

TEST REPORT

Report Reference No.....: 4787598692-2

FCC ID.....: 2AB7X-WISEPOS

Applicant's name.....: BBPOS International Limited

Address...... Suite 1602, 16/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road,

Tsuen Wan, N.T., Hong Kong

Manufacturer...... BBPOS International Limited

Address...... Suite 1602, 16/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road,

Tsuen Wan, N.T., Hong Kong

Test item description: WisePOS

Trade Mark: -

Model/Type reference...... WSC11

Listed Model(s) WSC10

Standard: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of receipt of test sample...... Sep. 18,2016

Date of testing...... Sep. 19,2016- Sep. 28, 2016

Result.....: PASS

Reviewed by:

Denny Huang(Project Engineer)

Approved by:

Stephen Guo (Laboratory Manager)

Testing Laboratory Name: Shenzhen Huatongwei International Inspection Co., Ltd

Gongming, Shenzhen, China

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REPORT NO: 4787598692-2 EUT: WisePOS

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MODEL: WSC11

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1. APPLICABLE STANDARDS ANDTEST DESCRIPTION

1.1. Applicable Standards

The tests were performed according to following standards: FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices

<u>KDB558074 D01 V03R03:</u> Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS)

1.2. Test Description

ReportSection	Test Item	FCC Rule	Result
4.1	Antenna requirement	15.203/15.247 (c)	Pass
4.2	Line Conducted Emission (AC Main)	15.207	Pass
4.3	Conducted Peak Output Power	15.247 (b)(3)	Pass
4.4	Power Spectral Density	15.247 (e)	Pass
4.5	6dB Bandwidth	15.247 (a)(2)	Pass
4.6	Restricted band	15.247(d)/15.205	Pass
4.7/4.8	Spurious Emission	15.247(d)/15.209	Pass

Remark: The measurement uncertainty is not included in the test result.

2. **SUMMARY**

2.1. Client Information

Applicant:	BBPOS International Limited
Address:	Suite 1602, 16/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, N.T., Hong Kong
Manufacturer:	BBPOS International Limited
Address:	Suite 1602, 16/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, N.T., Hong Kong

2.2. Product Description

Name of EUT	WisePOS	
Trade Mark:	-	
Model No.:	WSC11	
Listed Model(s):	WSC10	
IMEI 1:	352788070030212	
IMEI 2:	352788070030220	
Power supply:	DC 3.8V From internal battery	
Adapter information: _		
WIFI		
Supported type:	802.11b/802.11g/802.11n(H20)/802.11n(H40)	
Modulation:	802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11g/n(H20)/ n(H40): OFDM (BPSK / QPSK / 16QAM / 64QAM)	
Operation frequency:	802.11b/g/n(H20): 2412MHz~2462MHz 802.11n(H40): 2422MHz~2452MHz	
Channel number:	802.11b/g/n(H20): 11 802.11n(H40):7	
Channel separation: 5MHz		
Antenna type:	Internal Antenna	
Antenna gain:	-0.5dBi	

2.3. Operation state

◆ Test frequency list

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

802.11b/g/n(H20)		802.11b/g/n(H40)	
Channel	Frequency (MHz)		Frequency (MHz)
01	2412		
02	2417		
03	2422	03	2422
i	i		÷
06	2437	06	2437
i	i	÷	÷
09	2452	09	2452
10	2457		
11	2462		

Data Rated

Preliminary tests were performed in different data rate, and found which the below bit rate is worst case mode, so only show data which it is a worst case mode.

Mode	datarate (worst mode)
802.11b	1Mbps
802.11g	6Mbps
802.11n(H20)	6.5Mbps
802.11n(H40)	6.5Mbps

♦ Test mode

For RF test items:

the engineering test program was provided and enabled to make EUT continuous transmit/receive. The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

For AC power line conducted emissions:

the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

supplied by the manufacturer

O - supplied by the lab

Length (m):	1
Shield :	/
Detachable :	/
Manufacturer:	/
Model No. :	1

2.5. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China Phone: 86-755-26748019 Fax: 86-755-26748089

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: February 28, 2015. Valid time is until February 27, 2018.

A2LA-Lab Cert. No. 3902.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until December 31, 2016.

FCC-Registration No.: 317478

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 317478, Renewal date Jul. 18, 2014, valid time is until Jul. 18, 2017.

IC-Registration No.: 5377A&5377B

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A on Dec. 31, 2013, valid time is until Dec. 31, 2016.

