

## RF EXPOSURE EVALUATION

### EUT Specification

<b>EUT</b>	IP camera
<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 ~ 5.825GHz <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>	12.83 dBm (19.1867 mW)
<b>Antenna gain</b>	2 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> )
300-1500	--	--	F/1500
1500-100000	--	--	1

## 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	Gain	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	2	2412	8.16	$\pm 0.5$	7.345	0.00232	1
Middle	2	2437	9.43	$\pm 0.5$	9.840	0.00310	1
High	2	2462	10.25	$\pm 0.5$	11.885	0.00375	1
<b>Test Mode: 802.11g</b>							
Low	2	2412	10.24	$\pm 0.5$	11.858	0.00374	1
Middle	2	2437	11.65	$\pm 0.5$	16.406	0.00517	1
High	2	2462	11.59	$\pm 0.5$	16.181	0.00510	1
<b>Test Mode: 802.11n(HT20)</b>							
Low	2	2412	9.83	$\pm 0.5$	10.789	0.00340	1
Middle	2	2437	11.74	$\pm 0.5$	16.749	0.00528	1
High	2	2462	12.83	$\pm 0.5$	21.528	0.00679	1
<b>Test Mode: 802.11n(HT40)</b>							
Low	2	2422	10.22	$\pm 0.5$	11.80	0.00372	1
Middle	2	2437	10.82	$\pm 0.5$	13.55	0.00427	1
High	2	2452	11.88	$\pm 0.5$	17.30	0.00545	1