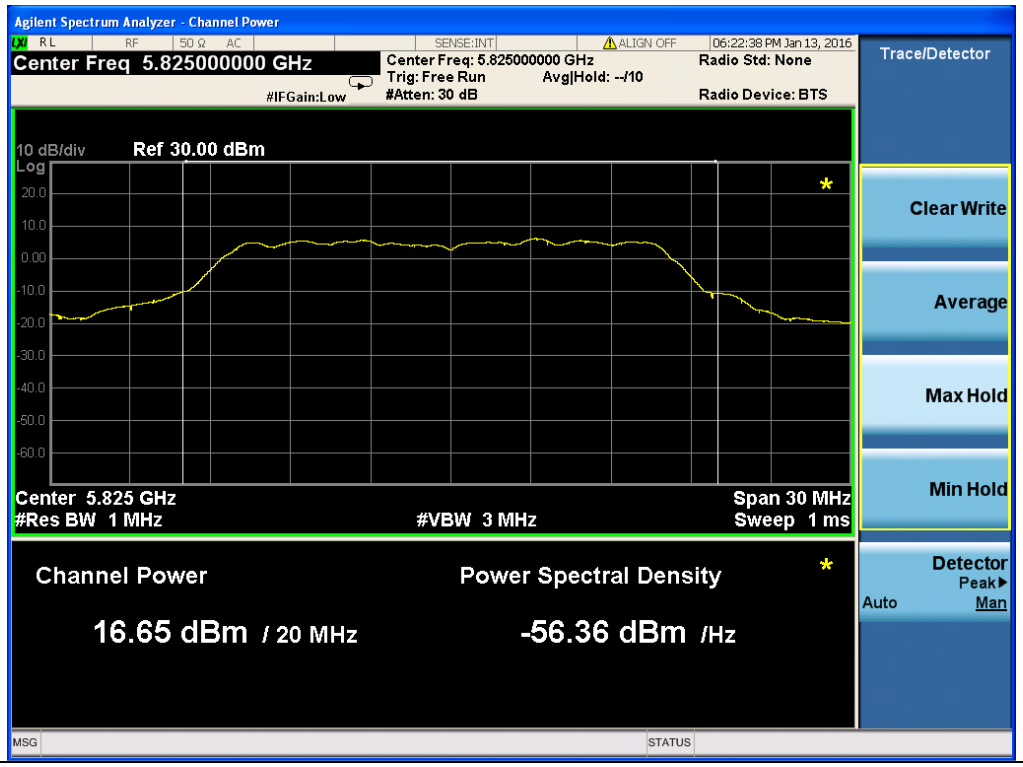


TX CH 149-AV

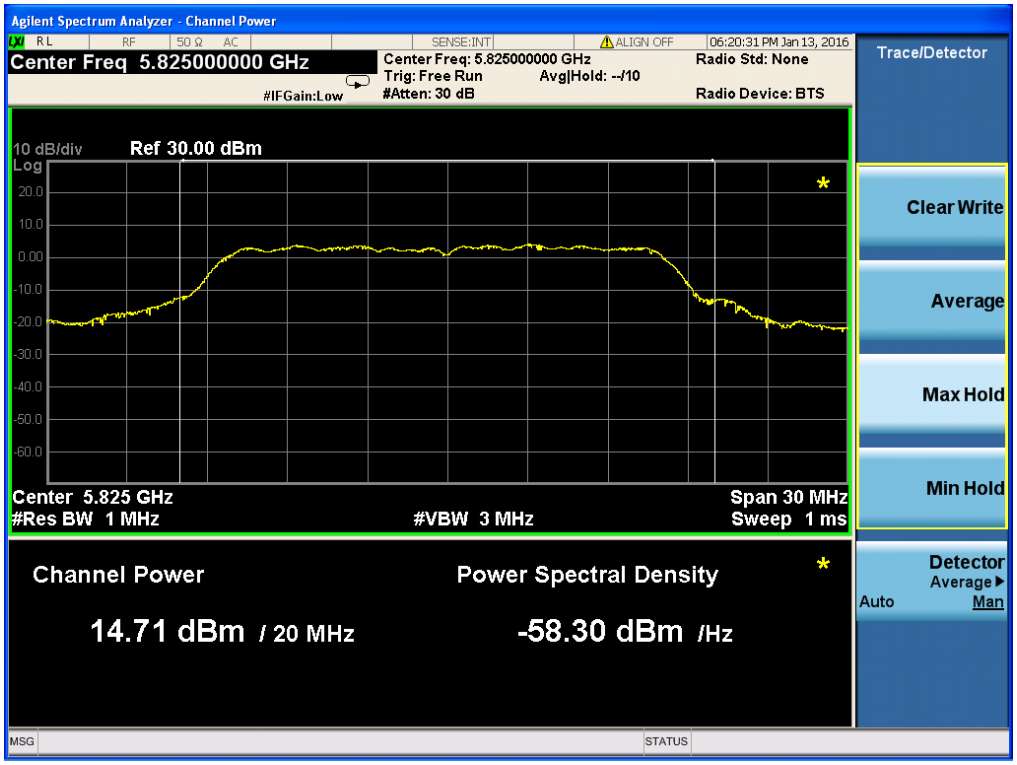
802.11 a Mode
Antenna A
TX CH 157-PK

TX CH 157-AV

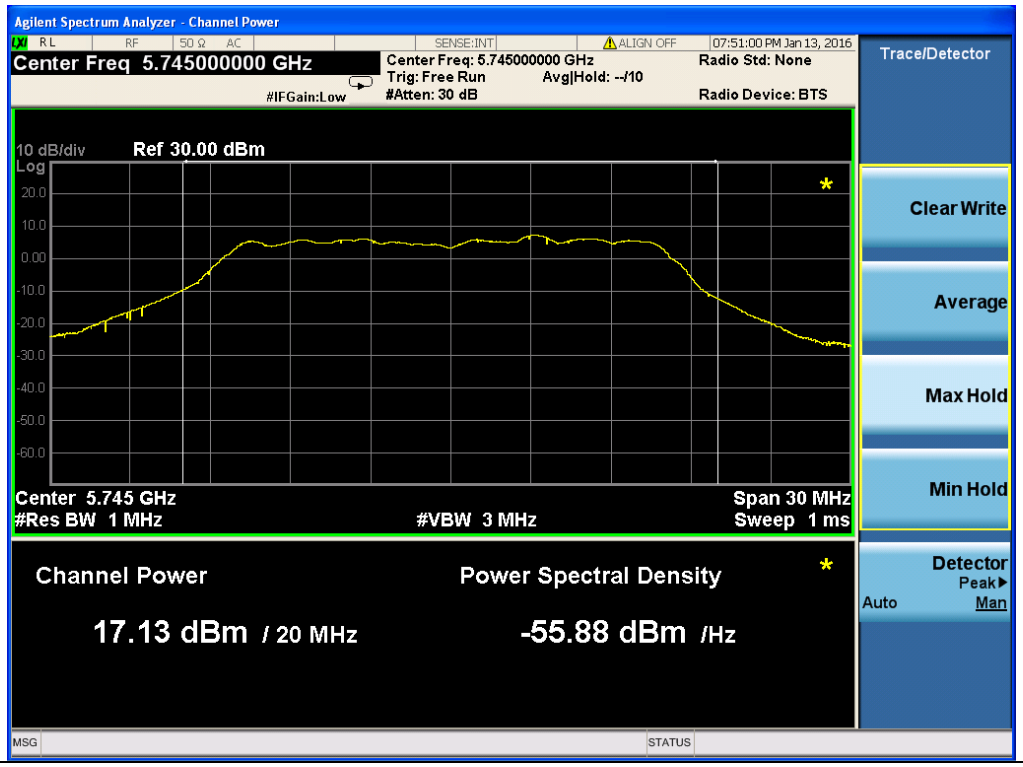
802.11 a Mode
Antenna A
TX CH 165-PK



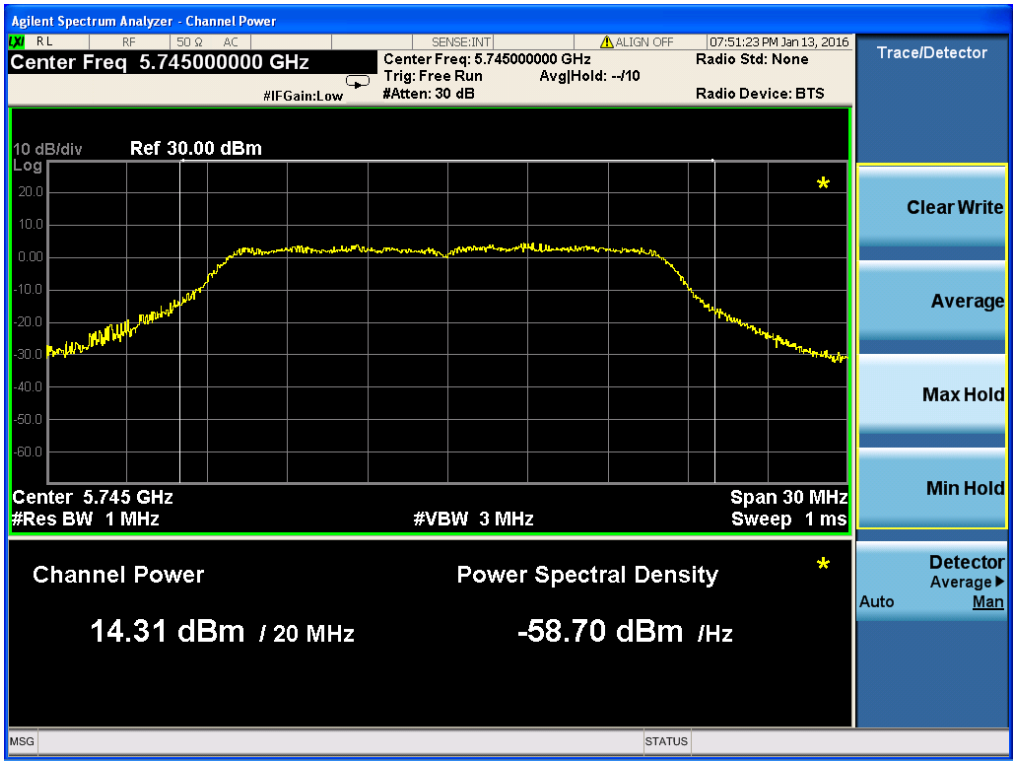
