



RADIO TEST REPORT

ETSI EN 300 328 V1.7.1 (2006-10)

Product : Wireless AP

Trade Name : N/A

Model Name : WNP-RP-002

Serial Model : WT-U26, JWA-N2308

Report No. : NTEK-2013NT0905144R-01

Prepared for

Gembird Europe B.V.

Wittevrouwen 56, 1358 CD, Almere Haven, The Netherlands

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 : Gembird Europe B.V.
Address : Wittevrouwen 56, 1358 CD, Almere Haven, The Netherlands
Manufacture's Name..... : Shenzhen Yichen Technology Development Co., Ltd.
Address : 5F, No.1, Honghualing 2nd Industrial Zone, Xili Town, Nanshan District, Shenzhen, Guangdong, People's Republic Of China

Product description

Product name : Wireless AP
Trademark : N/A
Model and/or type reference : WNP-RP-002
Serial Model : WT-U26, JWA-N2308
Rating(s) : AC 230V/50Hz

Standards : ETSI EN 300 328 V1.7.1 (2006-10)

This device described above has been tested by Shenzhen NTEK, and the test results show that the equipment under test (EUT) is in compliance with the 1999/5/EC R&TTE Directive Art.3.2 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 : 05 Sep. 2013 ~16 Sep. 2013
Date of Issue..... : 17 Sep. 2013
Test Result..... : **Pass**

Testing Engineer : Polo Cha
(Polo Cha)

Technical Manager : Brown Lu
(Brown Lu)

Authorized Signatory : Bovey Yang
(Bovey Yang)



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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

ETSI EN 300 328 V1.7.1				
Clause	Test Item	Limit	Frequency Range (MHz)	Applicable (Yes/No)
TRANSMITTER PARAMETERS				
4.2.1 4.3.4	Number of hopping channel	≥ 15	2400-2483.5	N
	Hopping channel carrier frequency separated	the 20dB bandwidth of the hopping channel		
	Average time of occupancy	≤ 0.4 sec		
4.3.1	Effective radiated power	AV: -10 dBW(20 dBm)	2400-2483.5	Y
4.3.2	Peak power density	FHSS N/A	2400-2483.5	N
		DSSS/OFDM, Other modulation 10 mW/MHz	2400-2483.5	Y
4.3.3	Frequency range	FHSS / e.i.r.p. -80dBm/Hz	2400-2483.5	N
		Other modulation / e.i.r.p. -80dBm/Hz	2400-2483.5	Y
4.3.6	Spurious emissions (conducted)	Operating: -36dBm Standby: -57dBm	30-1000	N
		Operating: -30dBm Standby: -47dBm	1000-12750	
		Operating: -47dBm Standby: -47dBm	1800-1900 5150-5300	
4.3.6	Spurious emissions (radiated)	Operating: -36dBm Standby: -57dBm	30-1000	Y
		Operating: -30dBm Standby: -47dBm	1000-12750	
		Operating: -47dBm Standby: -47dBm	1800-1900 5150-5300	
		-47dBm	1000-12750	
4.3.5	MEDIUM ACCESS PROTOCOL			Y
RECEIVER PARAMETERS				
4.3.7	Spurious emissions (conducted)	-57dBm	30-1000	N
		-47dBm	1000-12750	
	Spurious emissions (radiated)	-57dBm	30-1000	Y

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 Registered No.: 238937 IC Registered No.:9270A-1

CNAS Registration No.:L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded 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	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^\circ\text{C}$
7	Humidity	$\pm 2\%$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless AP	
Brand Name	N/A	
Model Name.	WNP-RP-002	
Serial Model	WT-U26, JWA-N2308	
Model Difference	All the model are the same circuit and RF module,except the mode names.	
Product Description	The EUT is Wireless AP	
	Operation Frequency:	802.11b/g/n(20MHz): 2412~2472MHz 802.11n(40MHz):2422~2462MHz
	Modulation Type:	CCK/OFDM/DBPSK/DAPSK
	Bit Rate of Transmitter	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n(20MHz):150/144.44/130/117/115.56/104/86.67/78/52/6.5Mbps 802.11n(40MHz):300/270/240/180/150/120/108/90/54 Mbps
	Number Of Channel	13CH .Please see Note 2.
	Antenna Designation:	FPCB Antenna
	Antenna Gain(Peak)	1.0dBi
	EIRP Power:	802.11b: 15.67 dBm (Max.) 802.11g: 14.83 dBm (Max.) 802.11n(20M) : 13.87 dBm (Max.) 802.11n (40M): 11.65 dBm (Max.)
	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	Refer to below
Adapter	N/A	
Battery	N/A	
Hardware Version	N/A	
Software Version	N/A	

Note:

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

2.

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	05	2432	09	2452	13	2472
02	2417	06	2437	10	2457		
03	2422	07	2442	11	2462		
04	2427	08	2447	12	2467		

2.2 TEST CONDITIONS AND CHANNEL

	Normal Test Conditions	Extreme Test Conditions
Temperature	15°C - 35°C	-20°C ~ 55°C Note: (1)
Relative Humidity	20% - 75%	N/A
Supply Voltage	DC 3.7V	DC 3.5V – DC 4.2V Note: (2)

11B/11G/11N(20M)

Test Channel	EUT Channel	Test Frequency (MHz)
lowest	CH01	2412
middle	CH07	2442
highest	CH13	2472

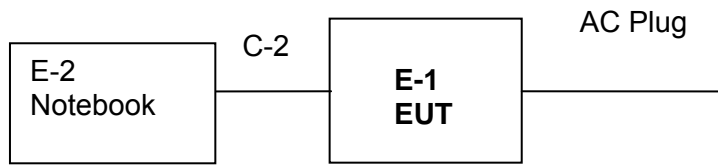
11G/11N(40M)

Test Channel	EUT Channel	Test Frequency (MHz)
lowest	CH03	2422
middle	CH07	2442
highest	CH11	2462

Note:

- (1) The HT 55°C and LT -20°C was declared by manufacturer, The EUT couldn't be operate normally with higher or lower temperature.
- (2) The High Voltage 4.2V and Low Voltage 3.5V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.
- (3) The measurements are performed at the highest, middle, lowest available channels.

2.3 DESCRIPTION OF TEST CONDITIONS



2.4 DESCRIPTION OF SUPPORT UNITS

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	Wireless AP	N/A	WNP-RP-002	N/A	EUT
E-2	Notebook	DELL	PP10L	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	80cm	

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

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	160400005	2013.07.06	2014.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2013.07.06	2014.07.05	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2013.07.06	2014.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2013.07.06	2014.07.05	1 year
5	Spectrum Analyzer	ADVANTES T	R3132	150900201	2013.07.06	2014.07.05	1 year
6	Horn Antenna	EM	EM-AH-20180	2011071402	2013.07.06	2014.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2013.07.06	2014.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2013.07.06	2014.07.05	1 year
9	Loop Antenna	ARA	PLA-2030/B	1029	2013.07.06	2014.07.05	1 year
10	Power Meter	R&S	NRVS	100696	2013.07.06	2014.07.05	1 year
11	Signal Generator	R&S	SMT 06	832080/007	2013.07.06	2014.07.05	1 year
12	Temperature & Humidity Chamber	GIANT FORCE	GTH-056P	GF-94454-1	2013.07.06	2014.07.05	1 year
13	Power Sensor (AV)	R&S	URV5-Z4	0395.1619.05	2013.07.06	2014.07.05	1 year

3. EFFECTIVE RADIATED POWER

3.1 APPLIED PROCEDURES / LIMIT

Clause	Test Item	Limit
4.3.1	Effective radiated power	AV: -10 dBW (20 dBm)

3.1.1 MEASURING INSTRUMENTS AND SETTING

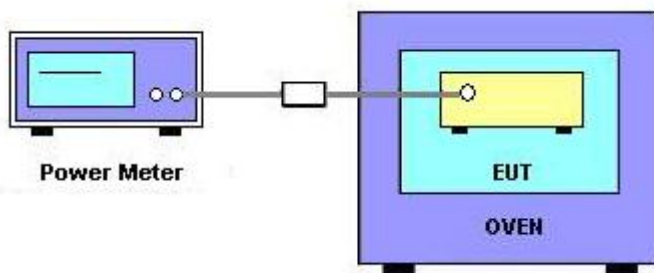
Please refer to section 4.1.1 in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Filter No.	Auto
Measurement time	0.135 s ~ 26 s
Used Average Sensor	URV5-Z4

3.1.2 TEST PROCEDURES

- a. Since a temporary antenna connector can be attached on the RF output port, so conducted measurement method was used in this case.
- b. A wide band power meter with a matched thermocouple detector was used to directly measure the output power from the RF output port of the EUT in continuously transmitting mode.
- c. The EIRP = $A+G+10*\log(1/x)$, where A is the power measured in (1), G is the gain of the antenna of the EUT in dBi and x is the duty cycle of the EUT in continuously transmitting mode.
- d. The measurement shall be repeated at the lowest, the Wireless AP dle, and the highest channel of the stated frequency range. These measurements shall also be performed at normal and extreme test conditions.

3.1.3 TEST SETUP LAYOUT



3.1.4 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.1.5 TEST RESULTS

EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26°C	Relative Humidity:	60 %
Pressure :	1012 hPa	Test Voltage :	DC3.7V(NORMAL)
Test Mode :	TX 11B Mode CH1 / CH7 / CH13		

TEST CONDITIONS				Average EIRP Power (dBm)		
				CH1	CH7	CH13
T nom (°C)	20	V nom (V)	3.7	15.67	15.63	15.24
T min (°C)	-20	V max (V)	4.2	15.58	15.12	15.37
		V min (V)	3.5	15.44	15.45	15.31
T max (°C)	55	V max (V)	4.2	15.38	15.49	15.46
		V min (V)	3.5	15.41	15.50	15.25
Max Peak Power				15.67dBm		
Limits				20dBm (-10dBW)		
Result				Complies		

EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26°C	Relative Humidity:	60 %
Pressure :	1012 hPa	Test Voltage :	DC3.7V(NORMAL)
Test Mode :	TX 11G Mode CH1 / CH7 / CH13		

TEST CONDITIONS				Average EIRP Power (dBm)		
				CH1	CH7	CH13
T nom (°C)	20	V nom (V)	3.7	14.53	14.66	14.75
T min (°C)	-20	V max (V)	4.2	14.76	14.83	14.53
		V min (V)	3.5	14.65	14.76	14.55
T max (°C)	55	V max (V)	4.2	14.37	14.57	11.55
		V min (V)	3.5	14.64	14.86	14.57
Max Peak Power				14.83 dBm		
Limits				20dBm (-10dBW)		
Result				Complies		

EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26°C	Relative Humidity:	60 %
Pressure :	1012 hPa	Test Voltage :	DC3.7V(NORMAL)
Test Mode :	TX 11N Mode CH1 / CH7 / CH13/20MHz		

TEST CONDITIONS				Average EIRP Power (dBm)		
				CH1	CH7	CH13
T nom (°C)	20	V nom (V)	3.7	13.87	13.58	13.74
T min (°C)	-20	V max (V)	4.2	13.69	13.71	13.66
		V min (V)	3.5	13.75	13.68	13.42
T max (°C)	55	V max (V)	4.2	13.64	13.70	13.62
		V min (V)	3.5	13.72	13.54	13.55
Max Peak Power				13.87 dBm		
Limits				20dBm (-10dBW)		
Result				Complies		

EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26°C	Relative Humidity:	60 %
Pressure :	1012 hPa	Test Voltage :	DC3.7V(NORMAL)
Test Mode :	TX 11N Mode CH3 / CH7 / CH11/40MHz		

TEST CONDITIONS				Average EIRP Power (dBm)		
				CH3	CH7	CH11
T nom (°C)	20	V nom (V)	3.7	11.63	11.22	11.65
T min (°C)	-20	V max (V)	4.2	11.45	11.37	11.25
		V min (V)	3.5	11.38	11.40	11.36
T max (°C)	55	V max (V)	4.2	11.59	11.36	11.41
		V min (V)	3.5	11.43	11.53	11.32
Max Peak Power				11.65 dBm		
Limits				20dBm (-10dBW)		
Result				Complies		

4. PEAK POWER DENSITY

4.1 APPLIED PROCEDURES / LIMIT

Clause	Test Item	Limit
4.3.2	Peak power density	FHSS N/A
		DSSS/OFDM, Other modulation 10 mW/MHz

4.1.1 MEASURING INSTRUMENTS AND SETTING

Please refer to section 5.1.1 in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Filter No.	Auto
Measurement time	0.135 s ~ 26 s
Used Average Sensor	URV5-Z4

4.1.2 TEST PROCEDURES

Step 1:

Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: The centre frequency of the channel under test.
- Resolution BW: 1 MHz.
- Video BW: 1 MHz.
- Span: Wide enough to cover the complete power envelope of the signal of the UUT.
- Detector: Peak.
- Trace Mode: Max Hold.

