

## RF EXPOSURE EVALUATION

### EUT Specification

<b>EUT</b>	SMART WIFI DUAL HEAD LED FLOOD LIGHT
<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(Bluetooth: 2.402GHz ~ 2.480GHz)
<b>Device category</b>	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others ____
<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>Max. output power</b>	WIFI: 18.04dBm(63.68mW)
<b>Antenna gain</b>	2.3dBi
<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: $P_d = \frac{P_{out} * G}{4 * \pi * R^2}$

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	Channel Frequency (MHz)	Max Output power (dBm)	Tolerance	Max Tune-UP power (mW)	Power density at 20cm ( $mW/cm^2$ )	Power density Limits ( $mW/cm^2$ )
<b>Test Mode: 802.11b</b>						
Low	2412	11.80	$\pm 0.1$	15.49	0.0052	1
Middle	2437	12.90	$\pm 0.1$	19.95	0.0067	1
High	2462	13.73	$\pm 0.1$	24.15	0.0082	1
<b>Test Mode: 802.11g</b>						
Low	2412	16.14	$\pm 0.1$	42.07	0.0142	1
Middle	2437	17.70	$\pm 0.1$	60.26	0.0204	1
High	2462	18.04	$\pm 0.1$	65.16	0.0220	1
<b>Test Mode: 802.11n(HT20)</b>						
Low	2412	14.36	$\pm 0.1$	27.93	0.0094	1
Middle	2437	16.20	$\pm 0.1$	42.66	0.0144	1
High	2462	16.63	$\pm 0.1$	47.10	0.0159	1
<b>Test Mode: 802.11n(HT40)</b>						
Low	2422	15.11	$\pm 0.1$	33.19	0.0112	1
Middle	2437	15.96	$\pm 0.1$	40.36	0.0136	1
High	2452	16.56	$\pm 0.1$	46.34	0.0157	1