



中国认可
国际互认
检测
TESTING
CNAS L5313



DEKRA

SAR Exemption Evaluation Report

Product Name : Barcode Scanner

Model No. : 8680i

FCC ID : HD5-8680A

Applicant : HONEYWELL INTERNATIONAL INC
Honeywell Safety and Productivity Solutions
Address : 9680 OLD BAILES RD
FORT MILL SC 29707-7539

Date of Receipt : Mar. 09, 2018
Test Date : Apr. 03, 2018
Issued Date : Apr. 08, 2018
Report No. : 1832060R-RF-US-P20V02
Report Version : V1.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by CNAS, TAF any agency of the government.

The test report shall not be reproduced without the written approval of DEKRA Testing & Certification (Suzhou) Co., Ltd.

Test Report Certification

Issued Date : Apr. 08, 2018

Report No. : 1832060R-RF-US-P20V02



Product Name : Barcode Scanner

Applicant : HONEYWELL INTERNATIONAL INC
Honeywell Safety and Productivity Solutions

Address : 9680 OLD BAILES RD
FORT MILL SC 29707-7539

Manufacturer : 1、 HONEYWELL INTERNATIONAL INC
Honeywell Safety and Productivity Solutions
2、 Metro(Suzhou)Technologies Co.,Ltd

Address : 1、 9680 OLD BAILES RD
FORT MILL SC 29707-7539
2、 No.221 Xinghai street China-Singapore Suzhou Industrial Park

Model No. : 8680i

FCC ID : HD5-8680A

EUT Voltage : DC 3.8V

Applicable Standard : KDB 447498 D01v06

Test Result : Complied

Performed Location : DEKRA Testing & Certification (Suzhou) Co., Ltd.
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,
215006, Jiangsu, China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Designation Number: CN1199;

Documented By : Kitty Li
(Adm. Specialist: Kitty Li)

Reviewed By : Frank He
(Senior Engineer: Frank He)

Approved By : Harry Zhao
(Engineering Manager : Harry Zhao)

1. RF Exposure Evaluation

1.1. Limits

According to **KDB 447498 D01 General RF Exposure Guidance v06**

4.3.1 Standalone SAR test exclusion considerations

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}]$

≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

2) At 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following, and as illustrated in Appendix B:

- a) $[\text{Power allowed at numeric threshold for 50 mm in step 1}) + (\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz})/150)] \text{ mW}$, at 100 MHz to 1500 MHz
- b) $[\text{Power allowed at numeric threshold for 50 mm in step 1}) + (\text{test separation distance} - 50 \text{ mm}) \cdot 10] \text{ mW}$ at > 1500 MHz and ≤ 6 GHz

3) The 1-g and 10-g SAR test exclusion thresholds for below 100 MHz at test separation distances ≤ 50 mm are determined by:

- a) The power threshold at the corresponding test separation distance at 100 MHz in step 2) is multiplied by $[1 + \log(100/f(\text{MHz}))]$ for test separation distances > 50 mm and < 200 mm
- b) The power threshold determined by the equation in a) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$ for test separation distances ≤ 50 mm
- c) SAR measurement procedures are not established below 100 MHz. When SAR test exclusion cannot be applied, a KDB inquiry is required to determine SAR evaluation requirements for any test results to be acceptable. Note: when the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

Product	:	EZ-BT WICED Module
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

● Antenna Gain:

Model No.	N/A			
Antenna manufacturer	N/A			
Antenna Delivery	<input checked="" type="checkbox"/> 1*TX+1*RX	<input type="checkbox"/> 2*TX+2*RX	<input type="checkbox"/> 3*TX+3*RX	
Antenna technology	<input checked="" type="checkbox"/> SISO			
	<input type="checkbox"/> MIMO	<input type="checkbox"/> Basic		
		<input type="checkbox"/> CDD		
		<input type="checkbox"/> Sectorized		
Antenna Type	<input type="checkbox"/> External	<input type="checkbox"/> Dipole		
		<input type="checkbox"/> Sectorized		
	<input checked="" type="checkbox"/> Internal	<input type="checkbox"/> PIFA		
		<input type="checkbox"/> PCB		
		<input type="checkbox"/> Ceramic Chip Antenna		
		<input checked="" type="checkbox"/> Type F antenna		
	Antenna Technology	Ant Gain (dBi)		
	<input checked="" type="checkbox"/> SISO	2.4G: 4.3		
	5G: 2.7			

1.3.1. Standalone SAR test exclusion

Based on The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm and the formula below:

$$\frac{\text{Max Power of Channel (mW)}}{\text{Test Separation Dist (mm)}} * \sqrt{\text{Frequency(GHz)}} \leq 7.5$$

Note: The Max power used for calculating standalone SAR exclusion had been considered the tune up power which is 8.5dBm for BT, 13dBm for 2.4GHz WiFi and 11.5dBm for 5GHz WiFi.

Band	Exposure Condition	Pmax	Pmax	Distance	f(GHz)	calculation result	Stand-alone Test exclusion threshold	SAR Test
		(dBm)	(mw)	(mm)				
BT	Body	8.5	7.08	5	2.48	2.23	7.5	No
2.4G WiFi	Body	13.0	19.95	5	2.462	6.26	7.5	No
5G WiFi	Body	11.5	14.13	5	5.825	6.82	7.5	No

1.3.2. Simultaneous transmission SAR test exclusion

According to 4.3.2 clause b, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:

- 1) $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot \sqrt{f(\text{GHz})/x}$ W/kg, for *test separation distances* ≤ 50 mm;
where $x = 7.5$ for 1-g SAR and $x = 18.75$ for 10-g SAR.
- 2) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the *test separation distance* is > 50 mm.

Standalone transmission Mode	Pmax	Pmax	Estimated 10g SAR
	(dBm)	(mw)	(W/kg)
BT	8.5	7.08	0.119
2.4GHz WiFi	13.0	19.95	0.334
5GHz WiFi	11.5	14.13	0.364

Simultaneous transmission Mode	Simultaneous 10g SAR (W/kg)	Limit (W/kg)
BT+2.4GHz WiFi	0.453	4.0
BT+5GHz WiFi	0.483	4.0

Conclusion: BT, 2.4GHz-WiFi and 5G-WiFi SAR was not required.

————— The End —————