Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

RF Exposure evaluation

Report Reference No..... :	**GTS20190613008-1-9**
FCC ID..... :	**2AL6KBL-R8812RD3**
Compiled by (position+printed name+signature)..:	File administrators Tracy Hu
Supervised by (position+printed name+signature)..:	Test Engineer Moon Tan
Approved by (position+printed name+signature)..:	Manager Simon Hu
Date of issue.....:	Aug. 30, 2019

Representative Laboratory Name :	**Shenzhen Global Test Service Co.,Ltd.**
Address.....:	No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

Applicant's name.....:	**Shenzhen Bilian Electronic Co.,Ltd.**
Address.....:	Building B1,Zhongxing Industrial Zone,Juling,Jutang Community, Guanlan street,Longhua New District, Shenzhen,Guangdong,P.R. China

Test specification ..... **:**	
Standard .....:	**47CFR §1.1310** **47CFR §2.1093** **KDB447498 v06**
TRF Originator.....:	Shenzhen Global Test Service Co.,Ltd.
Master TRF.....:	Dated 2014-12

Test item description .....:	**1200Mbps WIRELESS USB ADAPTER**
Trade Mark .....:	/
Manufacturer .....:	Shenzhen Bilian Electronic Co.,Ltd.
Model/Type reference.....:	BL-R8812RD3
Listed Models .....:	N/A
Exposure category.....:	General population/uncontrolled environment
EUT Type .....:	Production Unit
Rating .....:	DC 5V
Result.....:	**PASS**

TEST REPORT

Test Report No. :	**GTS20190613008-1-9**	Aug. 30, 2019 Date of issue

Equipment under Test	:	1200Mbps WIRELESS USB ADAPTER
Model /Type	:	BL-R8812RD3
Listed Models	:	N/A
Applicant	:	**Shenzhen Bilian Electronic Co.,Ltd.**
Address	:	Building B1,Zhongxing Industrial Zone,Juling,Jutang Community, Guanlan street,Longhua New District, Shenzhen,Guangdong,P.R. China
Manufacturer	:	**Shenzhen Bilian Electronic Co.,Ltd.**
Address	:	Building B1,Zhongxing Industrial Zone,Juling,Jutang Community, Guanlan street,Longhua New District, Shenzhen,Guangdong,P.R. China

Test Result:	**PASS**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1 . SUMMARY

1.1. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

○ - supplied by the manufacturer

● - supplied by the lab

●	Notebook	Length (m) :	1.5m
		Shield :	Non-Shielded
		Detachable :	Non- Detachable

1.2. Product Description

Name of EUT	1200Mbps WIRELESS USB ADAPTER
Trade Mark:	/
Model Number	BL-R8812RD3
Listed Models	N/A
FCC ID	2AL6KBL-R8812RD3
Power Supply	DC 5V
Adapter information:	N/A
WLAN	Supported 802.11 a/b/g/n HT20/n HT40/ac VHT20/ac VHT40/ac VHT80
Modulation Type	IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11ac20/40/80: OFDM(64QAM, 16QAM, 256QAM,QPSK, BPSK)
Operation frequency	IEEE 802.11a:5180-5240MHz 5745-5825MHz IEEE 802.11b:2412-2472MHz IEEE 802.11g:2412-2472MHz IEEE 802.11n HT20:2412-2472MHz, 5180-5240MHz 5745-5825MHz IEEE 802.11n HT40:2422-2462MHz, 5190-5230MHz 5755-5795MHz IEEE 802.11ac20:5180-5240MHz 5745-5825MHz IEEE 802.11ac40:5190-5230MHz 5755-5795MHz IEEE 802.11ac80:5210MHz 5775MHz
Antenna Description	Two same PCB Antenna,2.00dBi(Max.)
Remark:	

2. TEST ENVIRONMENT

2.1. Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

2.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS (No. CNAS L8169)
Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA (Certificate No. 4758.01)
Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.

