FCC Co-location Test Report

Equipment	:	**Greenpacket Wi-Fi 11ac/b/g/n Router**
Brand Name	:	**Greenpacket**
Model No.	:	**WA-1200**
FCC ID	:	**W9V-WA1200-GP**
Standard	:	**47 CFR FCC Part 15**
Applicant	:	**Green Packet Berhad, Taiwan** 6F, No.21, Lane 583, Rueiguang Rd. Neihu District, Taipei City 11492, Taiwan
Manufacturer	:	**Green Packet Berhad, Taiwan** 1. 6F, No.21, Lane 583, Rueiguang Rd. Neihu District, Taipei City 11492, Taiwan 2. Room A68, 3F., 151, Keyuan Road, Zhangjiang Hi-Tech Park, Pudong New Area, Shanghai 201203, P.R.China

The product sample received on Sep. 06, 2016 and completely tested on Nov. 24, 2016. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

Kevin Liang / Assistant Manager

Testing Laboratory
1190

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Revision History

Report No.	Version	Description	Issued Date
FR690512CO	Rev. 01	Initial issue of report	Dec. 01, 2016

1 Test Configuration of EUT

1.1 Test Condition

Radiated Co-TX or Cabinet	Remark	-
AC Adapter 1	WA-24Q12R	-
AC Adapter 2	S024AMM1200200	-

1.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests			
Tests Item	Transmitter Radiated Unwanted Emissions		
Test Condition	Radiated measurement		
User Position	☐ EUT will be placed in fixed position.		
	☒ EUT will be placed in mobile position and operating multiple positions.		
	☐ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions.		
Operating Mode	☒ 1. Adapter 1 Mode(WA-24Q12R)		
	☒ 2. Adapter 2 Mode(S024AMM1200200)		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
			
Worst Planes of EUT	V		
Worst Planes of Ant.			V

1.3 Testing Location Information

Testing Location						
☒	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.				
		TEL : 886-3-327-3456		FAX : 886-3-327-0973		
Test Condition		**Test Site No.**	**Test Engineer**		**Test Environment**	**Test Date**
Radiated		03CH09-HY	Terry		22.5°C / 59%	24/11/2016

Test site registered number [553509] with FCC.

2 CO-LOCATION

2.1 Transmitter Radiated Unwanted Emissions

2.1.1 Transmitter Radiated Unwanted Emissions Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 30 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Un-restricted Band Emissions Limit	
RF output power procedure	**Limit (dB)**
Peak output power procedure	20
Average output power procedure	30

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

2.1.2 Measuring Instruments

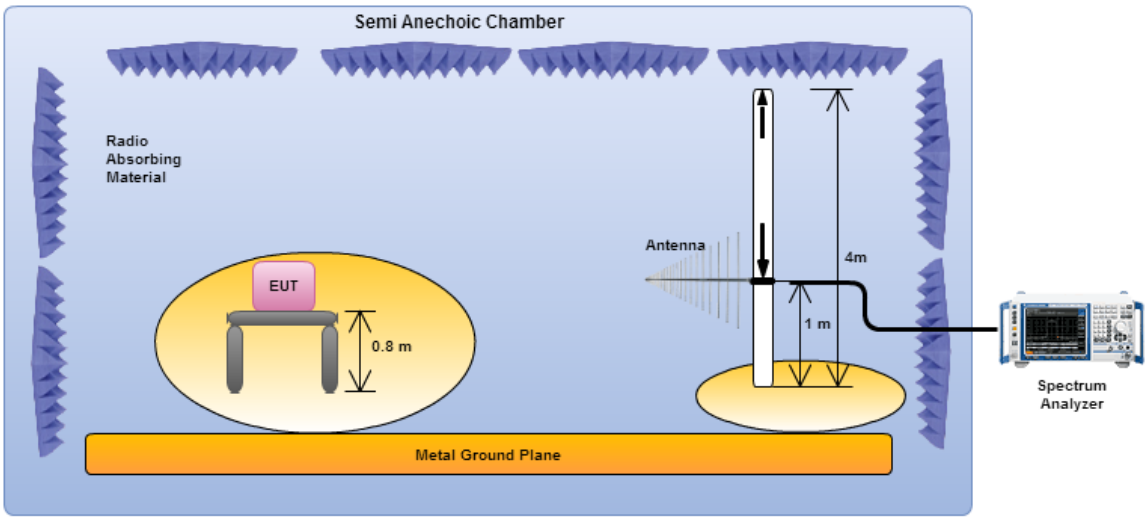
Refer a test equipment and calibration data table in this test report.

