

Beijing Roborock Technology Co., Ltd.

MPE ASSESSMENT REPORT

Report Type:

FCC Part §2.1091, §2.1093 and §1.1307(b) assessment report

Model:

F89ETSM13-W2

REPORT NUMBER:

190802386SHA-002

ISSUE DATE:

November 4, 2019

DOCUMENT CONTROL NUMBER:

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Manufacturer: Beijing Roborock Technology Co., Ltd.
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Heiquan Road, Haidian District, Beijing, P.R. China

Product Name: WIFI Module

Type/Model: F89ETSM13-W2

FCC ID: 2AN2O-RSW01

SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:

KDB447498 D01 General RF Exposure Guidance v06
FCC Part2.1091, FCC Part2.1093, FCC Part1.1307(b)

PREPARED BY:

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Reviewer
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Revision History

Report No.	Version	Description	Issued Date
190802386SHA-002	Rev. 01	Initial issue of report	November 4, 2019

TEST REPORT

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name:	WIFI Module
Type/Model:	F89ETSM13-W2
Description of EUT:	The EUT is a WIFI module which support WIFI 2.4GHz technology, and there have only one mode, we tested it and listed the WIFI 2.4GHz band result in this report.
Rating:	DC 3.3V
Software Version:	/
Hardware Version:	/
Sample received date:	September 19, 2019
Date of test:	September 19, 2019 ~ October 25, 2019

1.2 Technical Specification

Frequency Range:	2412MHz ~ 2462MHz
Support Standards:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n-HT20, IEEE 802.11n-HT40
Type of Modulation:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n-HT20: OFDM (64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n-HT40: OFDM (64-QAM, 16-QAM, QPSK, BPSK)
Channel Number:	11 Channels for 802.11b, 802.11g and 802.11n(HT20) 7 Channels for 802.11n(HT40)
Data Rate:	IEEE 802.11b: Up to 11 Mbps IEEE 802.11g: Up to 54 Mbps IEEE 802.11n-HT20: Up to MCS7 IEEE 802.11n-HT40: Up to MCS7
Channel Separation:	5 MHz
Antenna:	Internal PCB antenna, 3.7dBi Peak gain

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1.3 Description of Test Facility

Name:	Intertek Testing Services Shanghai
Address:	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone:	86 21 61278200
Telefax:	86 21 54262353

The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L0139
	FCC Accredited Lab Designation Number: CN1175
	IC Registration Lab CAB identifier.: CN0051
	VCCI Registration Lab Registration No.: R-14243, G-10845, C-14723, T-12252
	A2LA Accreditation Lab Certificate Number: 3309.02

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2 MPE Assessment

Test result: Pass

2.1 MPE Assessment Limit

Mobile device exposure for standalone operations:

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (uT)	Equivalent plane wave power density S_{eq} (W/m ²)
0-1 Hz	-	$3,2 \times 10^4$	4×10^4	-
1-8 Hz	10 000	$3,2 \times 10^4/f^2$	$4 \times 10^4/f^2$	-
8-25 Hz	10 000	$4\,000/f$	$5\,000/f$	-
0,025-0,8 kHz	$250/f$	$4/f$	$5/f$	-
0,8-3 kHz	$250/f$	5	6,25	-
3-150 kHz	87	5	6,25	-
0,15-1 MHz	87	$0,73/f$	$0,92/f$	-
1-10 MHz	$87/f^{1/2}$	$0,73/f$	$0,92/f$	-
10-400 MHz	28	0,073	0,092	2
400-2 000 MHz	$1,375 f^{1/2}$	$0,0037 f^{1/2}$	$0,0046 f^{1/2}$	$f/200$
2-300 GHz	61	0,16	0,20	10

Mobile device exposure for simultaneous transmission operations: **the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0**

2.2 Assessment Results

Power density (S) is calculated according to the formula:

$$S = PG / (4\pi R^2)$$

Where S = power density in mW/cm²

P = Radiated transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

As we can see from the test report 180400905SHA-001:

The calculations in the table below use the highest gain of antenna for client EUT. These calculations represent worst case in terms of the exposure levels.

Frequency band	Power		Antenna Gain		R	S	Limits
(MHz)	dBm	mW	dBi	(Numeric)	(cm)	(mW/cm ²)	(mW/cm ²)
2412 - 2462	18.12	64.86	3.7	2.34	20	0.030	1

Frequency band	Max Permit Power with tolerance		Antenna Gain		R	S	Limits
(MHz)	dBm	mW	dBi	(Numeric)	(cm)	(mW/cm ²)	(mW/cm ²)
2412 - 2462	19.00	79.43	3.7	2.34	20	0.037	1

Note: 1 mW/cm² from 1.310 Table 1

Appendix I

Definition below must be outlined in the User Manual:

To satisfy FCC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation.
To ensure compliance, operations at closer than this distance is not recommended.

***** END *****