2.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

2.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen Global Test Service Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. METHOD OF MEASUREMENT

3.1. Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
According to §1.1310 and §2.1093 RF exposure requirement
KDB447498 v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

3.2. Requirement

According to KDB 447498 D01 General RF Exposure Guidance

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:
[(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, where
1. f(GHz) is the RF channel transmit frequency in GHz.
2. Power and distance are rounded to the nearest mW and mm before calculation.
3. The result is rounded to one decimal place for comparison.
4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

3.3. Antenna Information

BL-R8812RD3 can only use antennas certificated as follows provided by manufacturer;

Internal Identification	Antenna type and antenna number	Operate frequency band	Maximum antenna gain
Antenna 0	PCB Antenna	2000 MHz – 2500 MHz 5000 MHz – 6000 MHz	2.00dBi
Antenna 1	PCB Antenna	2000 MHz – 2500 MHz 5000 MHz – 6000 MHz	2.00dBi

4. EVALUATION RESULT

4.1. Conducted Power

[2.4GHz WLAN]

Mode	Channel	Frequency	Average Conducted Output Power (dBm)	
			Antenna0	Antenna1
IEEE 802.11b	1	2412	6.41	6.33
	7	2442	6.30	6.36
	13	2472	6.41	6.30
IEEE 802.11g	1	2412	6.37	6.45
	7	2442	6.38	6.30
	13	2472	6.43	6.41
IEEE 802.11n HT20	1	2412	6.35	6.34
	7	2442	6.29	6.42
	13	2472	6.34	6.30
IEEE 802.11n HT40	3	2422	6.34	6.43
	7	2442	6.29	6.40
	11	2462	6.32	6.44

[5GHz WLAN Band 1]

Mode	Channel	Frequency	Average Conducted Output Power (dBm)	
			Antenna0	Antenna1
IEEE 802.11a	36	5180	4.53	4.37
	40	5200	4.41	4.47
	48	5240	4.31	4.36
IEEE 802.11n HT20	36	5180	4.60	4.30
	40	5200	4.45	4.53
	48	5240	4.57	4.51
IEEE 802.11ac VHT20	36	5180	4.41	4.46
	40	5200	4.57	4.55
	48	5240	4.29	4.52
IEEE 802.11n HT40	38	5190	4.48	4.45
	46	5230	4.51	4.29
IEEE 802.11ac VHT40	38	5190	4.39	4.54
	46	5230	4.59	4.29
IEEE 802.11ac VHT80	42	5210	4.45	4.32

[5GHz WLAN Band 3]

Mode	Channel	Frequency	Average Conducted Output Power (dBm)	
			Antenna0	Antenna1
IEEE 802.11a	149	5745	4.34	4.45
	157	5785	4.45	4.57
	165	5825	4.39	4.50
IEEE 802.11n HT20	149	5745	4.57	4.29
	157	5785	4.49	4.31
	165	5825	4.49	4.39
IEEE 802.11ac VHT20	149	5745	4.58	4.37
	157	5785	4.44	4.42
	165	5825	4.51	4.45
IEEE 802.11n HT40	151	5755	4.55	4.38
	159	5795	4.53	4.36
IEEE 802.11ac VHT40	151	5755	4.58	4.41
	159	5795	4.42	4.47
IEEE 802.11ac VHT80	155	5775	4.55	4.38

4.2. Manufacturing Tolerance

2.4GHz WLAN

IEEE 802.11b (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	2412	2442	2472	2412	2442	2472
Target (dBm)	6.0	6.0	6.0	6.0	6.0	6.0
Tolerance ± (dB)	1.5	1.5	1.5	1.5	1.5	1.5
IEEE 802.11g (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	2412	2442	2472	2412	2442	2472
Target (dBm)	6.0	6.0	6.0	6.0	6.0	6.0
Tolerance ± (dB)	1.5	1.5	1.5	1.5	1.5	1.5
IEEE 802.11n HT20 (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	2412	2442	2472	2412	2442	2472
Target (dBm)	6.0	6.0	6.0	6.0	6.0	6.0
Tolerance ± (dB)	1.5	1.5	1.5	1.5	1.5	1.5
IEEE 802.11n HT40 (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	2422	2442	2462	2422	2442	2462
Target (dBm)	6.0	6.0	6.0	6.0	6.0	6.0
Tolerance ± (dB)	1.5	1.5	1.5	1.5	1.5	1.5

