

## RF Exposure Report

**Report No.:** SA160922E02

**FCC ID:** UZ7AP7602

**Test Model:** AP-7602

**Received Date:** Sep. 22, 2016

**Test Date:** Nov. 12, 2016

**Issued Date:** Dec. 02, 2016

**Applicant:** Zebra Technologies Corporation

**Address:** One Zebra Plaza, Holtsville, NY,11742, USA

**Manufacturer:** Zebra Technologies Corporation

**Address:** One Zebra Plaza, Holtsville, NY,11742, USA

**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
SA160922E02	Original release.	Dec. 02, 2016

## 1 Certificate of Conformity

**Product:** Access Point

**Brand:** ZEBRA

**Test Model:** AP-7602

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Zebra Technologies Corporation

**Test Date:** Nov. 12, 2016

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

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

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:**

Dec. 02, 2016

Wendy Wu / Specialist

**Approved by :**



**Date:**

Dec. 02, 2016

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

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

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

### 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

No.	PCB Chain No	Brand	Model	Antenna Gain(dBi) Including cable loss	Frequency range	Antenna Type	Connector type	Cable Length (mm)
1	Chain 0	NA	NA	2.61	2.4~2.4835GHz	Dipole	i-pex(MHF)	155
				4.39	5.15~5.25GHz			
				4.2	5.25~5.35GHz			
				4.28	5.47~5.725GHz			
				5.61	5.725~5.85GHz			
2	Chain 1	NA	NA	3.76	2.4~2.4835GHz	Dipole	i-pex(MHF)	182
				5.18	5.15~5.25GHz			
				5.22	5.25~5.35GHz			
				4.44	5.47~5.725GHz			
				5.95	5.725~5.85GHz			
3	BT	NA	NA	1.8	2.4~2.483GHz	Dipole	i-pex(MHF)	88

## 2.5 Calculation Result of Maximum Conducted Power

### For Bluetooth:

#### BT-EDR

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2402-2480	5.957	1.8	20	0.00179	1

#### BT-LE

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2402-2480	2.244	1.8	20	0.00068	1

### For WLAN / BT coexistence mode:

Condition	Technology		
1	WLAN (2.4GHz-Chain0)	WLAN (5GHz-Chain1)	BT
2	WLAN (2.4GHz-Chain1)	WLAN (5GHz-Chain0)	BT
3	WLAN (2.4GHz-Chain0)	WLAN (2.4GHz-Chain1)	BT
4	WLAN (5GHz-Chain0)	WLAN (5GHz-Chain1)	BT

#### Condition 1

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462 (Chain 0)	92.257	2.61	20	0.03348	1
5180-5240 5745-5825 (Chain 1)	146.893	5.95	20	0.11501	1
2402-2480	5.957	1.8	20	0.00179	1

#### Condition 2

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462 (Chain 1)	90.782	3.76	20	0.04293	1
5180-5240 5745-5825 (Chain 0)	116.681	5.61	20	0.08448	1
2402-2480	5.957	1.8	20	0.00179	1

#### Condition 3

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462 (2TX)	183.039	6.21	20	0.15215	1
2402-2480	5.957	1.8	20	0.00179	1

#### Condition 4

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5180-5240 5745-5825 (2TX)	260.394	8.79	20	0.39207	1
2402-2480	5.957	1.8	20	0.00179	1

#### NOTE:

2.4GHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.21\text{dBi}$

5GHz: UNII-1: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.8\text{dBi}$

UNII-3: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.79\text{dBi}$

**Conclusion:**

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

**Condition 1:**

Therefore, the worst-case situation is  $0.03348 / 1 + 0.11501 / 1 + 0.00179 / 1 = 0.15028$ , which is less than "1".

This confirmed that the device comply with FCC 1.1310 MPE limit.

**Condition 2:**

Therefore, the worst-case situation is  $0.04293 / 1 + 0.08448 / 1 + 0.00179 / 1 = 0.12920$ , which is less than "1".

This confirmed that the device comply with FCC 1.1310 MPE limit.

**Condition 3:**

Therefore, the worst-case situation is  $0.15215 / 1 + 0.00179 / 1 = 0.15394$ , which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

**Condition 4:**

Therefore, the worst-case situation is  $0.39207 / 1 + 0.00179 / 1 = 0.39386$ , which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

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