

RF Exposure Evaluation Report

Product : WIFI Module
Trade mark : GSD
Model/Type reference : W5LM2001
Serial Number : N/A
Report Number : EED32L00320703
FCC ID : 2AC23-W5L
Date of Issue : Dec. 06, 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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2 Version

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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 Module
Model No.(EUT):	W5LM2001
Trade Mark:	GSD
EUT Supports Radios application	IEEE 802.11 a/b/g/n(HT20)(HT40): 2412MHz to 2462MHz, 5150MHz to 5250MHz, 5725MHz to 5850MHz.

4.3 Product Specification subjective to this standard

Frequency Range:	IEEE 802.11 a/b/g/n(HT20)(HT40): 2412MHz to 2462MHz, 5150MHz to 5250MHz, 5725MHz to 5850MHz.				
Modulation Type:	OFDM, DSSS				
Test Software of EUT:	2.4G/5G WI-FI: MT7688 QA 0.0.2.6				
Antenna Type:	PIFA antenna				
Antenna Gain:	2.4G/WIFI: 2.94 dBi / 5G WIFI: 2.67 dBi				
Antenna Specification	2.4GHz	Antenna Gain :	2.94 dBi	(Numeric gain: 1.97)	
	5GHz	Antenna Gain :	2.67 dBi	(Numeric gain: 1.85)	
Maximum tune up power	SISO				

	2.4G WIFI		
	IEEE 802.11b Mode:	22.00 dBm	(158.489 mW)
	IEEE 802.11g Mode:	26.00 dBm	(398.107 mW)
	IEEE 802.11n HT 20 Mode:	24.50 dBm	(281.838 mW)
	IEEE 802.11n HT 40 Mode:	24.00 dBm	(251.189 mW)
	5G WIFI		
	UNII-1:		
	IEEE 802.11a Mode:	13.50 dBm	(22.387 mW)
	IEEE 802.11n HT 20 Mode:	13.50 dBm	(22.387 mW)
	IEEE 802.11n HT 40 Mode:	13.50 dBm	(22.387 mW)
	UNII-3:		
	IEEE 802.11a Mode:	15.00 dBm	(31.623 mW)
	IEEE 802.11n HT 20 Mode:	14.00 dBm	(25.119 mW)
	IEEE 802.11n HT 40 Mode:	13.50 dBm	(22.387 mW)
	MIMO		
	2.4G WIFI		
	IEEE 802.11n HT 20 Mode:	25.00 dBm	(316.228 mW)
	IEEE 802.11n HT 40 Mode:	24.50 dBm	(281.838 mW)
	5G WIFI		
	UNII-1:		
	IEEE 802.11n HT 20 Mode:	13.50 dBm	(22.387 mW)
	IEEE 802.11n HT 40 Mode:	13.50 dBm	(22.387 mW)
	UNII-3:		
	IEEE 802.11n HT 20 Mode:	17.00 dBm	(50.119 mW)
	IEEE 802.11n HT 40 Mode:	17.50 dBm	(56.234 mW)
Power Supply:	DC 3.3V		
Sample Received Date:	Oct. 31, 2019		
Sample tested Date:	Oct. 31, 2019 to Nov. 25, 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:

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

Changing to units of mW and cm, using:

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

d (cm) = d(m) / 100

Yields

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

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

2.4G WIFI

IEEE 802.11b mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm ²	Limit(mW/cm ²)
6	2437	166.341	1.97	20	0.0651	1

IEEE 802.11g mode:

Ch.	Frq.(MHz)	P(mW)	Gain(num.)	D(cm)	Power density in mW/cm ²	Limit(mW/cm ²)
11	2462	414.954	1.97	20	0.1625	1

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	345.939	1.97	20	0.1355	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)
6	2437	262.422	1.97	20	0.1028	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)
165	5825	31.915	1.85	20	0.0117	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)
165	5825	25.468	1.85	20	0.0094	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)
38	5190	24.434	1.85	20	0.0090	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	325.087	1.97	20	0.1273	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	275.423	1.97	20	0.1079	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	52.481	1.85	20	0.0193	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	55.208	1.85	20	0.0203	1

PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32L00320701 for EUT external and internal photos.

*** End of Report ***

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