

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)

FCC ID: 2A2O4LC1OMV2

EUT Specification

EUT	Omni LightBulb Camera
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☒ WLAN: 5.18GHz ~ 5.24GHz ☒ WLAN: 5.745GHz ~ 5.825GHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation)
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm ²) ☒ General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	14.43 dBm for WIFI 2.4G Band; 16.15 dBm for UNII Band I; 15.18 dBm for UNII Band III
Antenna gain (Max)	2.2 dBi for WIFI 2.4 Band 2.4 dBi for WIFI 5G Band I 2.4 dBi for WIFI 5G Band III
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)	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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm^2 , P_{out} = output power to antenna in Mw

G = gain of antenna in linear scale, $P_i = 3.1416$

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

P_d the limit of MPE, $1\text{mW}/\text{cm}^2$. 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

For 2.4G band:

Test Channel	Peak Output Power (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	10.56	10.45	11.13	10.59	30	Pass
Middle	14.43	9.91	10	10.36		
Highest	13.76	9.65	9.46	9.77		

For 5G band:

Operation Mode	Channel Number	Channel Frequency (MHz)	Measurement Level (dBm)	Limit (dBm)	Verdict
			Ant1		
802.11a	CH36	5180	16.15	24	PASS
	CH40	5200	15.42	24	PASS
	CH48	5240	14.37	24	PASS
	CH149	5745	15.03	30	PASS
	CH157	5785	15.18	30	PASS
	CH165	5825	14.72	30	PASS
802.11n (VHT20)	CH36	5180	15.19	24	Pass
	CH40	5200	15.31	24	Pass
	CH48	5240	14.92	24	Pass
	CH149	5745	14.18	30	Pass
	CH157	5785	14.76	30	Pass
	CH165	5825	13.85	30	Pass
802.11n (VHT40)	CH38	5190	14.88	24	Pass
	CH46	5230	14.62	24	Pass
	CH151	5755	13.51	30	Pass
	CH159	5795	12.09	30	Pass
802.11ac (VHT20)	CH36	5180	15.26	24	Pass
	CH40	5200	15.37	24	Pass
	CH48	5240	14.25	24	Pass
	CH149	5745	14.46	30	Pass
	CH157	5785	14.67	30	Pass
	CH165	5825	13.97	30	Pass
802.11ac (VHT40)	CH38	5190	14.66	24	Pass
	CH46	5230	14.32	24	Pass
	CH151	5755	12.72	30	Pass
	CH159	5795	12.47	30	Pass
802.11ac (VHT80)	CH42	5210	13.52	24	Pass
	CH155	5775	12.03	30	Pass

MPE Result:

For 2.4G band:

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	10±1	11	31.6228	2.2	1.660	0.010441	1
	6	14±1	15	31.6228	2.2	1.660	0.010441	1
	11	14±1	15	25.1189	2.2	1.660	0.008293	1
802.11g	1	10±1	11	25.1189	2.2	1.660	0.008293	1
	6	10±1	11	31.6228	2.2	1.660	0.010441	1
	11	10±1	11	25.1189	2.2	1.660	0.008293	1
802.11n (HT20)	1	11±1	12	15.849	2.2	1.660	0.005233	1
	6	10±1	11	12.589	2.2	1.660	0.004157	1
	11	9±1	10	10.000	2.2	1.660	0.003302	1
802.11n (HT40)	3	10±1	11	12.589	2.2	1.660	0.004157	1
	6	10±1	11	12.589	2.2	1.660	0.004157	1
	9	10±1	11	12.589	2.2	1.660	0.004157	1

For 5G band:

Operating Mode	Test Channel	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Ant. Gain (dBi)	Ant. Gain (numeric)	Power density at 20cm (mW/cm ²)	Power density Limits (mW/cm ²)
802.11a	CH36	16±1	17	2.4	1.738	0.005877	1
	CH40	15±1	16	2.4	1.738	0.005532	1
	CH48	14±1	15	2.4	1.738	0.005186	1
	CH149	15±1	16	2.4	1.738	0.005532	1
	CH157	15±1	16	2.4	1.738	0.005532	1
	CH165	15±1	16	2.4	1.738	0.005532	1
802.11n (VHT20)	CH36	15±1	16	2.4	1.738	0.005532	1
	CH40	15±1	16	2.4	1.738	0.005532	1
	CH48	15±1	16	2.4	1.738	0.005532	1
	CH149	14±1	15	2.4	1.738	0.005186	1
	CH157	15±1	16	2.4	1.738	0.005532	1
	CH165	14±1	15	2.4	1.738	0.005186	1
802.11n (VHT40)	CH38	15±1	16	2.4	1.738	0.005532	1
	CH46	15±1	16	2.4	1.738	0.005532	1
	CH151	13±1	14	2.4	1.738	0.004840	1
	CH159	12±1	13	2.4	1.738	0.004494	1
802.11ac (VHT20)	CH36	15±1	16	2.4	1.738	0.005532	1
	CH40	15±1	16	2.4	1.738	0.005532	1
	CH48	14±1	15	2.4	1.738	0.005186	1
	CH149	14±1	15	2.4	1.738	0.005186	1
	CH157	15±1	16	2.4	1.738	0.005532	1
	CH165	14±1	15	2.4	1.738	0.005186	1
802.11ac (VHT40)	CH38	15±1	16	2.4	1.738	0.005532	1
	CH46	14±1	15	2.4	1.738	0.005186	1
	CH151	13±1	14	2.4	1.738	0.004840	1
	CH159	12±1	13	2.4	1.738	0.004494	1
802.11ac (VHT80)	CH42	13±1	14	2.4	1.738	0.004840	1
	CH155	12±1	13	2.4	1.738	0.004494	1

Signature:



Alan He

Date: 2021-12-10