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377B on Dec.03, 2014, valid time is until Dec.03, 2017.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

3.3. Equipments Used during the Test

Radia	Radiated Emission				
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal
1	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	2015/11/02
2	EMI TEST RECEIVER	Rohde&Schwarz	ESI 26	100009	2015/11/02
3	EMI TEST Software	Audix	E3	N/A	N/A
4	TURNTABLE	ETS	2088	2149	N/A
5	ANTENNA MAST	ETS	2075	2346	N/A
6	EMI TEST Software	Rohde&Schwarz	ESK1	N/A	N/A
7	HORNANTENNA	ShwarzBeck	9120D	1011	2015/11/02
8	Amplifer	Sonoma	310N	E009-13	2015/11/02
9	JS amplifer	Rohde&Schwarz	JS4-00101800- 28-5A	F201504	2015/11/02
10	High pass filter	Compliance Direction systems	BSU-6	34202	2015/11/02
11	HORNANTENNA	ShwarzBeck	9120D	1012	2015/11/02
12	Amplifer	Compliance Direction systems	PAP1-4060	120	2015/11/02
13	Loop Antenna	Rohde&Schwarz	HFH2-Z2	100020	2015/11/02
14	TURNTABLE	MATURO	TT2.0		N/A
15	ANTENNA MAST	MATURO	TAM-4.0-P		N/A
16	Horn Antenna	SCHWARZBECK	BBHA9170	25841	2015/11/02
17	ULTRA-BROADBAND ANTENNA	Rohde&Schwarz	HL562	100015	2015/11/02

Maxir	Maximum Peak Output Power / Power Spectral Density / 6dB Bandwidth / Band Edge Compliance of RF				
Emiss	Emission / Spurious RF Conducted Emission				
Item	Item Test Equipment Manufacturer Model No. Serial No. Last Cal				Last Cal
1	Spectrum Analyzer	Rohde&Schwarz	FSP	1164.4391.40	2015/11/02
2	Power Meter	Anritsu	ML2480B	100798	2015/11/02
3	Power Sensor	Anritsu	MA2411B	100258	2015/11/02

The Cal.Interval was one year

3.4. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
lative Humidity:	30~60 %
Air Pressure:	950~1050mba

3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01"Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1"and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test Items	MeasurementUncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	1.60 dB	(1)
Radiated spurious emission 9KHz-40 GHz	2.20 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emissio 1~18GHz	5.16 dB	(1)
Radiated Emissio 18-40GHz	5.54 dB	(1)
Occupied Bandwidth		(1)

⁽¹⁾ This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

4. TEST CONDITIONS AND RESULTS

4.1. Antenna requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203:

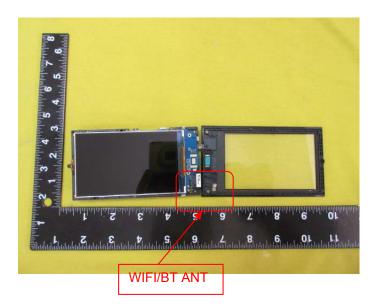
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of anantenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result:

The antenna is integral antenna, the best case gain of the antenna is-0.5dBi.



4.2. Conducted Emission (AC Main)

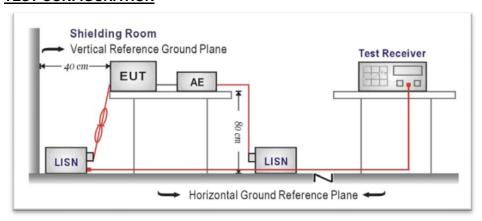
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Fraguency range (MIII)	Limit (dBuV)		
Frequency range (MHz)	Quasi-peak Average		
0.15-0.5	66 to 56*	56 to 46*	
0.5-5	56	46	
5-30	60	50	

^{*} Decreases with the logarithm of the frequency.

TEST CONFIGURATION

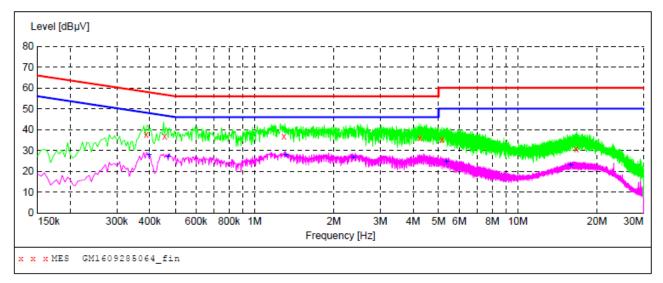


TEST PROCEDURE

- 1. The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
- 2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
- 3. The EUT and simulators are connected to the main power through a line impedancestabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for themeasuring equipment.
- 4. The peripheral devices are also connected to the main power through aLISN. (Please refer to the block diagram of the test setup and photographs)
- 5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor,was individually connected through a LISN to the input power source.
- 6. The excess length of the power cord between the EUT and the LISN receptacle were foldedback and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
- 7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHzusing a receiver bandwidth of 9 kHz.

