

## RF EXPOSURE EVALUATION

### EUT Specification

<b>EUT</b>	AM/FM/WX/USB/BT/AUX IN RADIO
<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>	1.883dBm(1.54mW)
<b>Antenna gain</b>	0dBi
<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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

$P_d$ = Power density in mW/cm<sup>2</sup>

$P_{out}$ =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<sup>2</sup>. 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 <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
<b>GFSK</b>							
Low	0	2402	1.394	±0.5	1.55	3.08e-4	1
Middle	0	2441	1.708	±0.5	1.66	3.30e-4	1
High	0	2480	1.883	±0.5	1.73	3.44e-4	1
<b>π/4-DQPSK</b>							
Low	0	2402	1.126	±0.5	1.45	2.88e-4	1
Middle	0	2441	1.462	±0.5	1.57	3.12e-4	1
High	0	2480	1.592	±0.5	1.62	3.22e-4	1
<b>8DPSK</b>							
Low	0	2402	1.228	±0.5	1.49	2.96e-4	1
Middle	0	2441	1.561	±0.5	1.61	3.20e-4	1
High	0	2480	1.799	±0.5	1.70	3.38e-4	1