RF Exposure Report

Report No.: SA150407E02

Compliance ID : ADBA-SX14015A

Product Name* : ADB-1761WF

**For any other product variant refer to above Compliance ID*

FCC ID: MCLADB1761WF

Received Date: Feb. 11, 2015

Test Date: Apr. 24 to May 09, 2015

Issued Date: May 28, 2015

Applicant: HON HAI PRECISION IND. CO., LTD.

Address: 5F-1,5 Hsin-An Road Hsinchu, Science-Based Industrial Park Taiwan, R.O.C.

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

Lab Address: No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

Test Location (1): No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

Test Location (2): No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
SA150407E02	Original release.	May 28, 2015

1 Certificate of Conformity

Compliance ID:	ADBA-SX14015A
Product Name*:	ADB-1761WF
Product Description:	IP Set-Top Box with Wi-Fi 11ac

**For any other product variant refer to above Compliance ID*

Brand:	ADB
Sample Status:	ENGINEERING SAMPLE
Applicant:	HON HAI PRECISION IND. CO., LTD.
Test Date:	Apr. 24 to May 09, 2015
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D03 IEEE C95.1

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 : _____ , **Date:** May 28, 2015

Elsie Hsu / Specialist

Approved by : _____ , **Date:** May 28, 2015

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^2)	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^2

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

1. The antennas provided to the EUT, please refer to the following table:

Zigbee							
Antenna No.	Transmitter Circuit	Brand	Model	Ant. Gain(dBi) <Including cable loss>	Frequency range (GHz to GHz)	Antenna Type	Connecter Type
1	Chain (0)	INPAQ	NA	2.78	2.4~2.5	PIFA	NA
2	Chain (1)		NA	2.45	2.4~2.5		
5GHz Band							
Antenna No.	Transmitter Circuit	Brand	Model	Ant. Gain(dBi) <Including cable loss>	Frequency range (GHz to GHz)	Antenna Type	Connecter Type
1	Chain (0)	TONGDA COMMUNICATION CO., LTD.	NA	3.49	5.15~5.25	PCB	i-pex(MHF)
			NA	3.99	5.725~5.85	PCB	i-pex(MHF)
2	Chain (1)		NA	3.47	5.15~5.25	PCB	i-pex(MHF)
			NA	4.57	5.725~5.85	PCB	i-pex(MHF)
3	Chain (2)		NA	4.11	5.15~5.25	PCB	i-pex(MHF)
			NA	3.7	5.725~5.85	PCB	i-pex(MHF)
4	Chain (3)		NA	3.45	5.15~5.25	PCB	i-pex(MHF)
			NA	3.46	5.725~5.85	PCB	i-pex(MHF)

3 Calculation Result Of Maximum Conducted Power

For WLAN

CDD MODE

802.11a

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
5180-5240	274.648	9.66	20	0.50525	1
5745-5825	217.062	9.96	20	0.42787	1

NOTE:

5150~5250MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.66dBi

5725~5825MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.96dBi

802.11ac (VHT20)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
5180-5240	264.91	9.66	20	0.48733	1
5745-5825	203.756	9.96	20	0.40164	1

NOTE:

5150~5250MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.66dBi

5725~5825MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.96dBi

802.11ac (VHT40)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
5190-5230	156.576	9.66	20	0.28804	1
5755-5795	231.77	9.96	20	0.45686	1

NOTE:

5150~5250MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.66dBi

5725~5825MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.96dBi

802.11ac (VHT80)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
5210	115.914	9.66	20	0.21324	1
5775	116.519	9.96	20	0.22968	1

NOTE:

5150~5250MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.66dBi

5725~5825MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.96dBi

Beamforming MODE

802.11ac (VHT20)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
5180-5240	224.64	9.66	20	0.41325	1
5745-5825	203.756	9.96	20	0.40164	1

NOTE:
5150~5250MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.66dBi
5725~5825MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.96dBi

802.11ac (VHT40)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
5190-5230	303.827	9.66	20	0.55893	1
5755-5795	302.577	9.96	20	0.59644	1

NOTE:
5150~5250MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.66dBi
5725~5825MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.96dBi

802.11ac (VHT80)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
5210	115.914	9.66	20	0.21324	1
5775	94.864	9.96	20	0.18700	1

NOTE:
5150~5250MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.66dBi
5725~5825MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 9.96dBi

For Zigbee

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2405-2480	1.959	2.78	20	0.00074	1

CONCLUSION:

Both of the WLAN and Zigbee can transmit simultaneously, the formula of calculated the MPE is:

$CPD_1 / LPD_1 + CPD_2 / LPD_2 + ……etc. < 1$

CPD = Calculation power density

LPD = Limit of power density

WLAN + Zigbee = 0.59644 + 0.00074 = 0.597
Therefore the maximum calculations of above situations are less than the "1" limit.

--- END ---