TEST RESULTS

Test mode:AC 120V	WIFI	Polarization	L
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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.388500 0.456000 1.293000 4.245000 5.149500 16.705500	37.50 36.70 37.00 36.10 35.00 30.70	10.2 10.2 10.3 10.4 10.5	58 57 56 56 60	20.6 20.1 19.0 19.9 25.0 29.3	QP QP QP QP QP QP	L1 L1 L1 L1 L1	GND GND GND GND GND GND
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
				_	AV AV AV AV AV	Line L1 L1 L1 L1 L1 L1 L1	GND GND GND GND GND GND

DATE: Nov. 09, 2016 MODEL: WSC11

Test mode: AC 120V	C 120V WIFI Polarization		N	
		,		
Level [dBµV]				
80				
70		i i i i i i	i i i i i i i i i i i i i i i i i i i	
60				
50				
40	A di k i in i di additi	and a make the state of the state of		
The same of the sa	A CANDING MINISTER AND	X and the latest the l		
30	AND THE PROPERTY OF THE PROPER			
20				
10	·-;;;-;-;-;	;;;;;;;;;;;	- - - - - 	
150k 300k 400k	600k 800k 1M	2M 3M 4M 5M 6M 8N	1 10M 20M 30M	
	F	requency [Hz]		
x x x MES GM1609285063_f	fin			
Frequency	Level Transd I	imit Margin Detect	or Line PE	
MHz	dBµV dB	dBµV dB		
0.370500 0.645000	38.30 10.2 34.20 10.2	59 20.2 QP 56 21.8 QP	N GND	
1.221000	35.10 10.3	56 20.9 QP	N GND N GND	
2.463000	35.70 10.3	56 20.3 QP	N GND	
5.478000	33.20 10.5	60 26.8 QP	N GND	
16.534500	31.20 10.7	60 28.8 QP	N GND	
Frequency		imit Margin Detecto	or Line PE	
MHz	dBμV dB	dBµV dB		
0.388500	31.70 10.2	48 16.4 AV	N GND	
1.153500	28.00 10.3	46 18.0 AV	N GND	
2.409000	27.60 10.3	46 18.4 AV	N GND	
5.284500	24.90 10.5	50 25.1 AV	N GND	
23.131500	27.00 10.8	50 23.0 AV	N GND	

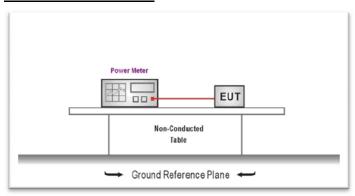
Remark:Transd=Cable lose+PULSE LIMITER factor+ARTIFICIAL MAINS factor;Margin=Limit-Level

4.3. Conducted Peak Output Power

<u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3): 30dBm

TEST CONFIGURATION



TEST PROCEDURE

- 1. The EUT was tested according to ANSI C63.10: 2013 for compliance to FCC 47CFR 15.247requirements.
- 2. The maximum peak conducted output power may be measured using a broadband peak RF power meter.
- 3. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector
- 4. Record the measurement data.

TEST RESULTS

Туре	Channel	Output power (dBm)	Limit (dBm)	Result
	01	14.29		
802.11b	06	14.83	30.00	Pass
	11	14.87		
	01	12.12		Pass Pass
802.11g	06	12.43	30.00	
	11	12.64		
	01	13.02	30.00	
802.11n(H20)	06	13.47		
	11	13.54		
	03	11.49		
802.11n(H40)	06	11.54	30.00	Pass
	09	11.73		

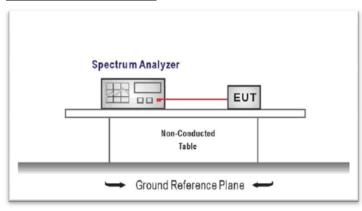
4.4. Power Spectral Density

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e): 8dBm/3KHz

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

TEST CONFIGURATION



TEST PROCEDURE

- 1. Connect the antenna port(s) to the spectrum analyzer input,
- 2. Configurethe spectrum analyzer as shown below:

Center frequency=DTS channel center frequency

Span =1.5 times the DTS bandwidth

RBW = 3 kHz ≤ RBW ≤ 100 kHz, VBW ≥ 3 × RBW

Sweep time = auto couple

Detector = peak

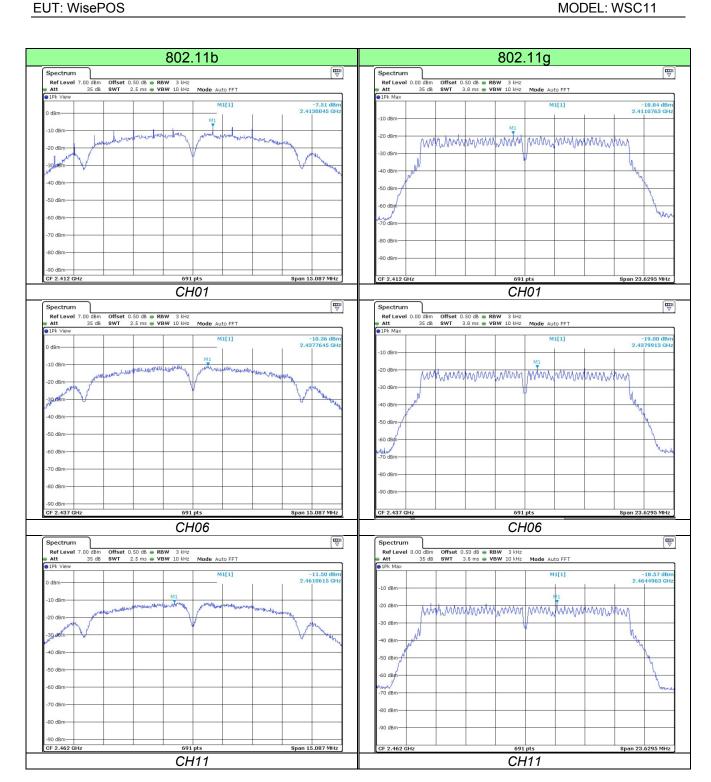
Trace mode = max hold

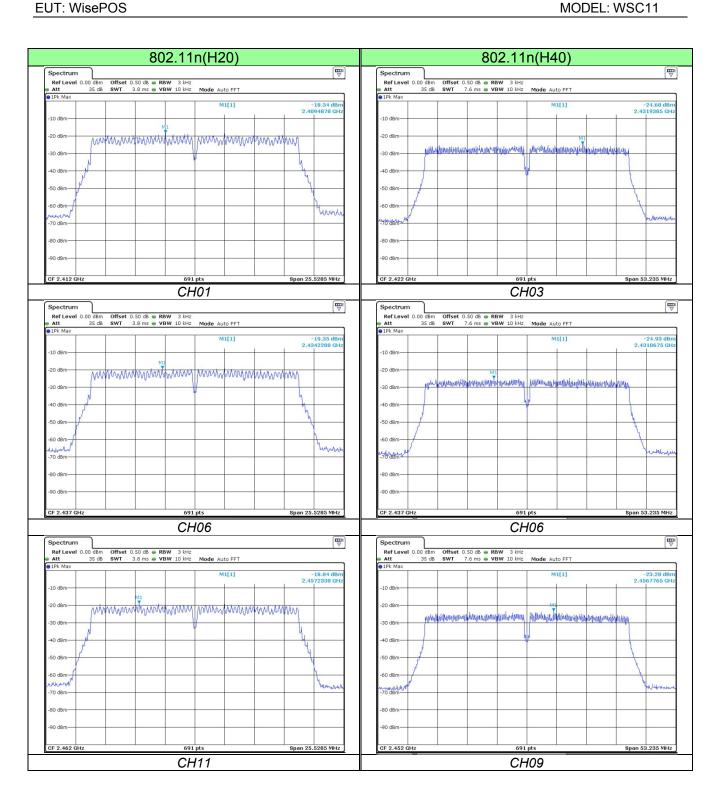
- 3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
- 4. Use the peak marker function to determine the maximum amplitude level within the RBW.
- 5. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST RESULTS

Туре	Channel	Power Spectral Density(dBm/3KHz)	Limit (dBm/3KHz)	Result
	01	-7.51		
802.11b	06	-10.36	8.00	Pass
	11	-11.50		
	01	-18.84		Pass
802.11g	06	-19.00	8.00	
	11	-18.57		
	01	-18.34		
802.11n(H20)	06	-19.35	8.00	Pass
	11	-18.84		
	03	-24.68		
802.11n(H40)	06	-24.93	8.00	Pass
	09	-23.28		