TX CH 165-AV



802.11 a Mode
Antenna B
TX CH 149-PK



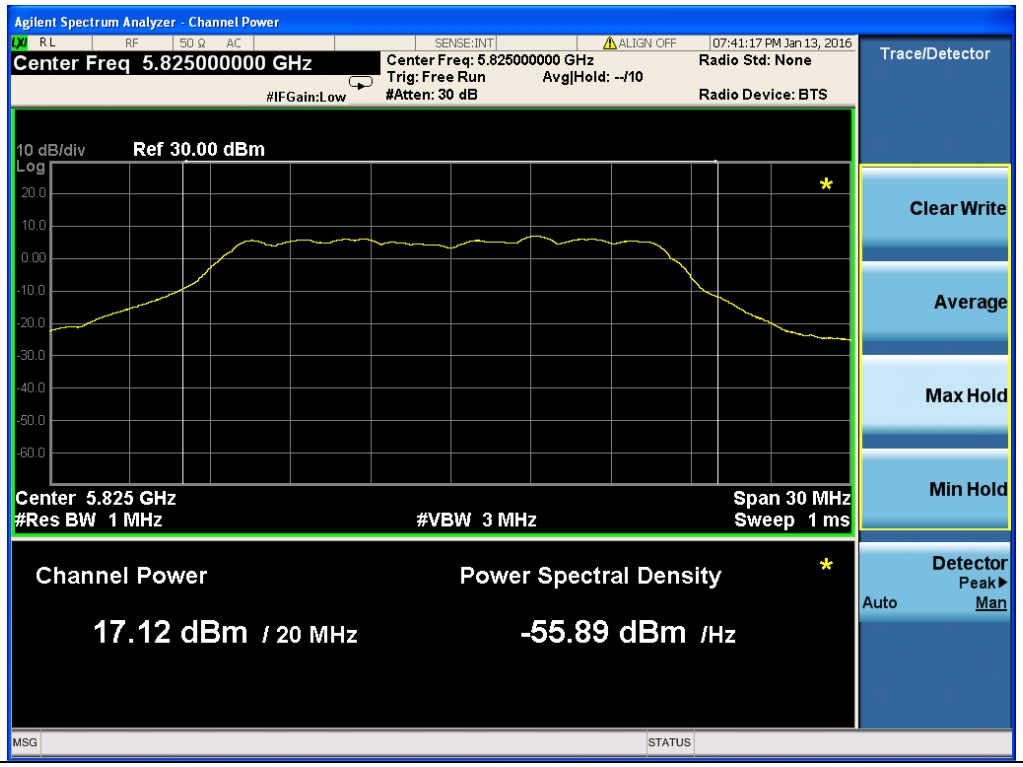
TX CH 149-AV



802.11 a Mode
Antenna B
TX CH 157-PK

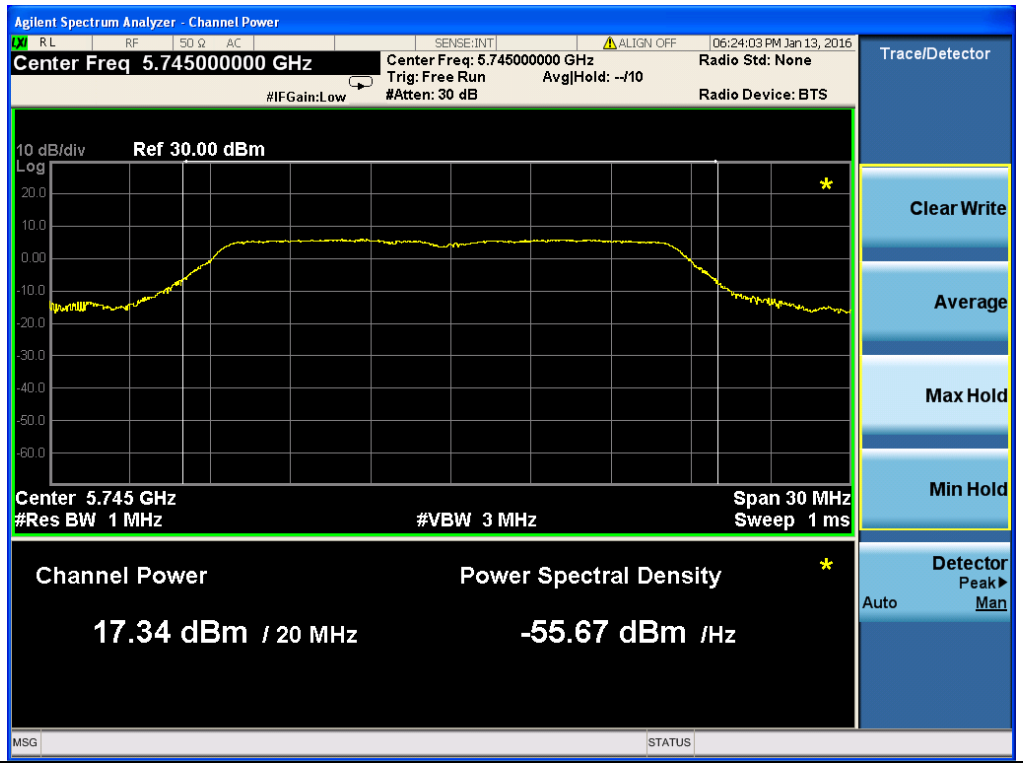
TX CH 157-AV

802.11 a Mode
Antenna B
TX CH 165-PK