Step 2:

When the trace is complete, find the peak value of the power envelope and record the frequency.

Step 3:

Make the following changes to the settings of the spectrum analyser:

- Centre Frequency: Equal to the frequency recorded in step 2.
- Span: 3 MHz.
- Resolution BW: 1 MHz.
- Video BW: 1 MHz.
- Sweep time: 1 minute.
- Detector: Average (see note).
 - Trace Mode: Max Hold.

Note: The detector mode "Average" is often referred to as "RMS Average" or "Sample" but do not use Video Average.

Step 4:

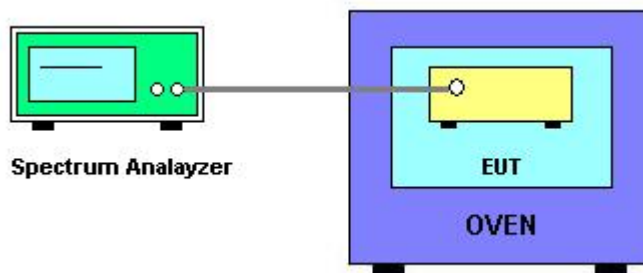
When the trace is complete, capture the trace, for example using the "View" option on the spectrum analyser. Find the peak value of the trace and place the analyser marker on this peak. This level is recorded as the highest mean power (spectral power density) D in a 1 MHz band. Alternatively, where a spectrum analyser is equipped with a facility to measure spectral power density, this facility may be used to display the spectral power density D in dBm/MHz.

Step 5:

The maximum e.i.r.p. spectral density is calculated from the above measured power density (D), the observed duty cycle x (see clause 5.7.2.2, step 1), and the applicable antenna assembly gain "G" in dBi, according to the formula below. If more than one antenna assembly is intended for this power setting, the gain of the antenna assembly with the highest gain shall be used.

- $PD = D + G + 10 \log (1/x)$;
- PD shall be recorded in the test report.

4.1.3 TEST SETUP LAYOUT



4.1.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

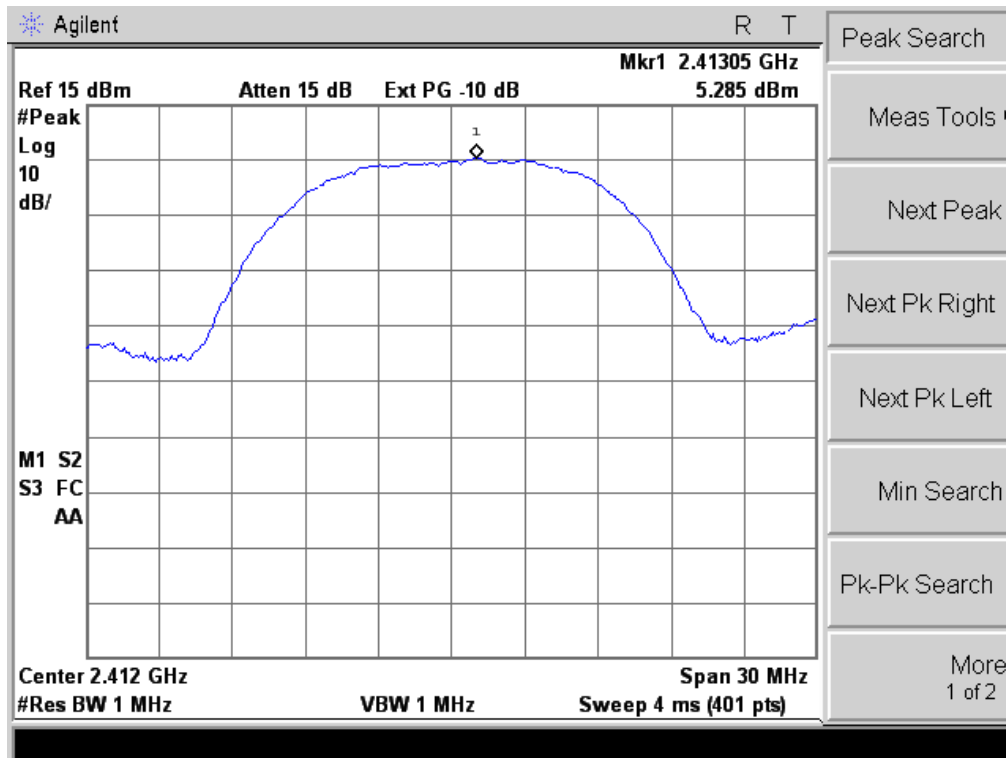
4.1.5 TEST RESULTS

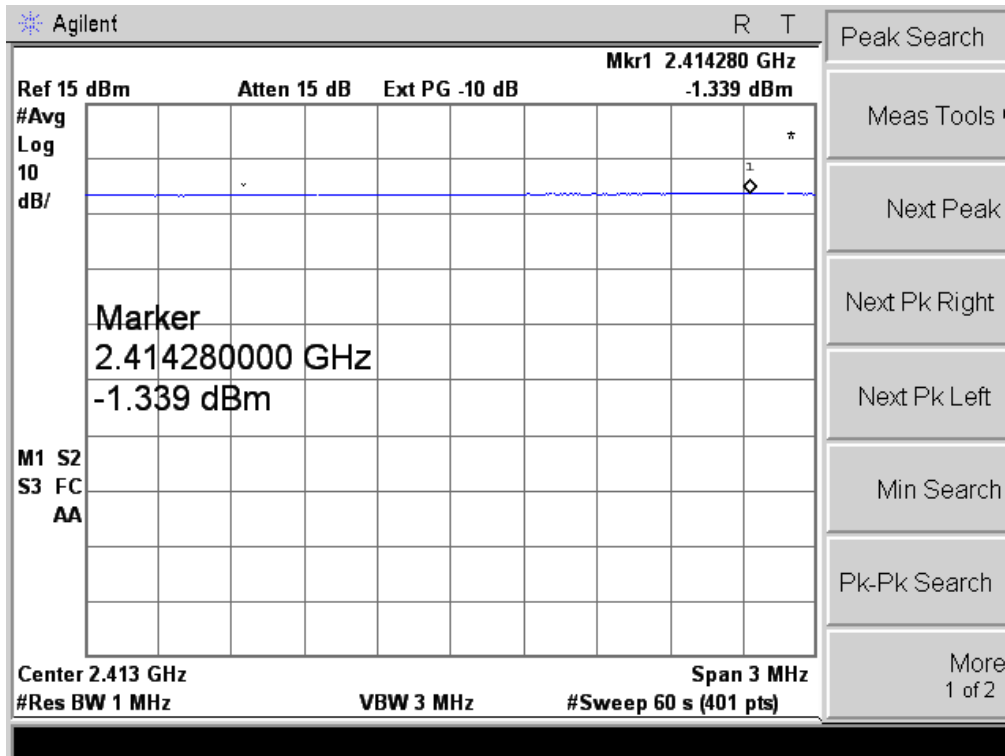
EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26°C	Relative Humidity:	60 %
Pressure :	1012 hPa	Test Voltage :	DC3.7V(NORMAL)
Test Mode :	TX 11B Mode CH1 /CH7/ CH13		

Frequency	Reading (dBm/MHz)	Antenna Gain (dBi)	10 log(1/x)	Power Density (dBm/MHz)	Limit (dBm/MHz)
2412	-1.339	1.0	0	-0.339	10
2442	-1.206	1.0	0	-0.209	10
2472	-1.825	1.0	0	-0.825	10

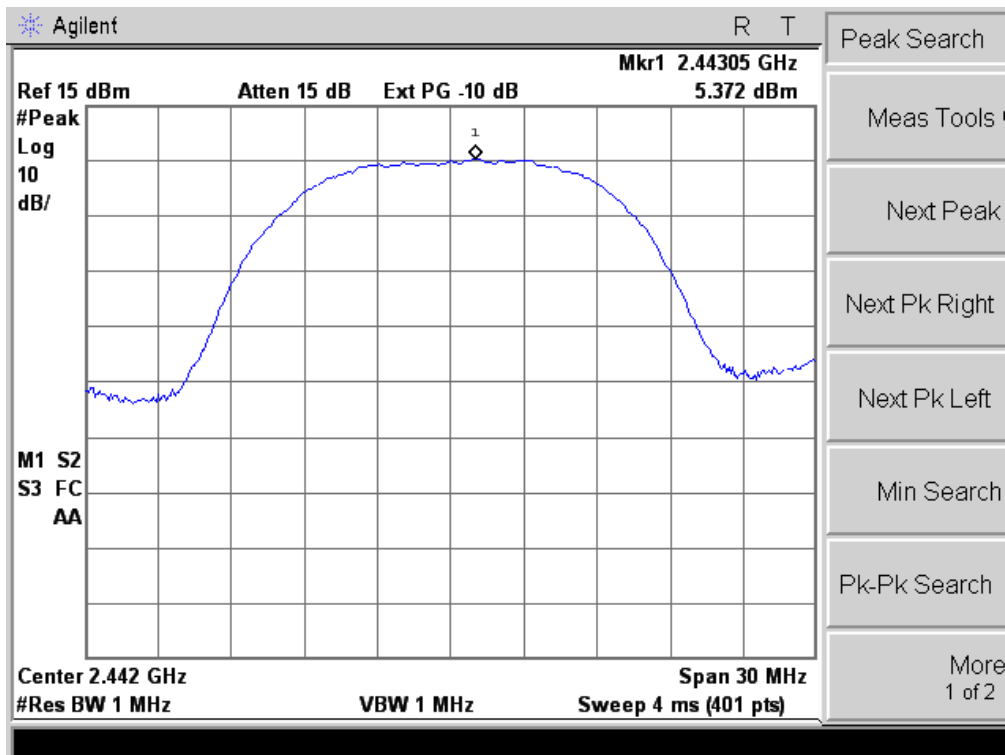
10 log (1/x) = 0, X=duty cycle=Ton/Tp, Ton= 100 ms, Tp= 100 ms