2.1.3 Test Procedures

Test Method			
☒	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).		
☒	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].		
☒	For the transmitter unwanted emissions shall be measured using following options below:		
	☒	Refer as KDB 558074, clause 11 for unwanted emissions into non-restricted bands.	
	☒	Refer as KDB 558074, clause 12 for unwanted emissions into restricted bands.	
		☐	Refer as KDB 558074, clause 12.2.5.1 and 9.2.1 Option 1 (spectral trace averaging)
		☐	Refer as KDB 558074, clause 12.2.5.2 and 9.2.1 Option 2 (slow sweep speed).
		☒	Refer as ANSI C63.10, clause 4.1.4.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		☐	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions.
		☒	Refer as KDB 558074, clause 12.2.4 and 9.1.1 measurement procedure peak limit.
		☐	Refer as KDB 558074, clause 12.2.3 measurement procedure Quasi-Peak limit.
☒	For radiated measurement, refer as KDB 558074, clause 12.1.		
	☐	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.	
	☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.	
	☒	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1 GHz and test distance is 3m.	
☐	For conducted and cabinet radiation measurement, refer as KDB 558074, clause 12.2.2.		
	☐	For conducted unwanted emissions into non-restricted bands (relative emission limits). Devices with multiple transmit chains: Refer as KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs.	
	☐	For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB	

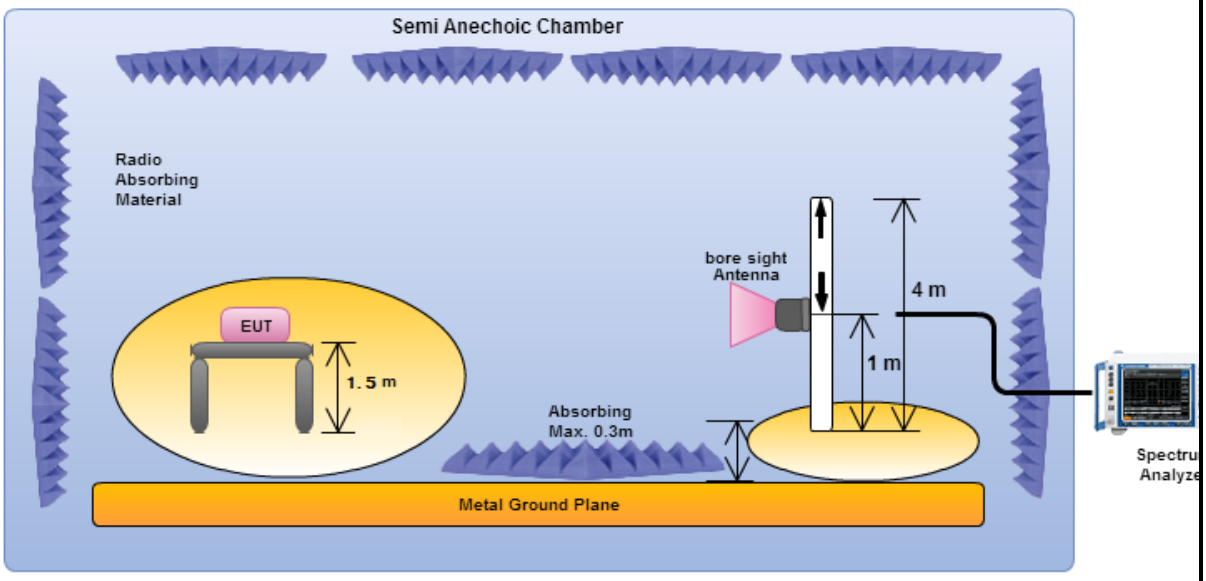
2.1.4 Test Setup

Transmitter Radiated Unwanted Emissions (below 1GHz)



Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna.

Transmitter Radiated Unwanted Emissions (above 1GHz)



Electric field tests shall be performed in the frequency range of 1 GHz to 10th harmonic of highest fundamental frequency or 40 GHz using a calibrated horn antenna.