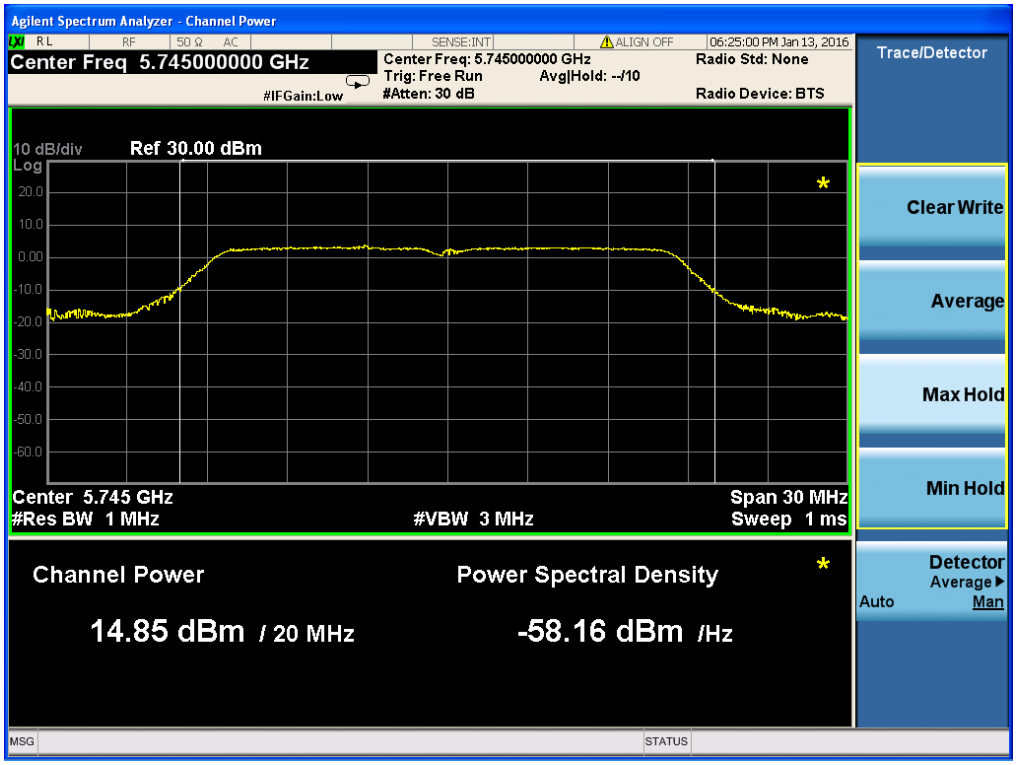


TX CH 165-AV

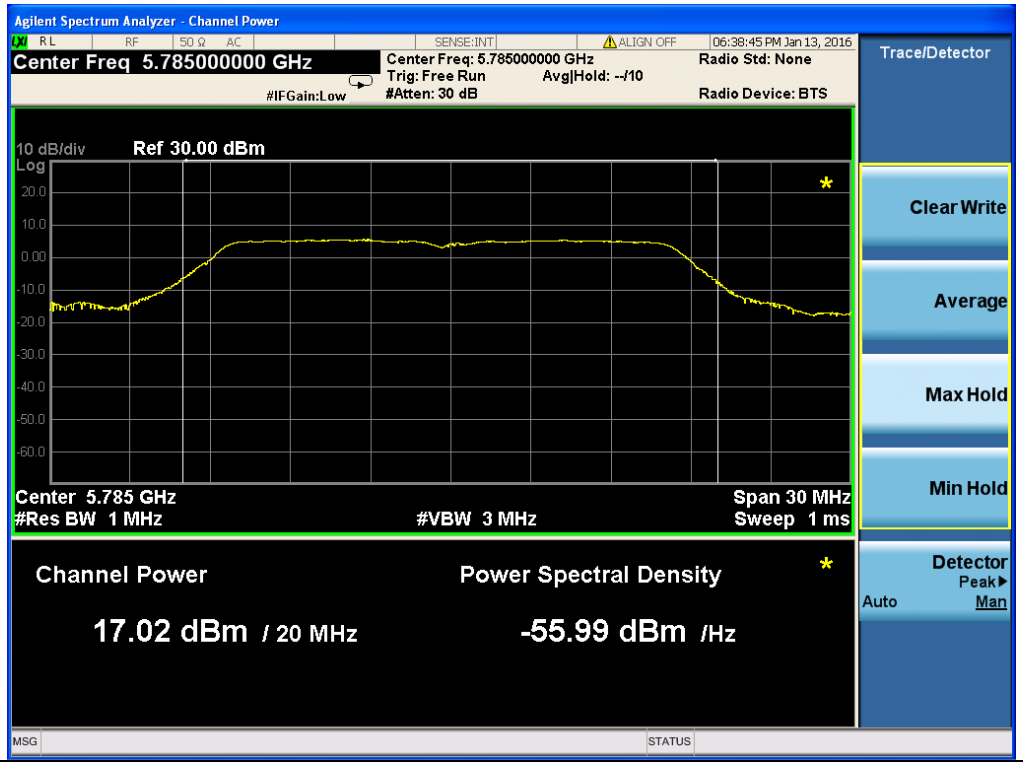
802.11 n20 Mode
Antenna A
TX CH 149-PK



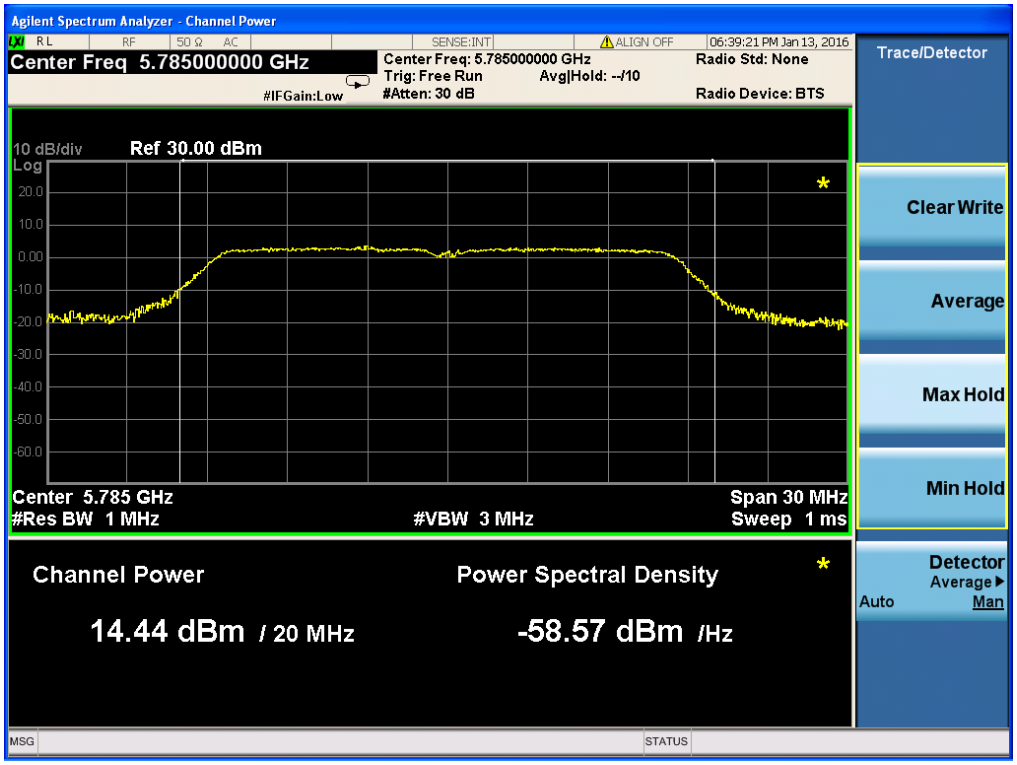
TX CH 149-AV



802.11 n20 Mode
Antenna A
TX CH 157-PK



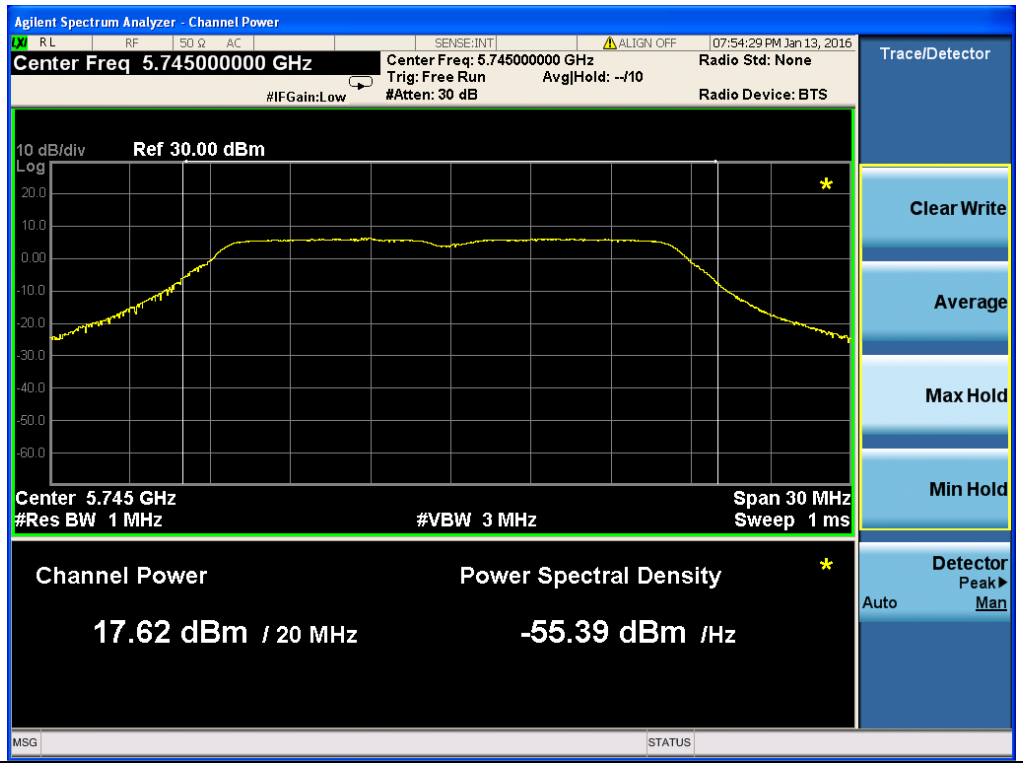
