Maximum Permissible Exposure Evaluation

FCC ID: 2A9VY-ORBITKR2126

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	
Models No.	:	Orbit/KR2126, KR2126 4K, KR2126 2K	
Model Different	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name.	
Sample ID	:	202302-0333-3-1# & 202302-0333-3-2#	
Product Description	:	Operation Frequency:	U-NII-1: 5180MHz~5240MHz 802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz
		Antenna Gain:	2dBi FPC Antenna
Power Rating	:	Adapter (JHD-AP030U-PD-CS501) Input: 100-240V~ 50/60Hz 1.0A Output: 5V⎓3A; 9V⎓3A; 12V⎓2.5A; 15V⎓2A; 20V⎓1.5A	
Li-ion Polymer Battery	:	DC 3.8V by 9800mAh/37.24Wh Rechargeable Li-ion battery	
Software Version	:	buildroot20230505	
Hardware Version	:	V23	
Remark	:	The adapter and antenna gain provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.	

1/F.,Building 6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an District, Shenzhen, Guangdong, China
Tel: +86 75526509301 Fax: +86 75526509195

Method of Measurement for FCC

1. **Max. Antenna Gain:**
   2.4G WIFI Antenna: 2dBi.
   5G WIFI Antenna: 2dBi.

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

3. **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

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. Test Result:

2.4G WIFI MPE Result Antenna								
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	16.517	17±1	18	2	20	0.0199
		2437	16.916	17±1	18	2	20	0.0199
		2462	16.974	17±1	18	2	20	0.0199
802.11g	1	2412	13.616	14±1	15	2	20	0.0100
		2437	11.513	12±1	13	2	20	0.0063
		2462	13.153	13±1	14	2	20	0.0079
802.11n20	1	2412	12.535	13±1	14	2	20	0.0079
		2437	13.134	13±1	14	2	20	0.0079
		2462	13.155	13±1	14	2	20	0.0079
802.11n40	1	2422	11.314	11±1	12	2	20	0.0050
		2437	12.197	12±1	13	2	20	0.0063
		2452	10.916	11±1	12	2	20	0.0050
Note: N_{TX}= Number of Transmit Antennas RF Output power specifies that Maximum Conducted Peak Output Power.								

5.2G WIFI MPE Result Antenna								
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	15.67	16±1	17	2	20	0.0158
		5200	15.02	15±1	16	2	20	0.0126
		5240	14.74	15±1	16	2	20	0.0126
802.11n20	1	5180	15.17	15±1	16	2	20	0.0126
		5200	15.38	15±1	16	2	20	0.0126
		5240	14.64	15±1	16	2	20	0.0126
802.11n40	1	5190	15.24	15±1	16	2	20	0.0126
		5230	15.09	15±1	16	2	20	0.0126
802.11ac20	1	5180	15.15	15±1	16	2	20	0.0126
		5200	15.41	15±1	16	2	20	0.0126
		5240	14.63	15±1	16	2	20	0.0126
802.11ac40	1	5190	15.24	15±1	16	2	20	0.0126
		5230	15.13	15±1	16	2	20	0.0126
802.11ac80	1	5210	13.98	14±1	15	2	20	0.0100

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

For: 2412~2462MHz&5180~5240MHz
MPE limit S: $1mW/ cm^2$
The MPE is calculated as ***$0.0199mW / cm^2 < limit\ 1mW / cm^2$***.
So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b). The RF Exposure Information page from the manual is included here for reference.

Remark:
1. Output power including turn-up tolerance;
2. Output power was adjust to duty cycle at 100% if measured duty cycle less than 98%;
3. MPE evaluate distance is 20cm from user manual provide by manufacturer.

Note

For a more detailed features description, please refer to the RF Test Report.

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