

RF EXPOSURE EVALUATION

EUT Specification

EUT	Robot Vacuum Cleaner
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.24GHz ☐ WLAN: 5.745GHz ~ 5.825GHz ☐ Others(Bluetooth: 2.402GHz ~ 2.480GHz)
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others ____
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	11.84dBm(15.28mW)
Antenna gain	0 dBi
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation

Limits for Maximum Permissible Exposure (MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm ²)
300-1500	--	--	F/1500
1500-100000	--	--	1

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm²

P_{out} =output power to antenna in Mw

G = gain of antenna in linear scale

π =3.1416

R = distance between observation point and center of the radiator in cm

P_d 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

Channel	Gain	Channel Frequency (MHz)	Max Output power (dBm)	Tolerance	Max Tune-UP power (mW)	Power density at 20cm (mW/cm ²)	Power density Limits (mW/cm ²)
802.11b							
Low	0	2412	11.84	± 0.5	17.13	0.0341	1
Middle	0	2437	11.70	± 0.5	16.60	0.0330	1
High	0	2462	11.22	± 0.5	14.86	0.0296	1
802.11g							
Low	0	2412	10.78	± 0.5	13.43	0.0267	1
Middle	0	2437	10.58	± 0.5	12.82	0.0255	1
High	0	2462	10.35	± 0.5	12.16	0.0242	1
802.11n HT20							
Low	0	2412	10.87	± 0.5	13.71	0.0276	1
Middle	0	2437	10.70	± 0.5	13.18	0.0262	1
High	0	2462	10.26	± 0.5	11.91	0.0237	1

According to the test result of power density at separation distance 20cm, compliance with RF Exposure requirement.