RF Exposure Evaluation Declaration

FCC ID:	2AN2O-S6MAXV
IC:	23317-S6MAXV
APPLICANT:	Beijing Roborock Technology Co., Ltd.
Application Type:	Certification
Product:	Robotic Vacuum Cleaner
Model No.:	roborock S6 MaxV
Brand Name:	roborock
FCC Rule Part(s):	KDB 447498 D01 General RF Exposure Guidance v06 IEEE C95.1-1992
IC Rule Part(s):	RSS-102 Issue 5
Test Date:	December 13 ~ 25, 2019

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Revision History

Report No.	Version	Description	Issue Date	Note
1912WSU006-U3	Rev. 01	Initial Report	02-27-2020	Valid

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name	Robotic Vacuum Cleaner
Model No.	roborock S6 MaxV
Brand Name	roborock
Wi-Fi Specification	802.11b/g/n-HT20/n-HT40
Antenna Type:	PCB Antenna
Antenna Gain:	3.21 dBi
Frequency Range	**2.4GHz:** For 802.11b/g/n-HT20: 2412 ~ 2462 MHz For 802.11n-HT40: 2422 ~ 2452 MHz
Type of Modulation	802.11b: DSSS 802.11g/n: OFDM
Maximum Average Output Power	802.11b: 8.67dBm 802.11g: 13.82dBm 802.11n-HT20: 13.14dBm 802.11n-HT40: 14.62dBm

2. RF Exposure Evaluation

2.1. Limits for FCC:

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	f/1500	6
1500-100,000	--	--	1	30

f= Frequency in MHz

Calculation Formula: $Pd = (Pout*G)/(4*pi*r^2)$

Where
Pd = power density in mW/cm^2
Pout = output power to antenna in mW
G = gain of antenna in linear scale
Pi = 3.1416
r = distance between observation point and center of the radiator in cm

Pd is the limit of MPE, $1mW/cm^2$. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.2. Limits for IC:

According to RSS-102: Exemption Limits for Routine Evaluation – RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

• below 20 MHz6 and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

• at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of

the device is equal to or less than 22.48/f0.5 W (adjusted for tune-up tolerance), where f is in MHz;
• at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
• at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1.31 x 10-2 f0.6834 W (adjusted for tune-up tolerance), where f is in MHz;
• at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

2.3. Test Result of RF Exposure Evaluation for FCC and IC

Product	Robotic Vacuum Cleaner
Test Item	RF Exposure Evaluation

FCC:

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Tune-up (dBm)	Power Density at R = 20 cm (mW/cm2)	Limit (mW/cm2)
802.11b/g/n	2412 ~ 2462	17.83	19.03	0.0159	1

IC:

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Tune-up (dBm)	Maximum EIRP (W)	Limit (W)
802.11b/g/n	2412 ~ 2462	17.83	19.03	0.07998	2.6840

CONCLUSION:

The Max Power Density at R (20 cm) =0.0159mW/cm^2 < 1mW/cm^2.

The device is excluded for SAR test and complies with the IC exposure requirements since the maximum conducted peak output power is lower than the SAR test exclusion thresholds.

So the EUT complies with RF Exposure requirement.

The End

Appendix A - EUT Photograph

Refer to “1912WSU006-UE” file.