

## 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: 2AQRWF96S

### EUT Specification

<b>EUT</b>	Wi-Fi Outdoor Smart Plug
<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5825GHz <input type="checkbox"/> Others
<b>Device category</b>	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others ____
<b>Exposure classification</b>	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> ) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )
<b>Antenna diversity</b>	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
<b>Antenna gain (Max)</b>	1 dBi
<b>Evaluation applied</b>	<input checked="" type="checkbox"/> MPE Evaluation <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	--	--	F/300	6
1500-100000	--	--	5	6
<b>(B) Limits for General Population/Uncontrol Exposures</b>				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

## Friis transmission formula: $P_d = \frac{P_{out} \cdot G}{4 \cdot \pi \cdot R^2}$

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

Modulation	Maximum Peak Output Power (dBm)		
	Low Channel	Middle Channel	High Channel
802.11b	9.42	9.35	9.41
802.11g	8.68	8.45	8.63
802.11n-HT20	7.65	7.74	7.66

Operating Mode	Test Channel	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 ( $mW/cm^2$ )
802.11b	1	$9.42 \pm 1$	10.42	11.015	1	1.259	0.0028	1
	6	$9.35 \pm 1$	10.35	10.839	1	1.259	0.0027	1
	11	$9.41 \pm 1$	10.41	10.990	1	1.259	0.0028	1
802.11g	1	$8.68 \pm 1$	9.68	9.290	1	1.259	0.0023	1
	6	$8.45 \pm 1$	9.45	8.492	1	1.259	0.0022	1
	11	$8.63 \pm 1$	9.63	9.183	1	1.259	0.0023	1
802.11n-H T20	1	$7.65 \pm 1$	8.65	7.328	1	1.259	0.0018	1
	6	$7.74 \pm 1$	8.74	7.482	1	1.259	0.0019	1
	11	$7.66 \pm 1$	8.66	7.345	1	1.259	0.0018	1

Signature



Date: 2019-07-16