

## **RF Exposure Evaluation for FCC ID: 2AI35-K2**

Refer user manual this device is a Head-Mounted Virtual Reality Equipment, and this device was designed used in portable devices that the minimum distance between human's Head is **56.4mm**. The minimum distance between human's hand is **102.8mm**. Based on the 47CFR 2.1093, this device belongs to portable device. The definition of the category as following:

The minimum test separation distance, please refer to the Appendix TX Antenna Picture and closest distance.

The EUT external, please refer to the BALUN report "BL-SZ1740297-AW".

### **Portable Derives:**

CFR Title 47 §2.1093(b)

(b) For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

### **FCC KDB 447498 D01 General RF Exposure Guidance v06 Limit**

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on sourcebased time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander.

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f}(\text{GHz})] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR}$$

Where

- $f$  (GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The 1-g and 10-g SAR test exclusion thresholds for 1500 MHz to 6 GHz at test separation distances  $> 50$  mm are determined by:

$$\{[\text{Power allowed at numeric threshold for 50 mm}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot 10]\}$$
  
mW, for  $> 1500$  MHz and  $\leq 6$  GHz

Where

- Power allowed at numeric threshold for 50 mm a is the max. power of channel threshold
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is > 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is 60 mm, a distance of 60 mm is applied to determine SAR test exclusion.

#### Test Data

Mode	Bluetooth 3.0			
	GFSK	π/4-DQPSK	8-DPSK	
Peak Power (dBm)	2.26	0.44	1.02	
Mode	Bluetooth 4.0			
	Low Channel	Middle Channel	High Channel	
Peak Power (dBm)	0.52	2.03	2.90	
Mode	2.4GHz WLAN			
	802.11b	802.11g	802.11n-20	802.11n-40
Peak Power (dBm)	12.50	11.87	10.03	8.19
Mode	5.2GHz WLAN			
	11a	11n (HT20)	11n (HT40)	11ac (HT80)
Peak Power (dBm)	19.47	19.34	<b>19.62</b>	18.53
Mode	5.8GHz WLAN			
	11a	11n (HT20)	11n (HT40)	11ac (HT80)
Peak Power (dBm)	11.03	9.89	9.82	6.39
Note: This report listed the worst case peak power value, please refer to RF test report for more details.				

#### Tune-up

Mode	Range(dBm)
Bluetooth 3.0	(-1.80)-2.80
Bluetooth 4.0	1.00-3.40
2.4GHz 802.11b	12.10-13.00
2.4GHz 802.11g	11.20-12.40
2.4GHz 802.11 n-20	9.50-10.50
2.4GHz 802.11 n-40	7.60-8.70
5.2GHz 11a	17.60-20.00
5.2GHz 11n (HT20)	18.20-19.80
5.2GHz 11n (HT40)	17.30-20.10
5.2GHz 11ac (HT80)	18.00-19.00
5.8GHz 11a	8.60-11.50
5.8GHz 11n (HT20)	7.60-10.40
5.8GHz 11n (HT40)	7.90-10.30
5.8GHz 11ac (HT80)	5.90-6.90

## Evaluation Result

### Head

Mode	Min. Distance (mm)	Exclusion power (mw)	Tune-up Power(mw)	Evaluation Result
Bluetooth 3.0	56.4	159.25	1.91	Pass
Bluetooth 4.0	56.4	159.25	2.19	Pass
2.4GHz WLAN (802.11 g)	56.4	159.60	19.95	Pass
5.2GHz WLAN (802.11 n HT-40)	56.4	129.84	102.33	Pass
5.8GHz WLAN (802.11 a)	56.4	129.72	14.13	Pass

Note:

This report listed the maximal case power value in each frequency band, please refer to RF test report for more details.

