RF EXPOSURE EVALUATION

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)

EUT Specification

Product Name	**:**	LAMBOT Robotic Vacuum Cleaner
Model Name	**:**	LBPWVNA1, LBPBVNA1, LBPPVNA1, LBPCVNA1, LBPAVNA1, LBPRVNA1, LBPGVNA1, LBPYVNA1, LBPOVNA1, LBPTVNA1, LBPVVNA1, LBPSVNA1, LBPNVNA1, LBPLVNA1, LBPDVNA1, LBPFVNA1, LBPHVNA1, LBPIVNA1, IHPPWNA1, IHPPBNA1, IHPPPNA1, IHPPCNA1, IHPPANA1, IHPPRNA1, IHPPGNA1, IHPPYNA1, IHPPONA1, IHPPTNA1, IHPPVNA1, IHPPSNA1, IHPPNNA1, IHPPLNA1, IHPPDNA1, IHPPFNA1, IHPPHNA1 (Note: The samples are the same except appearance and model number. So LBPWVNA1 was selected for full tested.)
FCC ID	**:**	2ARM8-LBPWVNA1
Operating frequency	:	2402-2480MHz For Bluetooth 2.4G Wi-Fi: 2412-2462MHz for 802.11b/g/n (HT20) 2422-2452MHz for 802.11n (HT40)
Numbers of Channel	:	802.11b/g/n(HT20): 11 Channels 802.11n(HT40): 7 Channels BLE: 40 Channels Bluetooth: 79 channels
Type of Modulation	:	802.11b/g/n: DSSS, OFDM BLE: GFSK Bluetooth: GFSK, Π/4-DQPSK, 8DPSK
Antenna installation	:	Internal Antenna
Antenna Gain	:	3 dBi
Power supply	:	AC 100-240V,50/60Hz
Device category	:	Mobile (>20cm separation)

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
(A) Limits for Occupational/Control Exposures				
300-1500	**--**	**--**	**F/300**	**6**
1500-100000	**--**	**--**	**5**	**6**
(B) Limits for General Population/Uncontrol Exposures				
300-1500	**--**	**--**	**F/1500**	**6**
1500-100000	**--**	**--**	**1**	**30**

Friis transmission formula: Pd=(Pout*G)\(4*pi*R2)

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 the limit of MPE, 1mW/cm2. If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

Wi-Fi:

Modulation	Maximum Peak Output Power (dBm)		
	Low Channel	Middle Channel	High Channel
802.11b	14.49	14.18	14.51
802.11g	13.99	14.05	13.44
802.11n-HT20	13.58	13.29	13.33
802.11n-HT40	12.17	12.11	11.05

Operating Mode	Test Channel	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Output Peak power (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
802.11b	1	14±1	15	31.62	3	1.995	0.012552	1
	6	14±1	15	31.62	3	1.995	0.012552	1
	11	14±1	15	31.62	3	1.995	0.012552	1
802.11g	1	13±1	14	25.12	3	1.995	0.009971	1
	6	14±1	15	31.62	3	1.995	0.012552	1
	11	13±1	14	25.12	3	1.995	0.009971	1
802.11n-HT20	1	13±1	14	25.12	3	1.995	0.009971	1
	6	13±1	14	25.12	3	1.995	0.009971	1
	11	13±1	14	25.12	3	1.995	0.009971	1
802.11n-HT40	3	12±1	13	19.95	3	1.995	0.007920	1
	6	12±1	13	19.95	3	1.995	0.007920	1
	9	11±1	12	15.85	3	1.995	0.006291	1

BLE:

Channel Frequency (MHz)	Measurement Peak Output Power(dBm)
	GFSK
2402	6.89
2440	8.33
2480	8.61

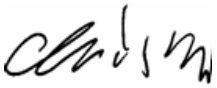
Channel Frequency (MHz)	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Output Peak power (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
2402	6±1	7	5.01	3	1.995	0.001989	1
2440	8±1	9	7.94	3	1.995	0.003153	1
2480	8±1	9	7.94	3	1.995	0.003153	1

Bluetooth:

Channel Frequency (MHz)	Measurement Peak Output Power(dBm)		
	GFSK	Π/4-DQPSK	8DPSK
2402	5.99	7.15	7.46
2441	6.54	7.76	8.01
2480	6.60	7.33	7.49

Channel Frequency (MHz)	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Output Peak power (mW)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
2402	5±1	6	3.98	3	1.995	0.001580	1
2441	6±1	7	5.01	3	1.995	0.001989	1
2480	6±1	7	5.01	3	1.995	0.001989	1
2402	7±1	8	6.31	3	1.995	0.002505	1
2441	7±1	8	6.31	3	1.995	0.002505	1
2480	7±1	8	6.31	3	1.995	0.002505	1
2402	7±1	8	6.31	3	1.995	0.002505	1
2441	8±1	9	7.94	3	1.995	0.003153	1
2480	7±1	8	6.31	3	1.995	0.002505	1

Signature



Date: 2018-11-20