

## RF EXPOSURE EVALUATION

### EUT Specification

<b>EUT</b>	Wi-Fi Speaker System
<b>Frequency band (Operating)</b>	<input 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 checked="" 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>	-1.49dBm(0.71mW)
<b>Antenna gain</b>	1.13dBi
<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>				
<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	Channel Frequency (MHz)	Max Output power (dBm)	Tolerance	Max Output power (mW)	Power density at 20cm ( $mW/cm^2$ )	Power density Limits ( $mW/cm^2$ )
GFSK						
Low	2402.00	-6.90	$\pm 0.2$	0.21	$4.25e-5$	1
Middle	2441.00	-3.88	$\pm 0.2$	0.43	$8.53e-5$	1
High	2480.00	-1.49	$\pm 0.2$	0.74	$1.48e-4$	1
$\pi/4$ -DQPSK						
Low	2402.00	-7.50	$\pm 0.2$	0.19	$3.70e-5$	1
Middle	2441.00	-4.56	$\pm 0.2$	0.37	$7.29e-5$	1
High	2480.00	-2.10	$\pm 0.2$	0.65	$1.28e-4$	1
8DPSK						
Low	2402.00	-7.56	$\pm 0.2$	0.18	$3.65e-5$	1
Middle	2441.00	-4.58	$\pm 0.2$	0.36	$7.26e-5$	1
High	2480.00	-2.16	$\pm 0.2$	0.64	$1.27e-4$	1