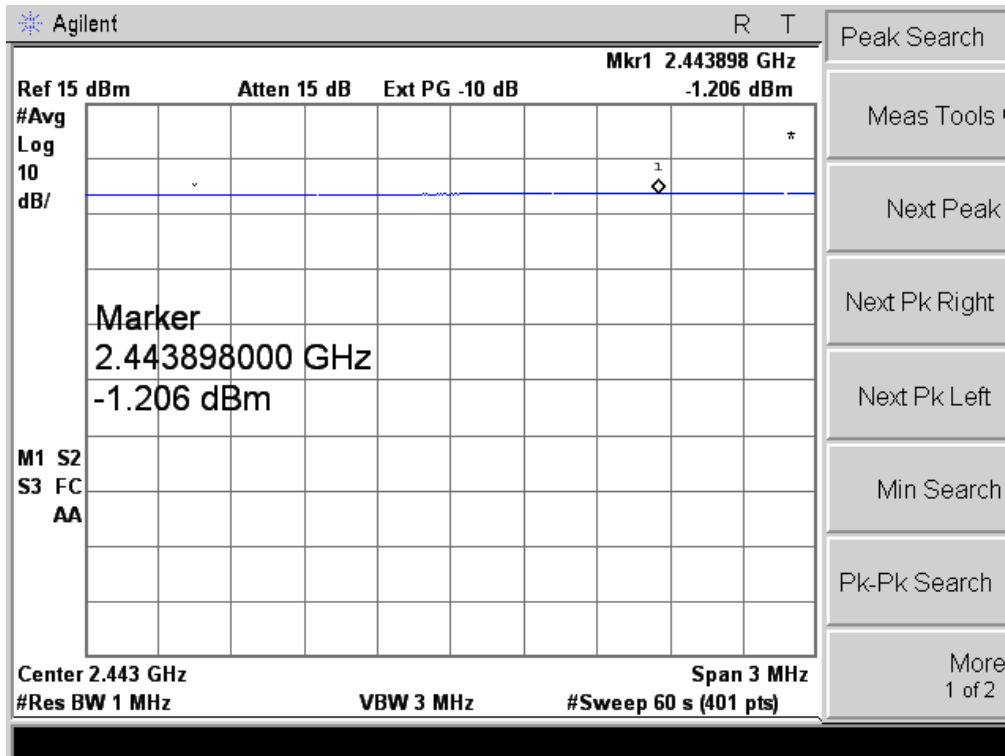
Low Channel



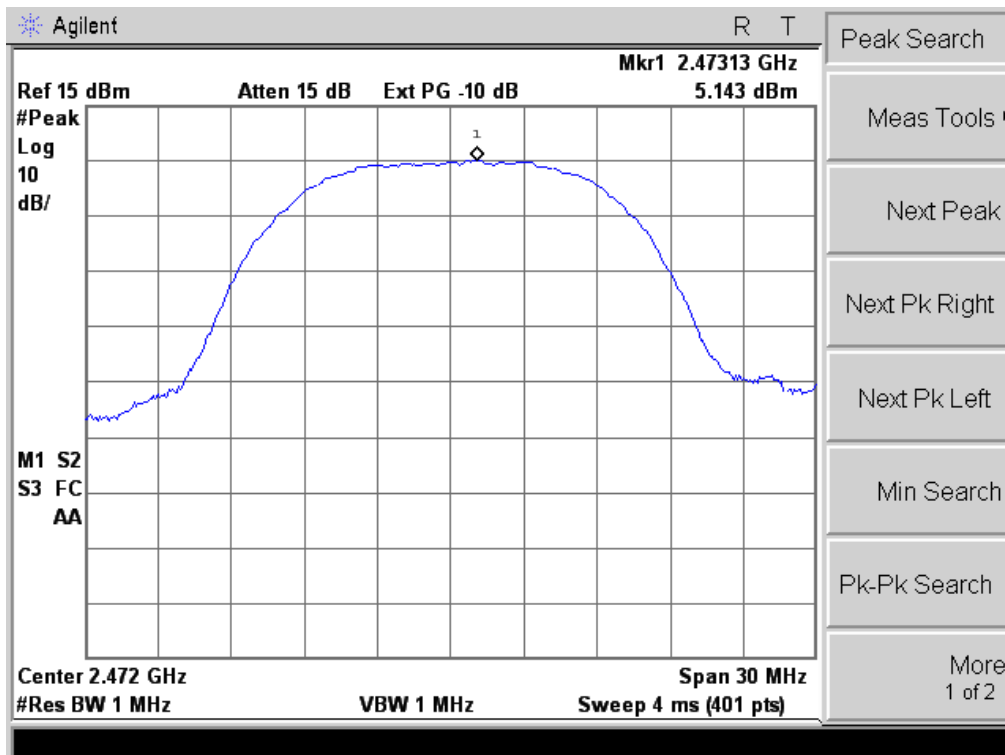


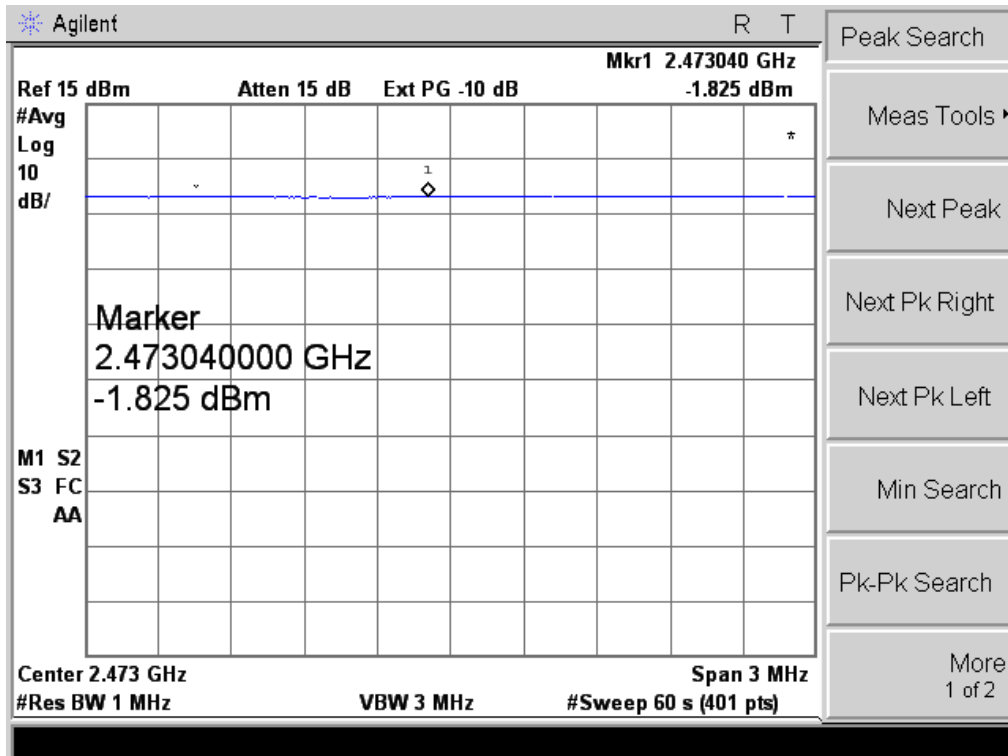
Middle Channel





High Channel



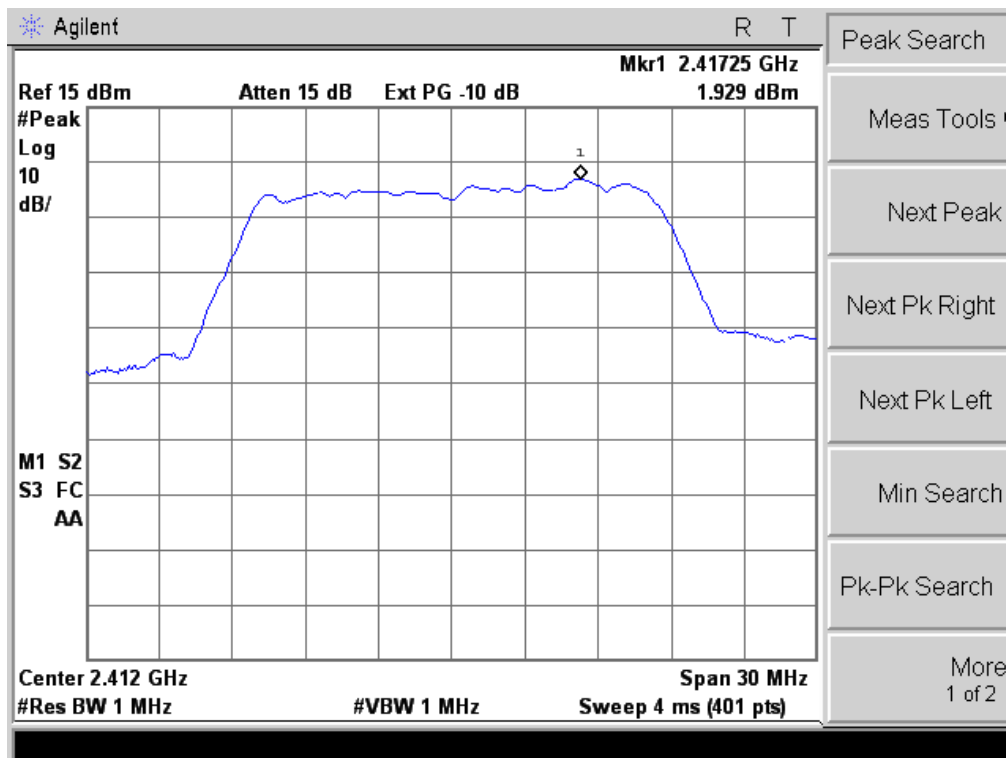


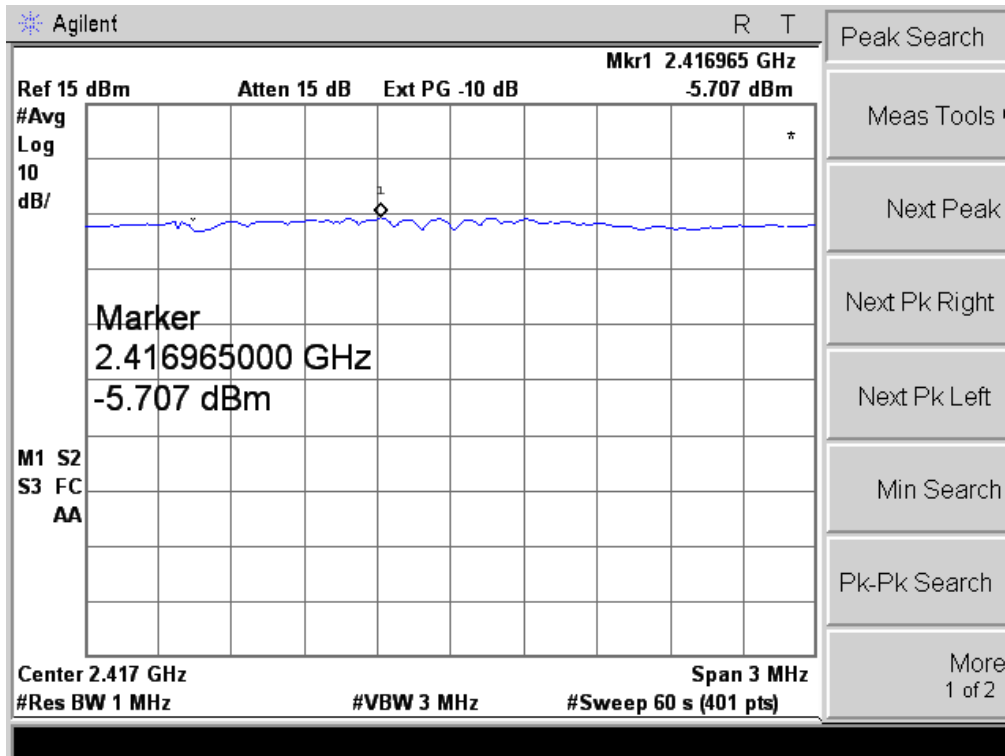
EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26°C	Relative Humidity:	60 %
Pressure :	1012 hPa	Test Voltage :	DC3.7V(NORMAL)
Test Mode :	TX 11G Mode CH1 /CH7/ CH13		

Frequency	Reading (dBm/MHz)	Antenna Gain (dBi)	10 log(1/x)	Power Density (dBm/MHz)	Limit (dBm/MHz)
2412	-5.707	1.0	0	-4.707	10
2442	-4.522	1.0	0	-3.522	10
2472	-3.516	1.0	0	-2.516	10

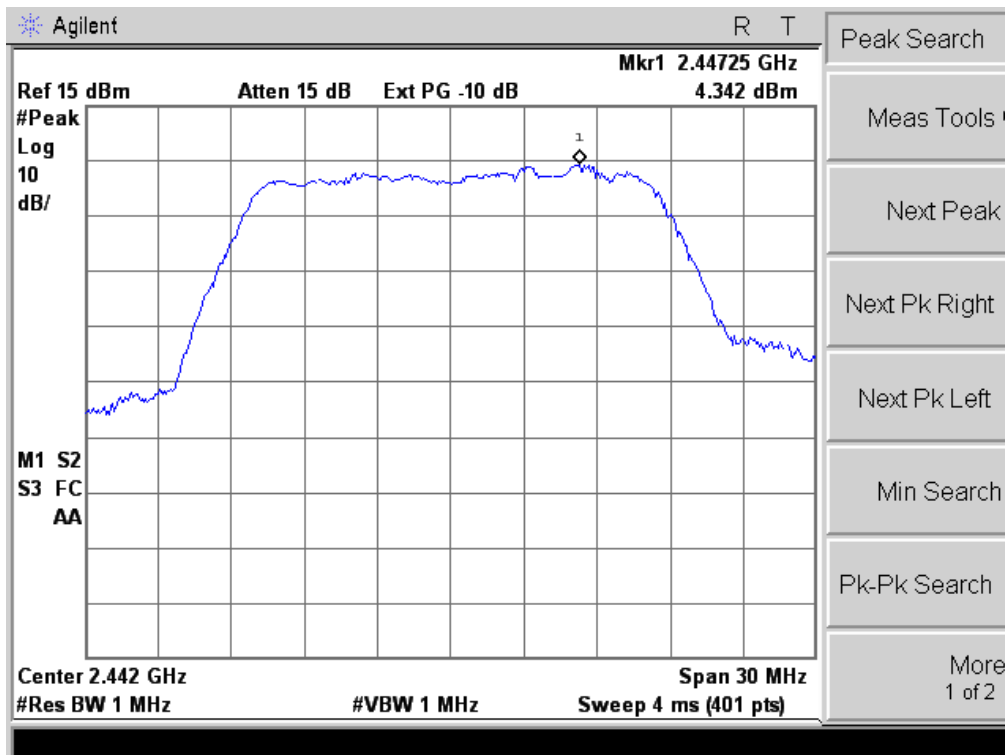
10 log (1/x) = 0, X=duty cycle=Ton/Tp, Ton= 100 ms, Tp= 100 ms