2.1.5 Transmitter Unwanted Emissions

Refer as Appendix A

3 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz	25/04/2016	24/04/2017
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz	21/06/2016	20/06/2017
Amplifier	Agilent	8449B	3008A02096	1GHz ~ 26.5GHz	11/04/2016	10/04/2017
Amplifier	EMC	EMC9135	980232	9kHz~1GHz	29/01/2016	28/01/2017
Spectrum Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz ~ 44GHz	04/07/2016	03/07/2017
Bilog Antenna	TESEQ	CBL 6111D	35418	30MHz~1GHz	01/10/2016	30/09/2017
Horn Antenna	SCHWARZBECK	BBHA 9120D	BBHA9120D 1534	1GHz~18GHz	22/04/2016	21/04/2017
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	18GHz ~ 40GHz	04/01/2016	03/01/2017
Amplifier	MITEQ	JS44-18004000-33-8P	1840917	18GHz ~ 40GHz	02/06/2015	01/06/2017

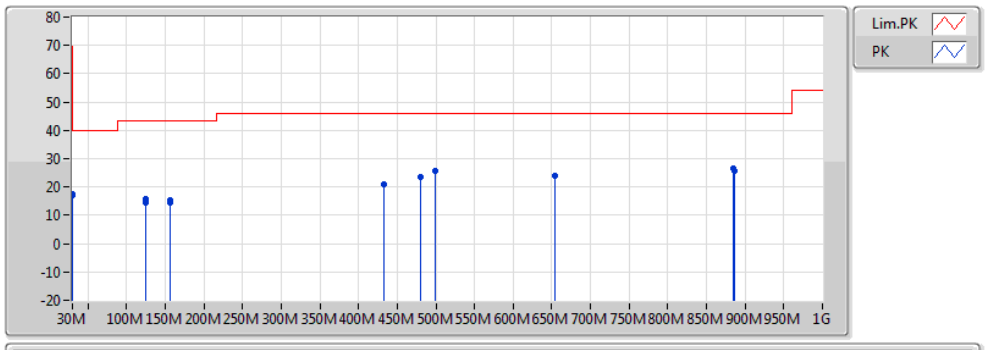
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
5.2G;11a;20;1;2;5240;H;TX	Pass	PK	9.748G	67.41	68.20	-0.87	11.71	3	H	NaN	NaN	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
5.2G;11a;20;1;2;5240;H;AC Adapter 1	Pass	PK	30.21M	16.99	40.00	-23.01	-14.76	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 1	Pass	PK	125.06M	14.57	43.50	-28.93	-19.54	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 1	Pass	PK	156.1M	15.39	43.50	-28.11	-20.14	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 1	Pass	PK	433.52M	21.10	46.00	-24.90	-13.78	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 1	Pass	PK	499.48M	25.81	46.00	-20.19	-12.87	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 1	Pass	PK	885.54M	25.59	46.00	-20.41	-8.22	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 1	Pass	PK	30M	17.43	40.00	-22.57	-14.76	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 1	Pass	PK	124.86M	15.79	43.50	-27.71	-19.54	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 1	Pass	PK	157.15M	14.68	43.50	-28.82	-20.19	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 1	Pass	PK	480.08M	23.33	46.00	-22.67	-13.08	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 1	Pass	PK	654.68M	23.78	46.00	-22.22	-10.67	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 1	Pass	PK	884.81M	26.43	46.00	-19.57	-8.23	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 2	Pass	PK	124.91M	14.73	43.50	-28.77	-19.54	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 2	Pass	PK	155.53M	14.65	43.50	-28.85	-20.11	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 2	Pass	PK	262.8M	16.51	46.00	-29.49	-16.82	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 2	Pass	PK	493.66M	22.61	46.00	-23.39	-12.94	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 2	Pass	PK	600.36M	22.22	46.00	-23.78	-11.41	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 2	Pass	PK	928.22M	26.97	46.00	-19.03	-7.02	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 2	Pass	PK	30.31M	18.17	40.00	-21.83	-14.87	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 2	Pass	PK	51.34M	14.98	40.00	-25.02	-23.99	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 2	Pass	PK	125.37M	15.19	43.50	-28.31	-19.54	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 2	Pass	PK	491.72M	25.88	46.00	-20.12	-12.96	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 2	Pass	PK	513.06M	27.08	46.00	-18.92	-12.81	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;AC Adapter 2	Pass	PK	800.18M	28.79	46.00	-17.21	-9.03	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	AV	4.874G	44.35	54.00	-9.65	2.21	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	AV	7.311G	50.29	54.00	-3.71	8.29	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	AV	15.72G	46.24	54.00	-7.76	13.94	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	PK	4.874G	56.57	74.00	-17.43	2.21	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	PK	7.311G	62.61	74.00	-11.39	8.29	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	PK	9.748G	67.41	68.20	-0.87	11.71	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	PK	10.48G	56.49	68.20	-11.43	13.33	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	PK	15.72G	58.10	74.00	-15.90	13.94	3	H	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	AV	4.874G	45.44	54.00	-8.56	2.21	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	AV	7.311G	51.39	54.00	-2.61	8.29	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	AV	15.72G	47.29	54.00	-6.71	13.94	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	PK	4.874G	57.58	74.00	-16.42	2.21	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	PK	7.311G	63.61	74.00	-10.39	8.29	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	PK	9.748G	66.32	68.20	-1.88	11.71	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	PK	10.48G	57.09	68.20	-11.11	13.33	3	V	NaN	NaN	-
5.2G;11a;20;1;2;5240;H;TX	Pass	PK	15.72G	58.88	74.00	-15.12	13.94	3	V	NaN	NaN	-