5GHz WLAN Band 1

IEEE 802.11a (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	5180	5200	5240	5180	5200	5240
Target (dBm)	5.0	5.0	5.0	5.0	5.0	5.0
Tolerance ± (dB)	1.5	1.5	1.5	1.5	1.5	1.5
IEEE 802.11n HT20 (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	5180	5200	5240	5180	5200	5240
Target (dBm)	5.0	5.0	5.0	5.0	5.0	5.0
Tolerance ± (dB)	1.5	1.5	1.5	1.5	1.5	1.5
IEEE 802.11ac VHT20 (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	5180	5200	5240	5180	5200	5240
Target (dBm)	5.0	5.0	5.0	5.0	5.0	5.0
Tolerance ± (dB)	1.5	1.5	1.5	1.5	1.5	1.5
IEEE 802.11n HT40 (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	5190	5230		5190	5230	
Target (dBm)	5.0	5.0		5.0	5.0	
Tolerance ± (dB)	1.5	1.5		1.5	1.5	
IEEE 802.11ac VHT40 (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	5190	5230		5190	5230	
Target (dBm)	5.0	5.0		5.0	5.0	
Tolerance ± (dB)	1.5	1.5		1.5	1.5	
IEEE 802.11ac VHT80 (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	5210			5210		
Target (dBm)	5.0			5.0		
Tolerance ± (dB)	1.5			1.5		

5GHz WLAN Band 3

IEEE 802.11a (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	5745	5785	5825	5745	5785	5825
Target (dBm)	5.0	5.0	5.0	5.0	5.0	5.0
Tolerance ± (dB)	1.5	1.5	1.5	1.5	1.5	1.5
IEEE 802.11n HT20 (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	5745	5785	5825	5745	5785	5825
Target (dBm)	5.0	5.0	5.0	5.0	5.0	5.0
Tolerance ± (dB)	1.5	1.5	1.5	1.5	1.5	1.5
IEEE 802.11ac VHT20 (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	5745	5785	5825	5745	5785	5825
Target (dBm)	5.0	5.0	5.0	5.0	5.0	5.0
Tolerance ± (dB)	1.5	1.5	1.5	1.5	1.5	1.5
IEEE 802.11n HT40 (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	5755		5795	5755		5795
Target (dBm)	5.0		5.0	5.0		5.0
Tolerance ± (dB)	1.5		1.5	1.5		1.5
IEEE 802.11ac VHT40 (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	5755		5795	5755		5795
Target (dBm)	5.0		5.0	5.0		5.0
Tolerance ± (dB)	1.5		1.5	1.5		1.5
IEEE 802.11ac VHT80 (Average)						
Frequency (MHz)	Antenna 0			Antenna 1		
	5775			5775		
Target (dBm)	5.0			5.0		
Tolerance ± (dB)	1.5			1.5		

