RF Exposure Evaluation

FCC ID: 2ABES-KR2109

1. Client Information

Applicant : Pathway Innovations and Technologies, Inc.

Address : 9985 Pacific Heights Blvd., Suite 100 San Diego, CA 92121, USA

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 518132

2. General Description of EUT

EUT Name	:	Ultra10	
Models No.	:	KR2109,Ultra9,Ultra10,Ultra11,Ultra12,Ultra13,Ultra15,Ultra16	
Model Difference	:	All these models are in the same PCB, layout and electrical circuit, the only difference is model No.	
Product Description	:	Operation Frequency:	**2.4G:** 802.11b/g/n(HT20): 2412MHz~2462MHz Bluetooth 4.1(BLE): 2402MHz~2480MHz **5G:** U-NII-1: 5180MHz~5240MHz
		Modulation Type:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n: OFDM(BPSK,QPSK,16QAM, 64QAM) 802.11a: OFDM (QPSK, BPSK, 16QAM) 802.11ac: OFDM (QPSK, BPSK, 16QAM, 64QAM, 256QAM) BLE: GFSK
Power Supply	:	AC Adapter(JHD-AP045U-PD-CS502): Input: AC 100-240V, 50/60Hz, 1.5A Output: DC 5V, 3A/9V-3A/12V-3A/15V-3A/20V-2.25A DC 3.8V by 12000mAh Li-ion battery.	
Software Version	:	Android 7.1.2	
Hardware Version	:	V0.7	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark	:	The adapter and antenna gain provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.	

Note: More test information about the EUT please refer the RF Test Report.

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SAR Test Exclusion Calculations

1. **FCC: According to KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies v06.**
   (1) Clause 4.3: General SAR test reduction and exclusion guidance
   Sub clause 4.31: Standalone SAR test exclusion considerations
   1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6GHz at test separation distance≤5 mm are determined by:
   [(max. power of channel, including tune-up tolerance, mW)/(min. test separation, mm)]*[$\sqrt{f_{(GHz)}}$] ≤3.0 for 1-g SAR
   [(max. power of channel, including tune-up tolerance, mW)/(min. test separation, mm)]*[$\sqrt{f_{(GHz)}}$] ≤7.5.0 for 10-g SAR

2. Calculation:

Test separation: 5mm						
2.4G WiFi Mode(802.11b)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.412	8.12	8±0.5	8.5	7.079	2.199	**3.0**
2.437	8.08	8±0.5	8.5	7.079	2.210	**3.0**
2.462	8.14	8±0.5	8.5	7.079	2.222	**3.0**
2.4G WiFi Mode(802.11g)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.412	7.89	8±0.5	8.5	7.079	2.199	**3.0**
2.437	7.96	8±0.5	8.5	7.079	2.210	**3.0**
2.462	7.78	8±0.5	8.5	7.079	2.222	**3.0**
2.4G WiFi Mode(802.11n(HT20))						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.412	7.85	8±0.5	8.5	7.079	2.199	**3.0**
2.437	7.84	8±0.5	8.5	7.079	2.210	**3.0**
2.462	7.83	8±0.5	8.5	7.079	2.222	**3.0**

Test separation: 5mm						
BLE Mode (GFSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-0.977	-1±1	0	1	0.310	**3.0**
2.442	-1.225	-1±1	0	1	0.313	**3.0**
2.480	-1.575	-1±1	0	1	0.315	**3.0**

Test separation: 5mm						
5G WiFi						
Mode	Worst Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
U-NII-1 (5180MHz)	6.98	6.5±0.5	7	5.012	2.281	**3.0**

Test separation: 5mm		
The worst RF Exposure Evaluation		
Worst Calculation Value	Total Calculation Value	Threshold Value
5G WiFi Mode		
2.281	2.281	**3.0**

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06.

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