TX CH 157-AV



802.11 n20 Mode
Antenna A
TX CH 165-PK

TX CH 165-AV

802.11 n20 Mode
Antenna B
TX CH 149-PK



TX CH 149-AV

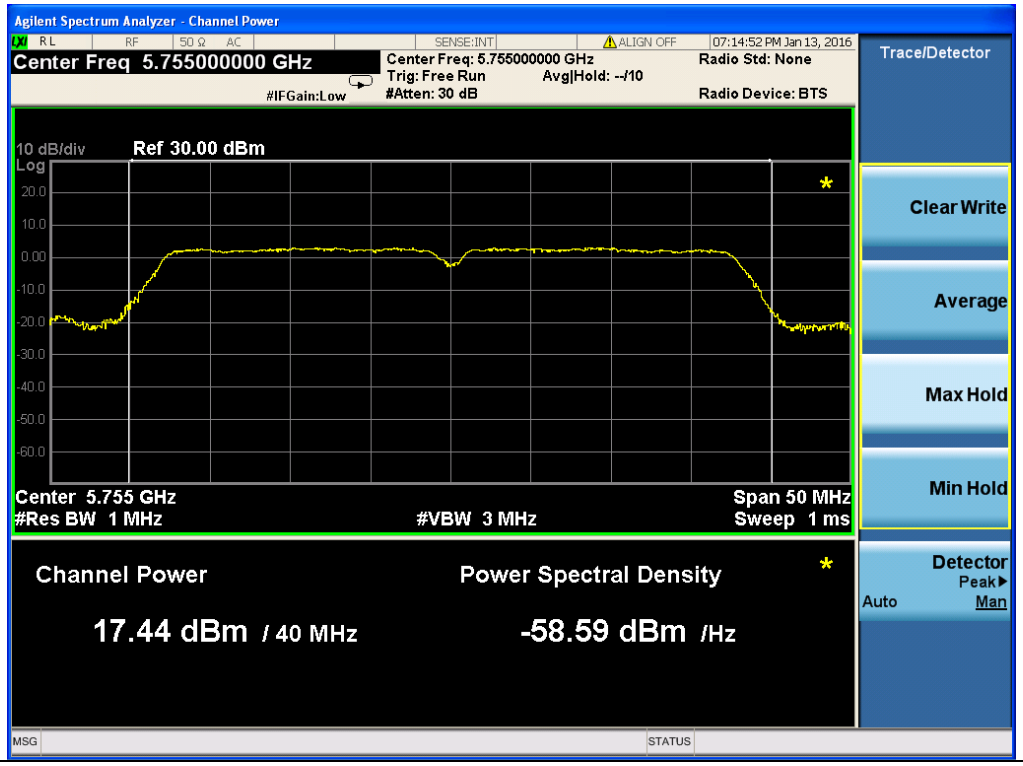
802.11 n20 Mode
Antenna B
TX CH 157-PK

TX CH 157-AV

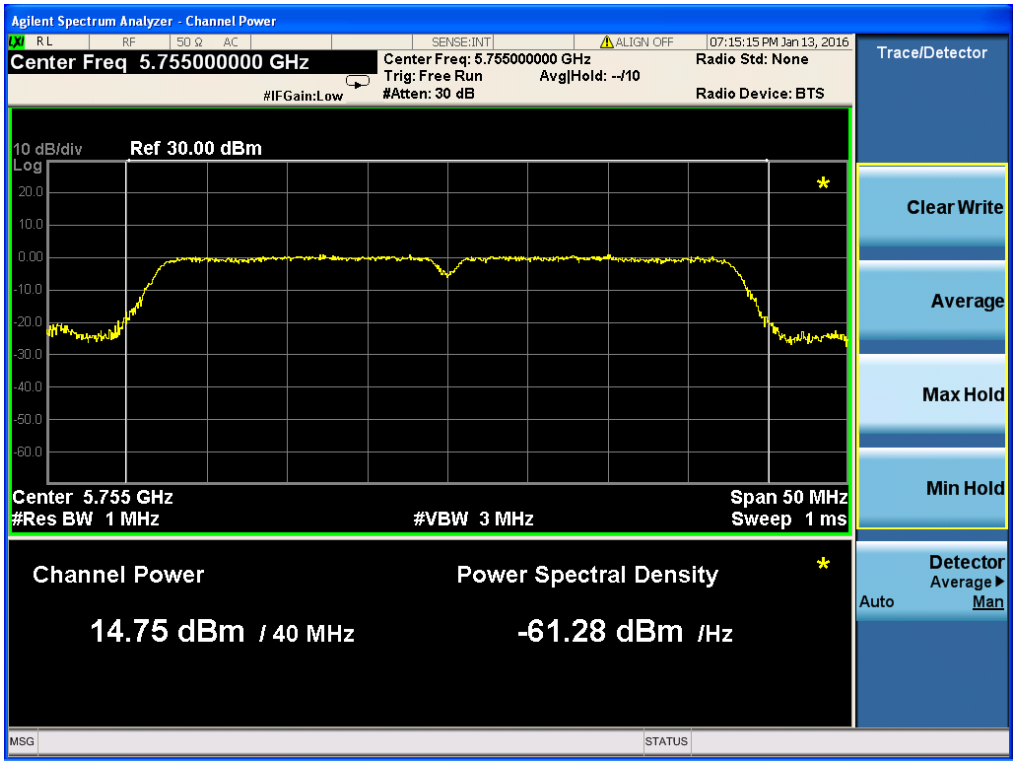