4.3. Standalone MPE

2.4GHz WLAN Antenna0

MODE	f (GHz)	Minimum Separation Distance (mm)	Output Power (Turn-up Procedure)		Calculated value	Threshold (1-g SAR)	SAR Test Exclusion
			dBm	mW			
802.11b	2.412	5	7.5	5.6234	1.78	3.0	YES
	2.442	5	7.5	5.6234	1.78	3.0	YES
	2.472	5	7.5	5.6234	1.78	3.0	YES
802.11g	2.412	5	7.5	5.6234	1.78	3.0	YES
	2.442	5	7.5	5.6234	1.78	3.0	YES
	2.472	5	7.5	5.6234	1.78	3.0	YES
802.11n(HT20)	2.412	5	7.5	5.6234	1.78	3.0	YES
	2.442	5	7.5	5.6234	1.78	3.0	YES
	2.472	5	7.5	5.6234	1.78	3.0	YES
802.11n(HT40)	2.422	5	7.5	5.6234	1.78	3.0	YES
	2.442	5	7.5	5.6234	1.78	3.0	YES
	2.462	5	7.5	5.6234	1.78	3.0	YES

2.4GHz WLAN Antenna1

MODE	f (GHz)	Minimum Separation Distance (mm)	Output Power (Turn-up Procedure)		Calculated value	Threshold (1-g SAR)	SAR Test Exclusion
			dBm	mW			
802.11b	2.412	5	7.5	5.6234	1.78	3.0	YES
	2.442	5	7.5	5.6234	1.78	3.0	YES
	2.472	5	7.5	5.6234	1.78	3.0	YES
802.11g	2.412	5	7.5	5.6234	1.78	3.0	YES
	2.442	5	7.5	5.6234	1.78	3.0	YES
	2.472	5	7.5	5.6234	1.78	3.0	YES
802.11n(HT20)	2.412	5	7.5	5.6234	1.78	3.0	YES
	2.442	5	7.5	5.6234	1.78	3.0	YES
	2.472	5	7.5	5.6234	1.78	3.0	YES
802.11n(HT40)	2.422	5	7.5	5.6234	1.78	3.0	YES
	2.442	5	7.5	5.6234	1.78	3.0	YES
	2.462	5	7.5	5.6234	1.78	3.0	YES

5.2GHz WLAN Antenna0

MODE	f (GHz)	Minimum Separation Distance (mm)	Output Power (Turn-up Procedure)		Calculated value	Threshold (1-g SAR)	SAR Test Exclusion
			dBm	mW			
802.11a	5.180	5	6.5	4.4668	2.16	3.0	YES
	5.200	5	6.5	4.4668	2.16	3.0	YES
	5.240	5	6.5	4.4668	2.16	3.0	YES
802.11n(HT20)	5.180	5	6.5	4.4668	2.16	3.0	YES
	5.200	5	6.5	4.4668	2.16	3.0	YES
	5.240	5	6.5	4.4668	2.16	3.0	YES
802.11ac(VHT20)	5.180	5	6.5	4.4668	2.16	3.0	YES
	5.200	5	6.5	4.4668	2.16	3.0	YES
	5.240	5	6.5	4.4668	2.16	3.0	YES
802.11n(HT40)	5.190	5	6.5	4.4668	2.16	3.0	YES
	5.230	5	6.5	4.4668	2.16	3.0	YES
802.11ac(VHT40)	5.190	5	6.5	4.4668	2.16	3.0	YES
	5.230	5	6.5	4.4668	2.16	3.0	YES
802.11ac(VHT80)	5.210	5	6.5	4.4668	2.16	3.0	YES

5.2GHz WLAN Antenna1

MODE	f (GHz)	Minimum Separation Distance (mm)	Output Power (Turn-up Procedure)		Calculated value	Threshold (1-g SAR)	SAR Test Exclusion
			dBm	mW			
802.11a	5.180	5	6.5	4.4668	2.16	3.0	YES
	5.200	5	6.5	4.4668	2.16	3.0	YES
	5.240	5	6.5	4.4668	2.16	3.0	YES
802.11n(HT20)	5.180	5	6.5	4.4668	2.16	3.0	YES
	5.200	5	6.5	4.4668	2.16	3.0	YES
	5.240	5	6.5	4.4668	2.16	3.0	YES
802.11ac(VHT20)	5.180	5	6.5	4.4668	2.16	3.0	YES
	5.200	5	6.5	4.4668	2.16	3.0	YES
	5.240	5	6.5	4.4668	2.16	3.0	YES
802.11n(HT40)	5.190	5	6.5	4.4668	2.16	3.0	YES
	5.230	5	6.5	4.4668	2.16	3.0	YES
802.11ac(VHT40)	5.190	5	6.5	4.4668	2.16	3.0	YES
	5.230	5	6.5	4.4668	2.16	3.0	YES
802.11ac(VHT80)	5.210	5	6.5	4.4668	2.16	3.0	YES