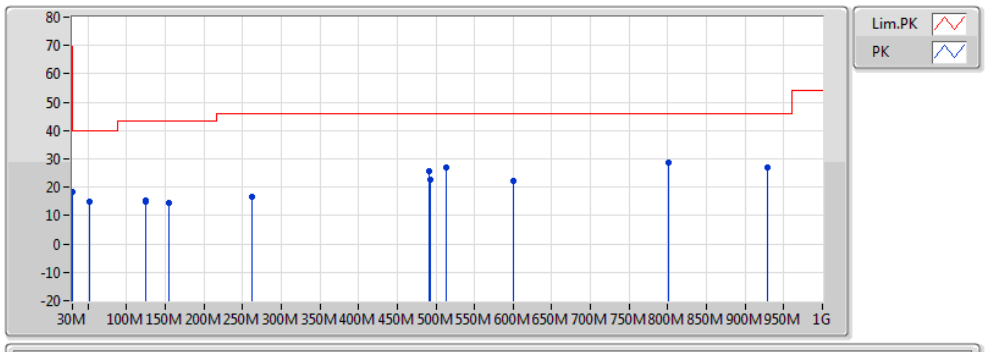
RE Co-TX or Cabinet;Band:5.2G;11a;BWch:20MHz;Nss:1;Nant:2;Ch:5240MHz;AC Adapter 1



EUT:Greenpacket Wi-Fi 11ac/b/g/n Router
Model:WA-1200
120V 60Hz
Power set: 30
EUT=X ,ANT= Z
& 2437MHz 11g , setting:27

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
PK	30.21M	16.99	40.00	-23.01	-14.76	3	H	NaN	NaN	-
PK	125.06M	14.57	43.50	-28.93	-19.54	3	H	NaN	NaN	-
PK	156.1M	15.39	43.50	-28.11	-20.14	3	H	NaN	NaN	-
PK	433.52M	21.10	46.00	-24.90	-13.78	3	H	NaN	NaN	-
PK	499.48M	25.81	46.00	-20.19	-12.87	3	H	NaN	NaN	-
PK	885.54M	25.59	46.00	-20.41	-8.22	3	H	NaN	NaN	-
PK	30M	17.43	40.00	-22.57	-14.76	3	V	NaN	NaN	-
PK	124.86M	15.79	43.50	-27.71	-19.54	3	V	NaN	NaN	-
PK	157.15M	14.68	43.50	-28.82	-20.19	3	V	NaN	NaN	-
PK	480.08M	23.33	46.00	-22.67	-13.08	3	V	NaN	NaN	-
PK	654.68M	23.78	46.00	-22.22	-10.67	3	V	NaN	NaN	-
PK	884.81M	26.43	46.00	-19.57	-8.23	3	V	NaN	NaN	-

RE Co-TX or Cabinet;Band:5.2G;11a;BWch:20MHz;Nss:1;Nant:2;Ch:5240MHz;AC Adapter 2