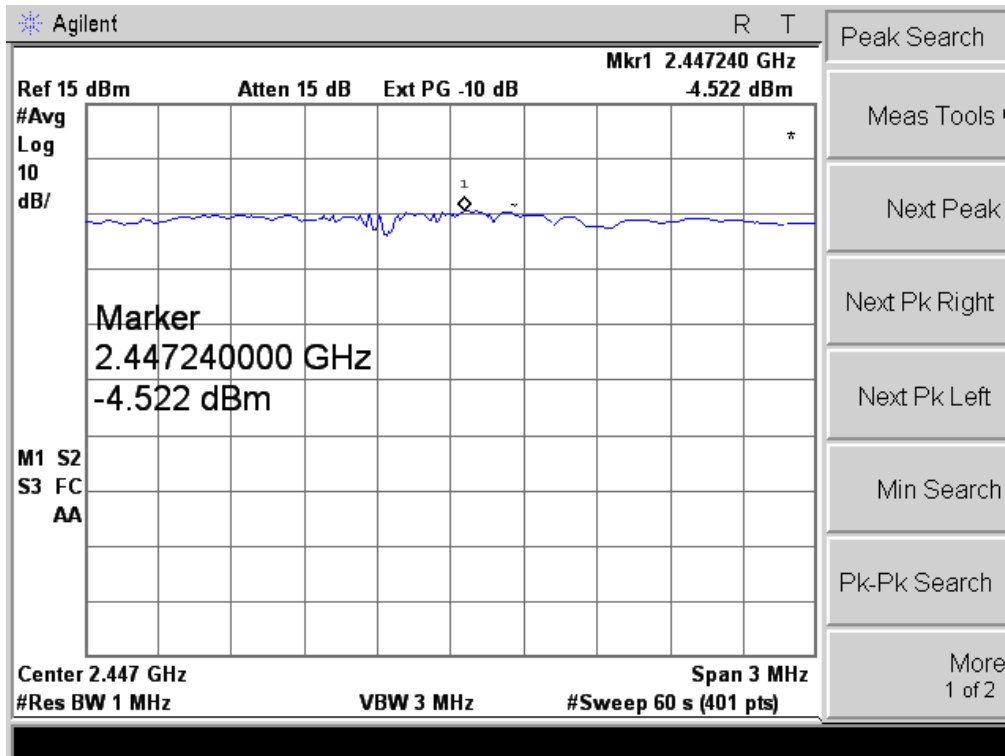
Low Channel



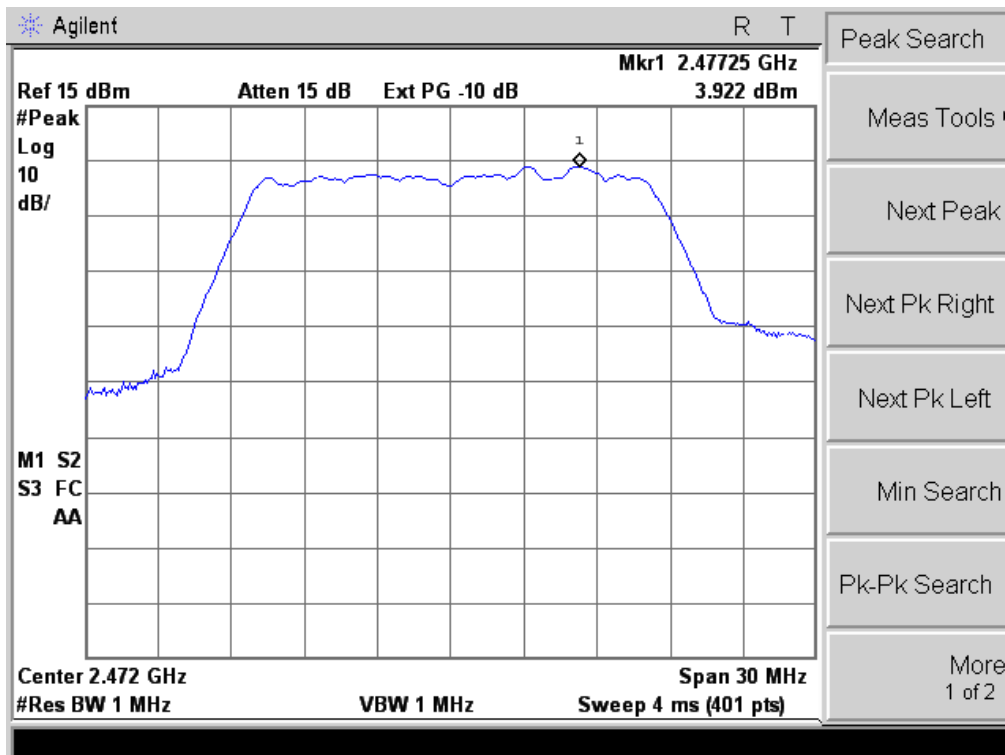


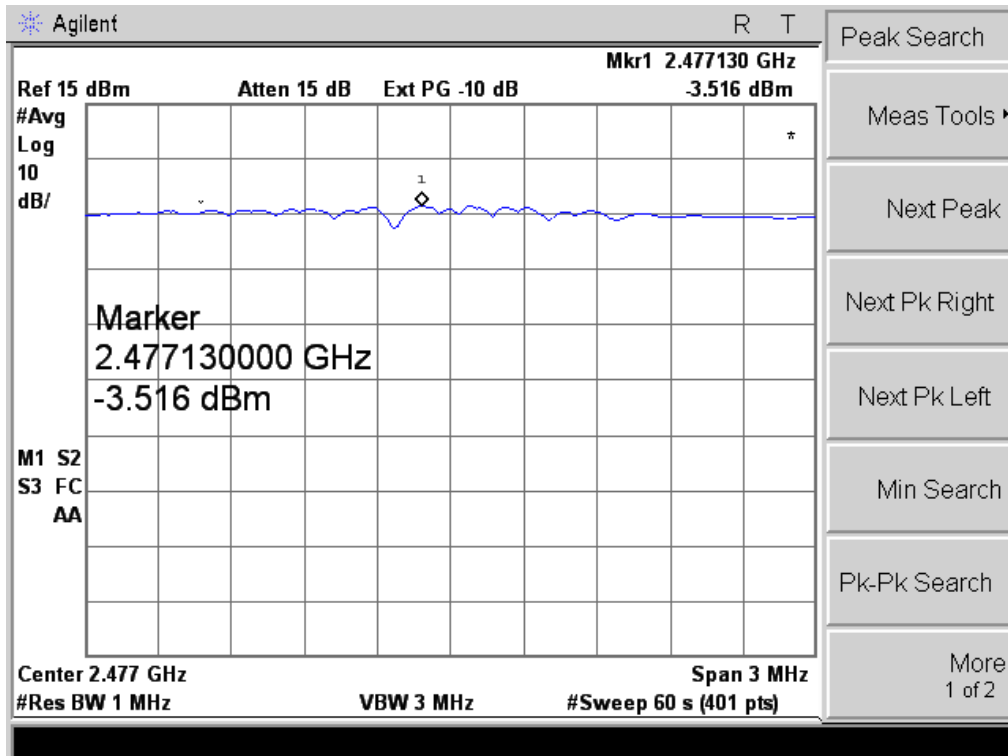
Middle Channel





High Channel



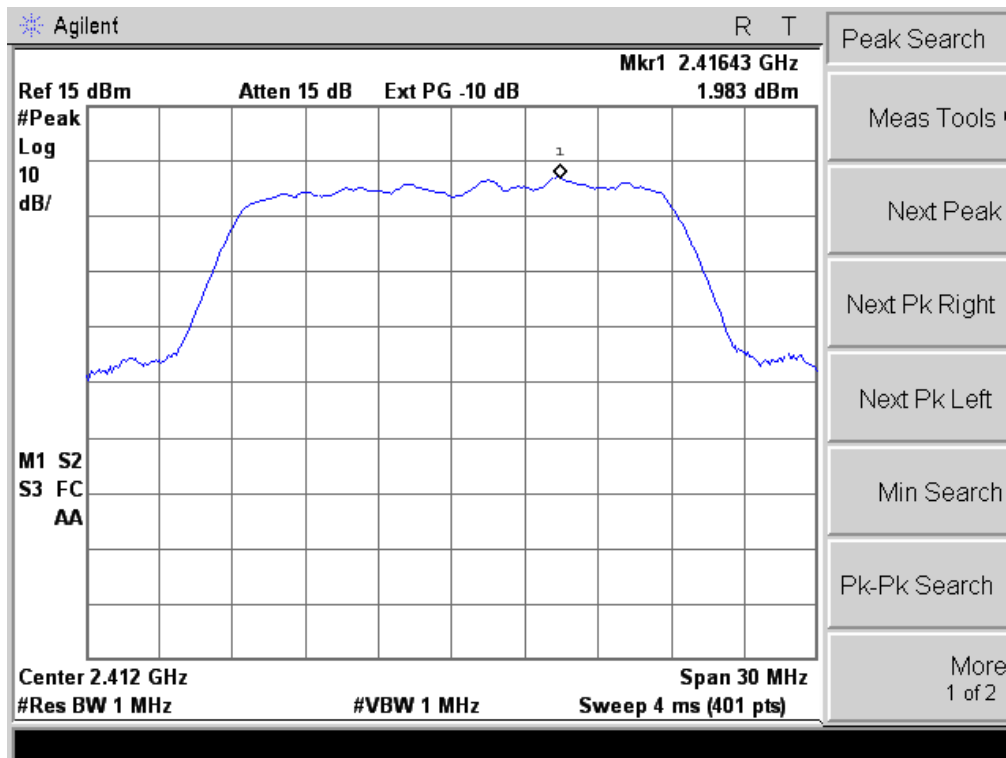


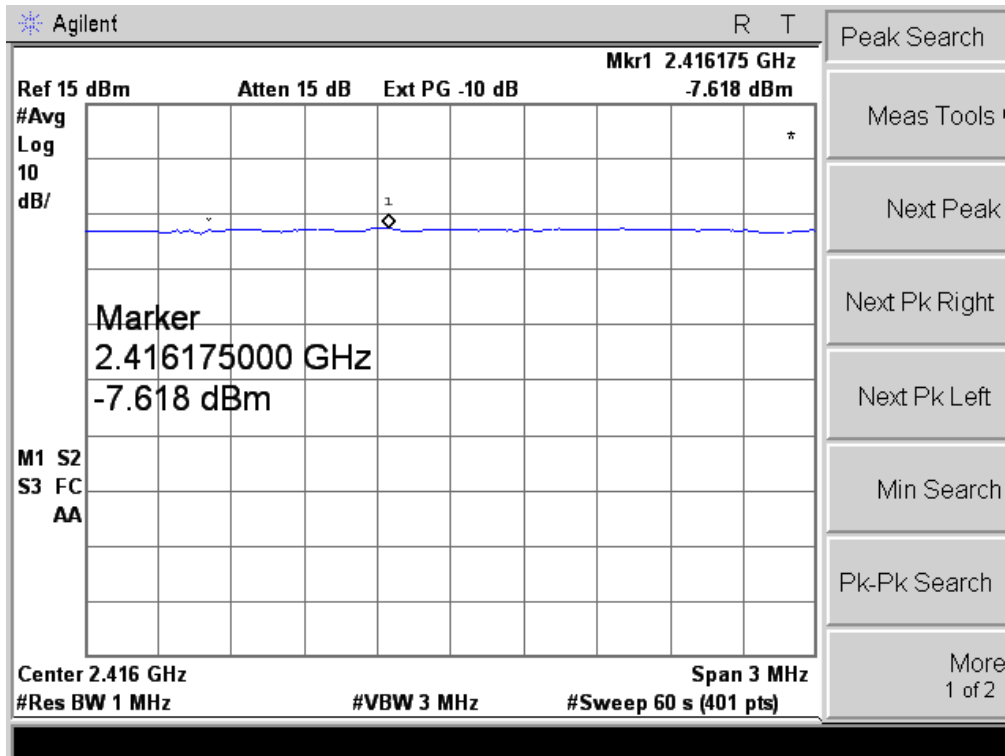
EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26°C	Relative Humidity:	60 %
Pressure :	1012 hPa	Test Voltage :	DC3.7V(NORMAL)
Test Mode :	TX 11N Mode CH1 /CH7/ CH13/20MHz		

