

## RF Exposure Report

**Report No.:** SA180517E07

**FCC ID:** 2ACY3-IPOSPLUSL

**Test Model:** BEETLE /iPOS plus SL

**Received Date:** May 17, 2018

**Test Date:** June 26, 2018

**Issued Date:** Aug. 08, 2018

**Applicant:** Diebold Nixdorf Singapore Pte Ltd.

**Address:** 151 Lorong Chuan New Tech Park #05-01 A/B 556741 SINGAPORE

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

**FCC Registration /  
Designation Number:** 723255 / TW2022

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.

## 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
2.4   Antenna Gain .....	6
2.5   Calculation Result .....	7

### Release Control Record

Issue No.	Description	Date Issued
SA180517E07	Original release.	Aug. 08, 2018

## 1 Certificate of Conformity

**Product:** POS Terminal

**Brand:**



**Test Model:** BEETLE /iPOS plus SL

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Diebold Nixdorf Singapore Pte Ltd.

**Test Date:** June 26, 2018

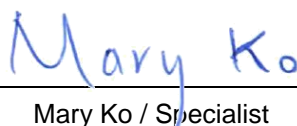
**Standards:** FCC Part 2 (Section 2.1091)

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.

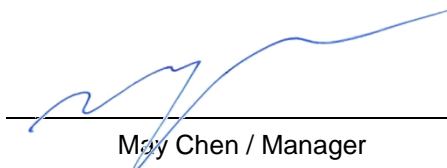
**Prepared by :**

  
Mary Ko / Specialist

**Date:**

Aug. 08, 2018

**Approved by :**

  
May Chen / Manager

**Date:**

Aug. 08, 2018

## 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				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

f = Frequency in MHz ; \*Plane-wave equivalent power density

### 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**.

## 2.4 Antenna Gain

WLAN antenna spec.						
Brand	Model	Antenna Net Gain (dBi)	Frequency range (GHz)	Antenna Type	Antenna Connector	Cable Length (mm)
Smart Approach	SE-EYISL-001 (Main)	-3.69	2.4~2.4835	PIFA	i-pex(MHF)	230
		3.08	5.15~5.35			
		3.14	5.47~5.725			
		3.14	5.725~5.85			
Bluetooth antenna spec.						
Brand	Model	Antenna Net Gain (dBi)	Frequency range (GHz)	Antenna Type	Antenna Connector	Cable Length (mm)
Smart Approach	SE-EYISL-002 (Aux)	-3.87	2.4~2.4835	PIFA	i-pex(MHF)	380
NFC antenna spec.						
Brand		Model	Frequency range (MHz)	Antenna Type		Antenna Connector
Smart Approach		51-MYISL-001	13.56	Loop		None

## 2.5 Calculation Result

### For WLAN (FCC ID: PD93168NG)

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WLAN 2.4GHz	2412	57	-3.69	20	0.00485	1
WLAN 5GHz	5755	63	3.14	20	0.02583	1
Bluetooth	2402	10	-3.87	20	0.00082	1

### For NFC

#### Field Strength Conversion:

Frequency (MHz)	Field Strength of Fundamental (dBuV/m) @3m	EIRP (dBm)	EIRP (mW)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
13.56	58.89	-36.34	0.0002323	20	0.00000005	0.9789

Note: 1. Pout EIRP (dBm) = Field Strength of Fundamental (dBuV/m) - 95.23 (dB)

2. Power Density Limit =  $(180/f^2)$

### 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

WLAN 2.4GHz + Bluetooth + NFC =  $0.00485 / 1 + 0.00082 / 1 + 0.00000005 / 0.9789 = 0.00567$

WLAN 5GHz + Bluetooth + NFC =  $0.02583 / 1 + 0.00082 / 1 + 0.00000005 / 0.9789 = 0.02665$

**Therefore the maximum calculations of above situations are less than the "1" limit.**

--- END ---