Test plot as follows:





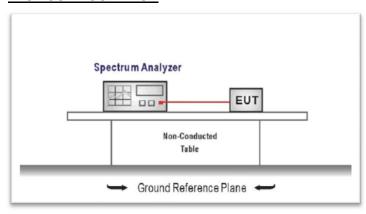
4.5. 6dB bandwidth

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2): at least 500KHz

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST CONFIGURATION



TEST PROCEDURE

- 1. Connect the antenna port(s) to the spectrum analyzer input.
- 2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output andthe spectrum analyzer).

Center Frequency =DTS channel center frequency

Span=2 x DTS bandwidth

 $RBW = 100 \text{ kHz}, VBW \ge 3 \times RBW$

Sweep time= auto couple

Detector = Peak

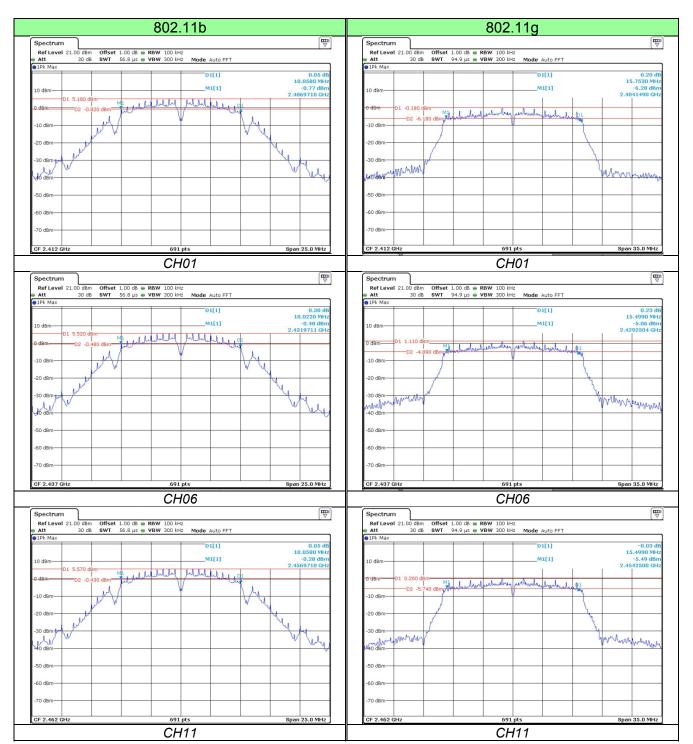
Trace mode = max hold

- 3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
- 4. 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, andrecord the pertinent measurements.

TEST RESULTS

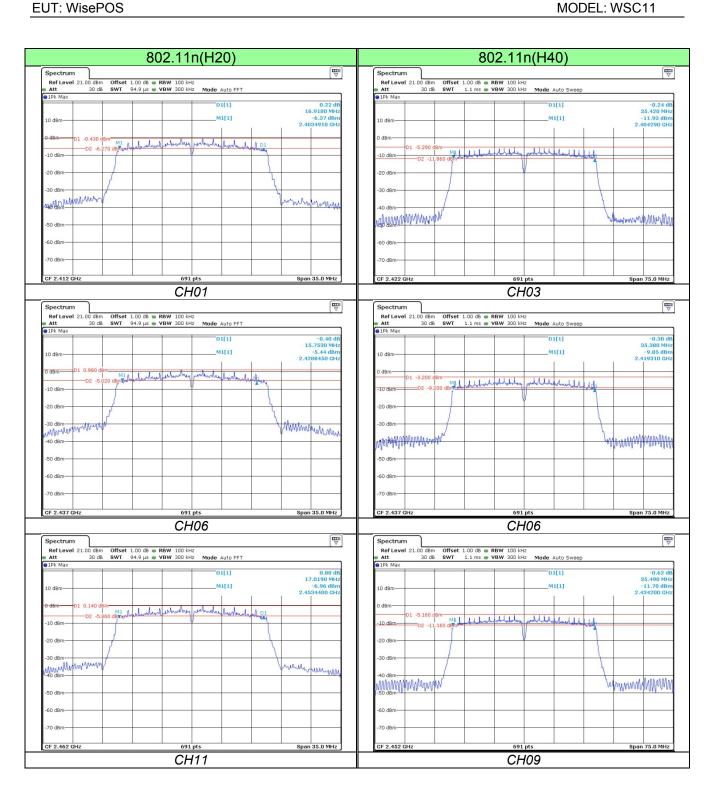
Туре	Channel	6dB Bandwidth(MHz)	Limit (KHz)	Result
	01	10.06		
802.11b	06	10.02	≥500	Pass
	11	10.06		
	01	15.75		
802.11g	06	15.50	≥500	Pass
	11	15.50		
	01	16.92		
802.11n(H20)	06	15.75	≥500	Pass
	11	17.02		
	03	35.42		
802.11n(H40)	06	35.38	≥500	Pass
	09	35.49		

