

## 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: 2AS9D-MAGIC420S

### EUT Specification

|                                   |  |
|-----------------------------------|--|
| <b>EUT</b>                        | <b>Wifi Digital Photo Frame</b>  |
| <b>Frequency band (Operating)</b> | <input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz<br><input type="checkbox"/> WLAN: 5.18GHz ~ 5.24GHz<br><input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz<br><input checked="" type="checkbox"/> Others: BDR+EDR: 2402-2480MHz |
| <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>Antenna gain (Max)</b>         | BT: -0.58 dBi<br>2.4G WIFI: 2.26 dBi   |
| <b>Directional Gain (Max)</b>     | N/A  |
| <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>         |                              |                              |                                    |              |
| 300-1500   | --                           | --                           | <b>F/300</b>                       | <b>6</b>     |
| 1500-100000  | --                           | --                           | <b>5</b>                           | <b>6</b>     |
| <b>(B) Limits for General Population/Uncontrol Exposures</b> |                              |                              |                                    |              |
| 300-1500   | --                           | --                           | <b>F/1500</b>                      | <b>6</b>     |
| 1500-100000  | --                           | --                           | <b>1</b>                           | <b>30</b>    |

**Friis transmission formula:  $Pd=(Pout \cdot G) / (4 \cdot \pi \cdot R^2)$**

Where

$Pd$ = Power density in  $mW/cm^2$

$Pout$ =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

$Pd$  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.

**Max Measurement Result**

| Operating Mode | Measured Power | Tune up tolerance | Max. Tune up Power | Antenna Gain | Power density at 20cm  | Power density Limits (mW/cm <sup>2</sup> ) |
|----------------|----------------|-------------------|--------------------|--------------|------------------------|--|
|                | (dBm)          | (dBm)             | (dBm)              | (dBi)        | (mW/ cm <sup>2</sup> ) |  |
| BDR+EDR        | -0.219         | -0.219 ±1         | 0.769              | -0.58        | -0.0001                | 1  |
| 2.4G WIFI      | 15.56          | 15.56 ±1          | 16.55              | 2.26         | 0.0203                 | 1  |

**For Transmit Simultaneously Mode:**

**Bluetooth+2.4G WiF:**

$$=MPE_{BT} / Limit_{above 1500} + MPE_{2.4G WiFi} / Limit_{above 1500}$$

$$= -0.0001 + 0.0203$$

$$= 0.0202 < 1$$