Maximum Permissible Exposure Evaluation

FCC ID: 2A9VY-ORBITKR2208

1. Client Information

Applicant	:	Pathway Innovations Inc.
Address	:	6780 Paradise Road Las Vegas, Nevada 89119
Manufacturer	:	ShenZhen KerunVisual Technology Co., LTD.
Address	:	Unit A, F/11, Bldg.1, Senyang Electronic Technology Park, Tianliao Community, Guangming High Tech Zone, Guangming New District, Shenzhen, China.

2. General Description of EUT

EUT Name	:	ORBIT AIR	
Models No.	:	ORBIT AIR/KR2208, ORBIT Pro/KR2136	
Model Difference	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is different clients have different names.	
Sample ID	:	HC-C-202407-0284-01-01-1#&HC-C-202407-0284-01-01-2#	
Product Description	:	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11ax(HE20): 2412MHz~2462MHz U-NII-1: 5180MHz~5240MHz
		Antenna Gain:	1.96dBi FPC Antenna1 for 2.4G WIFI 1.96dBi FPC Antenna2 for 2.4G WIFI 3.15dBi FPC Antenna1 for U-NII-1 3.15dBi FPC Antenna2 for U-NII-1
Power Rating	:	Adapter(JHD-AP024U-120200BA-A) Input: 100-240V~50/60Hz 0.55A Output: 12V, 2000mA DC 3.8V 9800mAh 37.24Wh Rechargeable Li-ion battery	
Software Version	:	----	
Hardware Version	:	MB_V1.2	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark	:	the MPE report used the EUT-2(HC-C-202407-0284-01-01-2#).	

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MPE Calculations for FCC

1. **EUT Operation Condition:**
   Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

2. **Exposure Evaluation:**
   Equation from page 18 of OET Bulletin 65, Edition 97-01
   $$S=(PG)/4\pi R^2$$
   Where
   S: power density
   P: power input to the antenna
   G: power gain of the antenna in the direction of interest relative to an isotropic radiator.
   R: distance to the center of radiation of the antenna

3. **Simultaneous transmission MPE Considerations**
   According to KDB447498: All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1. Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0.
   This means that:
   ∑ of MPE ratios ≤ 1.0

4. Standalone MPE Evaluation:

2.4G WIFI Worst Maximum MPE Result Ant.1								
Mode	N_{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/cm^2) [S]
802.11b	1	2412	18.21	18±1	19	1.96	20	0.02482
		2437	19.39	19±1	20	1.96	20	0.03124
		2462	18.26	18±1	19	1.96	20	0.02482
802.11g	1	2412	13.99	13±1	14	1.96	20	0.00785
		2437	13.42	13±1	14	1.96	20	0.00785
		2462	13.01	13±1	14	1.96	20	0.00785
802.11n (HT20)	1	2412	12.38	12±1	13	1.96	20	0.00623
		2437	13.32	13±1	14	1.96	20	0.00785
		2462	12.95	12±1	13	1.96	20	0.00623
802.11ax (HE20)	1	2412	14.48	14±1	15	1.96	20	0.00988
		2437	12.70	13±1	14	1.96	20	0.00785
		2462	13.21	13±1	14	1.96	20	0.00785

Note:
N_{TX}= Number of Transmit Antennas
RF Output power specifies that Maximum Conducted Output Power.

2.4G WIFI Worst Maximum MPE Result Ant.2								
Mode	N_{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/cm^2) [S]
802.11b	1	2412	14.41	14±1	15	1.96	20	0.00988
		2437	20.51	20±1	21	1.96	20	0.03933
		2462	19.96	19±1	20	1.96	20	0.03124
802.11g	1	2412	13.49	13±1	14	1.96	20	0.00785
		2437	13.26	13±1	14	1.96	20	0.00785
		2462	13.42	13±1	14	1.96	20	0.00785
802.11n (HT20)	1	2412	13.10	13±1	14	1.96	20	0.00785
		2437	13.09	13±1	14	1.96	20	0.00785
		2462	12.90	12±1	13	1.96	20	0.00623
802.11ax (HE20)	1	2412	13.77	13±1	14	1.96	20	0.00785
		2437	13.44	13±1	14	1.96	20	0.00785
		2462	13.58	13±1	14	1.96	20	0.00785

Note:
N_{TX}= Number of Transmit Antennas
RF Output power specifies that Maximum Conducted Output Power.