Test plot as follows:



DATE: Nov. 09, 2016

MODEL: WSC11



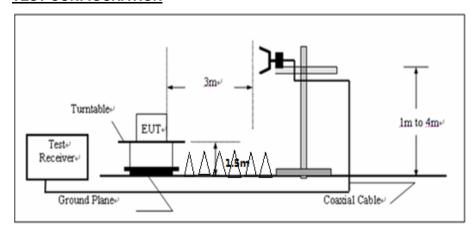
4.6. Restricted band

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

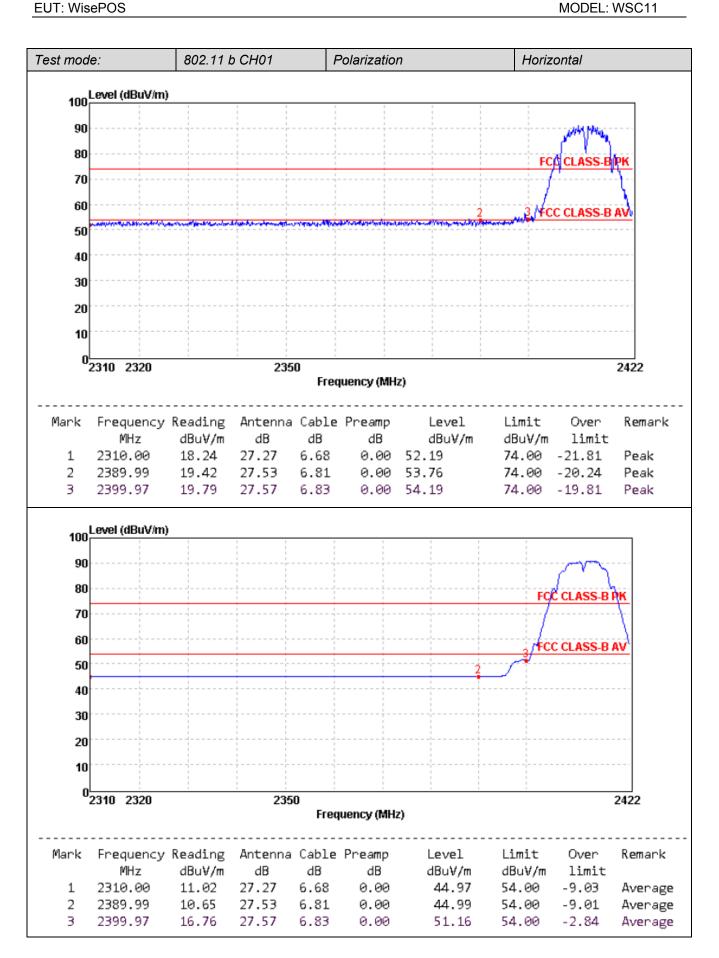
TEST CONFIGURATION

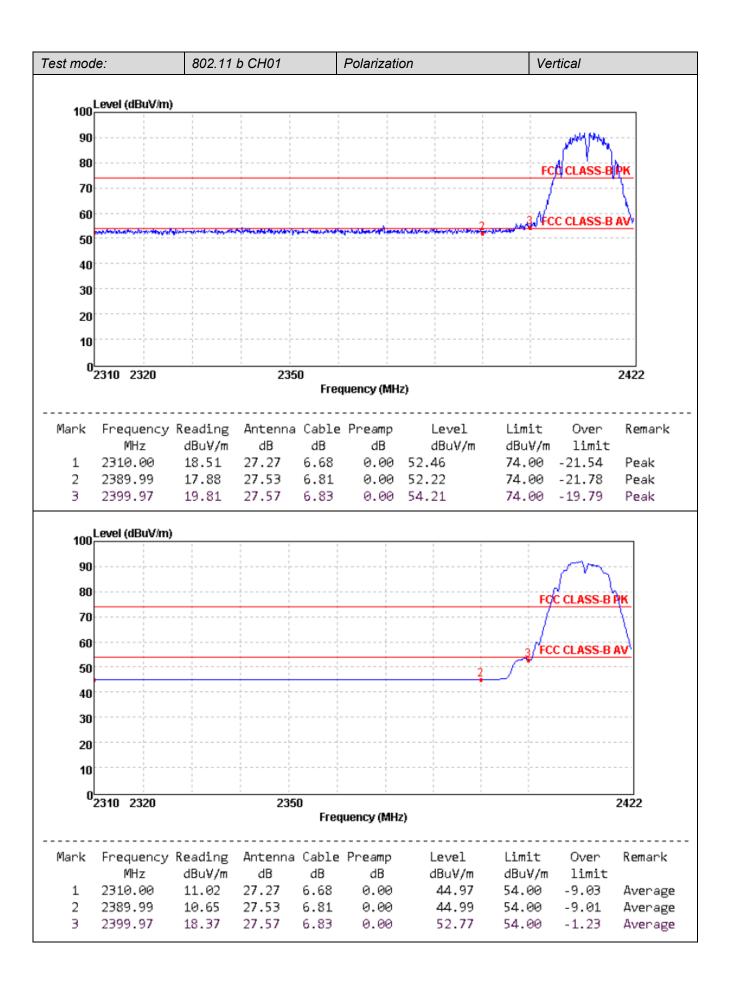


TEST PROCEDURE

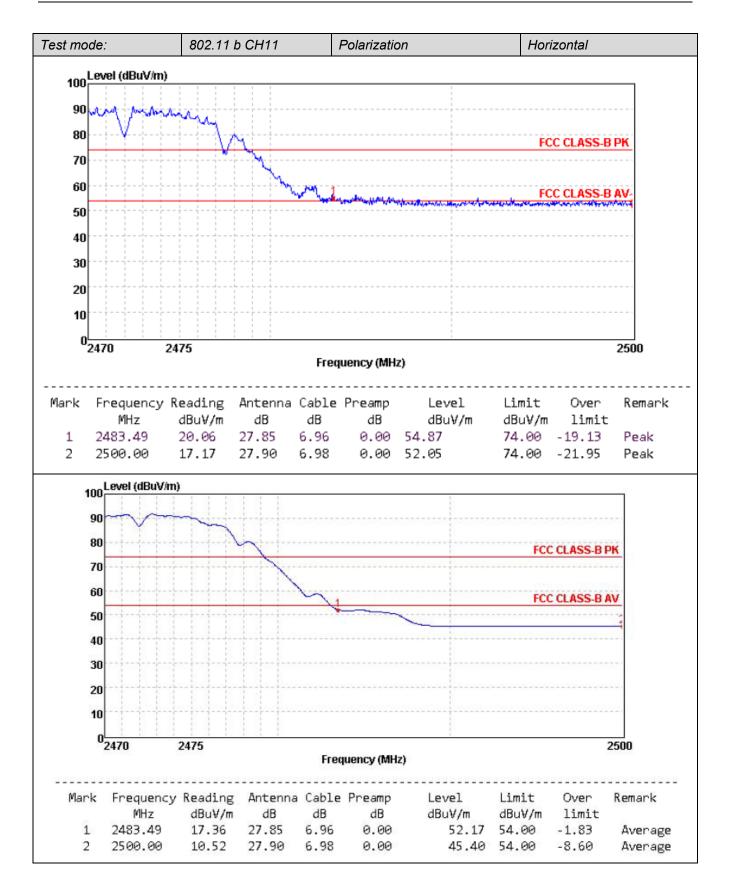
- The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
- 2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated360 degrees to determine the position of the maximum emission level.
- 3. The EUT waspositioned such that the distance from antenna to the EUT was 3 meters.
- 4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. Thisis repeated for both horizontal and vertical polarization of the antenna. In order to find themaximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
- The receiver set as follow: RBW=1MHz, VBW=3MHz for Peak value RBW=1MHz, VBW=10Hz for Average value.
- 6. Pre-scan 2310-2390MHz,2483.5-2500MHz,and only mark the worst case data in the test report