802.11 n20 Mode
Antenna B
TX CH 165-PK

TX CH 165-AV

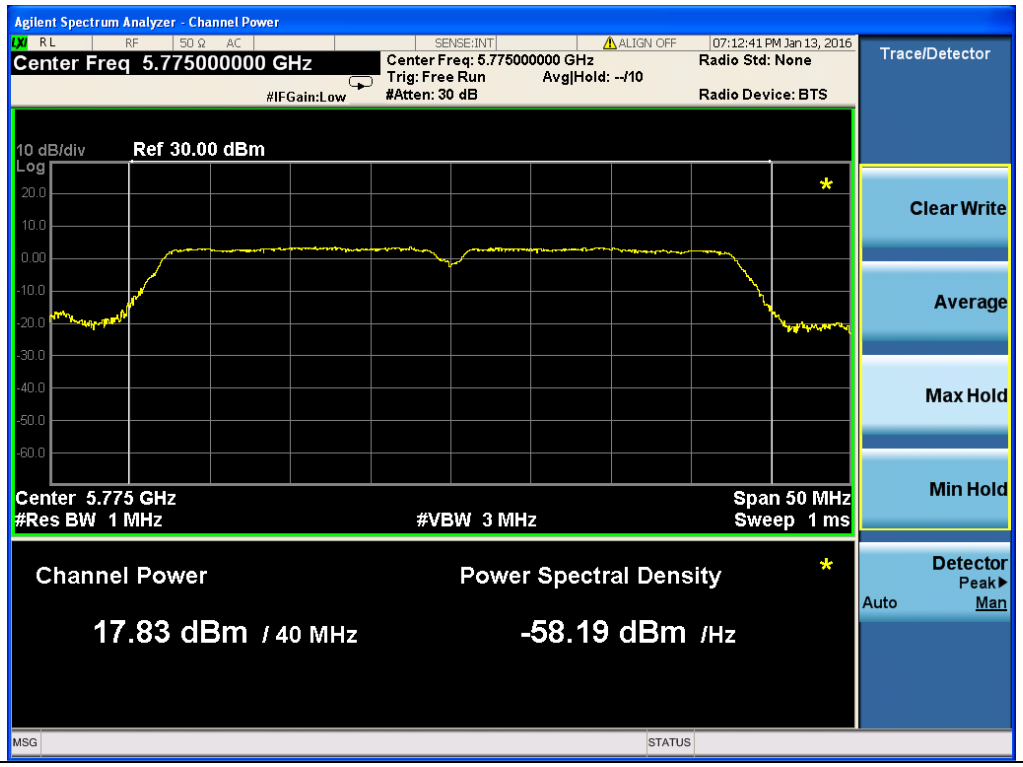
802.11 n40 Mode
Antenna A
TX CH 151-PK



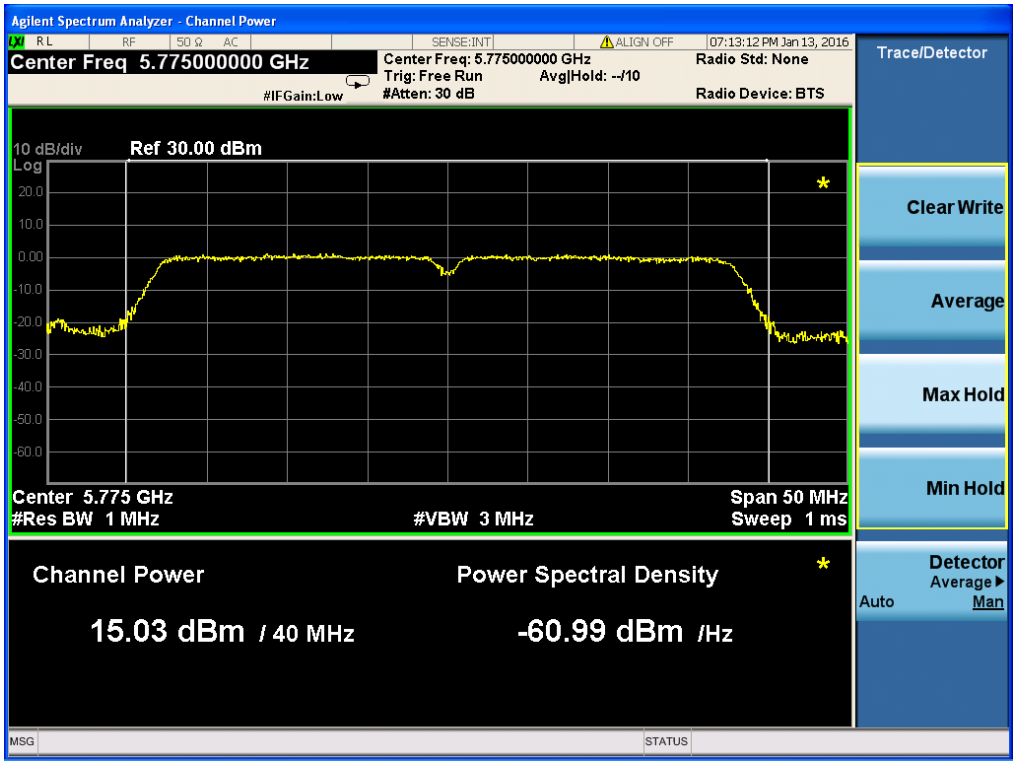
TX CH 151-AV



802.11 n40 Mode
Antenna A
TX CH 155-PK



TX CH 155-AV



802.11 n40 Mode