5.2G WIFI Worst Maximum MPE Result Ant.1								
Mode	N_{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/cm^2) [S]
802.11a	1	5180	14.26	14±1	15	3.15	20	0.01299
		5200	15.66	15±1	16	3.15	20	0.01636
		5240	16.61	16±1	17	3.15	20	0.02059
802.11n20	1	5180	11.75	11±1	12	3.15	20	0.00651
		5200	14.25	14±1	15	3.15	20	0.01299
		5240	15.18	15±1	16	3.15	20	0.01636
802.11n40	1	5190	10.65	10±1	11	3.15	20	0.00517
		5230	11.92	11±1	12	3.15	20	0.00651
802.11ac20	1	5180	11.22	11±1	12	3.15	20	0.00651
		5200	11.61	11±1	12	3.15	20	0.00651
		5240	12.71	12±1	13	3.15	20	0.00819
802.11ac40	1	5190	10.73	10±1	11	3.15	20	0.00517
		5230	11.96	11±1	12	3.15	20	0.00651
802.11ac80	1	5210	11.04	11±1	12	3.15	20	0.00651
802.11ax20	1	5180	9.39	9±1	10	3.15	20	0.00411
		5200	10.01	10±1	11	3.15	20	0.00517
		5240	11.07	11±1	12	3.15	20	0.00651
802.11ax40	1	5190	9.14	9±1	10	3.15	20	0.00411
		5230	10.38	10±1	11	3.15	20	0.00517
802.11ax80	1	5210	9.73	9±1	10	3.15	20	0.00411

Note:
N_{TX}= Number of Transmit Antennas
RF Output power specifies that Maximum Conducted Output Power.

5.2G WIFI Worst Maximum MPE Result Ant.2								
Mode	N_{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/cm^2) [S]
802.11a	1	5180	14.92	14±1	15	3.15	20	0.01299
		5200	12.21	12±1	13	3.15	20	0.00819
		5240	15.93	15±1	16	3.15	20	0.01636
802.11n20	1	5180	13.19	13±1	14	3.15	20	0.01032
		5200	15.34	15±1	16	3.15	20	0.01636
		5240	15.88	15±1	16	3.15	20	0.01636
802.11n40	1	5190	12.11	12±1	13	3.15	20	0.00819
		5230	12.87	12±1	13	3.15	20	0.00819
802.11ac20	1	5180	12.67	12±1	13	3.15	20	0.00819
		5200	12.98	12±1	13	3.15	20	0.00819
		5240	13.72	13±1	14	3.15	20	0.01032
802.11ac40	1	5190	12.04	12±1	13	3.15	20	0.00819
		5230	12.87	12±1	13	3.15	20	0.00819
802.11ac80	1	5210	12.25	12±1	13	3.15	20	0.00819
802.11ax20	1	5180	11.12	11±1	12	3.15	20	0.00651
		5200	11.46	11±1	12	3.15	20	0.00651
		5240	12.03	12±1	13	3.15	20	0.00819
802.11ax40	1	5190	10.60	10±1	11	3.15	20	0.00517
		5230	11.35	11±1	12	3.15	20	0.00651
802.11ax80	1	5210	11.03	11±1	12	3.15	20	0.00651

Note:
N_{TX}= Number of Transmit Antennas
RF Output power specifies that Maximum Conducted Output Power.

5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/ cm^2)
300-1,500	F/1500
1,500-100,000	1.0

6. Summary simultaneous transmission information

The sample supports two antennas for (2.4G WIFI&5G WIFI) Ant.1 and (2.4G WIFI&5G WIFI) Ant.2.
The (2.4G WIFI&5G WIFI) Ant.1 and (2.4G WIFI&5G WIFI) Ant.2 can transmit simultaneous.
The ((2.4G WIFI&5G WIFI) Ant.1 and (2.4G WIFI&5G WIFI) Ant.2 with two different Antenna.
According to KDB447498 for Transmitters used in mobile exposure conditions for simultaneous transmission operations;
∑ of MPE ratios ≤ 1.0

7. Summary simultaneous transmission results

(2.4G WIFI&5G WIFI) Ant.1 + (2.4G WIFI&5G WIFI) Ant.2 Maximum Simultaneous transmission MPE Ratios is ***0.03124+0.03933=0.07057⩽1.0.***

8. Conclusion:

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----END OF THE REPORT-----