Frequency	Reading (dBm/MHz)	Antenna Gain (dBi)	10 log(1/x)	Power Density (dBm/MHz)	Limit (dBm/MHz)
2412	-7.168	1.0	0	-6.168	10
2442	-7.222	1.0	0	-6.222	10
2472	-6.731	1.0	0	-5.731	10

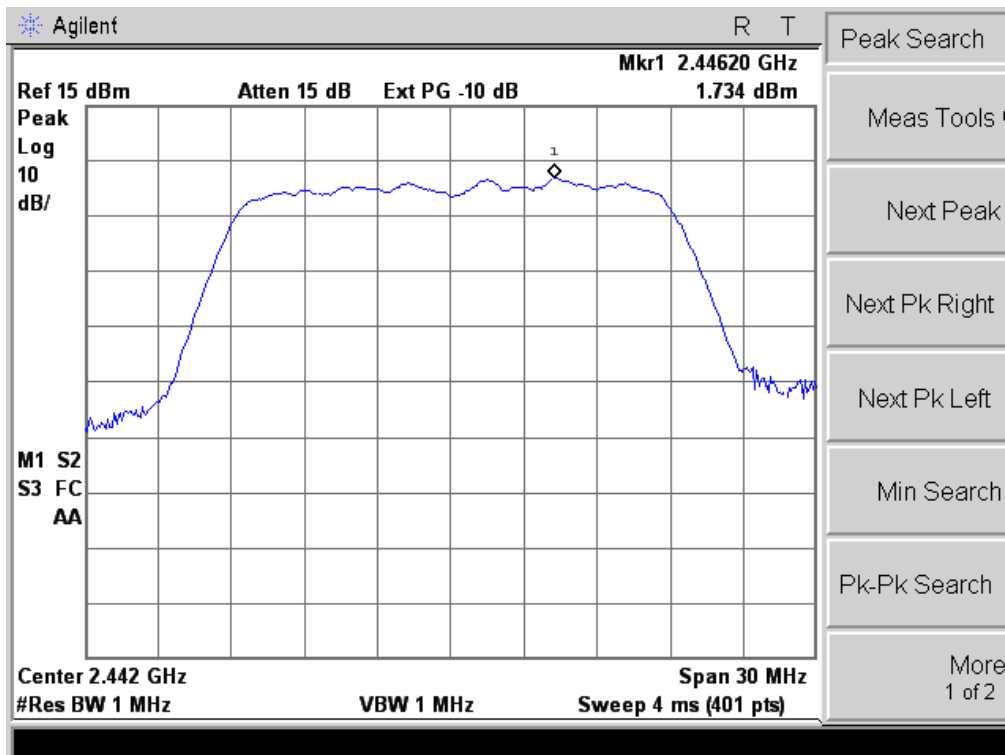
10 log (1/x) = 0, X=duty cycle=Ton/Tp, Ton= 100 ms, Tp= 100 ms