### Hand

Mode	Min. Distance (mm)	Exclusion power (mw)	Tune-up Power(mw)	Evaluation Result
Bluetooth 3.0	102.8	766.13	1.91	Pass
Bluetooth 4.0	102.8	766.13	2.19	Pass
2.4GHz WLAN (802.11 g)	102.8	766.99	19.95	Pass
5.2GHz WLAN (802.11 n HT-40)	102.8	692.61	102.33	Pass
5.8GHz WLAN (802.11 a)	102.8	692.29	14.13	Pass

Note:

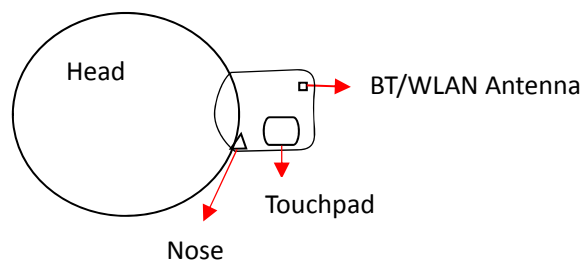
This report listed the maximal case power value in each frequency band, please refer to RF test report for more details.

Appendix : TX Antenna Picture and closest distance

i) Front View

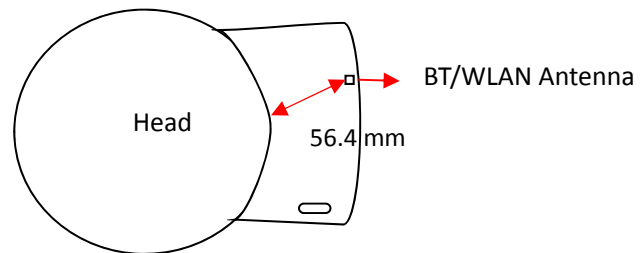


ii) Right View



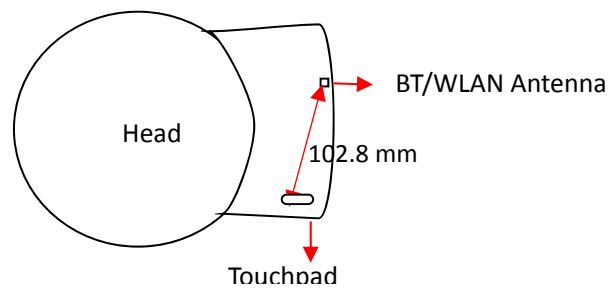
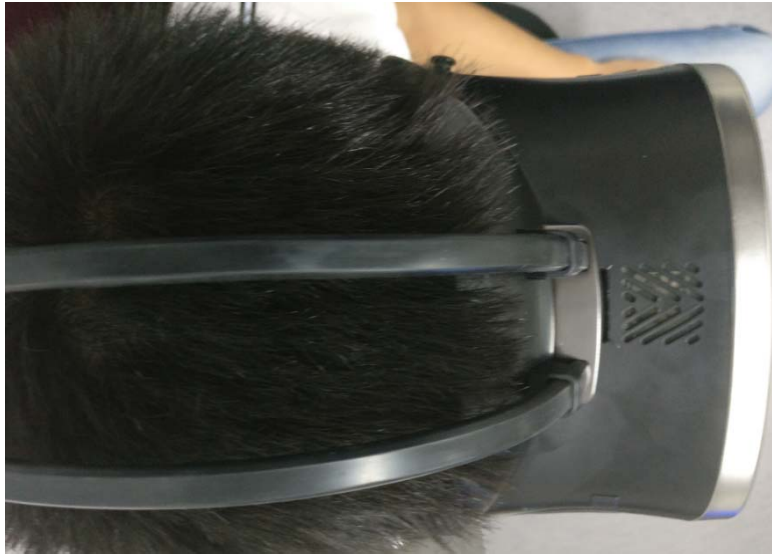
Note: According to real head-worn condition the distance between the nose to antenna is greater than the forehead to antenna.

iii) Top View



Note: According to real head-worn condition the forehead is the nearest distance between BT/WLAN Antenna and people head. The nearest distance between BT/WLAN Antenna and people head is **56.4** mm.

iv) Top View



Note: A According to real head-worn condition the nearest distance between BT/WLAN Antenna and people hand is **102.8** mm.