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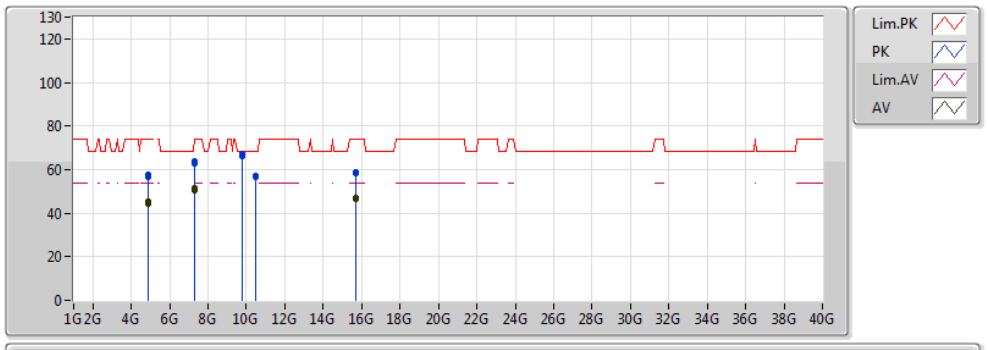
Model:WA-1200
120V 60Hz
Power set: 30
EUT=X ,ANT= Z
& 2437MHz 11g , setting:27

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
PK	124.91M	14.73	43.50	-28.77	-19.54	3	H	NaN	NaN	-
PK	155.53M	14.65	43.50	-28.85	-20.11	3	H	NaN	NaN	-
PK	262.8M	16.51	46.00	-29.49	-16.82	3	H	NaN	NaN	-
PK	493.66M	22.61	46.00	-23.39	-12.94	3	H	NaN	NaN	-
PK	600.36M	22.22	46.00	-23.78	-11.41	3	H	NaN	NaN	-
PK	928.22M	26.97	46.00	-19.03	-7.02	3	H	NaN	NaN	-
PK	30.31M	18.17	40.00	-21.83	-14.87	3	V	NaN	NaN	-
PK	51.34M	14.98	40.00	-25.02	-23.99	3	V	NaN	NaN	-
PK	125.37M	15.19	43.50	-28.31	-19.54	3	V	NaN	NaN	-
PK	491.72M	25.88	46.00	-20.12	-12.96	3	V	NaN	NaN	-
PK	513.06M	27.08	46.00	-18.92	-12.81	3	V	NaN	NaN	-
PK	800.18M	28.79	46.00	-17.21	-9.03	3	V	NaN	NaN	-

RE Co-TX or Cabinet;Band:5.2G;11a;BWch:20MHz;Nss:1;Nant:2;Ch:5240MHz;TX



EUT:Greenpacket Wi-Fi 11ac/b/g/n Router
Model:WA-1200
120V 60Hz
Power set: 30
EUT=X ,ANT= Z
& 2437MHz 11g , setting:27

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	4.874G	44.35	54.00	-9.65	2.21	3	H	NaN	NaN	-
AV	7.311G	50.29	54.00	-3.71	8.29	3	H	NaN	NaN	-
AV	15.72G	46.24	54.00	-7.76	13.94	3	H	NaN	NaN	-
PK	4.874G	56.57	74.00	-17.43	2.21	3	H	NaN	NaN	-
PK	7.311G	62.61	74.00	-11.39	8.29	3	H	NaN	NaN	-
PK	9.748G	67.41	68.20	-0.87	11.71	3	H	NaN	NaN	-
PK	10.48G	56.49	68.20	-11.43	13.33	3	H	NaN	NaN	-
PK	15.72G	58.10	74.00	-15.90	13.94	3	H	NaN	NaN	-
AV	4.874G	45.44	54.00	-8.56	2.21	3	V	NaN	NaN	-
AV	7.311G	51.39	54.00	-2.61	8.29	3	V	NaN	NaN	-
AV	15.72G	47.29	54.00	-6.71	13.94	3	V	NaN	NaN	-
PK	4.874G	57.58	74.00	-16.42	2.21	3	V	NaN	NaN	-
PK	7.311G	63.61	74.00	-10.39	8.29	3	V	NaN	NaN	-
PK	9.748G	66.32	68.20	-1.88	11.71	3	V	NaN	NaN	-
PK	10.48G	57.09	68.20	-11.11	13.33	3	V	NaN	NaN	-
PK	15.72G	58.88	74.00	-15.12	13.94	3	V	NaN	NaN	-