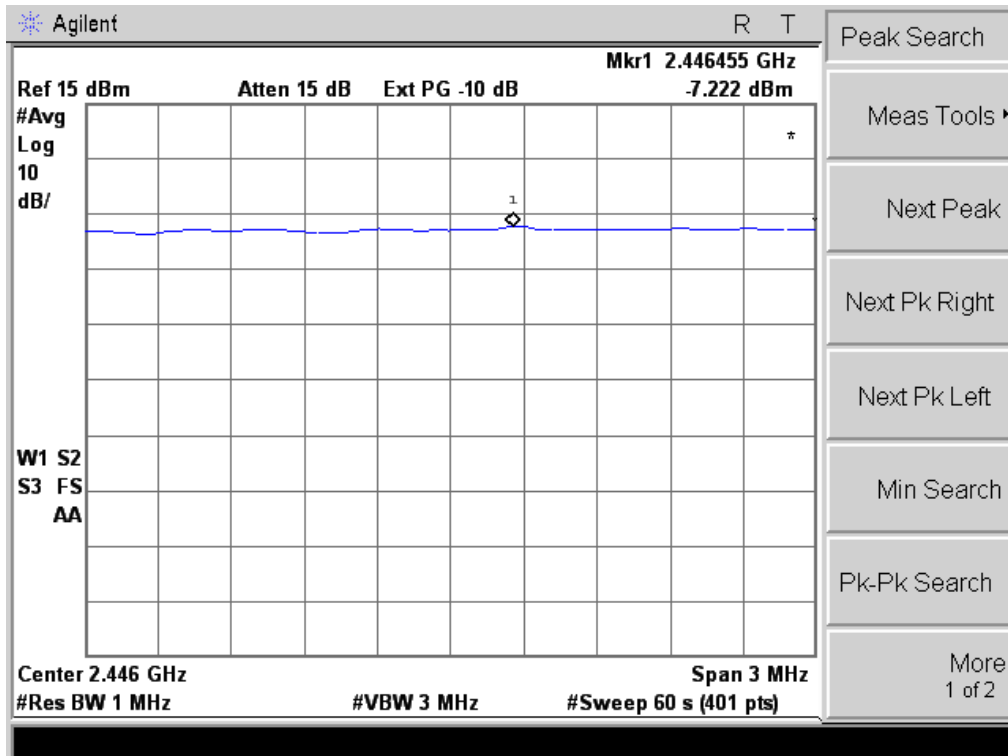
Low Channel



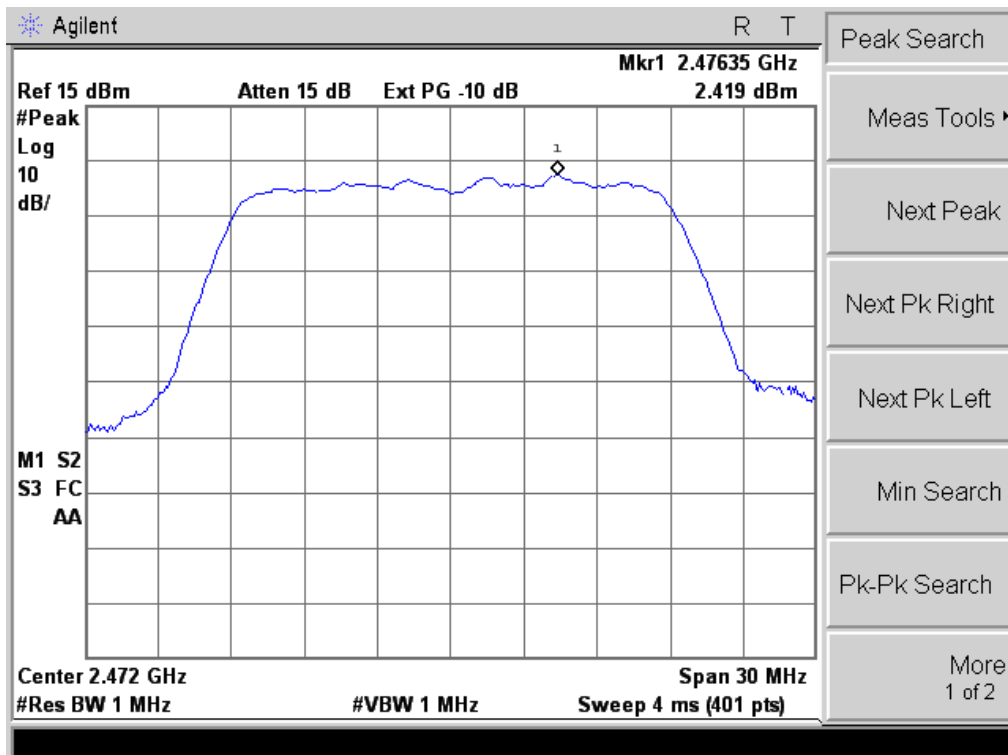


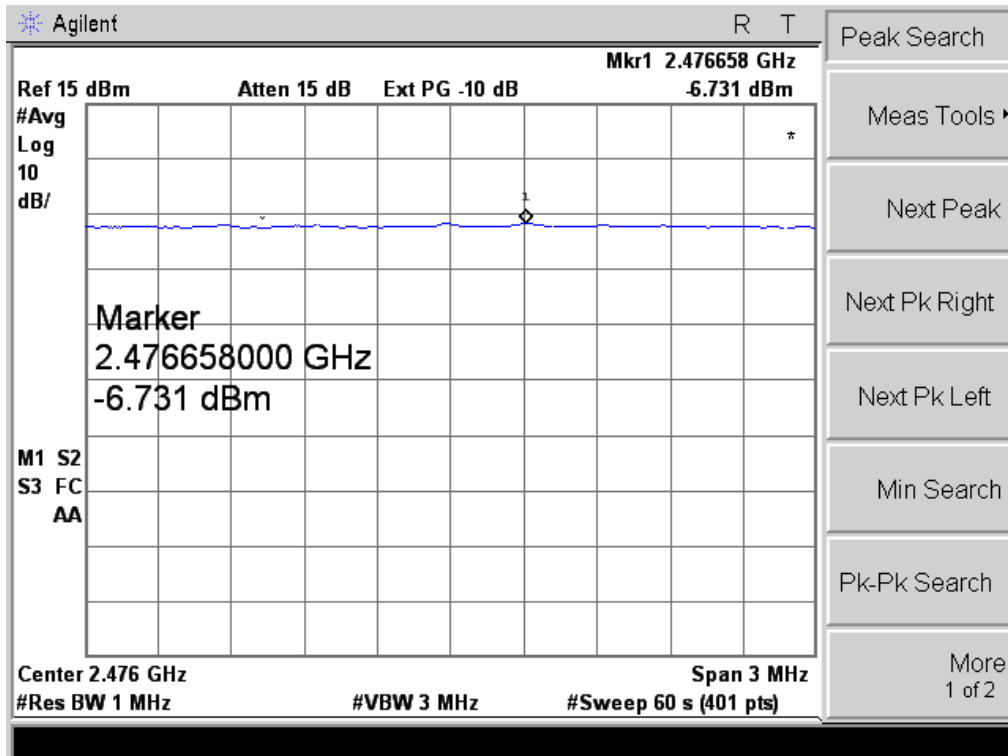
Middle Channel





High Channel



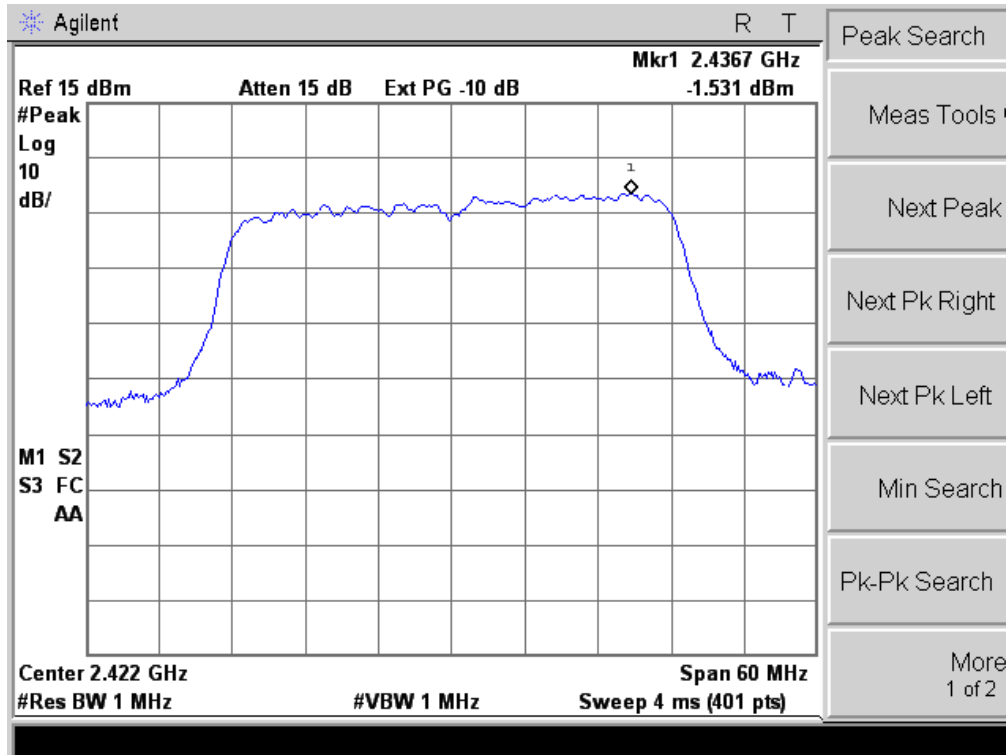


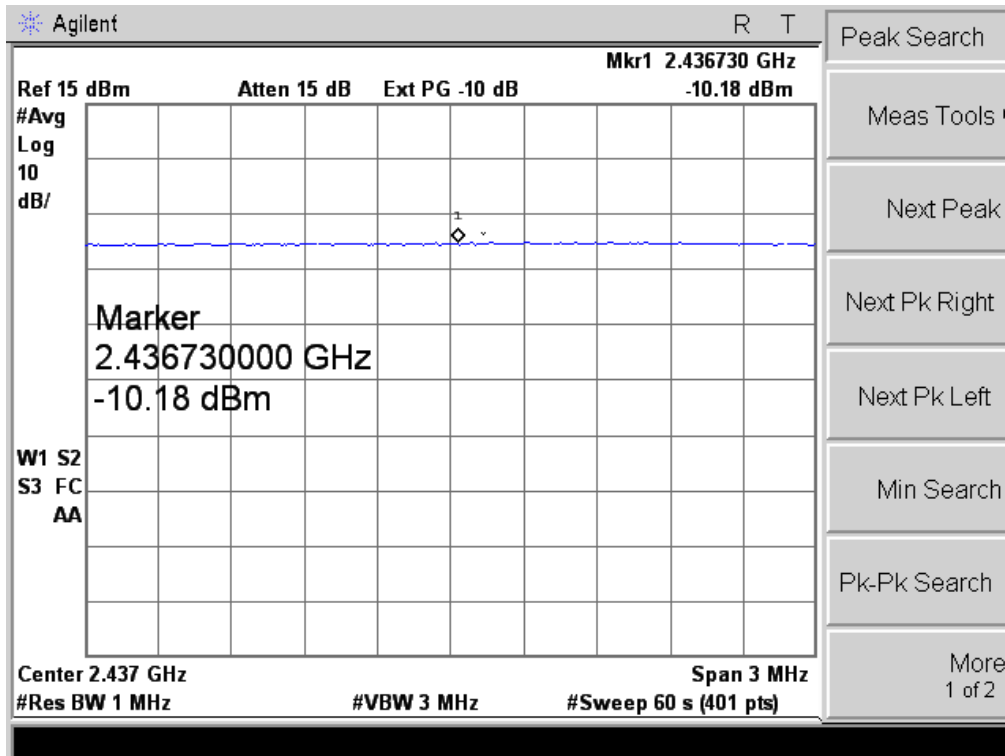
EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26°C	Relative Humidity:	60 %
Pressure :	1012 hPa	Test Voltage :	DC3.7V(NORMAL)
Test Mode :	TX 11N Mode CH3 /CH7/ CH11/40MHz		

Frequency	Reading (dBm/MHz)	Antenna Gain (dBi)	10 log(1/x)	Power Density (dBm/MHz)	Limit (dBm/MHz)
2422	-10.18	1.0	0	-9.18	10
2442	-10.69	1.0	0	-9.69	10
2462	-11.36	1.0	0	-10.36	10

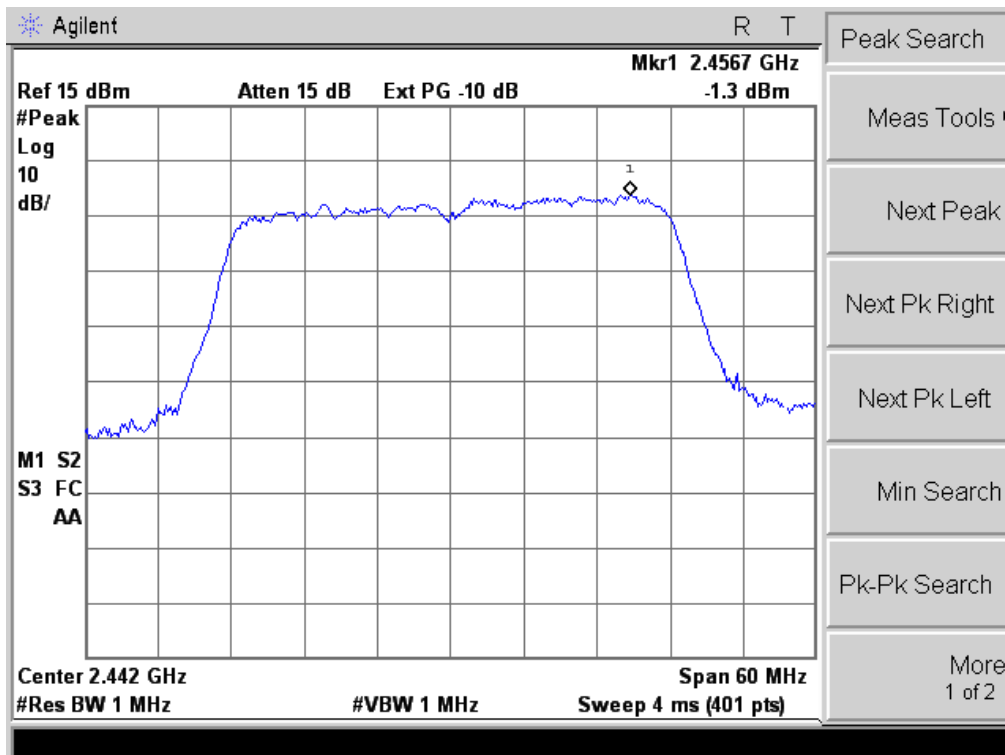
10 log (1/x) = 0, X=duty cycle=Ton/Tp, Ton= 100 ms, Tp= 100 ms

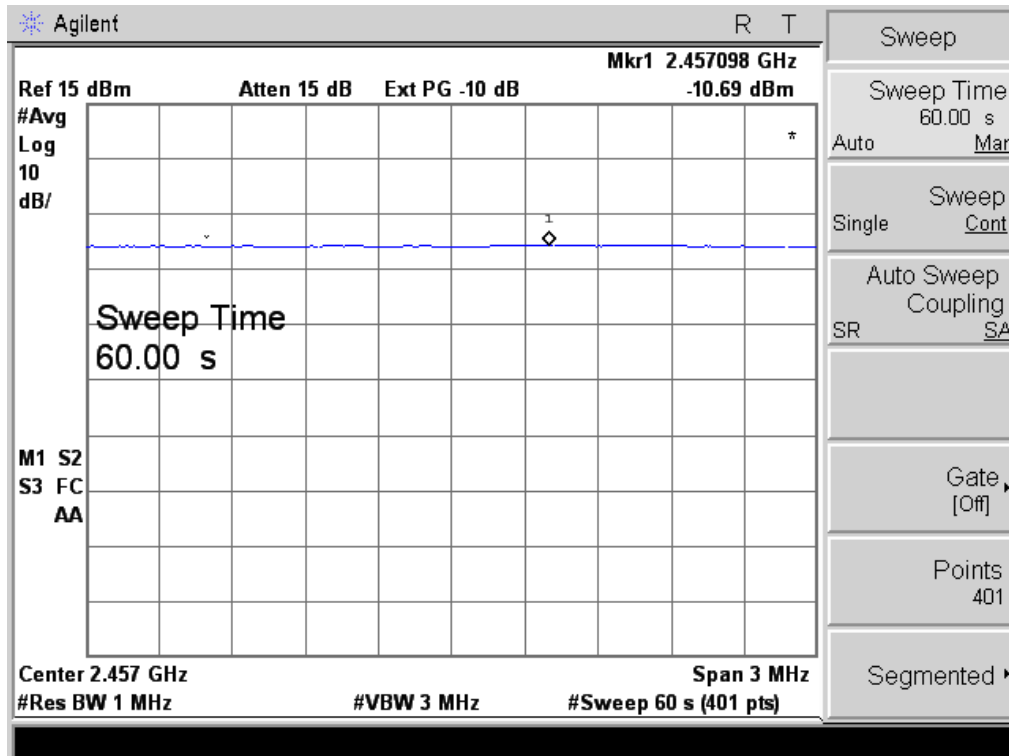
Low Channel



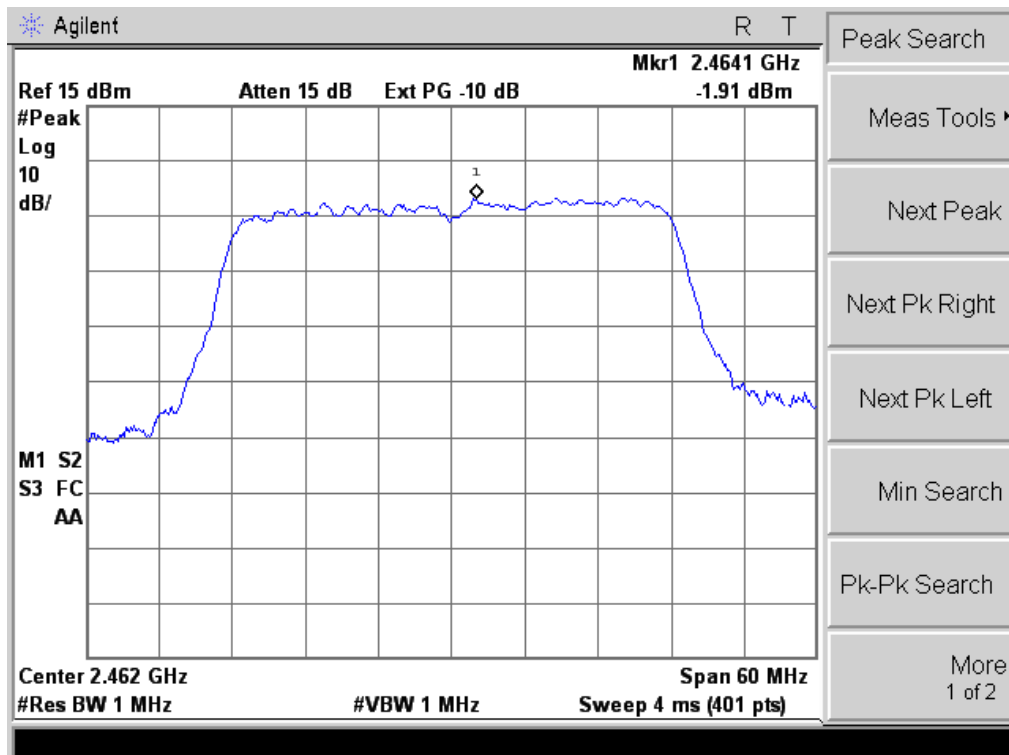


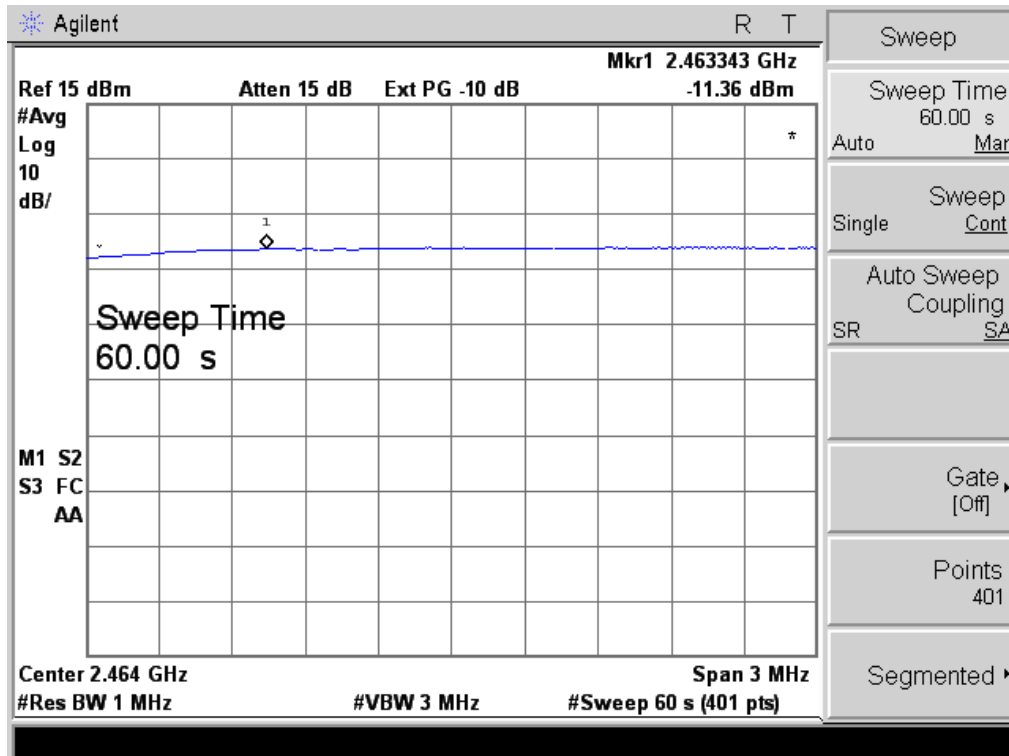
Middle Channel





High Channel





5. FREQUENCY RANGE

5.1 APPLIED PROCEDURES / LIMIT

Clause	Test Item	Limit
4.3.3	Frequency range	-80dBm/Hz

The frequency range of the equipment is determined by the lowest and highest frequencies occupied by the power envelope. f_H is the highest frequency of the power envelope: it is the frequency furthest above the frequency of maximum power where the output power drops below the level of -80 dBm/Hz e.i.r.p. spectral power density (-30 dBm if measured in a 100 kHz bandwidth). f_L is the lowest frequency of the power envelope; it is the frequency furthest below the frequency of maximum power where the output power drops below the level equivalent to -80 dBm/Hz e.i.r.p. spectral power density (or -30 dBm if measured in a 100 kHz bandwidth). The frequency range is determined by the lowest value of f_L and the highest value of f_H resulting from the adjustment of the equipment to the lowest and highest operating frequencies. For all equipment, the frequency range shall lie within the band 2.4 GHz to 2,4835 GHz ($f_L > 2.4$ GHz and $f_H < 2.4835$ GHz).

