

## 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: **PXK-HL2501**

### EUT Specification

|                                   |                                                                                                                                                                                                                                |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EUT</b>                        | Sunrise Speaker                                                                                                                                                                                                                |
| <b>Frequency band (Operating)</b> | <input type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz<br><input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz<br><input type="checkbox"/> WLAN: 5.745GHz ~ 5825GHz<br><input checked="" type="checkbox"/> Others  |
| <b>Device category</b>            | <input type="checkbox"/> Portable (<20cm separation)<br><input checked="" type="checkbox"/> Mobile (>20cm separation)<br><input type="checkbox"/> Others ____                                                                  |
| <b>Exposure classification</b>    | <input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> )<br><input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )                                  |
| <b>Antenna diversity</b>          | <input checked="" type="checkbox"/> Single antenna<br><input type="checkbox"/> Multiple antennas<br><input type="checkbox"/> Tx diversity<br><input type="checkbox"/> Rx diversity<br><input type="checkbox"/> Tx/Rx diversity |
| <b>Max. output power</b>          | 1.46dBm(0.0014W)                                                                                                                                                                                                               |
| <b>Antenna gain (Max)</b>         | 0 dBi                                                                                                                                                                                                                          |
| <b>Evaluation applied</b>         | <input checked="" type="checkbox"/> MPE Evaluation<br><input type="checkbox"/> 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 <sup>2</sup> ) | Average Time |
|--------------------------------------------------------------|------------------------------|------------------------------|------------------------------------|--------------|
| <b>(A) Limits for Occupational/Control Exposures</b>         |                              |                              |                                    |              |
| <b>300-1500</b>                                              | --                           | --                           | <b>F/300</b>                       | <b>6</b>     |
| <b>1500-100000</b>                                           | --                           | --                           | <b>5</b>                           | <b>6</b>     |
| <b>(B) Limits for General Population/Uncontrol Exposures</b> |                              |                              |                                    |              |
| <b>300-1500</b>                                              | --                           | --                           | <b>F/1500</b>                      | <b>6</b>     |
| <b>1500-100000</b>                                           | --                           | --                           | <b>1</b>                           | <b>30</b>    |

## 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

$\pi = 3.1416$

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

$P_d$  the limit of MPE,  $1mW/cm^2$ . 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

| Channel Frequency (MHz) | Measurement Peak Output Power(dBm) |                |       |
|-------------------------|------------------------------------|----------------|-------|
|                         | GFSK                               | $\pi/4$ -DQPSK | 8DPSK |
| 2402                    | -1.06                              | -2.92          | -2.78 |
| 2441                    | 0.57                               | -0.85          | -0.83 |
| 2480                    | <b>1.46</b>                        | -0.42          | -0.16 |

| Channel Frequency (MHz) | 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 ( $mW/cm^2$ ) |
|-------------------------|-------------------------|----------------------------------|------------------------|-----------------|---------------------|-------------------------------------|------------------------------------|
| 2402                    | $-1 \pm 1$              | 0                                | 1.00                   | 0               | 1                   | 0.000199                            | 1                                  |
| 2441                    | $0 \pm 1$               | 1                                | 1.26                   | 0               | 1                   | 0.000250                            | 1                                  |
| 2480                    | $1 \pm 1$               | 2                                | 1.58                   | 0               | 1                   | 0.000315                            | 1                                  |
| 2402                    | $-2 \pm 1$              | -1                               | 0.79                   | 0               | 1                   | 0.000158                            | 1                                  |
| 2441                    | $0 \pm 1$               | 1                                | 1.26                   | 0               | 1                   | 0.000250                            | 1                                  |
| 2480                    | $0 \pm 1$               | 1                                | 1.26                   | 0               | 1                   | 0.000250                            | 1                                  |
| 2402                    | $-2 \pm 1$              | -1                               | 0.79                   | 0               | 1                   | 0.000158                            | 1                                  |
| 2441                    | $0 \pm 1$               | 1                                | 1.26                   | 0               | 1                   | 0.000250                            | 1                                  |
| 2480                    | $0 \pm 1$               | 1                                | 1.26                   | 0               | 1                   | 0.000250                            | 1                                  |

Signature



Date: 2014-11-24