



Test report No. : 4788166493A-US-R3-V1
Page : 1 of 12
Issued date : 2017/11/24
FCC ID : A43-WISP5

Maximum Permissible Exposure Report

Applicant : **Portwell, Inc.**
Model No. : **WiSP**
FCC ID : **A43-WISP5**
Test regulation : **47 CFR FCC Part 1.1310**
Test Result : **Complied**

Date of test: 2017/10/2~2017/11/24

Sample received Date: 2017/9/29

Representative test engineer:

Wayne Chen

Bella Chen

Approved by:



Testing Laboratory

3398

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1. Attestation of Test Results

Applicant

Company Name: Portwell, Inc.
Address: No. 242, Bo-Ai St., Shu-Lin Dist., New Taipei City 238, Taiwan
Model Name WiSP

Manufacturer

Company Name: Portwell, Inc.
Address: No. 242, Bo-Ai St., Shu-Lin Dist., New Taipei City 238, Taiwan
Model Name WiSP

APPLICABLE STANDARDS	
STANDARD	Test Results
47 CFR FCC PART 1.1310	PASS

1. This test report shall not be reproduced in full or partial, without the written approval of UL Taiwan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.

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2. Test Methodology

The tests documented in this report were performed in accordance with CFR 47 FCC Part 1.1310, and KDB447498 D01 V06

3. Facilities and Accreditation

Test Location	UL Verification Services Taiwan Co., Ltd
Address	Building B & E, No.372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 310, Taiwan (R.O.C.)
Accreditation Certificate	UL Verification Services Inc. is accredited by TAF, Laboratory Code 3398. The full scope of accreditation can be viewed at http://www.taftw.org.tw/wSite/sp?xdUrl=/wSite/taf/lalab.jsp&mp=1

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4. Equipment Under Test

4.1. Description of EUT

Product	Wireless Service Platform
Model Name	WiSP
Power Supply	1. EUT power Rating : 100-240V 2. Internal Battery Rating:11.1V, 2500mAh / 28Wh
Operating Frequency	802.11b/g/n TH20 : 2412~2462 MHz 802.11n HT40 : 2422~2452 MHz 802.11a/n HT20 : 5180~5825MHz (exclude 5600~5650MHz) 802.11n HT40 :5190~5795MHz (exclude 5600~5650MHz)
Number of channels	802.11b/g/n HT20 : 11Channels 802.11n HT40 : 7 Channels 802.11a/n HT20 : 21 Channels 802.11n HT40 : 9 Channels

4.2. Description Of Available Antennas

Frequencny Band (GHz)	Brand Name	Model Name	Antenna Type	Antenna Gain(dBi)	
				Chain 0	Chain 1
2.4	Aristotle	RFA-25-L2M2	Dipole Antenna	2	2
5	Aristotle	RFA-25-L2M2	Dipole Antenna	2	2

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5. Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal.	Cal. Interval
Spectrum Analyzer	Keysight	N9010A	MY56070821	Nov. 21, 2016	1 year
Spectrum Analyzer	Keysight	N9010A	MY56070821	Nov. 20, 2017	1 year
Power meter	Anrisu	MA2411B	1531202	Dec. 13, 2016	1 year
Power sensor	Anrisu	ML2495A	1645002	Dec. 13, 2016	1 year

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6. Requirement

According to FCC 1.1310, the criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

Power Density (S) is calculated by the following formula:

$$S = (P \cdot G) / 4\pi R^2$$

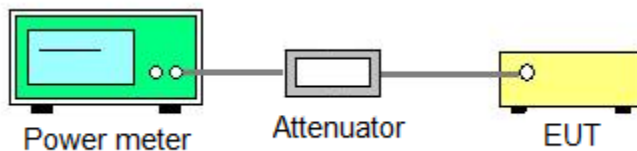
Where, S= Power Density (mW/cm²)

P=Output Power to antenna (mW)

G=Gain of antenna in numeric

R=Distance from transmitting antenna

Test Setup



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7. Maximum Conducted Output Power