5.1.1 MEASURING INSTRUMENTS AND SETTING

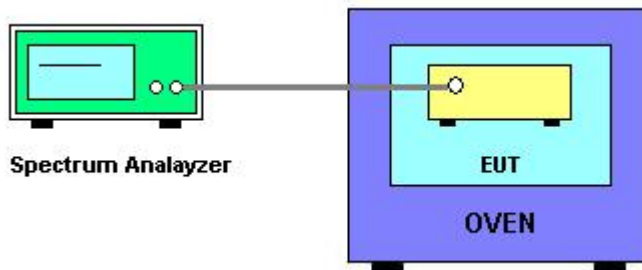
Please refer to section 6.1.1 in this report. The following table is the setting of Spectrum Analyzer.

Spectrum Analyzer	Setting
Attenuation	20~30dB
Span Frequency	40MHz
RB	100 kHz
VB	100 kHz
Detector	Average
Sweep time	$\geq 60s$
Trace	Average 50 sweeps

5.1.2 TEST PROCEDURES

- a. The transmitter output (antenna port) was connected to the spectrum analyzer.
- b. Added [x] dBi of antenna gain was on the spectrum analyzer.
- c. Place the spectrum analyzer in detector averaging mode with a minimum of 50 sweeps selected and activate transmitter with modulation applied.
- d. Select lowest operating frequency of the equipment under test.
- e. Find lowest frequency below the operating frequency at which spectral power density drops below -80 dBm/Hz e.i.r.p. (-30 dBm if measured in a 100 kHz bandwidth). This frequency shall be recorded (fL).
- f. Select the highest operating frequency of the equipment under test.
- g. Find the highest frequency at which the spectral power density drops below -80 dBm/Hz e.i.r.p. (-30 dBm if measured in a 100 kHz bandwidth). This frequency shall be recorded (fH).
- h. These measurements shall also be performed at normal and extreme test conditions.

5.1.3 TEST SETUP LAYOUT



5.1.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

5.1.5 TEST RESULTS

EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26 °C	Relative Humidity:	60 %
Pressure :	1012 hPa	Test Voltage :	DC3.7V(NORMAL)
Test Mode :	TX 11B Mode CH1 / CH13		

TEST CONDITIONS				Frequency range (MHz)	
				f _L CH1	f _H CH13
T nom (°C)	20.00	V nom (V)	3.7	2401.4125	2482.4352
T min (°C)	-20.00	V max (V)	4.2	2401.4348	2482.6524
		V min (V)	3.5	2401.3546	2482.5457
T max (°C)	55.00	V max (V)	4.2	2401.4278	2482.5654
		V min (V)	3.5	2401.2255	2482.5656
Min. f _L / Max. f _H Band Edges				2401.3217	2482.4454
EU / Australia / NZ Limits				f _L > 2400.0 MHz	f _H < 2483.5 MHz
Result				Complies	

EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26 °C	Relative Humidity:	60 %
Pressure :	1012 hPa	Test Voltage :	DC3.7V(NORMAL)
Test Mode :	TX 11G Mode CH1 / CH13		

TEST CONDITIONS				Frequency range (MHz)	
				f _L CH1	f _H CH13
T nom (°C)	20.00	V nom (V)	3.7	2401.4341	2482.5634
T min (°C)	-20.00	V max (V)	4.2	2401.3458	2482.5441
		V min (V)	3.5	2401.4554	2482.5627
T max (°C)	55.00	V max (V)	4.2	2401.5642	2482.5642
		V min (V)	3.5	2401.6542	2482.5678
Min. f _L / Max. f _H Band Edges				2401.3464	2482.2865
Other EU / Australia / NZ Limits				f _L > 2400.0 MHz	f _H < 2483.5 MHz
Result				Complies	

EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26 °C	Relative Humidity:	60 %
Pressure :	1012 hPa	Test Voltage :	DC3.7V(NORMAL)
Test Mode :	TX 11N Mode CH1 / CH13		

TEST CONDITIONS				Frequency range (MHz)	
				f _L CH1	f _H CH13
T nom (°C)	20.00	V nom (V)	3.7	2401.5652	2482.5348
T min (°C)	-20.00	V max (V)	4.2	2401.5221	2482.5640
		V min (V)	3.5	2401.5414	2482.5147
T max (°C)	55.00	V max (V)	4.2	2401.4537	2482.5669
		V min (V)	3.5	2401.4514	2482.5147
Min. f _L / Max. f _H Band Edges				2401.3456	2482.1832
Other EU / Australia / NZ Limits				f _L > 2400.0 MHz	f _H < 2483.5 MHz
Result				Complies	

EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26 °C	Relative Humidity:	60 %
Pressure :	1012 hPa	Test Voltage :	DC3.7V(NORMAL)
Test Mode :	TX 11N Mode CH3 / CH11/40MHz		

TEST CONDITIONS				Frequency range (MHz)	
				f _L CH3	f _H CH11
T nom (°C)	20.00	V nom (V)	3.7	2401.4575	2482.4211
T min (°C)	-20.00	V max (V)	4.2	2401.5382	2482.5742
		V min (V)	3.5	2401.5422	2482.5395
T max (°C)	55.00	V max (V)	4.2	2401.5487	2482.5478
		V min (V)	3.5	2401.6345	2482.4289
Min. f _L / Max. f _H Band Edges				2401.4521	2482.6692
Other EU / Australia / NZ Limits				f _L > 2400.0 MHz	f _H < 2483.5 MHz
Result				Complies	

6. SPURIOUS EMISSIONS – TRANSMITTER (30- 1000MHZ)

6.1 APPLIED PROCEDURES / LIMIT

Clause	Test Item	Frequency(MHz)	Limit	
4.3.6	Spurious emissions	30-1000	Operating	-36dBm
			Standby	-57dBm
	(radiated)	1000-12750	Operating	-30dBm
			Standby	-47dBm
		1800-1900	Operating	-47dBm
		5150-5300	Standby	-47dBm

6.1.1 MEASURING INSTRUMENTS AND SETTING

Please refer to section 7.1.1 in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Analyzer	Setting
Attenuation	Auto
Start Frequency	30 MHz
Stop Frequency	1000 MHz
Detector	Positive Peak
Span	100 MHz
Sweep Time	1s
RB / VB	100 kHz / 30 kHz

6.1.2 TEST PROCEDURES

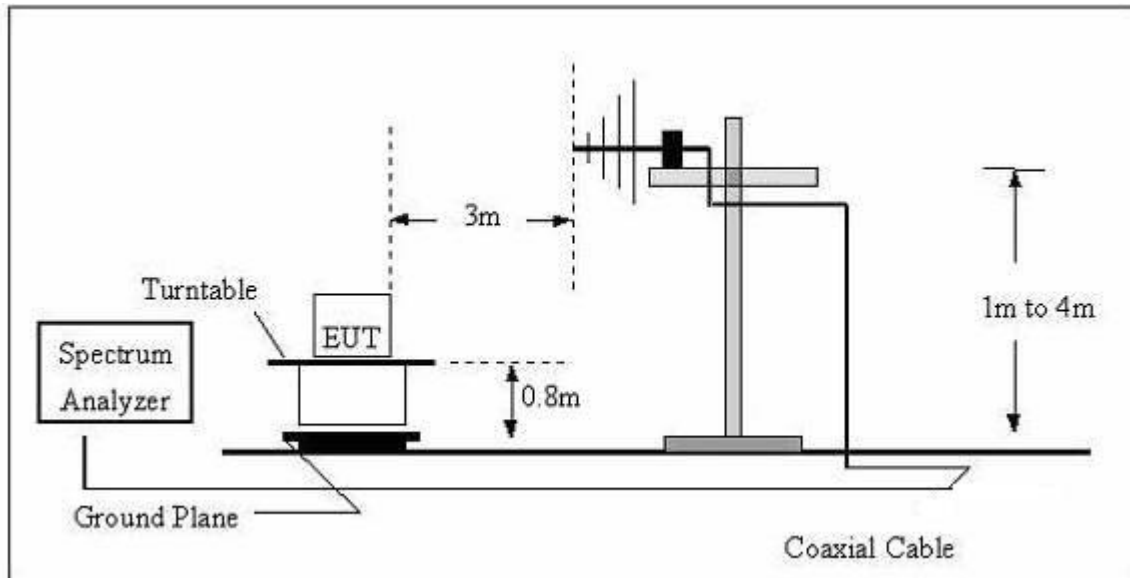
- a. The EUT was placed on the top of the turntable in open test site area.
- b. The test shall be made in the transmitting mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- c. This measurement shall be repeated with the transmitter in standby mode where applicable.
- d. For 30~1000MHz spurious emissions measurement, the broad band bi-log receiving antenna was placed 3 meters far away from the turntable.
- e. The broadband receiving antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Each recorded suspected value is indicated as Read Level (Raw).
- f. Replace the EUT by standard antenna and feed the RF port by signal generator.
- g. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.
- h. Adjust the power level of the signal generator to reach the same reading with Read Level (Raw).
- i. The level of the spurious emission is the power level of (8) plus the gain of the standard antenna in dBi and minus the loss of the cable used between the signal generator and the standard antenna.
- j. If the level calculated in (9) is higher than limit by more than 6dB, then lower the RBW of the spectrum analyzer to 30KHz. If the level of this emission does not change by more than 2dB, then it is taken as narrowband emission, otherwise, wideband emission.
- k. The measurement shall be repeated at the lowest and the highest channel of the stated frequency range.

H. EUT Orthogonal Axis:

"X" - denotes Laid on Table; "Y" - denotes Vertical Stand; "Z" - denotes Side Stand.

6.1.3 TEST SETUP LAYOUT

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



6.1.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

For the initial investigation on the highest, middle, lowest frequency in 30-1000MHz, no significant differences in spurious emissions were observed between these 3 modes. The worst test data was shown

6.1.5 TEST RESULTS (30MHz ~ 1000MHz)

EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Power :	DC3.7V
Test Mode :	TX		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
V	68.6310	-74.06	5.76	-68.3	-57	-11.3	peak
V	207.8497	-77.64	9.14	-68.5	-57	-11.5	peak
V	554.8251	-90.03	22.43	-67.6	-57	-10.6	peak
H	45.6948	-78.95	10.25	-68.7	-57	-11.7	peak
H	135.0319	-79.49	11.99	-67.5	-57	-10.5	peak
H	595.1326	-87.62	20.92	-66.7	-57	-9.7	peak

Remark:

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

7. SPURIOUS EMISSIONS – TRANSMITTER (ABOVE 1000MHZ)

7.1 APPLIED PROCEDURES / LIMIT

Clause	Test Item	Frequency(MHz)	Limit	
4.3.6	Spurious emissions	30-1000	Operating	-36dBm
			Standby	-57dBm
	(narrowband)	1000-12750	Operating	-30dBm
			Standby	-47dBm
		1800-1900	Operating	-47dBm
		5150-5300	Standby	-47dBm

7.1.1 MEASURING INSTRUMENTS AND SETTING

Please refer to section 7.1.1 in this report. The following table is the setting of the Spectrum Analyzer.

