

## 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

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### 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 , **Date:** Aug. 08, 2018  
Mary Ko / Specialist

**Approved by :** May Chen , **Date:** Aug. 08, 2018  
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				
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

<b>WLAN antenna spec.</b>						
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			
<b>Bluetooth antenna spec.</b>						
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
<b>NFC antenna spec.</b>						
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.**

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