RF Exposure Evaluation Report

Product	:	WIFI+BT Module
Trade mark	:	GSD
Model/Type reference	:	WCT5LM2001
Serial Number	:	N/A
Report Number	:	EED32L00242604
FCC ID	:	2AC23-WCT5L
Date of Issue	:	Dec. 04, 2019
Test Standards	:	IEEE C95.1 2005 KDB 447498 D03 47 C.F.R. Part 1, Subpart I, Section 1.1310 47 C.F.R. Part 2, Subpart J, Section 2.1091
Test result	:	PASS

Prepared for:

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Prepared by:

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CENTRE TESTING INTERNATIONAL GROUP CO.,LTD. Report Seal

2 Version

Version No.	Date	Description
00	Dec. 04, 2019	Original

3 Contents

4 General Information

4.1 Client Information

Applicant:	Hui Zhou Gaoshengda Technology Co.,LTD
Address of Applicant:	NO.75 Zhongkai Development Area,Huizhou,Guangdong, China
Manufacturer:	Hui Zhou Gaoshengda Technology Co.,LTD
Address of Manufacturer:	NO.75 Zhongkai Development Area,Huizhou,Guangdong, China
Factory:	Hui Zhou Gaoshengda Technology Co.,LTD
Address of Factory:	NO.75 Zhongkai Development Area,Huizhou,Guangdong, China

4.2 General Description of EUT

Product Name:	WIFI+BT Module
Model No.(EUT):	WCT5LM2001
Trade Mark:	GSD
EUT Supports Radios application	BT 5.0 Dual mode 2.4G WiFi: 802.11b/g/n(20MHz)/n(40MHz) 5G WiFi: 802.11a/n(HT20)/n(HT40)/ac(HT20)/ac(HT40)/ac(HT80)

4.3 Product Specification subjective to this standard

Frequency Range:	BT 5.0 Dual mode: 2402MHz~2480MHz 2.4G WIFI: IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz 5G WiFi: U-NII-1: 5.15-5.25GHz; U-NII-2a: 5.25-5.355GHz; U-NII-2c: 5.47-5.6GHz; U-NII-3: 5.725-5.85GHz
Modulation Type:	GFSK, 8DPSK, π/4DQPSK OFDM, DSSS
Test Software of EUT:	2.4G/5G WI-FI: MT7688 QA 0.0.2.6 BT: WCN Combo Tool
Antenna Type:	PIFA antenna
Antenna Gain:	BT 2 dBi / 2.4GHz 2 dBi / 5GHz 3dBi
Antenna Specification	Bluetooth : Antenna Gain : 2.00 dBi (Numeric gain: 1.58) 2.4GHz Antenna Gain : 2.00 dBi (Numeric gain: 1.58) 5GHz Antenna Gain : 3.00 dBi (Numeric gain: 2.00)

Maximum tune up power

SISO

Bluetooth:	5.50 dBm	(3.548 mW)
2.4G WIFI		
IEEE 802.11b Mode:	19.00 dBm	(79.433 mW)
IEEE 802.11g Mode:	22.50 dBm	(177.828 mW)
IEEE 802.11n HT 20 Mode:	21.00 dBm	(125.893 mW)
IEEE 802.11n HT 40 Mode:	21.00 dBm	(125.893 mW)
5G WIFI		
IEEE 802.11a Mode:	18.00 dBm	(63.096 mW)
IEEE 802.11n HT 20 Mode:	16.00 dBm	(39.811 mW)
IEEE 802.11n HT 40 Mode:	16.00 dBm	(39.811 mW)
IEEE 802.11ac VHT 20 Mode:	16.00 dBm	(39.811 mW)
IEEE 802.11ac VHT 40 Mode:	15.00 dBm	(31.623 mW)
IEEE 802.11ac VHT 80 Mode:	11.00 dBm	(12.589 mW)

MIMO

2.4G WIFI		
IEEE 802.11n HT 20 Mode:	24.50 dBm	(281.838 mW)
IEEE 802.11n HT 40 Mode:	24.50 dBm	(281.838 mW)
5G WIFI		
IEEE 802.11n HT 20 Mode:	19.00 dBm	(79.433 mW)
IEEE 802.11n HT 40 Mode:	19.00 dBm	(79.433 mW)
IEEE 802.11ac VHT 20 Mode:	19.00 dBm	(79.433 mW)
IEEE 802.11ac VHT 40 Mode:	19.50 dBm	(89.125 mW)
IEEE 802.11ac VHT 80 Mode:	14.00 dBm	(25.119 mW)

Power Supply:	DC 3.3V
Sample Received Date:	Aug. 29, 2019
Sample tested Date:	Aug. 29, 2019 to Nov. 04, 2019

4.4 Test Location

All tests were performed at:
Centre Testing International Group Co., Ltd
Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China
Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385
No tests were sub-contracted.
FCC Designation No.: CN1164

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Other Information Requested by the Customer

None.

5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***Equation 1***

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

5.2 Maximum Permissible Exposure

Substituting the MPE safe distance using d = 20 cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

SISO
Bluetooth:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm²	Limit(mW/cm²)
78	2480	5.548	1.58	20	0.0017	1

2.4G WIFI
IEEE 802.11b mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm²	Limit(mW/cm²)
6	2437	90.991	1.58	20	0.0287	1

IEEE 802.11g mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm²	Limit(mW/cm²)
6	2437	229.087	1.58	20	0.0723	1

IEEE 802.11n HT20 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm²	Limit(mW/cm²)
6	2437	145.211	1.58	20	0.0458	1

IEEE 802.11n HT40 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm²	Limit(mW/cm²)
9	2452	152.055	1.58	20	0.0480	1

5G WIFI

IEEE 802.11a mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm^2	Limit(mW/cm^2)
157	5785	67.298	2	20	0.0267	1

IEEE 802.11 HT20 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm^2	Limit(mW/cm^2)
64	5320	55.719	2	20	0.0221	1

IEEE 802.11 HT40 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm^2	Limit(mW/cm^2)
62	5310	59.566	2	20	0.0237	1

IEEE 802.11ac VHT20 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm^2	Limit(mW/cm^2)
64	5320	56.494	2	20	0.0224	1

IEEE 802.11ac VHT40 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm^2	Limit(mW/cm^2)
38	5190	48.529	2	20	0.0193	1

IEEE 802.11ac VHT80 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm^2	Limit(mW/cm^2)
42	5210	14.825	2	20	0.0059	1

MIMO

2.4G WIFI

IEEE 802.11n HT20 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm^2	Limit(mW/cm^2)
6	2437	299.226	1.58	20	0.0944	1

IEEE 802.11n HT40 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm^2	Limit(mW/cm^2)
3	2422	307.610	1.58	20	0.0970	1

5G WIFI

IEEE 802.11 HT20 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm^2	Limit(mW/cm^2)
157	5785	98.628	2	20	0.0392	1

IEEE 802.11 HT40 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm^2	Limit(mW/cm^2)
159	5795	96.161	2	20	0.0382	1

IEEE 802.11ac VHT20 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm^2	Limit(mW/cm^2)
157	5785	96.161	2	20	0.0382	1

IEEE 802.11ac VHT40 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm^2	Limit(mW/cm^2)
159	5795	100.693	2	20	0.0400	1

IEEE 802.11ac VHT80 mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm^2	Limit(mW/cm^2)
155	5775	31.261	2	20	0.0124	1

PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32L00242601 for EUT external and internal photos.

*** End of Report ***