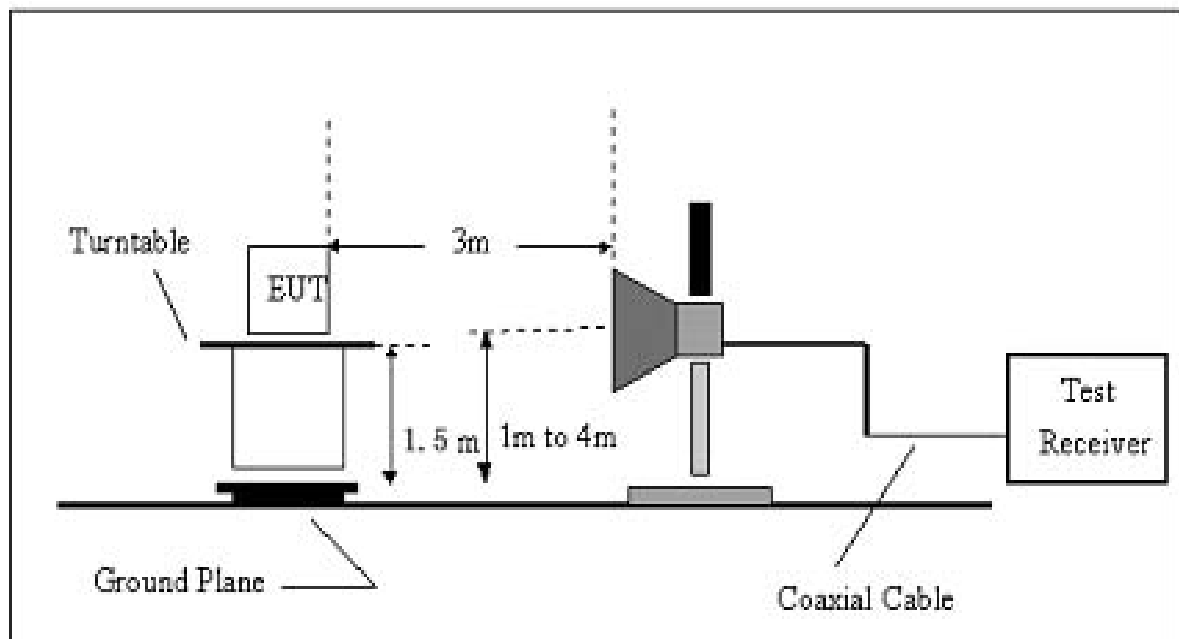
Spectrum Analyzer	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	12750 MHz
Detector	Positive Peak
Span	100 MHz
Sweep Time	1s
RB / VB	100 kHz / 30 kHz

7.1.2 TEST PROCEDURES

- a. The EUT was placed on the top of the turntable in open test site area.
 - b. The test shall be made in the transmitting mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
 - c. This measurement shall be repeated with the transmitter in standby mode where applicable.
 - d. For 30~1000MHz spurious emissions measurement, the broad band bi-log receiving antenna was placed 3 meters far away from the turntable.
 - e. The broadband receiving antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Each recorded suspected value is indicated as Read Level (Raw).
 - f. Replace the EUT by standard antenna and feed the RF port by signal generator.
 - g. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.
 - h. Adjust the power level of the signal generator to reach the same reading with Read Level (Raw).
 - i. The level of the spurious emission is the power level of (8) plus the gain of the standard antenna in dBi and minus the loss of the cable used between the signal generator and the standard antenna.
 - j. If the level calculated in (9) is higher than limit by more than 6dB, then lower the RBW of the spectrum analyzer to 30KHz. If the level of this emission does not change by more than 2dB, then it is taken as narrowband emission, otherwise, wideband emission.
 - k. The measurement shall be repeated at the lowest and the highest channel of the stated frequency range.
- H. EUT Orthogonal Axis:
"X" - denotes Laid on Table; "Y" - denotes Vertical Stand; "Z" - denotes Side Stand.

7.1.3 TEST SETUP LAYOUT

(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



7.1.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

7.1.5 TEST RESULTS

802.11b

Normal Voltage

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
operation frequency:2412							
V	2414.629	-35.87	-1.32	-37.19	-30	-7.19	peak
V	3620.034	-41.05	3.02	-38.03	-30	-8.03	peak
V	4830.532	-48.7	8.54	-40.16	-30	-10.16	peak
H	1559.486	-39.47	-5.61	-45.08	-30	-15.08	peak
H	2410.307	-40.5	-1.31	-41.81	-30	-11.81	peak
H	3620.034	-44.23	3.02	-41.21	-30	-11.21	peak

Remark:

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

802.11b

Normal Voltage

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
operation frequency:2472							
V	1246.558	-43.37	-3.41	-46.78	-30	-16.78	peak
V	2462.692	-40.09	-1.32	-41.41	-30	-11.41	peak
V	4369.367	-46.81	6.74	-40.07	-30	-10.07	peak
H	2462.692	-39.8	-1.32	-41.12	-30	-11.12	peak
H	4369.367	-49.88	6.74	-43.14	-30	-13.14	peak
H	5625.198	-54.11	7.75	-46.36	-30	-16.36	peak

Remark:

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

802.11g

Normal Voltage

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
operation frequency:2412							
V	1166.597	-36.19	-5.19	-41.38	-30	-11.38	peak
V	3239.42	-44.66	1.25	-43.41	-30	-13.41	peak
V	4059.89	-49.69	6.10	-43.59	-30	-13.59	peak
H	1080.091	-31.73	-7.29	-39.02	-30	-9.02	peak
H	3239.42	-44.66	1.25	-43.41	-30	-13.41	peak
H	4059.89	-49.69	6.10	-43.59	-30	-13.59	peak

Remark:

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

802.11g

Normal Voltage

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
operation frequency:2472							
V	1332	-49.35	-3.17	-52.52	-30	-22.52	peak
V	2188.024	-54.14	-0.39	-54.53	-30	-24.53	peak
V	3959.316	-53.82	5.59	-48.23	-30	-18.23	peak
H	1410.604	-46.72	-3.17	-49.89	-30	-19.89	peak
H	2414.629	-46.87	-1.32	-48.19	-30	-18.19	peak
H	4865.277	-57.43	8.52	-48.91	-30	-18.91	peak

Remark:

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

802.11n/20MHz

Normal Voltage

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
operation frequency:2412							
V	1162.424	-35.62	-5.38	-41.00	-30.00	-11.00	peak
V	3245.229	-49.63	1.27	-48.36	-30.00	-18.36	peak
V	4804.636	-56.27	8.47	-47.8	-30.00	-17.8	peak
H	1162.424	-35.62	-5.38	-41.00	-30.00	-11.00	peak
H	1996.946	-50.00	-1.00	-51.00	-30.00	-21.00	peak
H	3620.034	-52.98	3.02	-49.96	-30.00	-19.96	peak

Remark:

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

802.11n/20MHz

Normal Voltage

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
operation frequency:2472							
V	1625.096	-39.76	-5.38	-45.14	-30.00	-15.14	peak
V	3119.795	-51.14	0.66	-50.48	-30.00	-20.48	peak
V	4865.277	-56.75	8.52	-48.23	-30.00	-18.23	peak
H	1499.209	-40.62	-4.38	-45.00	-30.00	-15.00	peak
H	3620.034	-49.06	3.02	-46.04	-30.00	-16.04	peak
H	4865.277	-56.75	8.52	-48.23	-30.00	-18.23	peak

Remark:

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

8. SPURIOUS EMISSIONS – RECEIVER (30-1000MHZ)

8.1 APPLIED PROCEDURES / LIMIT

Clause	Test Item	Frequency(MHz)	Limit
4.3.5	Spurious emissions	30-1000	-57dBm
	(radiated)	1000-12750	-47dBm

8.1.1 MEASURING INSTRUMENTS AND SETTING

Please refer to section 8.1.1 in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Analyzer	Setting
Attenuation	Auto
Start Frequency	30 MHz
Stop Frequency	1000 MHz
Detector	Positive Peak
Span	100 MHz
Sweep Time	1s
RB / VB	100 kHz / 30 kHz

8.1.2 TEST PROCEDURES

- a. The EUT was placed on the top of the turntable in open test site area.
- b. The test shall be made in the receiving mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- c. For 30~1000MHz spurious emissions measurement, the broad band bi-log receiving antenna was placed 3 meters far away from the turntable. .
- d. The broadband receiving antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Each recorded suspected value is indicated as Read Level (Raw).
- e. Replace the EUT by standard antenna and feed the RF port by signal generator.
- f. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.
- g. Adjust the power level of the signal generator to reach the same reading with Read Level (Raw).
- h. The level of the spurious emission is the power level of (7) plus the gain of the standard antenna in dBi and minus the loss of the cable used between the signal generator and the standard antenna.
- i. The measurement shall be repeated at the lowest and the highest channel of the stated frequency range.

H. EUT Orthogonal Axis:

“X” - denotes Laid on Table; “Y” - denotes Vertical Stand; “Z” - denotes Side Stand.

8.1.3 TEST SETUP LAYOUT

This test setup layout is the same as that shown in section 6.1.4

8.1.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously receiving mode.

8.1.5 TEST RESULTS (30MHz-1000MHz)

EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26°C	Relative Humidity :	53 %
Pressure :	1012 hPa	Test Power :	DC3.7V
Test Mode :	RX		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
V	33.6802	-83.97	28.66	-55.31	-36	-19.31	peak
V	57.5939	-84.78	17.79	-66.99	-36	-30.99	peak
V	262.8955	-89.18	26.81	-62.37	-36	-26.37	peak
V	554.8254	-89.66	35.53	-54.13	-36	-18.13	peak
H	31.2893	-96.05	29.88	-66.17	-36	-30.17	peak
H	129.4677	-95.15	24.32	-70.83	-36	-34.83	peak
H	256.5211	-93.79	26.59	-67.2	-36	-31.2	peak
H	614.2142	-93.72	35.6	-58.12	-36	-22.12	peak

Remark:

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

9. SPURIOUS EMISSIONS – RECEIVER (ABOVE 1000MHZ)

9.1 APPLIED PROCEDURES / LIMIT

Clause	Test Item	Frequency(MHz)	Limit
4.3.5	Spurious emissions	30-1000	-57dBm
	(narrowband)	1000-12750	-47dBm

9.1.1 MEASURING INSTRUMENTS AND SETTING

Please refer to section 9.1.1 in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Analyzer	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	12750 MHz
Detector	Positive Peak
Span	100 MHz
Sweep Time	1s
RB / VB	100 kHz / 30 kHz

9.1.2 TEST PROCEDURES

- a. The EUT was placed on the top of the turntable in open test site area.
 - b. The test shall be made in the receiving mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
 - c. For 30~1000MHz spurious emissions measurement, the broad band bi-log receiving antenna was placed 3 meters far away from the turntable. .
 - d. The broadband receiving antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Each recorded suspected value is indicated as Read Level (Raw).
 - e. Replace the EUT by standard antenna and feed the RF port by signal generator.
 - f. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.
 - g. Adjust the power level of the signal generator to reach the same reading with Read Level (Raw).
 - h. The level of the spurious emission is the power level of (7) plus the gain of the standard antenna in dBi and minus the loss of the cable used between the signal generator and the standard antenna.
 - i. The measurement shall be repeated at the lowest and the highest channel of the stated frequency range.
- H. EUT Orthogonal Axis:
 "X" - denotes Laid on Table; "Y" - denotes Vertical Stand; "Z" - denotes Side Stand.

9.1.3 TEST SETUP LAYOUT

This test setup layout is the same as that shown in section 7.1.3

9.1.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously receiving mode.

9.1.5 TEST RESULTS (ABOVE 1000MHZ)

EUT :	Wireless AP	Model Name :	WNP-RP-002
Temperature :	26°C	Relative Humidity :	53 %
Pressure :	1012 hPa	Test Power :	DC3.7V
Test Mode :	RX		

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
V	5406.25	-66.02	7.87	-58.15	-47	-11.15	peak
V	9225.00	-67.04	11.22	-55.82	-47	-8.82	peak
H	5318.125	-65.97	7.37	-58.6	-47	-11.6	peak
H	7932.5	-65.05	9.95	-55.1	-47	-8.1	peak
H	9724.375	-65.18	10.38	-54.8	-47	-7.8	peak

Remark:

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

10.MEDIUM ACCESS PROTOCOL

10.1 APPLIED PROCEDURES / LIMIT

A medium access protocol is a mechanism designed to facilitate spectrum sharing with other devices in a wireless network.

A medium access protocol shall be implemented by the equipment.

10.1.1 TEST RESULTS

The EUT is accord with medium access protocol.

11. EUT TEST PHOTO

Spurious Emissions Measurement Photos

