

## 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: [2A288-PT005](#)

### EUT Specification

<b>EUT</b>	<b>cutting plotter</b>
<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 ~ 5825GHz <input checked="" type="checkbox"/> Others: BLE: 2402-2480MHz <input checked="" type="checkbox"/> Others: BDR+EDR: 2402-2480MHz
<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>Max. output power</b>	BDR+EDR: 1.53 dBm (0.0014W) BLE: 1.92 dBm (0.0016W)
<b>Antenna gain (Max)</b>	BDR+EDR/ BLE: 0 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	--	--	<b>F/300</b>	<b>6</b>
1500-100000	--	--	<b>5</b>	<b>6</b>
<b>(B) Limits for General Population/Uncontrol Exposures</b>				
300-1500	--	--	<b>F/1500</b>	<b>6</b>
1500-100000	--	--	<b>1</b>	<b>30</b>

## 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

Operating Mode		Channel Frequency (MHz)	Maximum output power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
BDR + EDR	GFSK	2402	1.36	1.36 ± 1	2.36	0	0.0003	1
		2440	1.53	1.53 ± 1	2.53	0	0.0004	1
		2480	1.2	1.2 ± 1	2.20	0	0.0003	1
	π/4-DQ PSK	2402	1.33	1.33 ± 1	2.33	0	0.0003	1
		2440	0.87	0.87 ± 1	1.87	0	0.0003	1
		2480	0.36	0.36 ± 1	1.36	0	0.0003	1
	8DPSK	2402	0.43	0.43 ± 1	1.43	0	0.0003	1
		2440	-0.06	-0.06 ± 1	0.94	0	0.0002	1
		2480	-0.28	-0.28 ± 1	0.72	0	0.0002	1
BLE		2402	1.92	1.92 ± 1	2.92	0	0.0004	1
		2440	0.77	0.77 ± 1	1.77	0	0.0003	1
		2480	1.63	1.63 ± 1	2.63	0	0.0004	1