

## RF Exposure Report

**Report No.:** SA160420E06A

**FCC ID:** I88WAP6405

**Test Model:** WAP6405

**Received Date:** Dec. 15, 2016

**Test Date:** Jan. 05, 2016

**Issued Date:** Feb. 15, 2017

**Applicant:** Zyxel Communications Corporation

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

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### Release Control Record

Issue No.	Description	Date Issued
SA160420E06A	Original release.	Feb. 15, 2017



**1 Certificate of Conformity**

**Product:** Single-Band Wireless AC1750 HD Media Streaming Box

**Brand:** **ZYXEL**

**Test Model:** WAP6405

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Zyxel Communications Corporation

**Test Date:** Jan. 05, 2016

**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :** Wendy Wu , **Date:** Feb. 15, 2017  
Wendy Wu / Specialist

**Approved by :** May Chen , **Date:** Feb. 15, 2017  
May Chen / Manager

## 2 RF Exposure

### 2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

### 2.2 MPE Calculation Formula

$$Pd = (Pout * G) / (4 * \pi * r^2)$$

where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user.

So, this device is classified as **Mobile Device**.

**2.4 Antenna Gain Table**

Frequency	Antenna Gain (dBi)			Antenna Gain (dBi)		
	ANT_0			ANT_1		
	20 MHz	40 MHz	80 MHz	20 MHz	40 MHz	80 MHz
5260	2.12	--	--	2.90	--	--
5270	--	2.01	--	--	2.68	--
5290	--	--	2.36	--	--	2.54
5300	2.57	--	--	2.59	--	--
5310	--	2.55	--	--	2.17	--
5320	--	--	2.65	--	--	2.30
5500	2.45	--	--	2.85	--	--
5510	--	2.72	--	--	2.83	--
5530	--	--	2.40	--	--	3.17
5550	--	2.51	--	--	3.08	--
5580	2.39	--	--	3.05	--	--
5610	--	--	2.51	--	--	3.08
5620	3.03	--	--	3.29	--	--
5630	--	2.93	--	--	3.24	--
5670	--	2.86	--	--	2.81	--
5690	--	--	2.92	--	--	2.56
5700	3.26	--	--	2.58	--	--
5710	--	3.60	--	--	3.53	--
5720	--	--	3.36	--	--	3.54
Frequency	Antenna Gain (dBi)			Antenna Gain (dBi)		
	ANT_2			ANT_3		
	20 MHz	40 MHz	80 MHz	20 MHz	40 MHz	80 MHz
5260	2.72	--	--	2.62	--	--
5270	--	2.36	--	--	2.73	--
5290	--	--	2.38	--	--	2.98
5300	2.14	--	--	3.08	--	--
5310	--	1.90	--	--	2.75	--
5320	--	--	2.11	--	--	2.74
5500	3.00	--	--	3.70	--	--
5510	--	3.01	--	--	3.25	--
5530	--	--	3.42	--	--	2.99
5550	--	2.89	--	--	2.82	--
5580	3.06	--	--	3.51	--	--
5610	--	--	2.89	--	--	2.82
5620	3.23	--	--	3.54	--	--
5630	--	2.98	--	--	3.75	--
5670	--	3.25	--	--	3.55	--
5690	--	--	3.03	--	--	3.20
5700	2.65	--	--	3.39	--	--
5710	--	3.52	--	--	3.29	--
5720	--	--	3.72	--	--	3.23

## 2.5 Directional Gain Table

Frequency (MHz)	Max Gain (dBi) for Non-TxBF (CDD) mode			Max Gain (dBi) for TxBF mode		
	1 Stream 4TX for Non-TxBF (CDD) mode			2 Stream 4TX for TxBF mode		
	20 MHz	40 MHz	80 MHz	20 MHz	40 MHz	80 MHz
5260	6.11	--	--	3.10	--	--
5270	--	6.10	--	--	3.09	--
5290	--	--	6.19	--	--	3.18
5300	6.18	--	--	3.17	--	--
5310	--	5.96	--	--	2.95	--
5320	5.98	--	--	2.97	--	--
5500	6.80	--	--	3.79	--	--
5510	--	6.77	--	--	3.76	--
5530	--	--	7.02	--	--	4.01
5550	--	6.55	--	--	3.54	--
5580	6.77	--	--	3.76	--	--
5610	--	--	6.55	--	--	3.54
5620	6.37	--	--	3.36	--	--
5630	--	6.23	--	--	3.22	--
5670	--	6.50	--	--	3.49	--
5690	--	--	6.34	--	--	3.33
5700	6.37	--	--	3.36	--	--
5710	--	6.66	--	--	3.65	--
5720	6.40	--	--	3.39	--	--

Note:

1. Non-TxBF mode & TxBF mode antenna gain refer to KDB 662911 F 2) f) (ii)

$$DirectionalGain = 10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

$N_{SS}$  = the number of independent spatial streams of data;

$N_{ANT}$  = the total number of antennas

$g_{j,k} = 10^{G_k/20}$  if the  $k$ th antenna is being fed by spatial stream  $j$ , or zero if it is not;

$G_k$  is the gain in dBi of the  $k$ th antenna.

### 3 Calculation Result of Conducted Power

For U-NII-1 and UNII-3 band data were copied from the original test report (Report No.: SA160420E06)

#### CDD Mode

Frequency (MHz)	Conducted Power (mW)	Directional Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5180-5240	767.523	6.8	20	0.73084	1
5260-5320	236.492	6.10	20	0.19167	1
5500-5720	192.836	6.55	20	0.17335	1
5745-5825	766.475	6.61	20	0.69860	1

**NOTE:**

1. For UNII-1: Directional gain of CDD mode (Nss=1) = 6.8dBi
2. For UNII-2A: Directional gain of CDD mode (Nss=1) = 6.10dBi
3. For UNII-2C: Directional gain of CDD mode (Nss=1) = 6.55dBi
4. For UNII-3: Directional gain of CDD mode (Nss=1) = 6.61dBi
5. Calculations for maximum RF exposure compliance are base on the directional gain and conducted power condition.

#### Beamforming Mode

Frequency (MHz)	Conducted Power (mW)	Directional Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5180-5240	745.95	3.79	20	0.35517	1
5260-5320	236.492	3.09	20	0.09584	1
5500-5720	234.816	3.76	20	0.11103	1
5745-5825	752.811	3.6	20	0.34310	1

**NOTE:**

1. For UNII-1: Directional gain of beamforming mode (Nss=2) = 3.79dBi
2. For UNII-2A: Directional gain of beamforming mode mode (Nss=2) = 3.09dBi
3. For UNII-2C: Directional gain of beamforming mode mode (Nss=2) = 3.76dBi
4. For UNII-3: Directional gain of beamforming mode (Nss=2) = 3.6dBi
5. Calculations for maximum RF exposure compliance are base on the directional gain and conducted power condition.

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