

## Supplementary RF Exposure Report

**Report No.:** SA991201E03O

**FCC ID:** UZ7MC319ZUS

**Test Model:** MC319ZUS

**Received Date:** Jan. 11, 2016

**Test Date:** Jan. 25, 2016

**Issued Date:** Feb. 04, 2016

**Applicant:** Zebra Technologies Corporation

**Address:** 1 Zebra Plaza, Holtsville, NY 11742

**Manufacturer:** Zebra Technologies Corporation

**Address:** 1 Zebra Plaza, Holtsville, NY 11742

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
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Taiwan R.O.C.

**Test Location (2):** No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin  
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## Table of Contents

<b>Release Control Record</b> .....	<b>3</b>
<b>1 Certificate of Conformity</b> .....	<b>4</b>
<b>2 RF Exposure</b> .....	<b>5</b>
2.1 Limits For Maximum Permissible Exposure (MPE).....	5
2.2 Mpe Calculation Formula .....	5
2.3 Classification .....	5
<b>3 Calculation Result Of Maximum Conducted Power</b> .....	<b>7</b>



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**Report Issue History Record of EUT (MC319ZUS)**

Attachment No.	Issue Date	Description
991201E03-2	Sep. 11, 2013	Original release.
991201E03O-2	Feb. 04, 2016	Upgraded the versions of the standard to section 15.407 under new rule.

**Release Control Record**

Issue No.	Description	Date Issued
SA991201E03O	Original release.	Feb. 04, 2016

## 1 Certificate of Conformity

**Product:** Mobile Computing Terminal

**Brand:** Zebra

**Test Model:** MC319ZUS

**Sample Status:** MASS-PRODUCTION

**Applicant:** Zebra Technologies Corporation

**Test Date:** Jan. 25, 2016

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

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-2005

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 :** C. L., **Date:** Feb. 04, 2016  
Claire Kuan / Specialist

**Approved by :** May Chen, **Date:** Feb. 04, 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**.

### 3 Antenna Gain

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

WLAN Antenna Spec.							
Brand	Antenna Type		Peak Gain(dBi) with cable loss	Connector Type	Frequency range	Cable Loss (dB)	Cable Length
Auden	Monopole + coupling		3.4 dBi (2.4GHz) 4.5 dBi (5GHz)	hirose	2.4 ~ 2.5 GHz 4.92 ~ 5.85 GHz	-0.2640 dB -0.6168 dB	52 mm
Auden	PIFA		1.3 dBi (2.4GHz) 3.6 dBi (5GHz)	hirose	2.4 ~ 2.5 GHz 4.92 ~ 5.85 GHz	-0.6409 dB -1.0418 dB	68 mm
RFID Antenna Spec.							
Brand	Antenna Type		Peak Gain(dBi) with cable loss	Connector Type	Frequency range	Cable Loss (dB)	Cable Length
Auden	Dipole		3.66	hirose	902 ~ 928 MHz	-0.43 dB	85 mm
Auden	Slot Dipole		1.95	hirose	902 ~ 928 MHz	-0.43 dB	85 mm
Bluetooth Antenna Spec.							
Brand	Model No.	Antenna Type	Peak Gain(dBi)	Connector Type	Frequency range (MHz)	Cable Loss (dB)	Cable Length
Antenova	(Mica 2.4GHz) 303DA5654-01	Chip Antenna	-1.34	U.FL	2400-2500 MHz	0.185	74 mm

#### 4 Calculation Result Of Maximum Conducted Power

For WLAN (2.4GHz) & WLAN (5GHz - U-NII-1, U-NII-2A, U-NII-2C) & Bluetooth, RFID data was copied from the original test report (Report No.: SA991201E03 R1).

##### For WLAN

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	151.4	3.6	20	0.066	1
5180-5320	27.5	4.5	20	0.015	1
5500-5720	33.1	4.5	20	0.019	1
5745-5825	30.269	4.5	20	0.01697	1

##### For Bluetooth

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	2.9	-1.34	20	0.00042	1

##### For RFID

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
902.75 ~ 927.25	955.0	3.66	20	0.441	1

**Note:** Bluetooth technology (BT2.1+EDR), WLAN and RFID technology cannot transmit at same time.

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