TEST REPORT

FCC ID: ZC8S321NETWORK

Applicant : Hemisphere GNSS Inc.

Address : 8515 E Anderson Dr, Scottsdale, AZ 85255, USA

Equipment under Test (EUT):

Name : GNSS Survey Receiver

Model : S321 Network , BRx6 Network

In Accordance with: FCC PART 15, SUBPART C: 2015 (Section 15.247)
ANSI C63.10:2013

Report No	:	T1851403 16
Date of Test	:	September 22- November 16, 2015
Date of Issue	:	November 16, 2015
Test Result	:	PASS

Test Result: **PASS**

In the configuration tested, the EUT complied with the standards specified above

Authorized Signature

(Mark Zhu)

General Manager

TABLE OF CONTENT

Description **Page**

TEST REPORT VERIFICATION

Applicant	:	Hemisphere GNSS Inc.
Manufacturer	:	Hemisphere GNSS Inc.
EUT Description	:	GNSS Survey Receiver

(A) Model No. : S321 Network , BRx6 Network
(B) Trademark : N/A
(C) Ratings Supply : DC 10.8V from internal battery or external battery
(D)Test Voltage : DC 10.8V from internal battery

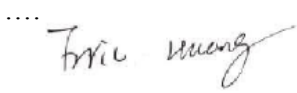
Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart C 2014, ANSI C63.10:2013

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the Part 15C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....…..:	Eric Huang Test Engineer	
Approved by (name + signature)…....:	Simple Guan Project Manager	
Date of issue…… ……..:	November 16, 2015	

1 General Information

1.1 Description of Device (EUT)

Trade Name	:	N/A
EUT	:	GNSS Survey Receiver
Model No.		S321 Network , BRx6 Network
DIFF	:	Only differ in model number.
Antenna Type	:	Integrated Antenna, Maximum Gain is 3.92 dBi
Operation Frequency	:	IEEE 802.11b/g: 2412MHz-2462MHz IEEE 802.11n HT20: 2412MHz-2462MHz IEEE 802.11n HT40: 2422MHz-2452MHz
Channel number	:	EEE 802.11b/g: 11Channels IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Modulation type	:	IEEE 802.11b: DSSS (CCK,DQPSK,DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n :OFDM (64QAM, 16QAM, QPSK, BPSK)
Power Supply	:	DC 10.8V from internal battery or external battery
Adapter		PSAA30R-150
Applicant	:	Hemisphere GNSS Inc.
Address	:	8515 E Anderson Dr, Scottsdale, AZ 85255, USA
Manufacturer	:	Hemisphere GNSS Inc.
Address	:	8515 E Anderson Dr, Scottsdale, AZ 85255, USA

1.2 Description of Test Facility

Shenzhen Alpha Product Testing Co., Ltd
Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road,
Bao'an, Shenzhen, China

August 11, 2014 File on Federal Communication Commission
Registration Number: 203110

July 18, 2014 Certificated by IC
Registration Number: 12135A

2 EMC Equipment List

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	2015.01.19	1Year
Spectrum analyzer	Agilent	E4407B	MY46185649	2015.01.19	1Year
Receiver	R&S	ESCI	1166.5950K03-1011	2015.01.19	1Year
Receiver	R&S	ESCI	101202	2015.01.19	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2015.01.21	1Year
Horn Antenna	EMCO	3115	640201028-06	2015.01.21	1Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2015.01.21	1Year
Cable	Resenberger	N/A	No.1	2015.01.19	1Year
Cable	SCHWARZBECK	N/A	No.2	2015.01.19	1Year
Cable	SCHWARZBECK	N/A	No.3	2015.01.19	1Year
Pre-amplifier	Schwarzbeck	BBV9743	9743-019	2015.01.19	1Year
Pre-amplifier	R&S	AFS33-18002650-30-8P-44	SEL0080	2015.01.19	1Year
Base station	Agilent	E5515C	GB44300243	2015.01.19	1 Year
Temperature controller	Terchy	MHQ	120	2015.01.19	1Year

Power divider	Anritsu	K240C	020346	2015.01.19	1 Year
Signal Generator	HP	83732B	VS3449051	2015.01.19	1 Year
Power Meter	Anritsu	ML2487A	6K00001491	2015.01.19	1Year
Power sensor	Anritsu	ML2491A	32516	2015.01.19	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2016.01.19	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2016.01.19	1 Year

3 Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The test procedure used was ANSI Standard ANSI C63.10:2013 using a 50 u H LISN. Both Lines were observed. The bandwidth of the receiver was 10 kHz with an appropriate sweep speed. The ambient temperature of the EUT was 25℃with a humidity of 58%.

RADIATION INTERFERENCE: The test procedure used was ANSI Standard ANSI C63.10:2013 using a ANRITSU spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a micro volt at the output of the antenna. The resolution bandwidth was 100kHz and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3MHz above 1 GHz. The ambient temperature of the EUT was 25℃with a humidity of 58%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer and cable loss. The antenna correction factors and cable loss are stated in terms of dB. The gain of the Pre-selector was accounted for in the Spectrum Analyzer Meter Reading.
Example:
Freq (MHz) METER READING + ACF + CABLE = FS
33.20 dBuV + 10.36 dB + 0.9 dB= 44.46 dBuV/m @ 3m
ANSI STANDARD ANSI C63.10: 2013 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes. The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSI Standard ANSI C63.10:2013 with the EUT 40 cm from the vertical ground wall.

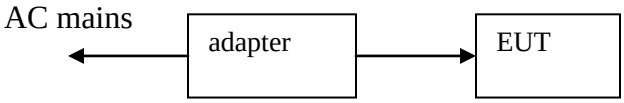
4 Summary of Measurement

4.1 Summary of test result

Test Item	Test Requirement	Standards Paragraph	Result
Spurious Emission	FCC PART 15:2014	Section 15.247&15.209	Compliance
Conduction Emission	FCC PART 15:2014	Section 15.207	Compliance
Bandwidth Test	FCC PART 15:2014	Section 15.247	Compliance
Peak Power	FCC PART 15:2014	Section 15.247	Compliance
Power Density	FCC PART 15:2014	Section 15.247	Compliance
Band Edge	FCC PART 15:2014	Section 15.247	Compliance
Antenna Requirement	FCC PART 15:2014	Section 15.203	Compliance

Note: The EUT has been tested as an independent unit, and continual transmitting in maximum power (The adapter be used during Test)

4.2 Test connection



4.3 Assistant equipment used for test

Description	:	Adapter
Manufacturer	:	NIL
Model No.	:	PSAA30R-150
Input	:	AC 100-240V, 50-60Hz, 0.8A
Output	:	DC 15V, 2A

4.4 Test mode

Duty cycle :100% Keeping TX			
Mode	data rate (Mpbs)(see Note)	Channel	Frequency (MHz)
IEEE 802.11b	1	Low :CH1	2412
	1	Middle: CH6	2437
	1	High: CH11	2462
IEEE 802.11g	6	Low :CH1	2412
	6	Middle: CH6	2437
	6	High: CH11	2462
IEEE 802.11 n/HT20 with 2.4G	6.5	Low :CH1	2412
	6.5	Middle: CH6	2437
	6.5	High: CH11	2462
IEEE 802.11 n/HT40 with 2.4G	13.5	Low :CH3	2422
	13.5	Middle:CH6	2437
	13.5	High:CH9	2452
Note: According exploratory test, EUT will have maximum output power in those data rate. so those data rate were used for all test.			

4.5 Channel list

For IEEE 802.11b/g and IEEE 802.11n/HT20 with 2.4G					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH1	2412	CH5	2432	CH9	2452
CH2	2417	CH6	2437	CH10	2457
CH3	2422	CH7	2442	CH11	2462
CH4	2427	CH8	2447		

For IEEE 802.11n/HT40 with 2.4G					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH1	/	CH5	2432	CH9	2452
CH2	/	CH6	2437	/	/
CH3	2422	CH7	2442	/	/
CH4	2427	CH8	2447	/	/

4.6 Test Conditions

Temperature range	21-25°C
Humidity range	40-75%
Pressure range	86-106kPa

4.7 Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.42dB	
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB	Polarize: V
	2.57dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.54dB	Polarize: V
	4.1dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	2.08dB	Polarize: H
	2.56dB	Polarize: V
Uncertainty for radio frequency	1×10-9	
Uncertainty for conducted RF Power	0.65dB	
Uncertainty for temperature	0.2℃	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	

5 Spurious Emission

5.1 Radiation Emission

5.1.1 Radiation Emission Limits(15.209)

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

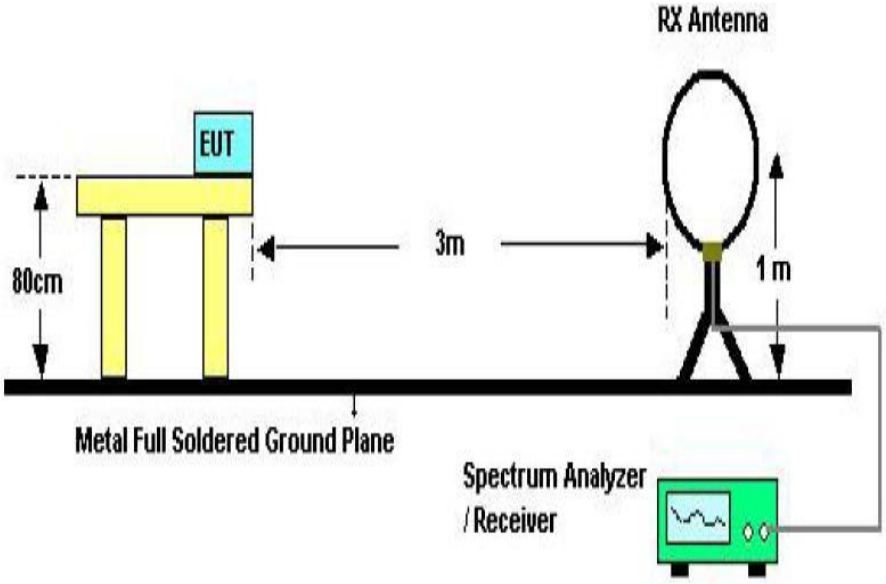
Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

NOTE:

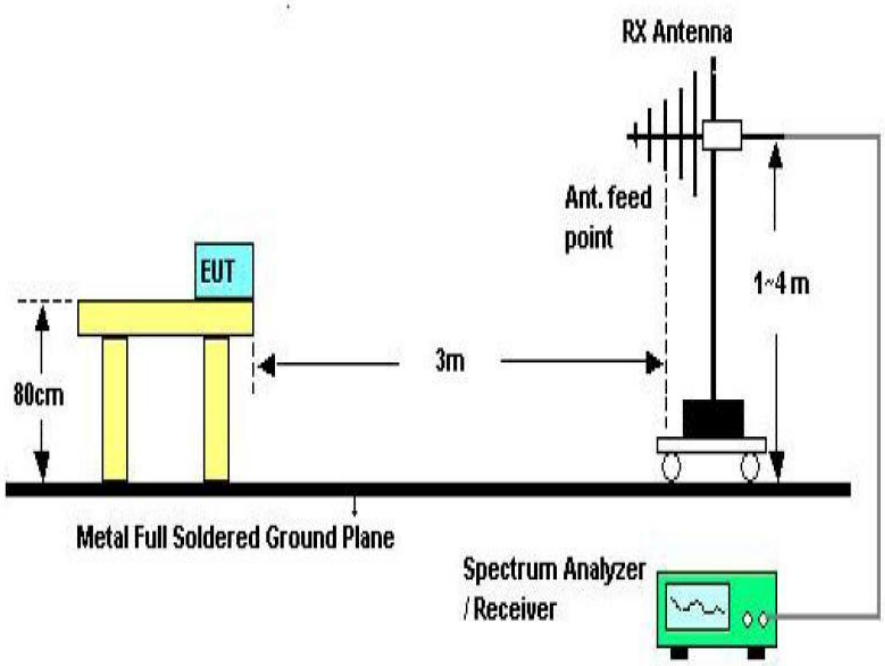
a) The tighter limit applies at the band edges.
b) Emission Level(dB uV/m)=20log Emission Level(uv/m)

5.1.2 Test Setup

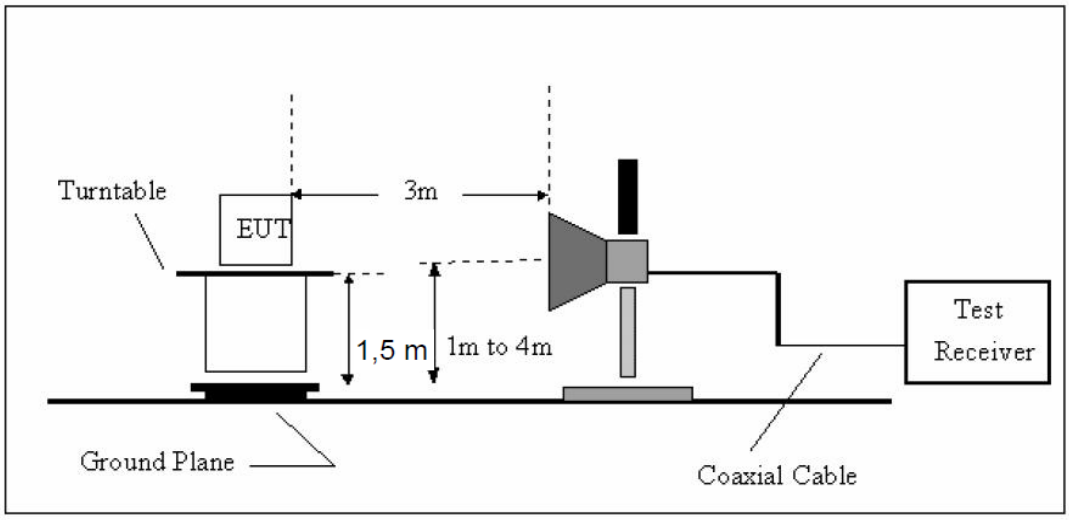
See the next page



Below 30 MHz Test Setup



Above 30 MHz Test Setup



Above 1 GHz Test Setup

5.1.3 Test Procedure

a) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1GHz, The EUT was placed on a rotating 0.8 m high above ground for below 1GHz and 1.5m high for above1GHz testing, The table was rotated 360 degrees to determine the position of the highest radiation
b) The Test antenna shall vary between 1m and 4m, both Horizontal and Vertical antennas are set of make measurement.
c) 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 premeasured
d) If Peak value comply with QP limit below 1GHz.The EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.
e) For the actual test configuration, please see the test setup photo.

