



# SUPPLEMENTARY RF EXPOSURE REPORT

**REPORT NO.:** SA140702E01C R1

**MODEL NO.:** AP-7502

**FCC ID:** UZ7AP7502

**RECEIVED:** Sep. 16, 2014

**TESTED:** Oct. 31, 2014

**ISSUED:** June 05, 2015

**APPLICANT:** Zebra Technologies Corporation

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**MANUFACTURER:** Accton Technology Corporation

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**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.) Ltd.,  
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## REPORT ISSUE HISTORY RECORD OF EUT (AP-7502)

ATTACHMENT NO.	ISSUE DATE	DESCRIPTION
140702E01	Aug. 12, 2014	Original release
140702E01C	June 05, 2015	Add DFS band <5250~5350MHz & 5500~5700MHz>

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA140702E01C	Original release	June 04, 2015
SA140702E01C R1	Modified the information of applicant & address	June 05, 2015



## 1. CERTIFICATION

**PRODUCT:** Dual Radio Wallplate AP  
**BRAND NAME:** Motorola  
**MODEL NO.:** AP-7502  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**APPLICANT:** Zebra Technologies Corporation  
**TESTED:** Oct. 31, 2014  
**STANDARDS:** FCC Part 2 (Section 2.1091)  
KDB 447498 D03  
IEEE C95.1

The above equipment (Model: AP-7502) 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 :** Midoli Peng, **Date:** June 05, 2015  
( Midoli Peng, Specialist )

**Approved by :** May Chen, **Date:** June 05, 2015  
( May Chen, Manager )

## 2. RF EXPOSURE LIMIT

### 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)
<b>LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE</b>				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

### 3. MPE CALCULATION FORMULA

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

### 4. 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**.

## 5. ANTENNA GAIN

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

WLAN (2.4GHz)					
Transmitter Circuit	PCB Chain NO.	Antenna Type	Antenna Gain(dBi) Including cable loss	Connector type	Frequency range (GHz to GHz)
Chain (0)	ALA140-051025	PCB-Dipole	5.81	I-Pex	2400~2483.5
Chain (1)	ALA140-051024	PCB-Dipole	4.52	I-Pex	2400~2483.5
WLAN (5GHz)					
Transmitter Circuit	PCB Chain NO.	Antenna Type	Antenna Gain(dBi) Including cable loss	Connector type	Frequency range (GHz to GHz)
Chain (0)	ALA140-091020	PCB-Dipole	7.22	I-Pex	5150~5850
Chain (1)	ALA140-091020	PCB-Dipole	7.3	I-Pex	5150~5850
BT					
Transmitter Circuit	PCB Chain NO.	Antenna Type	Antenna Gain(dBi) Including cable loss	Connector type	Frequency range (GHz to GHz)
Chain (0)	ALC140-051020	PCB-Dipole	4.74	I-Pex	2400~2483.5

## 6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For 15.247 and 15.407(U-NII-1 & U-NII-3) data was copied from the original test report (Report No.: SA140702E01).

### For WLAN: 15.247(2.4GHz)

#### 802.11b

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412 - 2462	185.368	8.20	20	0.24365	1.00

NOTE: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.20\text{dBi}$ .

#### 802.11g

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412 - 2462	342.766	8.20	20	0.45053	1.00

NOTE: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.20\text{dBi}$ .

#### 802.11n (HT20)

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412 - 2462	341.779	8.20	20	0.44924	1.00

NOTE: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.20\text{dBi}$ .

#### 802.11n (HT40)

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2422 - 2452	152.641	8.20	20	0.20063	1.00

NOTE: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.20\text{dBi}$ .

## For WLAN: 15.407(5GHz)

### 802.11a

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5180 - 5240, 5745 - 5825	77.907	10.27	20	0.16493	1.00
5260 - 5320, 5500 - 5700	61.255	10.27	20	0.12968	1.00

NOTE: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 10.27\text{dBi}$ .

### 802.11n (HT20)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5180 - 5240, 5745 - 5825	79.398	10.27	20	0.16809	1.00
5260 - 5320, 5500 - 5700	61.751	10.27	20	0.13073	1.00

NOTE: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 10.27\text{dBi}$ .

### 802.11n (HT40)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5190 - 5230, 5755 - 5795	56.579	10.27	20	0.11978	1.00
5270 - 5310, 5510 - 5670	52.758	10.27	20	0.11169	1.00

NOTE: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 10.27\text{dBi}$ .

### 802.11ac (VHT20)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5180 - 5240, 5745 - 5825	80.513	10.27	20	0.17045	1.00
5260 - 5320, 5500 - 5700	63.532	10.27	20	0.13450	1.00

NOTE: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 10.27\text{dBi}$ .



**802.11ac (VHT40)**

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5190 - 5230, 5755 - 5795	57.373	10.27	20	0.12146	1.00
5270 - 5310, 5510 - 5670	53.782	10.27	20	0.11386	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 10.27\text{dBi}$ .

**802.11ac (VHT80)**

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5210 - 5290, 155	6.498	10.27	20	0.01376	1.00
5290, 5530 - 5610	41.169	10.27	20	0.08716	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 10.27\text{dBi}$ .

**For Bluetooth:**

**GFSK**

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2402-2480	2.118	4.74	20	0.00126	1.00

**CONCLUSION:**

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

$$CPD_1 / LPD_1 + CPD_2 / LPD_2 + \dots \text{etc.} < 1$$

**CPD = Calculation power density**

**LPD = Limit of power density**

**For WLAN (2.4GHz/ 5GHz) and Bluetooth:**

Therefore, the worst-case situation is  $0.45053 / 1 + 0.17045 / 1 + 0.00126 / 1 = 0.622$ , which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

**-- END ---**