WLAN 2.4GHz

Mode	Channel	Frequency (MHz)	Output Power (PK) (dBm)	Output Power (PK) (mW)
802.11b	1	2412	18.99	79.25
	6	2437	18.68	73.79
	11	2462	18.15	65.31
802.11g	1	2412	22.05	160.32
	6	2437	22.2	165.96
	11	2462	22.26	168.27

Mode	Channel	Frequency (MHz)	Output Power (dBm)		Total Power (dBm)	
			Chain 0	Chain 1	0+1(mW)	0+1(dBm)
802.11n HT20	1	2412	19.87	19.72	190.81	22.81
	6	2437	19.48	19.97	188.03	22.74
	11	2462	19.57	19.35	176.67	22.47
802.11n HT40	3	2422	20.02	20.06	201.85	23.05
	6	2437	19.68	19.62	184.52	22.66
	9	2452	19.61	19.68	184.31	22.66

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WLAN 5GHz

Mode	Channel	Frequency (MHz)	Output Power(AV) (dBm)	Output Power(AV) (mW)
802.11a Chain 0	36	5180	11.15	13.03
	40	5200	11.32	13.55
	48	5240	11.39	13.77
	52	5260	11.28	13.43
	60	5300	11.20	13.18
	64	5320	11.80	15.14
	100	5500	11.53	14.22
	116	5580	11.19	13.15
	140	5700	11.25	13.34
	149	5745	11.24	13.30
	157	5785	11.73	14.89
	165	5825	11.81	15.17

Mode	Channel	Frequency (MHz)	Output Power(AV) (dBm)		Total Power(AV) (dBm)	
			Chain 0	Chain 1	0+1(mW)	0+1(dBm)
802.11n HT20	36	5180	8.27	8.36	13.57	11.33
	40	5200	8.35	8.24	13.51	11.31
	48	5240	8.57	8.13	13.70	11.37
	52	5260	8.59	8.29	13.97	11.45
	60	5300	8.54	8.65	14.47	11.61
	64	5320	8.94	8.34	14.66	11.66
	100	5500	8.36	8.45	13.85	11.42
	116	5580	8.67	8.57	14.56	11.63
	140	5700	8.47	8.36	13.89	11.43
	149	5745	8.32	9.21	15.13	11.80
	157	5785	8.16	8.77	14.08	11.49
	165	5825	8.02	8.45	13.34	11.25

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Mode	Channel	Frequency (MHz)	Output Power(AV) (dBm)		Total Power(AV) (dBm)	
			Chain 0	Chain 1	0+1(mW)	0+1(dBm)
802.11n HT40	38	5190	8.21	8.34	13.45	11.29
	46	5230	8.23	8.22	13.29	11.24
	54	5270	8.46	8.5	14.09	11.49
	62	5310	8.71	8.17	13.99	11.46
	102	5510	8.14	8.05	12.90	11.11
	110	5550	8.77	8.16	14.08	11.49
	134	5670	8.68	8.36	14.23	11.53
	151	5755	8.34	8.92	14.62	11.65
	159	5795	8.01	8.62	13.60	11.34

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8. Result

Mode	Channel	Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Output power (dBm)	Tune-up Power Tolerance (dB)	Maximum Tune-up Power (dBm)	Maximum Tune-up Power (mW)	Power density (mW/cm ²)	Limit of power density (mW/cm ²)	Distance (cm)
802.11n HT40	3	2422	2	1.58	23.05	2	25.05	319.91	0.101	1	20
802.11a (chain0)	165	5825	2	1.58	11.81	2	13.81	24.04	0.008	1	20

Mode	WLAN 2.4GHz Power density (mW/cm ²)	WLAN 5GHz Power density (mW/cm ²)	Total Power density (mW/cm ²)	Limit of power density (mW/cm ²)	Result
WLAN 2.4GHz	0.101	0.008	0.108	1	Pass
WLAN 5GHz	0.101	0.008			

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