5.8GHz WLAN Antenna0

MODE	f (GHz)	Minimum Separation Distance (mm)	Output Power (Turn-up Procedure)		Calculated value	Threshold (1-g SAR)	SAR Test Exclusion
			dBm	mW			
802.11a	5.745	5	6.5	4.4668	2.16	3.0	YES
	5.785	5	6.5	4.4668	2.16	3.0	YES
	5.825	5	6.5	4.4668	2.16	3.0	YES
802.11n(HT20)	5.745	5	6.5	4.4668	2.16	3.0	YES
	5.785	5	6.5	4.4668	2.16	3.0	YES
	5.825	5	6.5	4.4668	2.16	3.0	YES
802.11ac(VHT20)	5.745	5	6.5	4.4668	2.16	3.0	YES
	5.785	5	6.5	4.4668	2.16	3.0	YES
	5.825	5	6.5	4.4668	2.16	3.0	YES
802.11n(HT40)	5.755	5	6.5	4.4668	2.16	3.0	YES
	5.795	5	6.5	4.4668	2.16	3.0	YES
802.11ac(VHT40)	5.755	5	6.5	4.4668	2.16	3.0	YES
	5.795	5	6.5	4.4668	2.16	3.0	YES
802.11ac(VHT80)	5.775	5	6.5	4.4668	2.16	3.0	YES

5.8GHz WLAN Antenna1

MODE	f (GHz)	Minimum Separation Distance (mm)	Output Power (Turn-up Procedure)		Calculated value	Threshold (1-g SAR)	SAR Test Exclusion
			dBm	mW			
802.11a	5.745	5	6.5	4.4668	2.16	3.0	YES
	5.785	5	6.5	4.4668	2.16	3.0	YES
	5.825	5	6.5	4.4668	2.16	3.0	YES
802.11n(HT20)	5.745	5	6.5	4.4668	2.16	3.0	YES
	5.785	5	6.5	4.4668	2.16	3.0	YES
	5.825	5	6.5	4.4668	2.16	3.0	YES
802.11ac(VHT20)	5.745	5	6.5	4.4668	2.16	3.0	YES
	5.785	5	6.5	4.4668	2.16	3.0	YES
	5.825	5	6.5	4.4668	2.16	3.0	YES
802.11n(HT40)	5.755	5	6.5	4.4668	2.16	3.0	YES
	5.795	5	6.5	4.4668	2.16	3.0	YES
802.11ac(VHT40)	5.755	5	6.5	4.4668	2.16	3.0	YES
	5.795	5	6.5	4.4668	2.16	3.0	YES
802.11ac(VHT80)	5.775	5	6.5	4.4668	2.16	3.0	YES

Remark:

1. Output power including tune up tolerance;

2. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to f) in section 4.1 is applied to determine SAR test exclusion.

Simultaneous Transmission for SAR Exclusion

The sample supports 2 antennas for 2.4GHz WLAN and 5G WLAN. The Antenna 0 is used for 2.4G/5G WLAN and the Antenna 1 is used for 2.4G/5G WLAN. they supports same antenna, need consider simultaneous transmission;

$\sum$ of (the highest estimated $SAR_{Antenna0}$+ the highest estimated $SAR_{Antenna1}$)/1.6 = (0.2371+0.2371)/1.6 = 0.3 < 1.0;

5. CONCLUSION

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06, No SAR is required.

.....End of Report.....