Antenna A
TX CH 163-PK

TX CH 163-AV

802.11 n40 Mode

Antenna B

TX CH 151-PK

TX CH 151-AV

802.11 n40 Mode

Antenna A

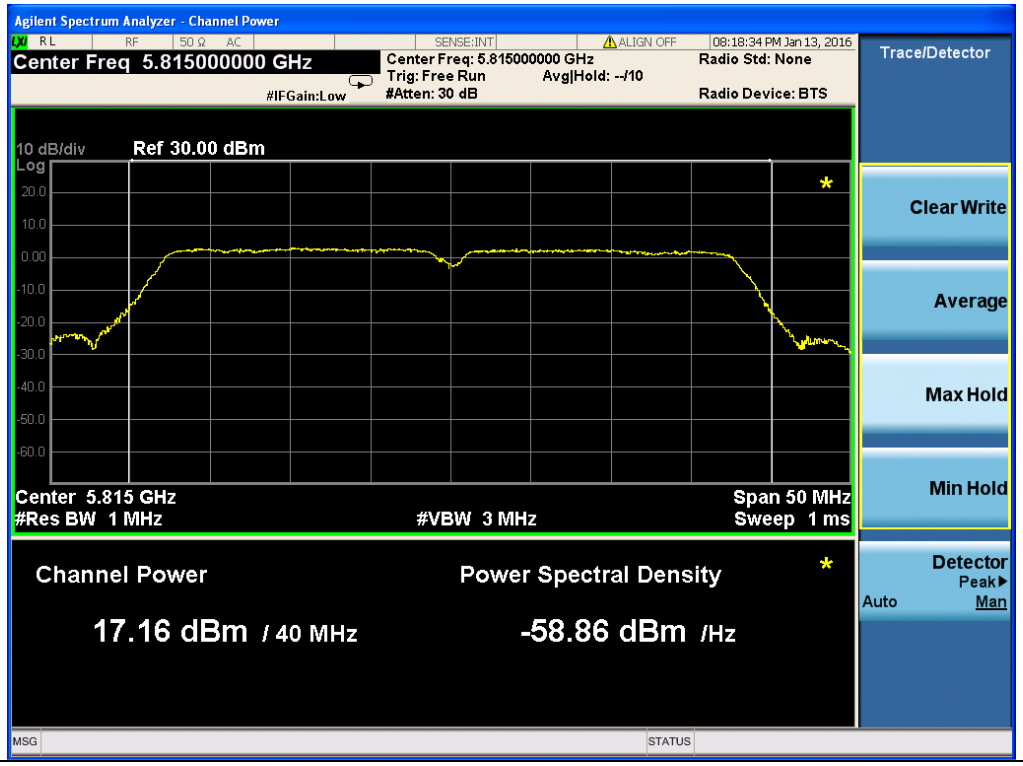
TX CH 155-PK

TX CH 155-AV

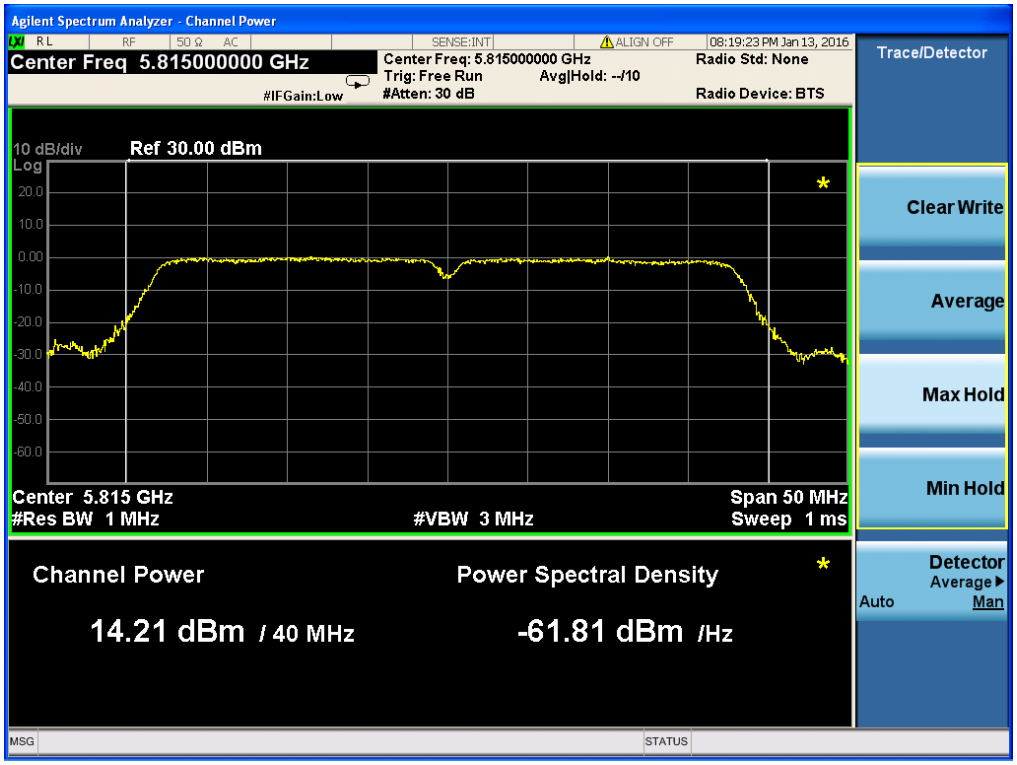
802.11 n40 Mode

Antenna A

TX CH 163-PK



TX CH 163-AV



8. OUT OF BAND EMISSIONS

8.1 APPLICABLE STANDARD

According to FCC §15.407(b)

4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

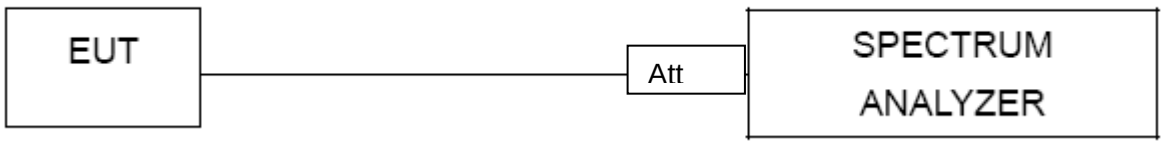
8.2 TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