5.1.4 Test Equipment Setting For emission test Result

9KHz~150KHz	RBW 200Hz	VBW1KHz
150KHz~30MHz	RBW 9KHz	VBW 30KHz
30MHZ~1GHz	RBW 120KHz	VBW 300KHz
Above 1GHz	RBW 1MHz	VBW 3MHz

5.1.5 Test Condition

Continual transmitting in maximum power.

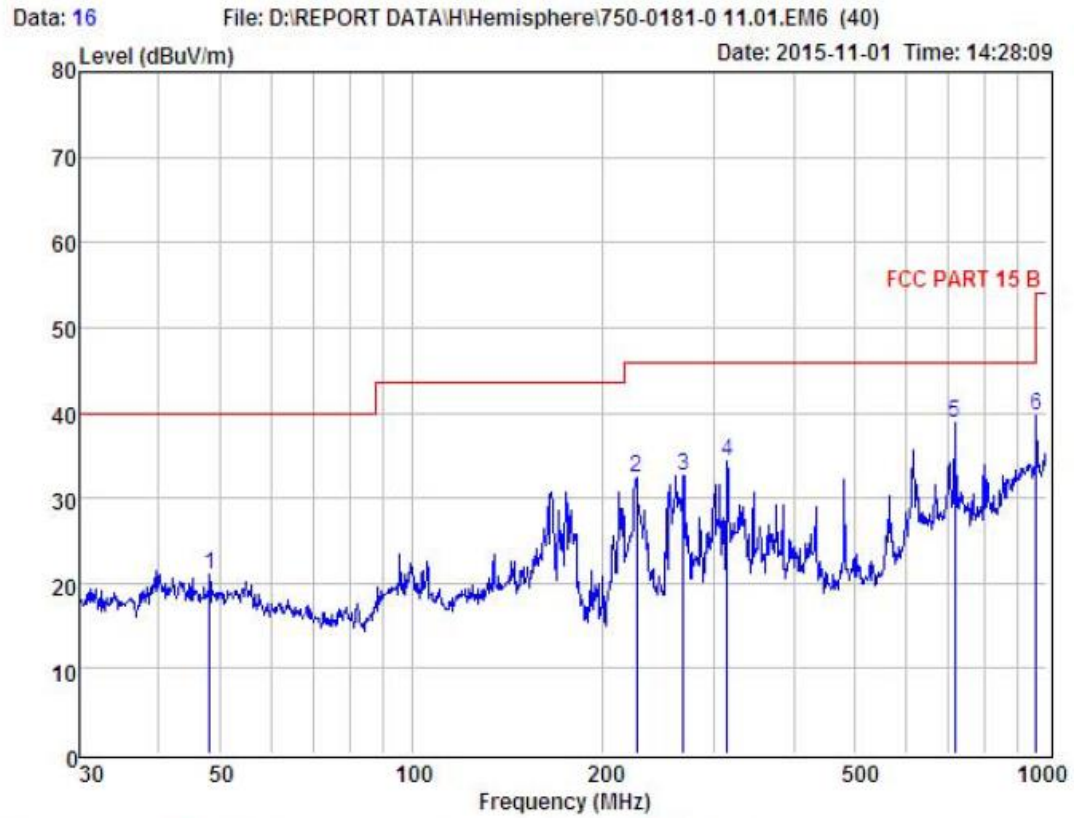
5.1.6 Test Result

We have scanned the 9 kHz from 25 GHz to the EUT.
Detailed information please see the following page.

From 9 kHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

H:

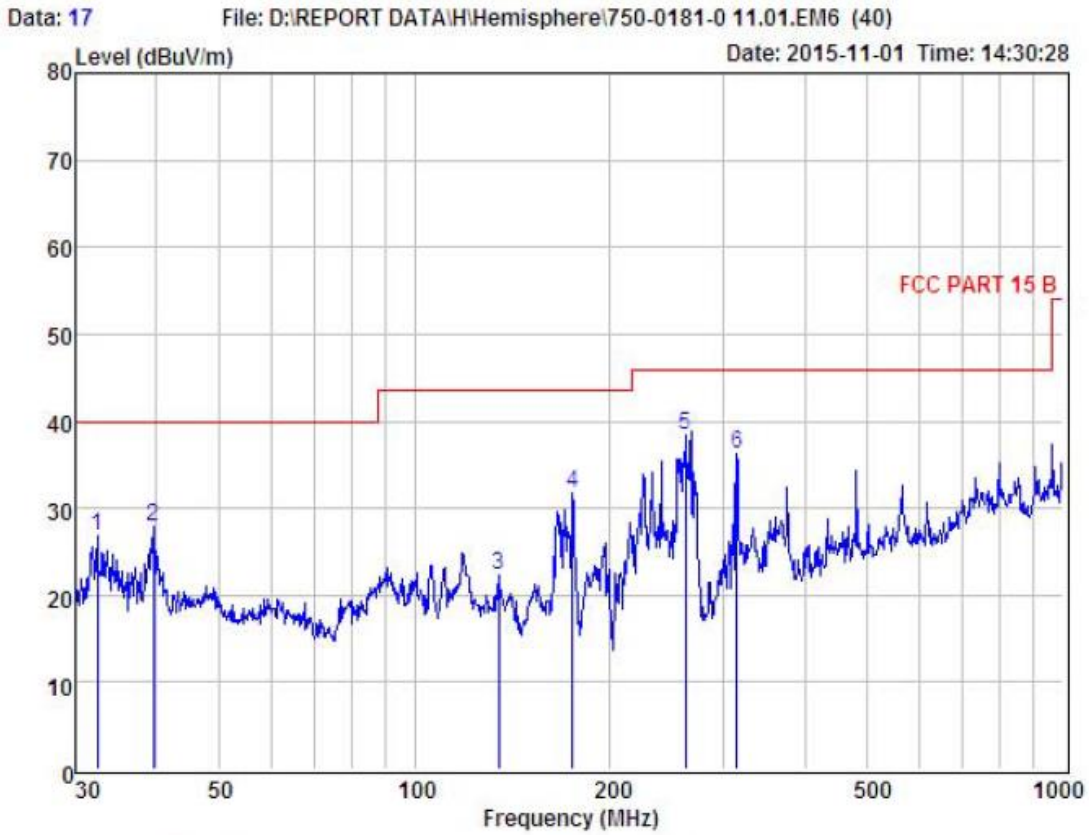


Condition : FCC PART 15 B 3m POL: HORIZONTAL
EUT : S321 GNSS Smart Antenna
Model No : 750-0181-0
Test Mode : Wifi mode
Power : DC 5V From PC AC 120V/60Hz
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	48.16	37.49	13.59	30.25	0.09	20.92	40.00	-19.08	Peak
2	226.10	49.05	10.98	28.24	0.51	32.30	46.00	-13.70	Peak
3	267.55	48.12	12.03	28.14	0.70	32.71	46.00	-13.29	Peak
4	314.38	48.45	13.19	27.92	0.55	34.27	46.00	-11.73	Peak
5	716.68	43.67	19.87	25.79	1.12	38.87	46.00	-7.13	Peak
6	962.16	40.80	22.17	25.03	1.77	39.71	54.00	-14.29	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

V:



Condition : FCC PART 15 B 3m POL: VERTICAL
EUT : S321 GNSS Smart Antenna
Model No : 750-0181-0
Test Mode : Wifi mode
Power : DC 5V From PC AC 120V/60Hz
Test Engineer :
Remark :
Temp : 24.2℃
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	32.41	44.23	13.28	30.90	0.11	26.72	40.00	-13.28	Peak
2	39.58	44.47	14.07	30.84	0.17	27.87	40.00	-12.13	Peak
3	135.03	38.25	13.08	29.41	0.46	22.38	43.50	-21.12	Peak
4	175.04	47.52	12.58	29.07	0.74	31.77	43.50	-11.73	Peak
5	261.98	54.05	11.83	28.17	0.65	38.36	46.00	-7.64	Peak
6	314.38	50.43	13.19	27.92	0.55	36.25	46.00	-9.75	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

From 1G-25GHz

EUT	GNSS Survey Receiver	**Model Name**	S321 Network
Temperature	26°C	**Relative Humidity**	56%
Pressure	960hPa	**Test voltage**	DC 10.8V From battery
Test Mode	TX Low		

IEEE 802.11b

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	V	44.52	---	-11.24	33.28	---	74	54	40.72	Peak
4824	V	36.9	---	0.64	37.54	---	74	54	36.46	Peak
N/A										

EUT	GNSS Survey Receiver	**Model Name**	S321 Network
Temperature	26°C	**Relative Humidity**	56%
Pressure	960hPa	**Test voltage**	DC 10.8V From battery
Test Mode	TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	H	44.04	---	-11.24	32.8	---	74	54	41.2	Peak
4824	H	36.63	---	0.64	37.27	---	74	54	36.73	Peak
N/A										

Notes: AV Means AV detector test data, Peak Means Peak detector test data.
Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	V	43.49	---	-11.24	32.25	---	74	54	41.75	Peak
4874	V	39.23	---	0.76	39.99	---	74	54	34.01	Peak

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	H	43.65	---	-11.24	32.41	---	74	54	41.59	Peak
4874	H	40.23	---	0.76	40.99	---	74	54	33.01	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.
Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	V	43.44	---	-11.24	32.2	---	74	54	41.8	Peak
4924	V	34.86	---	0.87	35.73	---	74	54	38.27	Peak

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	H	43.85	---	-11.24	32.61	---	74	54	41.39	Peak
4924	H	33.7	---	0.87	34.57	---	74	54	39.43	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.
Emissions attenuated more than 20 dB below the permissible value are not reported.

IEEE 802.11 g:

EUT	GNSS Survey Receiver	**Model Name**	S321 Network
Temperature	26°C	**Relative Humidity**	56%
Pressure	960hPa	**Test voltage**	DC 10.8V From battery
Test Mode	TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1145	V	44.32	---	-11.24	33.08	---	74	54	40.92	Peak
2586	V	46.39	---	-7.13	39.26	---	74	54	34.74	Peak
3062	V	44.45	---	-5.74	38.71	---	74	54	35.29	Peak
4824	V	44.05	---	0.64	44.69	---	74	54	29.31	Peak
N/A										

EUT	GNSS Survey Receiver	**Model Name**	S321 Network
Temperature	26°C	**Relative Humidity**	56%
Pressure	960hPa	**Test voltage**	DC 10.8V From battery
Test Mode	TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1294	H	43.66	---	-10.96	32.7	---	74	54	41.3	Peak
2038	H	43.85	---	-8.58	35.27	---	74	54	38.73	Peak
3483	H	42.75	---	-4.95	37.8	---	74	54	36.2	Peak
4824	H	41.55	---	0.64	42.19	---	74	54	31.81	Peak
N/A										

Notes: AV Means AV detector test data, Peak Means Peak detector test data.
Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1374	V	43.85	---	-10.43	33.42	---	74	54	40.58	Peak
2589	V	44.44	---	-7.13	37.31	---	74	54	36.69	Peak
3365	V	43.82	---	-5.18	38.64	---	74	54	35.36	Peak
4874	V	43.04	---	0.76	43.8	---	74	54	30.2	Peak

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1321	H	43.85	---	-10.84	33.01	---	74	54	40.99	Peak
2314	H	44.55	---	-7.46	37.09	---	74	54	36.91	Peak
3577	H	42.84	---	-4.76	38.08	---	74	54	35.92	Peak
4874	H	40.55	---	0.76	41.31	---	74	54	32.69	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.
Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1302	V	43.85	---	-10.84	33.01	---	74	54	40.99	Peak
2982	V	44.39	---	-5.86	38.53	---	74	54	35.47	Peak
3831	V	43.45	---	-3.96	39.49	---	74	54	34.51	Peak
4924	V	41.85	---	0.87	42.72	---	74	54	31.28	Peak

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1446	H	44.03	---	-10.29	33.74	---	74	54	40.26	Peak
2198	H	42.85	---	-8.24	34.61	---	74	54	39.39	Peak
3905	H	43.95	---	-3.68	40.27	---	74	54	33.73	Peak
4924	H	41.43	---	0.87	42.3	---	74	54	31.7	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.
Emissions attenuated more than 20 dB below the permissible value are not reported.

