

## 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  
Hsin Chu Laboratory

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Location (1):** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
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.

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by any government agencies.



A D T

## Table of Contents

<b>Release Control Record</b> .....	3
<b>1 Certificate of Conformity</b> .....	4
<b>2 RF Exposure</b> .....	5
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> .....	7



A D T

### 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 :** M. C., **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

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

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**.

### 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	Connecter 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	Connecter 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)	Connecter Type	Frequency range (MHz)	Cable Loss (dB)
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.

--- END ---