TEST RESULTS

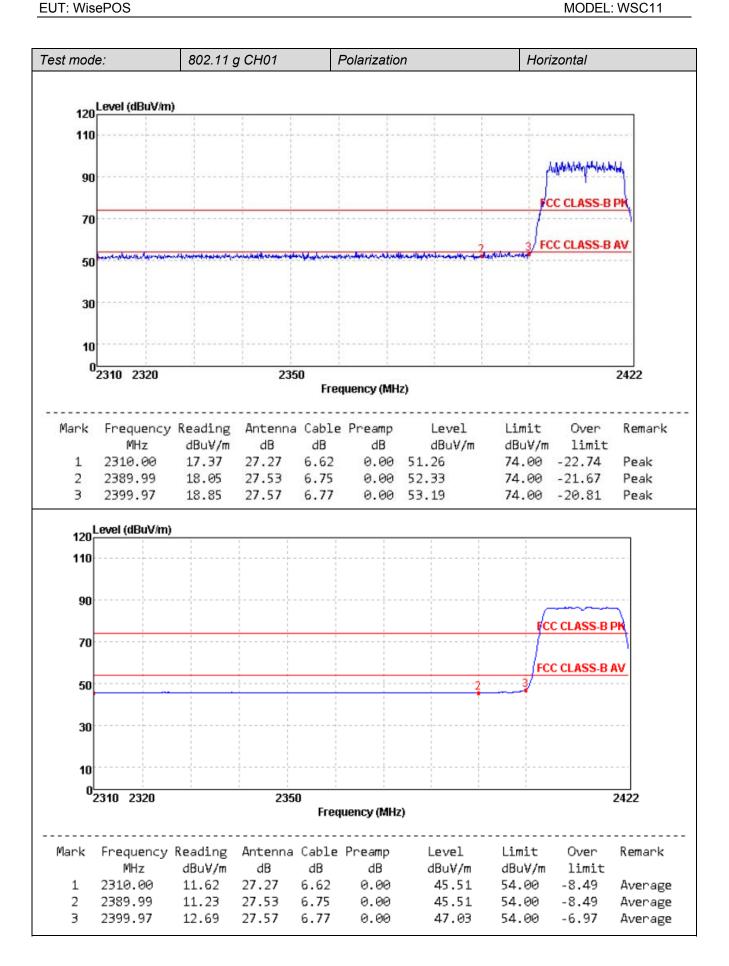


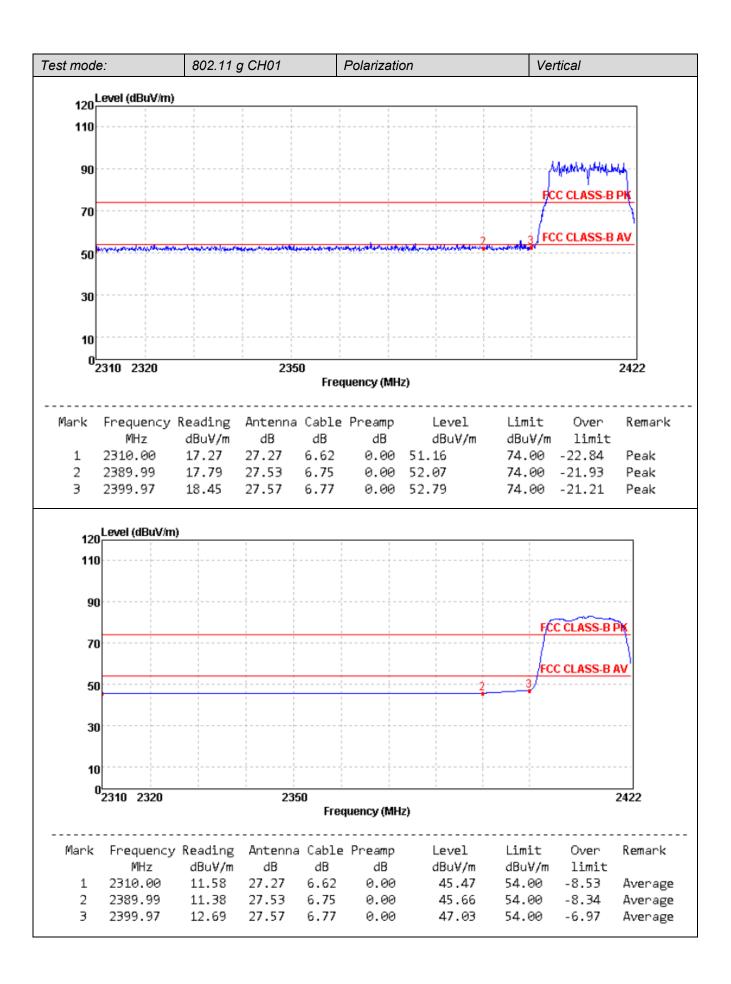


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