IEEE 802.11n/HT20 with 2.4G

EUT	GNSS Survey Receiver	**Model Name**	S321 Network
Temperature	26°C	**Relative Humidity**	56%
Pressure	960hPa	**Test voltage**	DC 10.8V From battery
Test Mode	TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1492	V	44.03	---	-10.27	33.76	---	74	54	40.24	Peak
2671	V	43.62	---	-6.94	36.68	---	74	54	37.32	Peak
3948	V	43.81	---	-3.68	40.13	---	74	54	33.87	Peak
4824	V	42.56	---	0.64	43.2	---	74	54	30.8	Peak
N/A										

EUT	GNSS Survey Receiver	**Model Name**	S321 Network
Temperature	26°C	**Relative Humidity**	56%
Pressure	960hPa	**Test voltage**	DC 10.8V From battery
Test Mode	TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1451	H	44.06	---	-10.27	33.79	---	74	54	40.21	Peak
2839	H	44.33	---	-6.17	38.16	---	74	54	35.84	Peak
3607	H	43.9	---	-4.52	39.38	---	74	54	34.62	Peak
4824	H	42.82	---	0.64	43.46	---	74	54	30.54	Peak
N/A										

Notes: AV Means AV detector test data, Peak Means Peak detector test data.
Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1262	V	43.75	---	-10.96	32.79	---	74	54	41.21	Peak
2013	V	44.19	---	-8.58	35.61	---	74	54	38.39	Peak
3798	V	43.43	---	-4.07	39.36	---	74	54	34.64	Peak
4874	V	42.55	---	0.76	43.31	---	74	54	30.69	Peak

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1511	H	43.65	---	-10.14	33.51	---	74	54	40.49	Peak
2353	H	43.81	---	-7.59	36.22	---	74	54	37.78	Peak
3266	H	44.08	---	-5.39	38.69	---	74	54	35.31	Peak
4874	H	42.82	---	0.76	43.58	---	74	54	30.42	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.
Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1477	V	45.08	---	-10.27	34.81	---	74	54	39.19	Peak
2703	V	43.96	---	-6.43	37.53	---	74	54	36.47	Peak
3561	V	43.85	---	-4.76	39.09	---	74	54	34.91	Peak
4924	V	42.68	---	0.87	43.55	---	74	54	30.45	Peak

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1503	H	43.63	---	-10.14	33.49	---	74	54	40.51	Peak
3588	H	43.93	---	-4.96	38.97	---	74	54	35.03	Peak
4153	H	43.74	---	-2.48	41.26	---	74	54	32.74	Peak
4924	H	41.79	---	0.87	42.66	---	74	54	31.34	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.
Emissions attenuated more than 20 dB below the permissible value are not reported.

IEEE 802.11n/HT40 with 2.4G

EUT	GNSS Survey Receiver	**Model Name**	S321 Network
Temperature	26°C	**Relative Humidity**	56%
Pressure	960hPa	**Test voltage**	DC 10.8V From battery
Test Mode	TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1551	V	44.09	---	-10.07	34.02	---	74	54	39.98	Peak
2695	V	43.96	---	-6.94	37.02	---	74	54	36.98	Peak
3463	V	43.25	---	-4.95	38.3	---	74	54	35.7	Peak
4844	V	41.84	---	0.64	42.48	---	74	54	31.52	Peak
N/A										

EUT	GNSS Survey Receiver	**Model Name**	S321 Network
Temperature	26°C	**Relative Humidity**	56%
Pressure	960hPa	**Test voltage**	DC 10.8V From battery
Test Mode	TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1542	H	43.86	---	-10.14	33.72	---	74	54	40.28	Peak
2358	H	43.72	---	-7.59	36.13	---	74	54	37.87	Peak
3096	H	44.13	---	-5.74	38.39	---	74	54	35.61	Peak
4844	H	42.53	---	0.64	43.17	---	74	54	30.83	Peak
N/A										

Notes: AV Means AV detector test data, Peak Means Peak detector test data.
Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1628	V	44.42	---	-9.84	34.58	---	74	54	39.42	Peak
2593	V	43.84	---	-7.13	36.71	---	74	54	37.29	Peak
3301	V	43.98	---	-5.31	38.67	---	74	54	35.33	Peak
4874	V	42.83	---	0.76	43.59	---	74	54	30.41	Peak

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1564	H	44.05	---	-10.07	33.98	---	74	54	40.02	Peak
2248	H	44.39	---	-8.13	36.26	---	74	54	37.74	Peak
3159	H	43.35	---	-5.52	37.83	---	74	54	36.17	Peak
4874	H	42.6	---	0.76	43.36	---	74	54	30.64	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.
Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1645	V	44.48	---	-9.84	34.64	---	74	54	39.36	Peak
2590	V	44.01	---	-7.13	36.88	---	74	54	37.12	Peak
3851	V	43.43	---	-3.84	39.59	---	74	54	34.41	Peak
4904	V	41.78	---	0.87	42.65	---	74	54	31.35	Peak

EUT	GNSS Survey Receiver	Model Name	S321 Network
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 10.8V From battery
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1792	H	44.15	---	-9.27	34.88	---	74	54	39.12	Peak
2804	H	44.33	---	-6.17	38.16	---	74	54	35.84	Peak
3743	H	44.69	---	-4.24	40.45	---	74	54	33.55	Peak
4904	H	43.12	---	0.87	43.99	---	74	54	30.01	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.
Emissions attenuated more than 20 dB below the permissible value are not reported.

6 POWER LINE CONDUCTED EMISSION

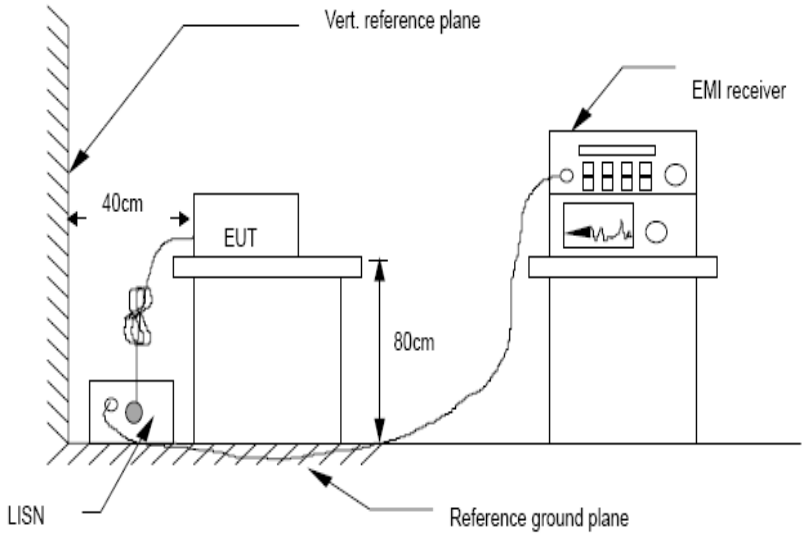
6.1 Conducted Emission Limits(15.207)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 -0.50	66 -56*	56 - 46*
0.50 -5.00	56	46
5.00 -30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

3. The limit decreases in line with the logarithm of the frequency in the rang of 0.15 to 0.50 MHz.

6.2 Test Setup



6.3 Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10:2013 on Conducted Emission Measurement.
The bandwidth of test receiver (R & S ESCI) is set at 9 kHz.

6.4 Test Results

Not apply to battery operated product.

7 Conducted Maximum Output Power

7.1 Test limit

Please refer section RSS-247 & 15.247.

7.2 Test Procedure

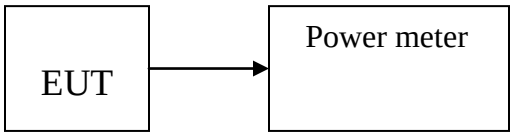
Details see the KDB558074 Meas Guidance V03

7.2.1 Place the EUT on the table and set it in transmitting mode.

7.2.2 Measure out each mode and each bands peak output power of EUT.

Note: The cable loss and attenuator loss were offset into measure device as amplitude offset. Details see the KDB 558074 DTS Meas Guidance V03

7.3 Test Setup



7.4 Test Results

PASS

Detailed information please see the following page.

EUT: GNSS Survey Receiver M/N: S321 Network				
Test date: 2015-11-10 Test site: RF site Tested by: Eric Huang				
Mode	Frequency (MHz)	PK Output power (dBm)	Limit (dBm)	Margin (dB)
IEEE 802.11 b	CH1: 2412	17.35	30	12.65
	CH6: 2437	17.28	30	12.72
	CH11: 2462	17.16	30	12.84
IEEE 802.11 g	CH1: 2412	16.76	30	13.24
	CH6: 2437	16.84	30	13.16
	CH11: 2462	16.75	30	13.25
IEEE 802.11 n/HT20 with 2.4G	CH1: 2412	16.12	30	13.88
	CH6: 2437	16.33	30	13.67
	CH11: 2462	16.29	30	13.71
IEEE 802.11 n/HT40 with 2.4G	CH1: 2422	15.16	30	14.84
	CH4: 2437	15.39	30	14.61
	CH7: 2452	15.68	30	14.32
Conclusion: PASS				

8 PEAK POWER SPECTRAL DENSITY

8.1 Test limit

8.1.1 Please refer section RSS-247 & 15.247.

8.1.2 For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

8.1.3 The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

8.2 Method of measurement

Details see the KDB558074 DTS Meas Guidance V03

8.2.1 Place the EUT on the table and set it in transmitting mode.

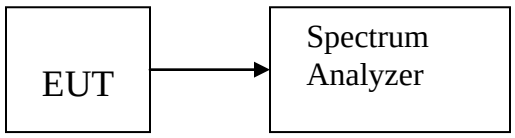
8.2.2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

8.2.3 Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, span=5-30%EBW, detail see the test plot.

8.2.4 Record the max reading.

8.2.5 Repeat the above procedure until the measurements for all frequencies are completed.

8.3 Test Setup



8.4 Test Results

PASS.

Detailed information please see the following page.

EUT: GNSS Survey Receiver M/N: S321 Network				
Test date: 2015-11-10 Test site: RF site Tested by: Eric Huang				
Mode	Frequency (MHz)	PK Output power(dBm)	Limit (dBm)	Result
IEEE 802.11 b	CH1: 2412	-6.553	8	PASS
	CH6: 2437	-9.165	8	PASS
	CH11: 2462	-9.618	8	PASS
IEEE 802.11 g	CH1: 2412	-16.047	8	PASS
	CH6: 2437	-16.331	8	PASS
	CH11: 2462	-17.238	8	PASS
IEEE 802.11 n/HT20 with 2.4G	CH1: 2412	-16.537	8	PASS
	CH6: 2437	-16.572	8	PASS
	CH11: 2462	-16.315	8	PASS
IEEE 802.11 n/HT40 with 2.4G	CH1: 2422	-19.963	8	PASS
	CH4: 2437	-19.926	8	PASS
	CH7: 2452	-20.301	8	PASS
Conclusion: PASS				