8.6 TEST RESULTS

EUT：	Refer to Page 6	Model Name ：	SBWD100B
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1010 hPa	Test Voltage ：	DC 5V From adapter AC120V/60Hz

802.11a: Band Edge, Right Side

802.11a: Band Edge, Left Side

802.11n20: Band Edge, Right Side

802.11n20: Band Edge, Left Side

802.11n40: Band Edge, Right Side

802.11n40: Band Edge, Left Side

9. ANTENNA REQUIREMENT

9.1 STANDARD REQUIREMENT

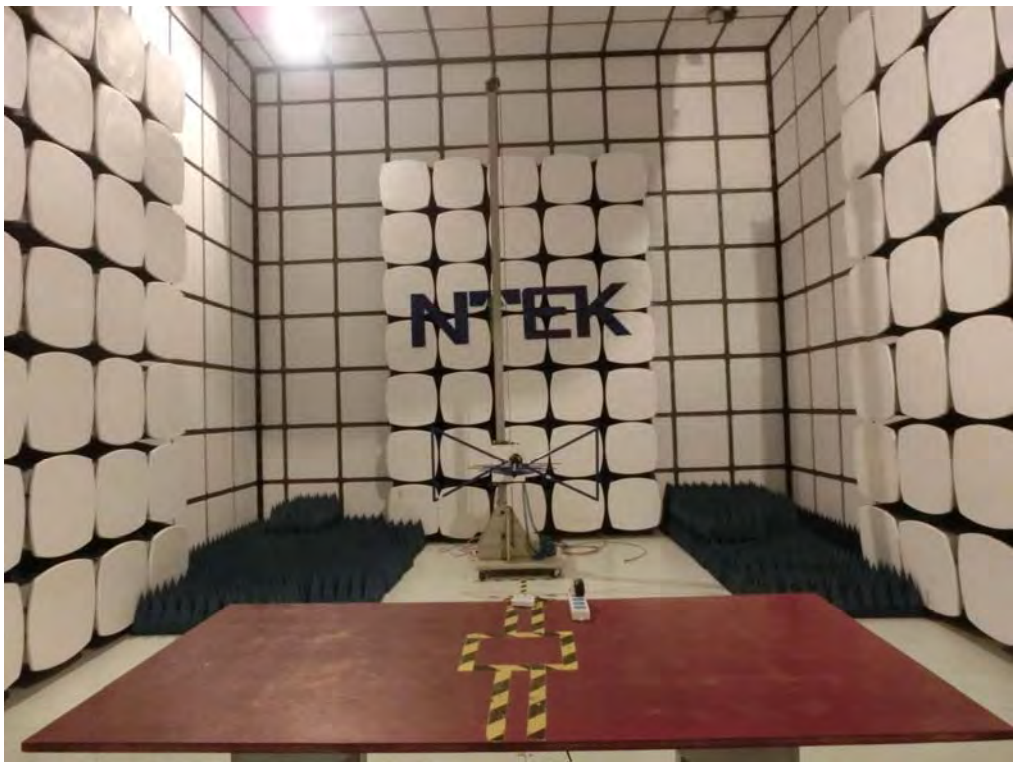
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

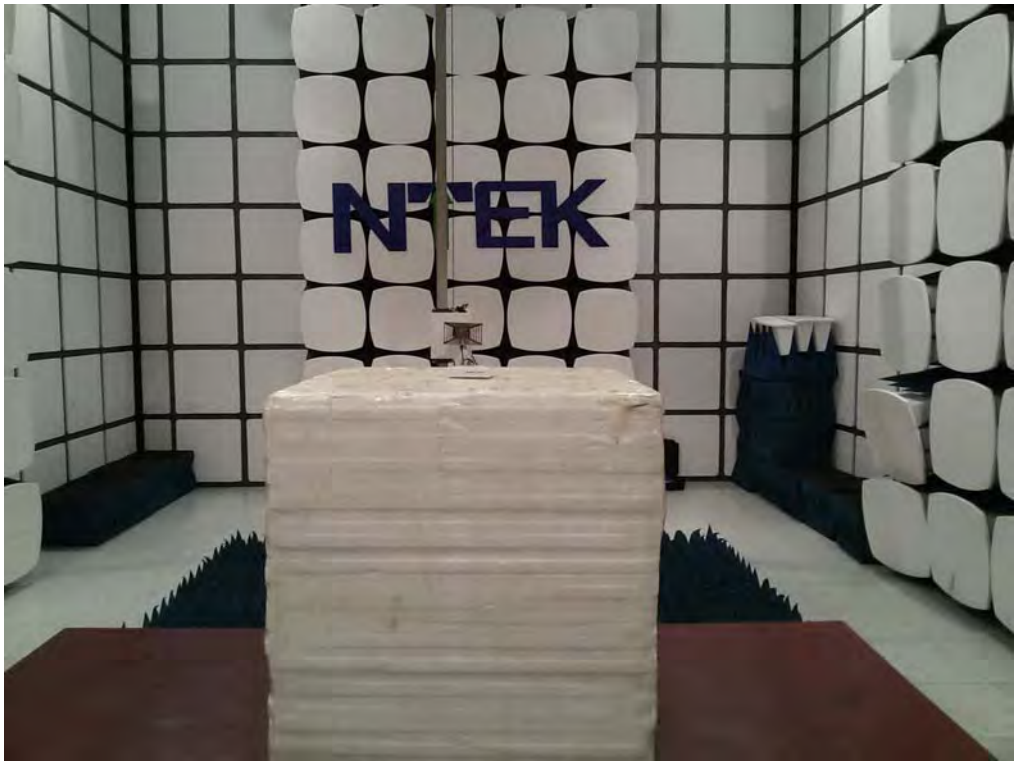
9.2 EUT ANTENNA

The EUT antenna is permanent attached antenna. It comply with the standard requirement.

10. EUT TEST PHOTO

Radiated Measurement Photos





Conducted Measurement Photos