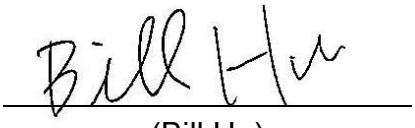
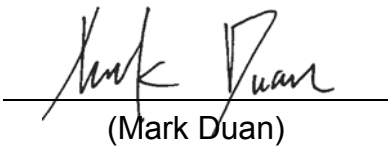
SAR Exclusion Evaluation Report

Applicant	:	Unitech Electronics Co., Ltd.
Product Type	:	BT Barcode Scanner
Trade Name	:	unitech
Model Number	:	MS926
Date of Received	:	Sep. 01, 2016
Test Period	:	Sep. 20, 2016
Date of Issued	:	Oct. 20, 2016

Issue by

Approved By :  (Bill Hu)

Tested By :  (Mark Duan)

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Oct. 20, 2016	Initial Issue	Joyce Liao

Contents

1. Description of Equipment under Test (EUT)

Applicant	Unitech Electronics Co., Ltd. 5F, No. 136, Lane 235, Pao-Chiao Rd., Hsin-Tien Dist., New Taipei City, Taiwan		
Manufacturer	Unitech Electronics Co., Ltd. 5F, No. 136, Lane 235, Pao-Chiao Rd., Hsin-Tien Dist., New Taipei City, Taiwan		
Product Type	BT Barcode Scanner		
Trade Name	unitech		
Model Number	MS926		
FCC ID	HLEMS926BT		
Operate Freq. Band	Frequency Range (MHz)	Modulation Type	Number of Channels
Bluetooth BR	2402 ~ 2480	GFSK	79
Bluetooth EDR	2402 ~ 2480	π/4-DQPSK	79
		8DPSK	79
Antenna information	Model	Type	Max. Gain (dBi)
	AT9520	Chip Antenna	3

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1093. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

2. Reference Testing Standards

Standard	Description	Version
ANSI/IEEE C95.1	American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300 KHz to 100 GHz, New York.	1992
IEEE 1528	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head From Wireless Communications Devices: Measurement Techniques.	2013
FCC 47 CFR Part 2.1093	Radiofrequency radiation exposure evaluation: portable devices.	---
FCC KDB 865664 D01	SAR measurement 100 MHz to 6 GHz - describes SAR measurement procedures for devices operating between 100 MHz to 6 GHz	v01r04
FCC KDB 865664 D02	RF Exposure Reporting - provides general reporting requirements as well as certain specific information required to support MPE and SAR compliance.	v01r02
FCC KDB 447498 D01	General RF Exposure Guidance - provides guidance pertaining to RF exposure requirements for mobile and portable device equipment authorizations.	v06

3. SAR Test Exclusion

As RF exposure evaluation of portable device, SAR test is not required when the evaluation results. According to KDB 447498 4.3.1, unless excluded by specific FCC test procedures, portable devices shall include SAR data for equipment approval. SAR test necessity will be based on the exclusion result.

The test exclusion refers KDB 447498 as below:

≤50mm:

[(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

>50mm and <200mm:

a) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz

b) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

3.1 Conducted Power

The conducted power turn-up tolerance, please reference manufacturer specification.

Operate Band	Modulation Type	Data Rate (Mbps)	Frequency (MHz)	Packet Type	Average Power (dBm)
Bluetooth BR	GFSK	1	2402	DH1	-5.16
				DH3	-5.14
				DH5	-5.14
			2441	DH1	-3.01
				DH3	-2.96
				DH5	-2.95
			2480	DH1	-1.16
				DH3	-1.11
				DH5	-1.05
Bluetooth EDR	π /4-DQPSK	2	2402	2DH1	-9.04
				2DH3	-8.73
				2DH5	-8.46
			2441	2DH1	-7.15
				2DH3	-6.91
				2DH5	-6.77
			2480	2DH1	-5.38
				2DH3	-5.06
				2DH5	-4.68
	8DPSK	3	2402	3DH1	-8.82
				3DH3	-8.68
				3DH5	-8.37
			2441	3DH1	-6.97
				3DH3	-6.91
				3DH5	-6.69
			2480	3DH1	-5.07
				3DH3	-4.80
				3DH5	-4.33

3.2 Antenna Location

Transmitter and antenna implementation	
Operate Band	Bluetooth Antenna
Bluetooth BR/EDR	V

Ant. Used	Antenna to user distance (mm)					
	Side 1	Side 2	Side 3	Side 4	Side 5	Side 6
Bluetooth Antenna	5	5	5	5	5	5

3.3 Evaluation Results

The evaluation of SAR test reduction according to KDB447498

SAR test is not required when the results showed “EXEMPT”.

Body SAR test reduction											
Ant. Used	Operate Band	Frequency (GHz)	Power		Calculated threshold value						
			(dBm)	(mW)	Side 1	Side 2	Side 3	Side 4	Side 5	Side 6	
Bluetooth Antenna	Bluetooth BR (GFSK)	2480	-1	1	0.3	0.3	0.3	0.3	0.3	0.3	
					EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT	
Bluetooth Antenna	Bluetooth EDR (π/4-DQPSK)	2480	-1	1	0.3	0.3	0.3	0.3	0.3	0.3	
					EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT	
Bluetooth Antenna	Bluetooth EDR (8DPSK)	2480	-1	1	0.3	0.3	0.3	0.3	0.3	0.3	
					EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT	EXEMPT	

Exclusion Considerations: SAR is not required

Note:
1. Calculated Threshold Value include string "mW", that is mean through compare output power with threshold, if the output power more than threshold value the SAR test should be perform.
2. Calculated Threshold Value only include number format, that is mean through compare output power with threshold, if the threshold value more than 3 the SAR test should be perform.
3. When an antenna qualifies for the standalone SAR test exclusion of KDB447498 section 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to KDB447498 section "4.3.2. Simultaneous transmission SAR test exclusion considerations b) ".
4. Power and distance are rounded to the nearest mW and mm
5. The result is rounded to one decimal place for comparison.
6. Otherwise, the SAR test could be exempt.