

## RF EXPOSURE EVALUATION

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

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)

### EUT Specification

<b>FCC ID</b>	<b>2BBP3-DBR4</b>
<b>EUT</b>	DBR4
<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> BT: 2.402GHz ~ 2.480GHz <input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> RLAN: 5.180GHz ~ 5.240GHz <input type="checkbox"/> RLAN: 5.260GHz ~ 5.320GHz <input type="checkbox"/> RLAN: 5.500GHz ~ 5.700GHz <input type="checkbox"/> RLAN: 5.745GHz ~ 5.825GHz <input checked="" type="checkbox"/> Others: SRD 2.4G: 2402.4MHz~2479.4MHz Lora: 903.5-926.9MHz
<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/cm2) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm2)
<b>Antenna diversity</b>	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
<b>Antenna gain (Max)</b>	BDR+EDR: 1.35dBi WiFi 2.4G: 1.35dBi SRD 2.4G ANT1: 1.35dBi SRD 2.4G ANT2: 1.35dBi Lora ANT1: 1.35dBi Lora ANT2: 1.35dBi

#### Shenzhen Anbotek Compliance Laboratory Limited



Evaluation applied	<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
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

## 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.

## Max Measurement Result

Operating Mode	Measure d Power	Tune up tolerance	Max. Tune up Power	Max. Tune up Power	Antenna Gain	Antenna Gain in linear	Power density at 20cm	Power density Limits
	(dBm)	(dBm)	(dBm)	(mW)	(dBi)	(Numerical value)	(mW/ cm2 )	(mW/cm <sup>2</sup> )
BLE	3.93	3.93 ±1	4.93	3.1117	1.35	1.3646	0.0008	1
WiFi 2.4G	15.70	15.70 ±1	16.70	46.7735	1.35	1.3646	0.0127	1
SRD 2.4G ANT1	20.28	20.28 ±1	21.28	134.2765	1.35	1.3646	0.0365	1
SRD 2.4G ANT2	19.55	19.55 ±1	20.55	113.5011	1.35	1.3646	0.0308	1
Lora ANT1	22.703	22.703 ±1	23.70	234.5849	1.35	1.3646	0.0637	0.6023
Lora ANT2	22.843	22.843 ±1	23.84	242.2702	1.35	1.3646	0.0658	0.6023

BT & WiFi & SRD & Lora cannot support simultaneous transmission

**Result: PASS**