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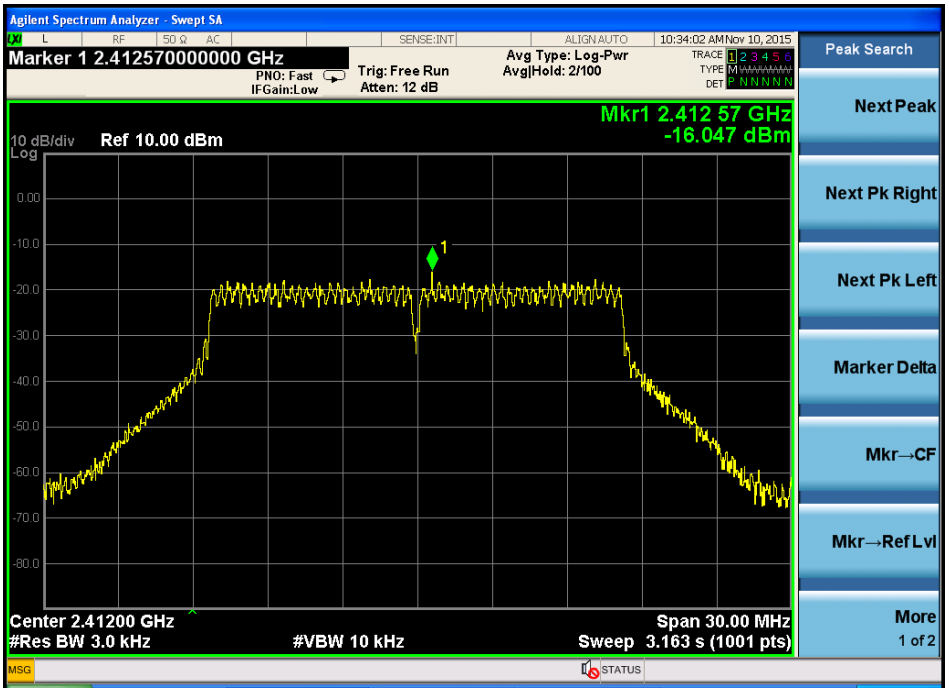
IEEE 802.11b :
CH Low:

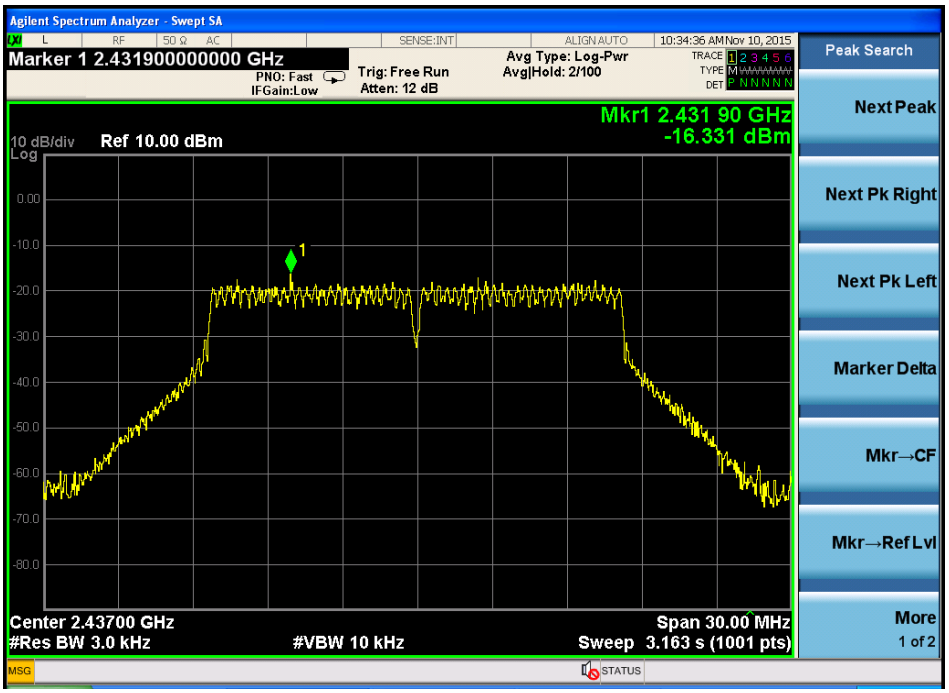
CH Mid:

CH High:

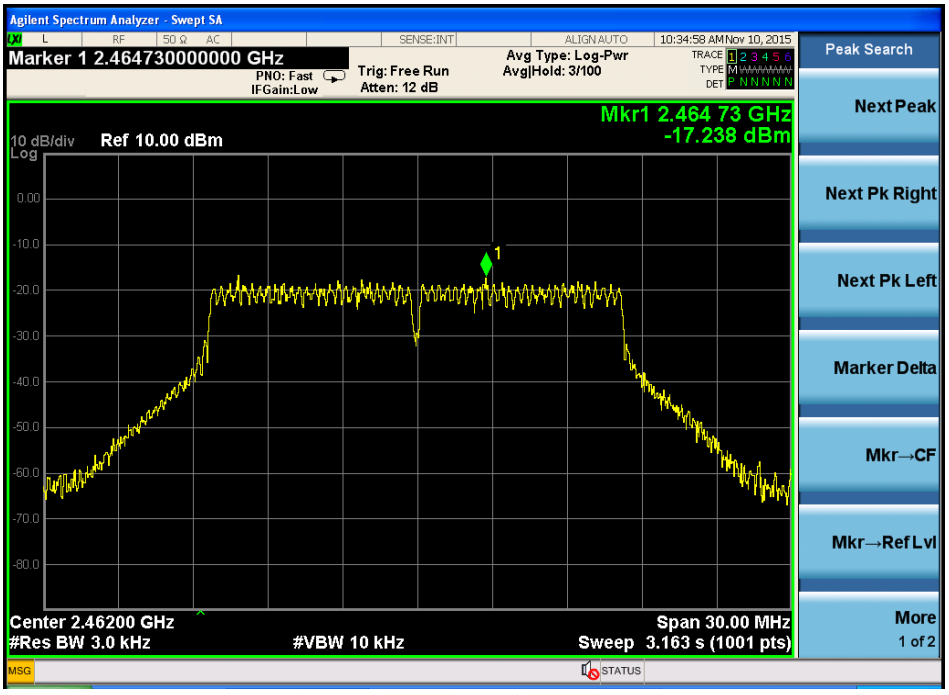
IEEE 802.11g :
CH Low



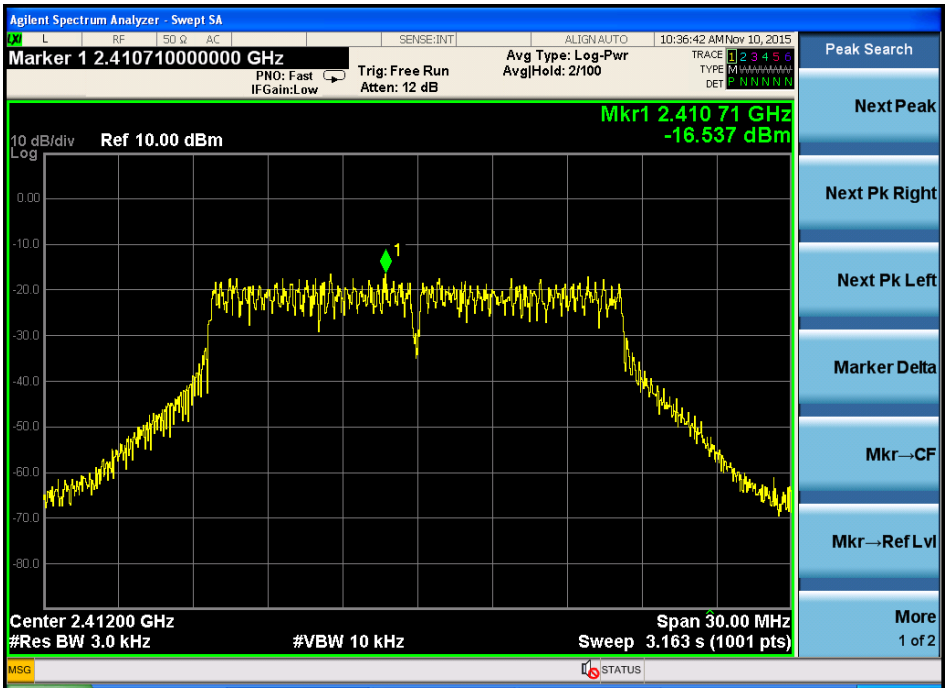
CH Mid:



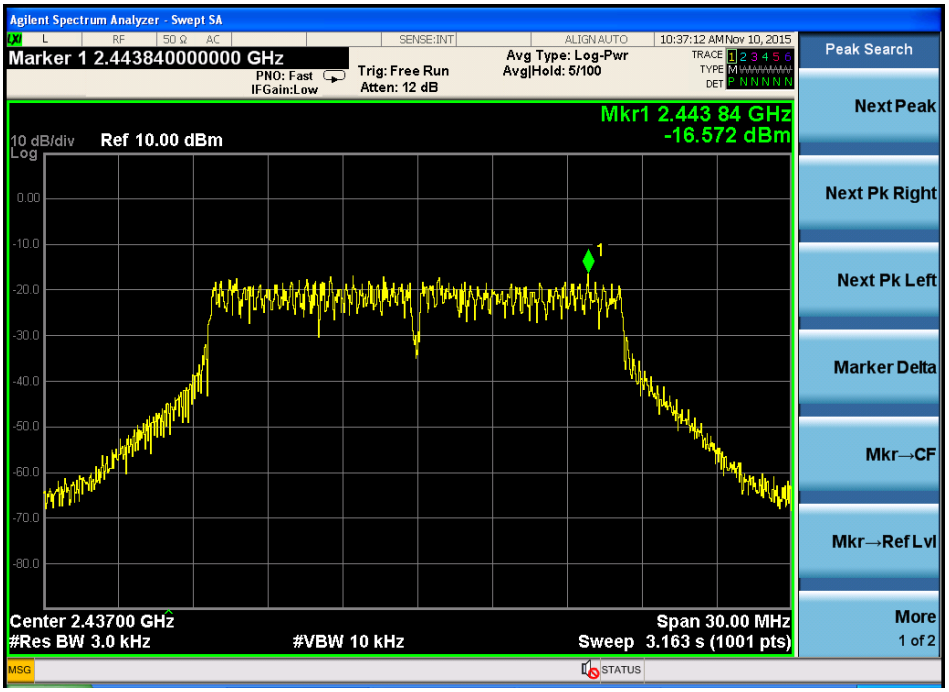
CH High:



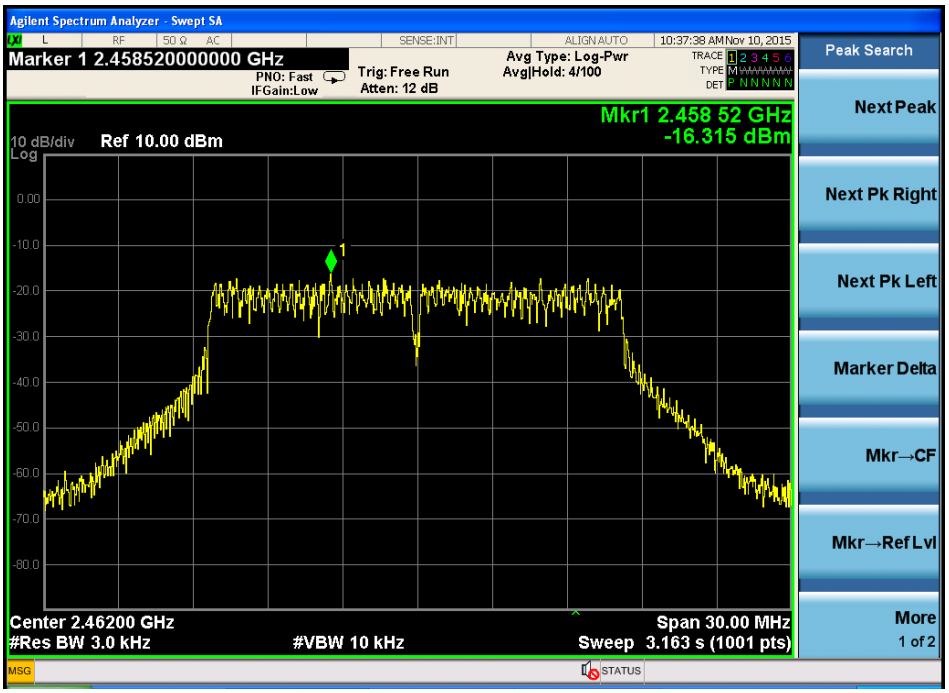
IEEE 802.11n HT20:
CH Low:



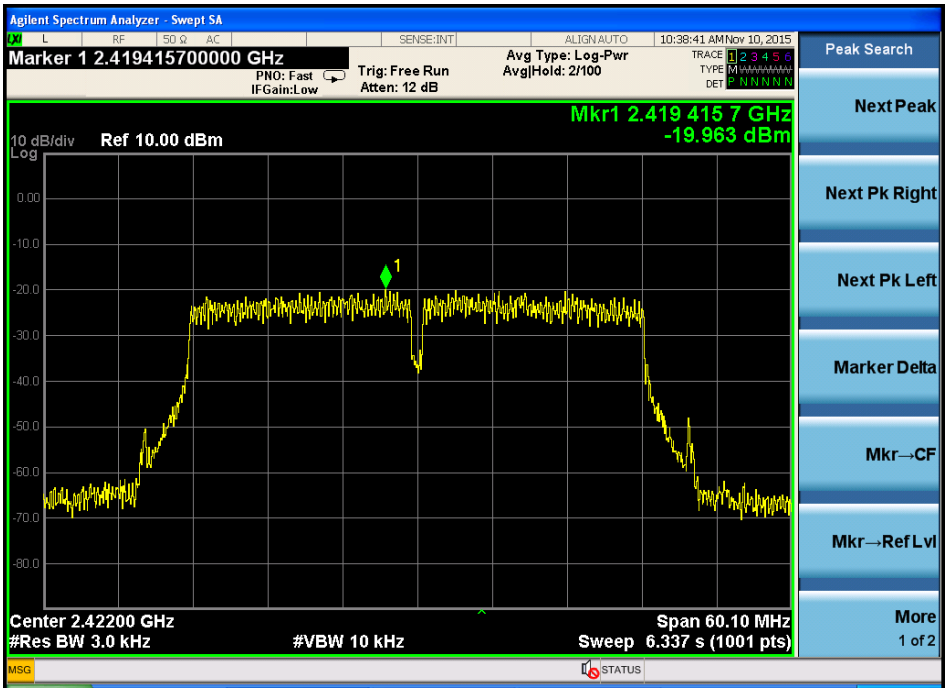
CH Mid:



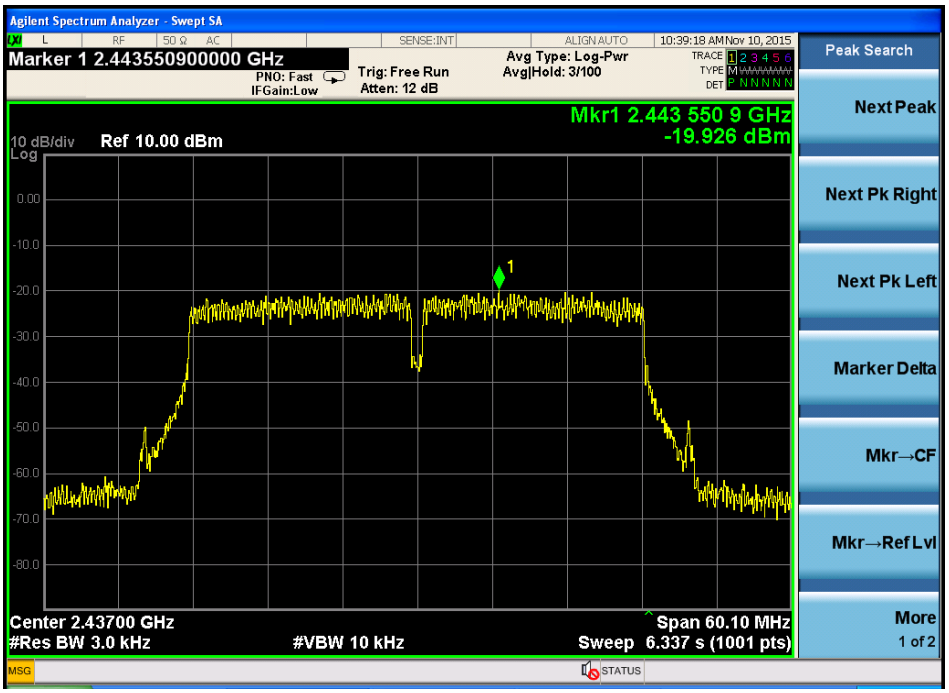
CH High:



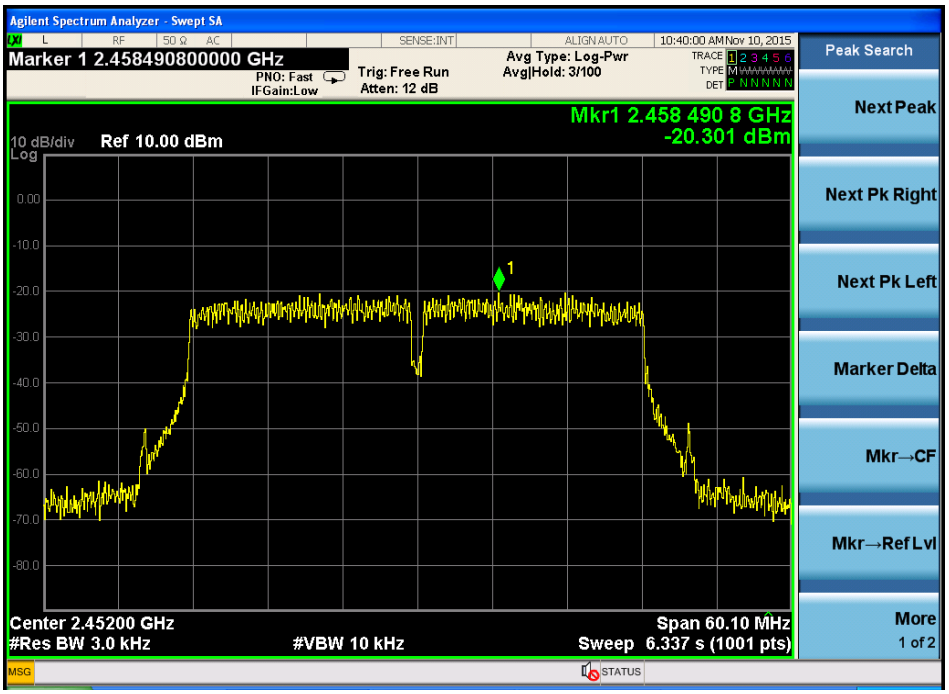
IEEE 802.11n HT40:
CH Low:



CH Mid:



CH High:



9 Bandwidth

9.1 Test limit

Please refer section RSS-247 & 15.247

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 kHz.

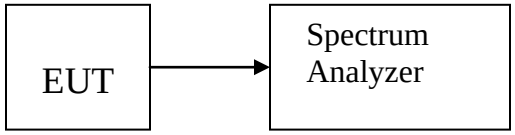
9.2 Method of measurement

Details see the KDB558074 D01 Meas Guidance

a) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

b) The test receiver set RBW = 1-5 % EBW, VBW≥3RBW, Sweep time set auto, detail see the test plot.

9.3 Test Setup



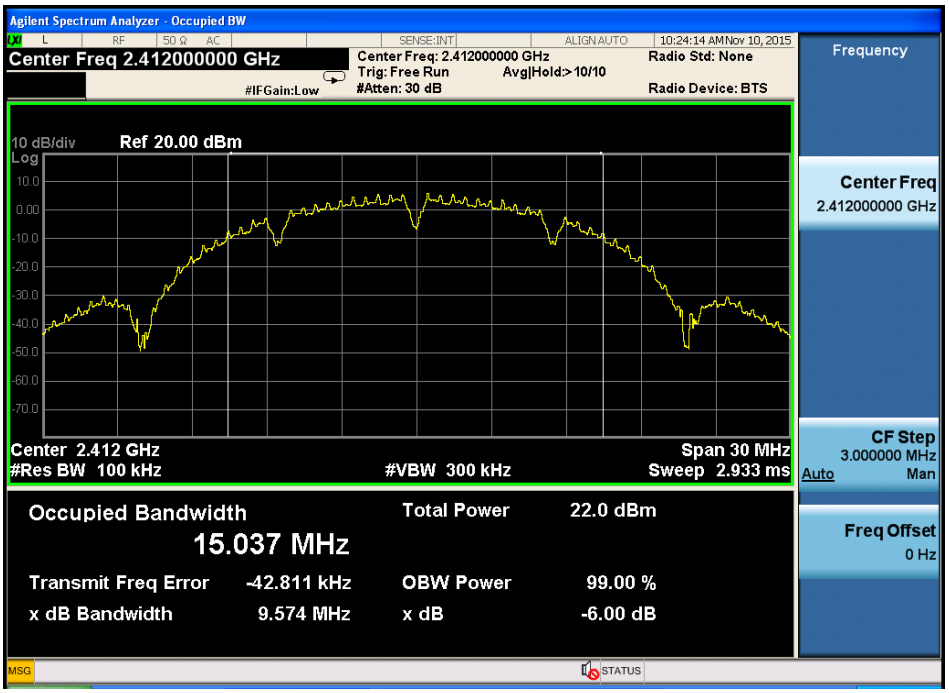
9.4 Test Results

PASS.

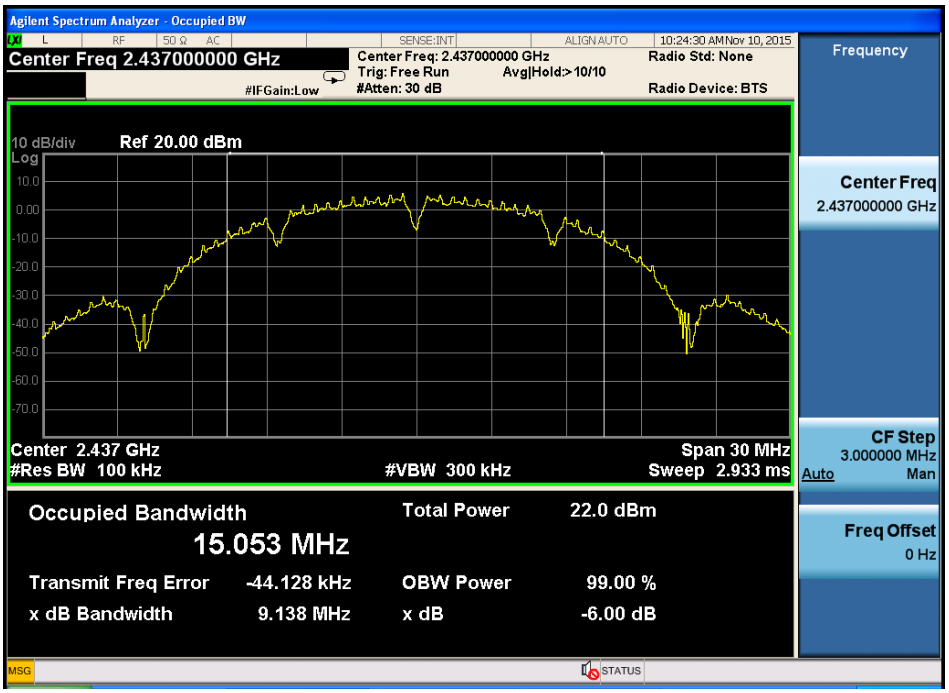
Detailed information please see the following page.

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11b:					
Low	2412	9.574	15.037	0.5	PASS
Mid	2437	9.138	15.053	0.5	PASS
High	2462	10.05	15.030	0.5	PASS
IEEE 802.11g					
Low	2412	16.38	16.475	0.5	PASS
Mid	2437	16.40	16.496	0.5	PASS
High	2462	16.38	16.487	0.5	PASS
IEEE 802.11n/HT20:					
Low	2412	17.62	17.698	0.5	PASS
Mid	2437	17.62	17.695	0.5	PASS
High	2462	17.61	17.701	0.5	PASS
IEEE 802.11n/HT40:					
Low	2422	35.85	36.001	0.5	PASS
Mid	2437	35.78	36.026	0.5	PASS
High	2452	35.72	36.019	0.5	PASS

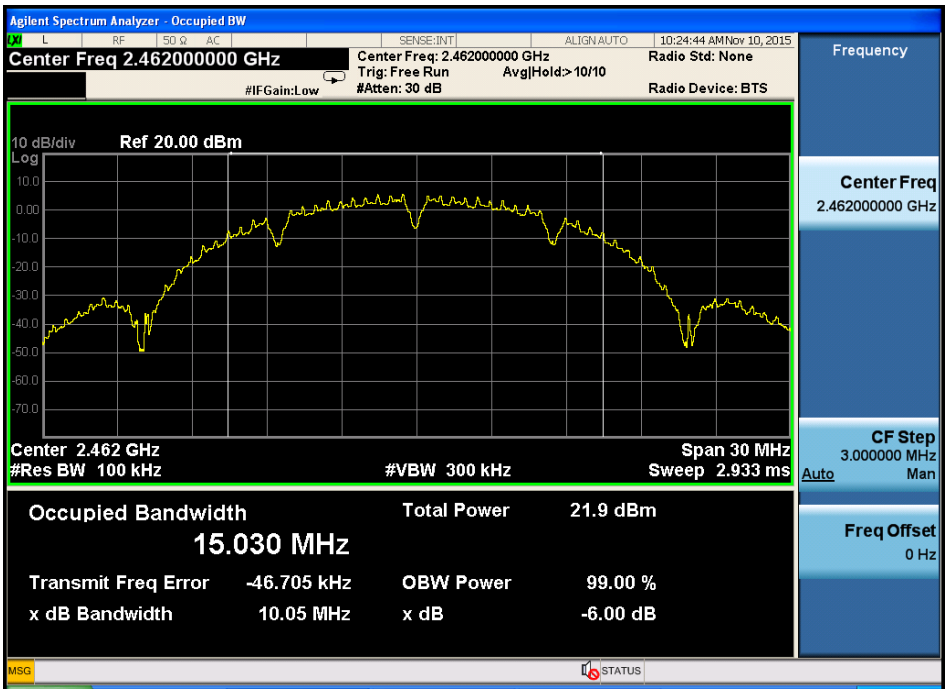
IEEE 802.11b:
CH Low:



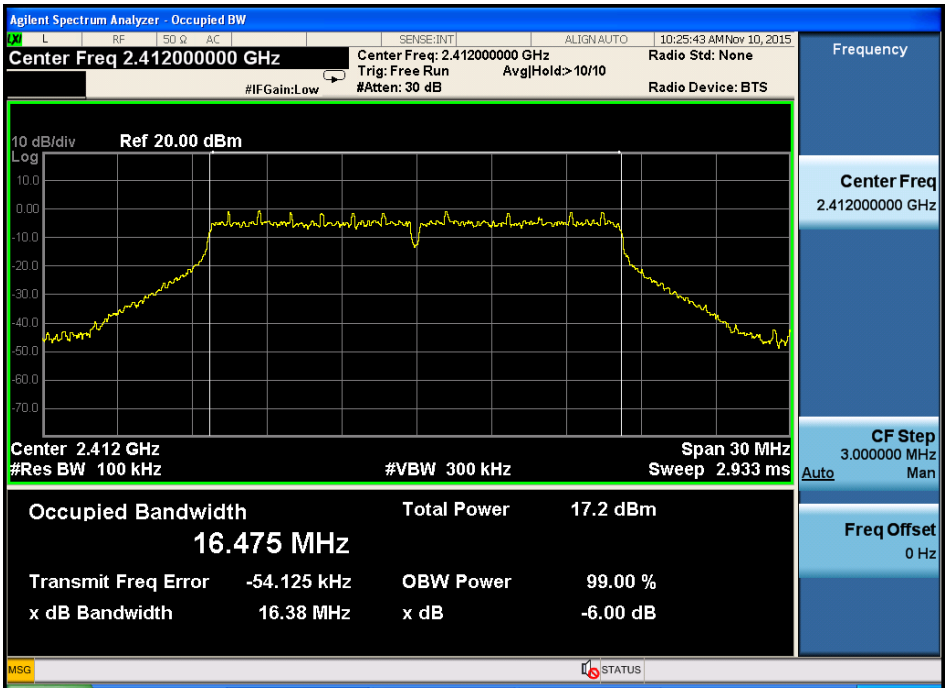
CH Mid:



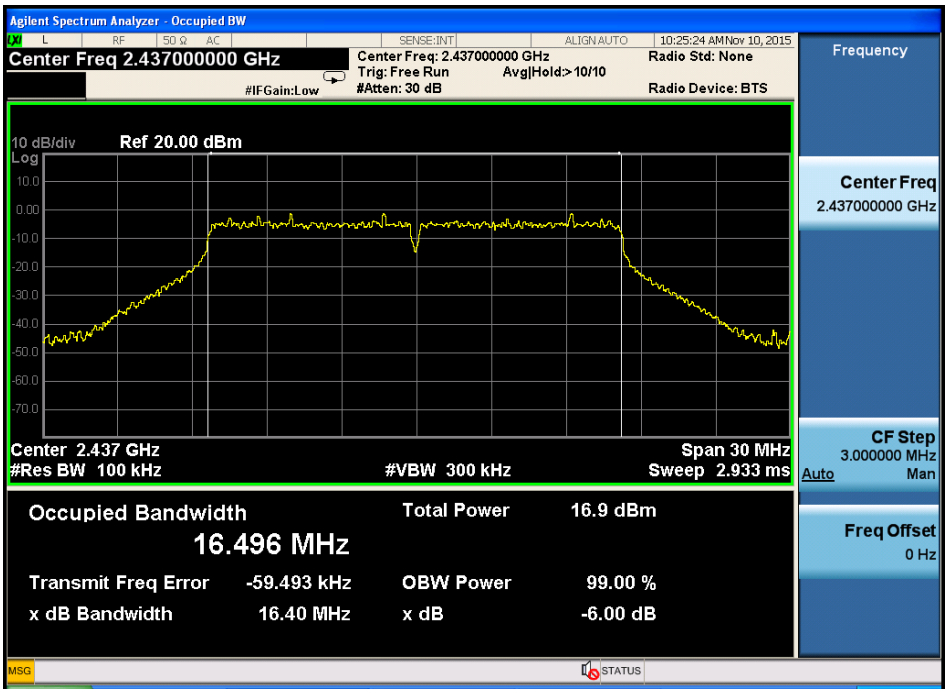
CH High:



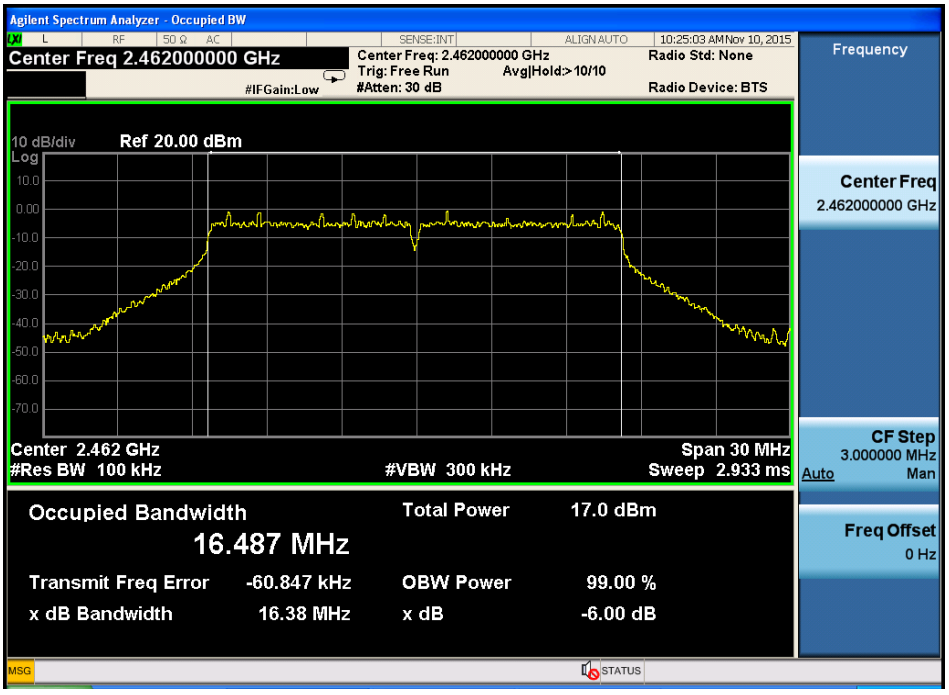
IEEE 802.11g:
CH Low:



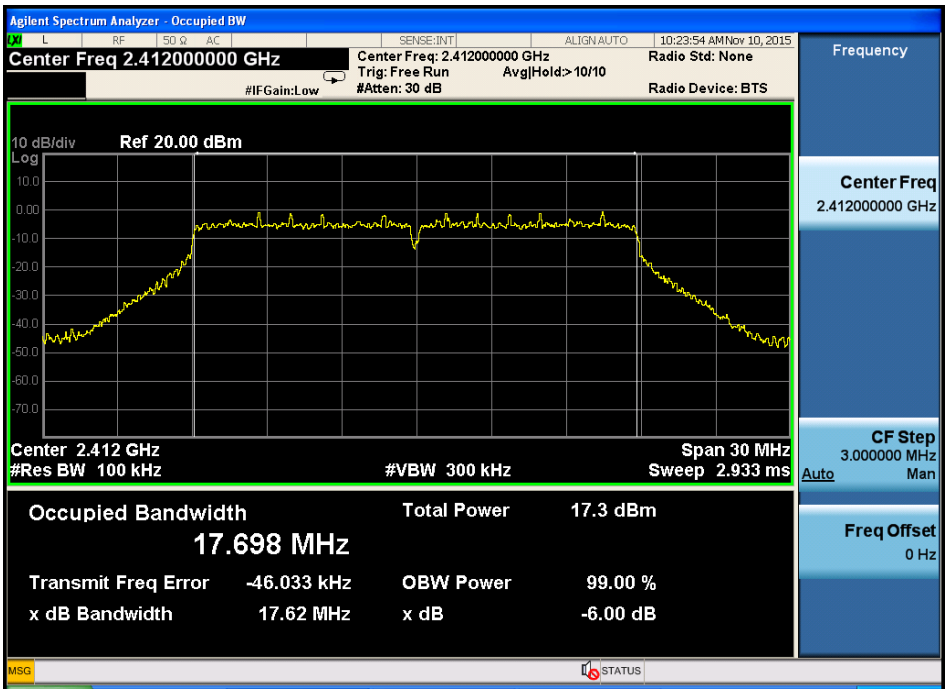
CH Mid:



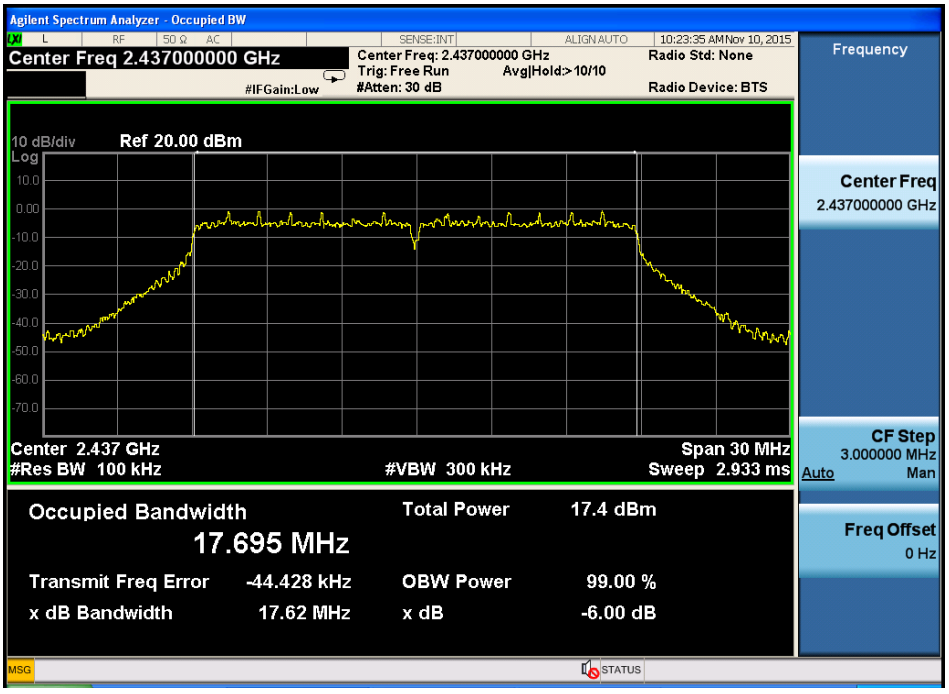
CH High:



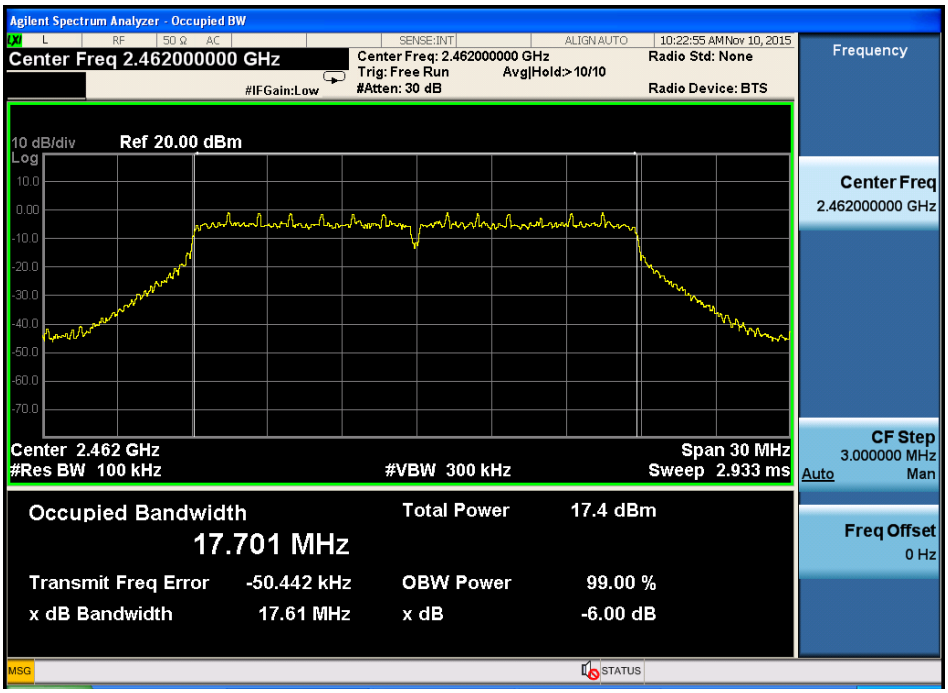
IEEE 802.11n HT20:
CH Low:



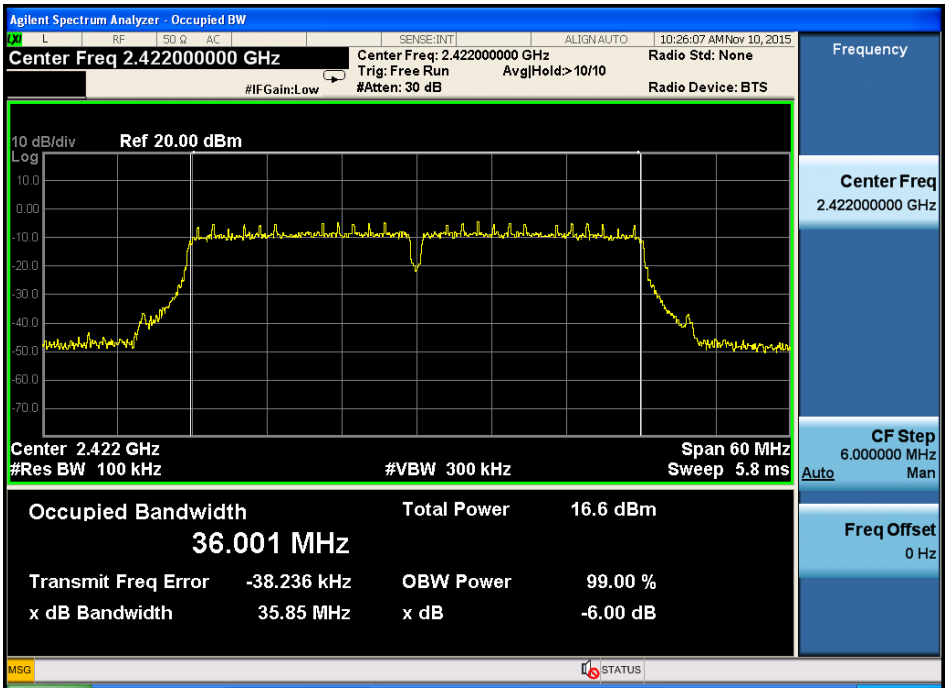
CH Mid:



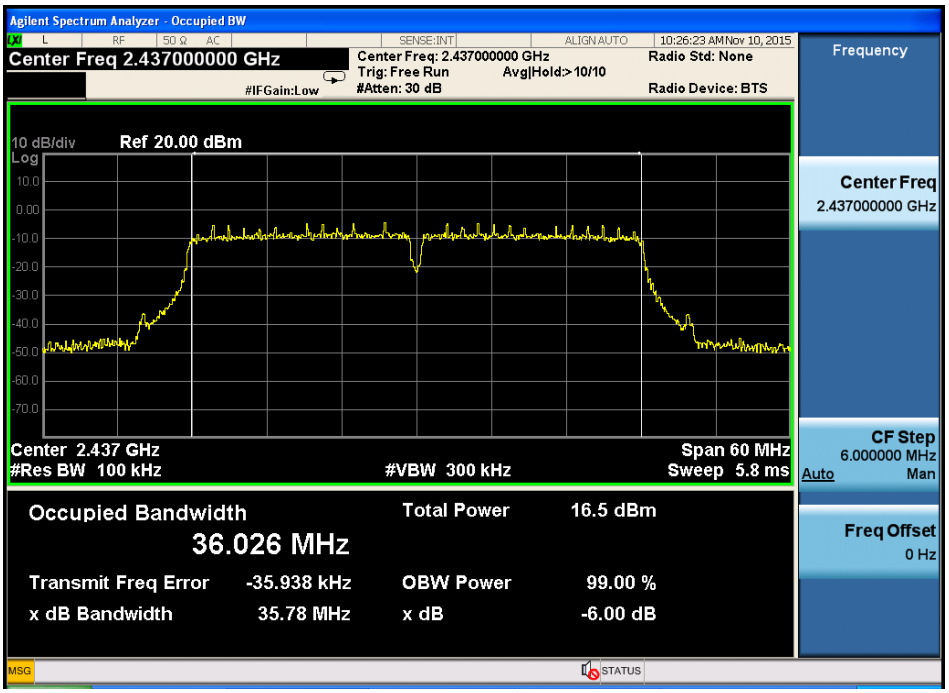
CH High:



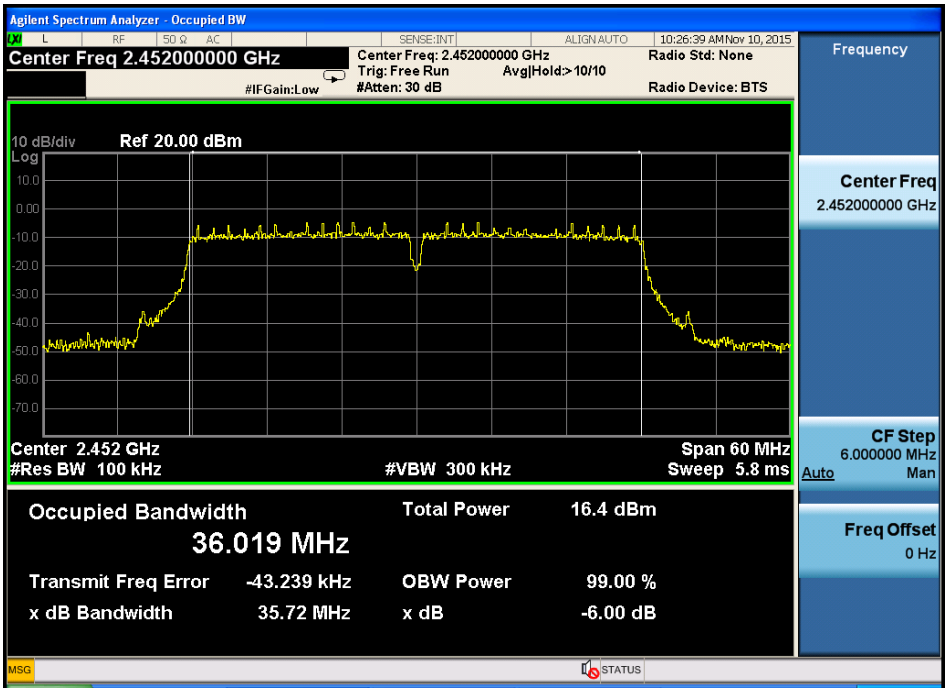
IEEE 802.11n/HT40:
CH Low:



CH Mid:



CH High:



10 Band Edge Check

10.1 Test limit

Please refer section RSS-247 & 15.247.

10.2 Test Procedure

12.2.1 Put the EUT on a 1.5 m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission

12.2.2 Check the spurious emissions out of band.

12.2.3 RBW 1MHz,VBW 3MHz ,peak detector for peak value, RBW=1MHz ,VBW= 3MHz, RMS detector for AV value.

10.3 Test Setup

Same as 5.2.2.

10.4 Test Result

PASS.

Detailed information please see the following page.

Radiated Method:
802.11b

Band Edge Test result								
EUT: GNSS Survey Receiver M/N: S321 Network								
Power: DC 10.8V From battery								
Test date: 2015-06-06 Test site: 3m Chamber Tested by: Eric Huang								
Test mode: Tx Low								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss (dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390	42.16	27.62	3.92	34.97	38.73	74	35.27	**PK**
2390	--	27.62	3.94	34.97	--	54	--	AV
Antenna Polarity: Horizontal								
2390	42.29	27.62	3.92	34.97	38.86	74	35.14	**PK**
2390	--	27.62	3.94	34.97	--	54	--	AV
Note: 1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK 2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS 3, Result = Read level + Antenna factor + cable loss-Amp factor 4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

Band Edge Test result								
EUT: GNSS Survey Receiver M/N: S321 Network								
Power: DC 10.8V From battery								
Test date: 2015-06-06 Test site: 3m Chamber Tested by: Eric Huang								
Test mode: Tx High								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss (dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.5	42.29	27.89	4	34.97	39.21	74	34.79	**PK**
2483.5		--	--	--	--	54	--	AV
Antenna Polarity: Horizontal								
2483.5	43.77	27.89	4	34.97	40.69	74	33.31	**PK**
2483.5		--	--	--	--	54	--	AV

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

802.11g

Band Edge Test result								
EUT: GNSS Survey Receiver M/N: S321 Network								
Power: DC 10.8V From battery								
Test date: 2015-06-06 Test site: 3m Chamber Tested by: Eric Huang								
Test mode: Tx Low								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss (dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390	48.76	27.62	3.92	34.97	45.33	74	28.67	**PK**
2390	--	27.62	3.94	34.97	--	54	--	AV
Antenna Polarity: Horizontal								
2390	49.13	27.62	3.92	34.97	45.7	74	28.3	**PK**
2390	--	27.62	3.94	34.97	--	54	--	AV

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Band Edge Test result								
EUT: GNSS Survey Receiver M/N: S321 Network								
Power: DC 10.8V From battery								
Test date: 2015-06-06 Test site: 3m Chamber Tested by: Eric Huang								
Test mode: Tx High								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss (dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.5	45.36	27.89	4	34.97	42.28	74	31.72	**PK**
2483.5		--	--	--	--	54	--	AV
Antenna Polarity: Horizontal								
2483.5	46.18	27.89	4	34.97	43.1	74	30.9	**PK**
2483.5		--	--	--	--	54	--	AV

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

802.11n20

Band Edge Test result								
EUT: GNSS Survey Receiver M/N: S321 Network								
Power: DC 10.8V From battery								
Test date: 2015-06-06 Test site: 3m Chamber Tested by: Eric Huang								
Test mode: Tx Low								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss (dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390	43.29	27.62	3.92	34.97	39.86	74	34.14	**PK**
2390	--	27.62	3.94	34.97	--	54	--	AV
Antenna Polarity: Horizontal								
2390	45.17	27.62	3.92	34.97	41.74	74	32.26	**PK**
2390	--	27.62	3.94	34.97	--	54	--	AV

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Band Edge Test result								
EUT: GNSS Survey Receiver M/N: S321 Network								
Power: DC 10.8V From battery								
Test date: 2015-06-06 Test site: 3m Chamber Tested by: Eric Huang								
Test mode: Tx High								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss (dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.5	46.12	27.89	4	34.97	43.04	74	30.96	PK
2483.5		--	--	--	--	54	--	AV
Antenna Polarity: Horizontal								
2483.5	46.74	27.89	4	34.97	43.66	74	30.34	PK
2483.5		--	--	--	--	54	--	AV

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

802.11n40

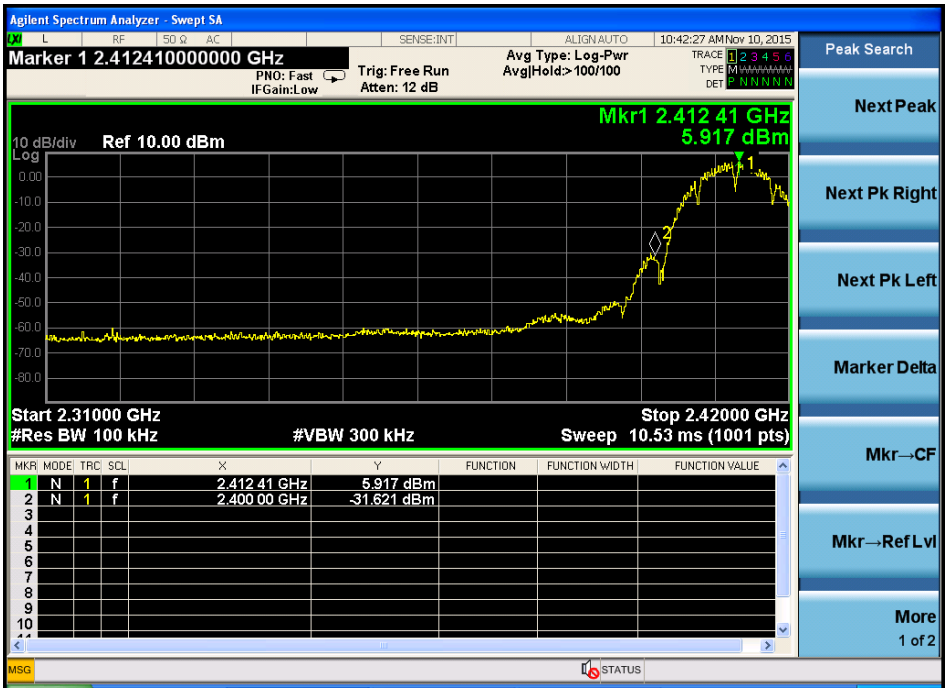
Band Edge Test result								
EUT: GNSS Survey Receiver M/N: S321 Network								
Power: DC 10.8V From battery								
Test date: 2015-06-06 Test site: 3m Chamber Tested by: Eric Huang								
Test mode: Tx Low								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss (dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390	43.14	27.62	3.92	34.97	39.71	74	34.29	**PK**
2390	--	27.62	3.94	34.97	--	54	--	AV
Antenna Polarity: Horizontal								
2390	44.06	27.62	3.92	34.97	40.63	74	33.37	**PK**
2390	--	27.62	3.94	34.97	--	54	--	AV

Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

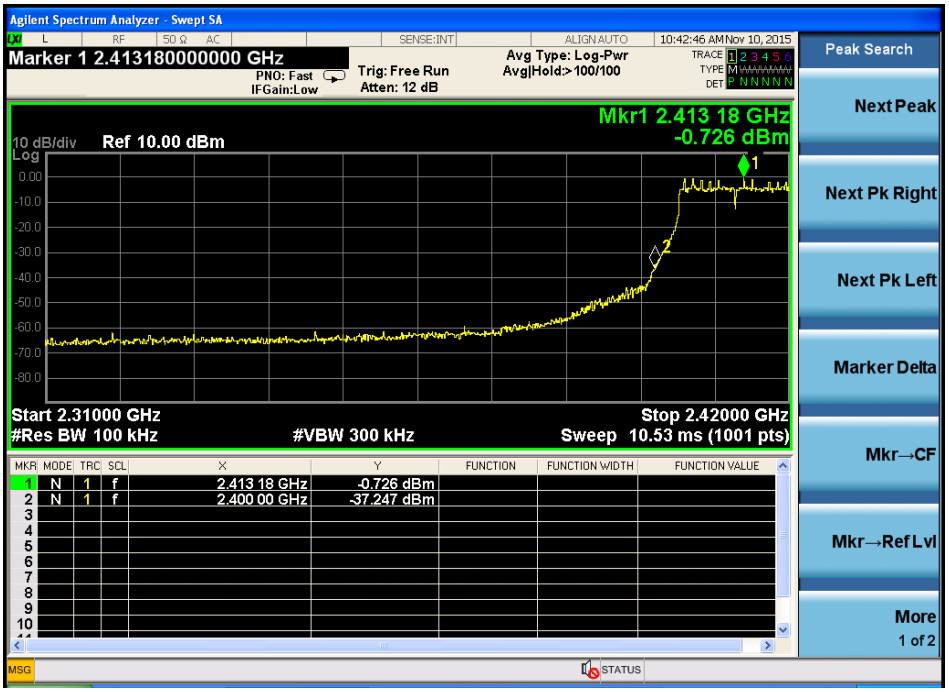
Band Edge Test result								
EUT: GNSS Survey Receiver M/N: S321 Network								
Power: DC 10.8V From battery								
Test date: 2015-06-06 Test site: 3m Chamber Tested by: Eric Huang								
Test mode: Tx High								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss (dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.5	45.78	27.89	4	34.97	42.7	74	31.3	PK
2483.5		--	--	--	--	54	--	AV
Antenna Polarity: Horizontal								
2483.5	46.12	27.89	4	34.97	43.04	74	30.96	PK
2483.5		--	--	--	--	54	--	AV

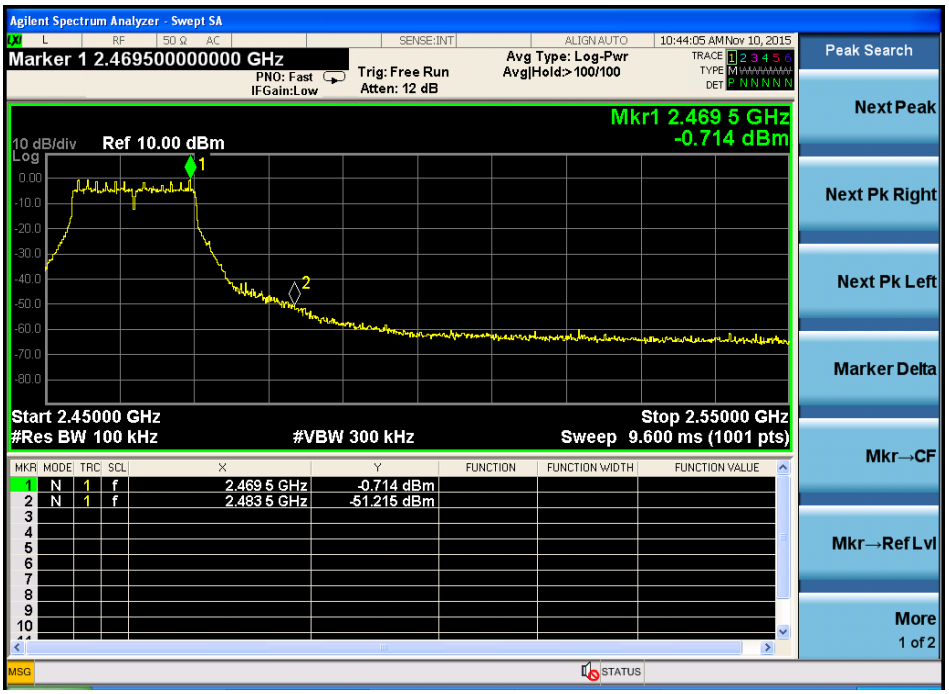
Note:
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS
3, Result = Read level + Antenna factor + cable loss-Amp factor
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.

Conducted Method:
802.11b

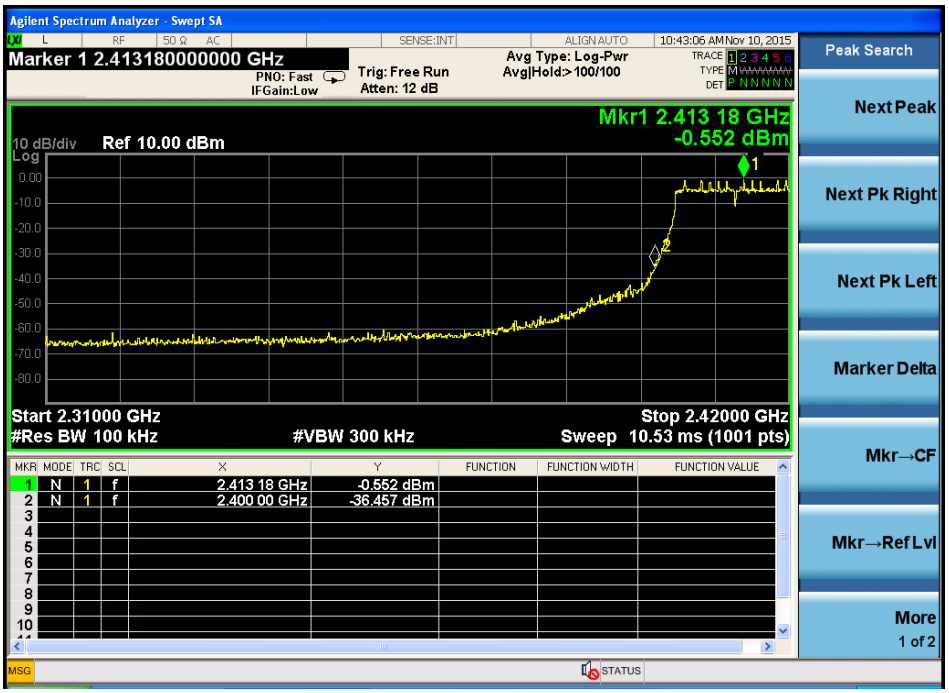


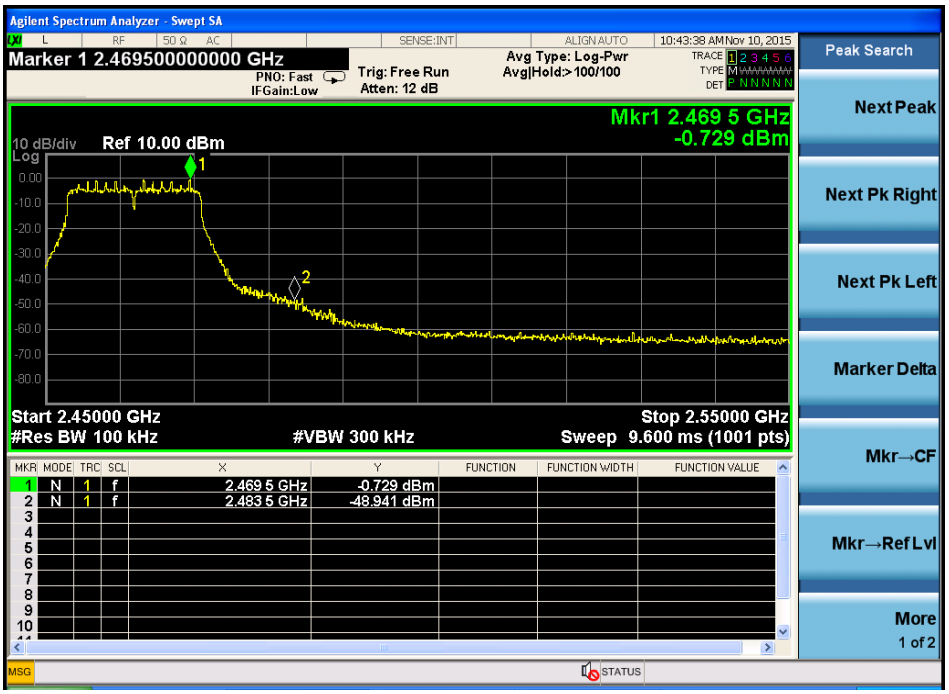
802.11g


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.413180000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 12 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:42:46 AM Nov 10, 2015
Mkr1 2.413 18 GHz
-0.726 dBm
10 dB/div
Log
Ref 10.00 dBm
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.42000 GHz
Sweep 10.53 ms (1001 pts)
1 N 1 f 2.413 18 GHz -0.726 dBm
2 N 1 f 2.400 00 GHz -37.247 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.469500000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 12 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:44:05 AM Nov 10, 2015
Mkr1 2.469 5 GHz
-0.714 dBm
10 dB/div
Log
Ref 10.00 dBm
Start 2.45000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.55000 GHz
Sweep 9.600 ms (1001 pts)
1 N 1 f 2.469 5 GHz -0.714 dBm
2 N 1 f 2.483 5 GHz -51.215 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

802.11n HT20


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.413180000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 12 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:43:06 AM Nov 10, 2015
Mkr1 2.413 18 GHz
-0.552 dBm
10 dB/div
Ref 10.00 dBm
Log
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.42000 GHz
Sweep 10.53 ms (1001 pts)
1 N 1 f 2.413 18 GHz -0.552 dBm
2 N 1 f 2.400 00 GHz -36.457 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.469500000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 12 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:43:38 AM Nov 10, 2015
Mkr1 2.469 5 GHz
-0.729 dBm
10 dB/div
Ref 10.00 dBm
Log
Start 2.45000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.55000 GHz
Sweep 9.600 ms (1001 pts)
1 N 1 f 2.469 5 GHz -0.729 dBm
2 N 1 f 2.483 5 GHz -48.941 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

802.11n HT40


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.425640000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 12 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:41:54 AM Nov 10, 2015
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Mkr1 2.425 64 GHz
-4.568 dBm
10 dB/div
Ref 10.00 dBm
Log
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.45000 GHz
Sweep 13.40 ms (1001 pts)
1 N 1 f 2.425 64 GHz -4.568 dBm
2 N 1 f 2.400 00 GHz -36.103 dBm


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.443200000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 12 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
10:41:01 AM Nov 10, 2015
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Mkr1 2.443 20 GHz
-4.528 dBm
10 dB/div
Ref 10.00 dBm
Log
Start 2.43000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.55000 GHz
Sweep 11.53 ms (1001 pts)
1 N 1 f 2.443 20 GHz -4.528 dBm
2 N 1 f 2.483 50 GHz -48.091 dBm

11 Antenna Requirement

11.1 Standard Requirement

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

11.2 Antenna Connected Construction

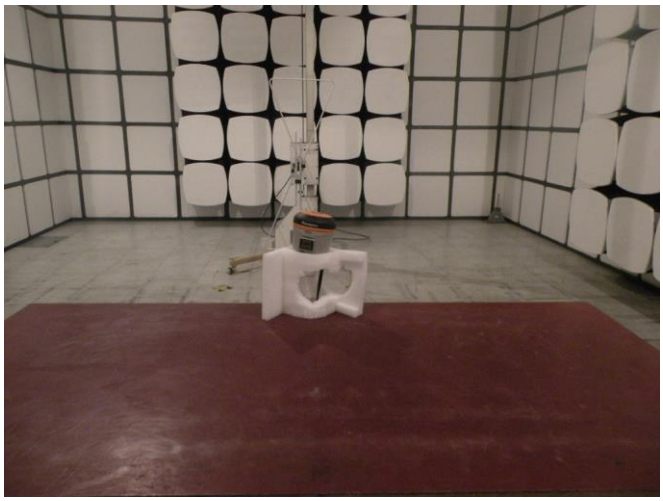
The antenna connector is unique antenna and no consideration of replacement. Please see EUT photo for details.

11.3 Result

It complies with the standard requirement.

12 Test setup photo

Photographs-Radiated Emission Test Setup in Chamber



---------END OF THE REPORT-------