

## RF EXPOSURE EVALUATION

KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies v06.

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>	2BLVV-BW4
<b>EUT</b>	Battery camera
<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> BT: 2.402GHz ~ 2.480GHz <input checked="" type="checkbox"/> BLE: 2.402GHz ~ 2.480GHz <input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input checked="" type="checkbox"/> RLAN: 5.180GHz ~ 5.240GHz <input checked="" type="checkbox"/> RLAN: 5.260GHz ~ 5.320GHz <input checked="" type="checkbox"/> RLAN: 5.500GHz ~ 5.700GHz <input checked="" type="checkbox"/> RLAN: 5.745GHz ~ 5.825GHz <input type="checkbox"/> Others:
<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>Antenna gain (Max)</b>	Wi-Fi 2.4G/BT/BLE: 4.5dBi WiFi 5.2G: 5.82dBi WiFi 5.3G: 5.82dBi WiFi 5.6G: 5.58dBi WiFi 5.8G: 4.47dBi
<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
(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	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits
	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm <sup>2</sup> )	(mW/cm <sup>2</sup> )
BDR&EDR	5.02	5.02 ±1	6.02	4.5	0.0022	1
BLE	1.2	1.2 ±1	2.20	4.5	0.0009	1
WiFi 2.4G	13.52	13.52 ±1	14.52	4.5	0.0159	1
WiFi 5.2G	13.71	13.71 ±1	14.71	5.82	0.0225	1
WiFi 5.3G	13.18	13.18 ±1	14.18	5.82	0.0199	1
WiFi 5.6G	13.32	13.32 ±1	14.32	5.58	0.0195	1
WiFi 5.8G1	12.26	12.26 ±1	13.26	4.47	0.0118	1

The Maximum simultaneous transmission for BDR&EDR+WiFi 5.2G:

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

$$= S_{BDR\&EDR} / S_{limit-BDR\&EDR} + S_{WiFi\ 5.2G} / S_{limit-WiFi\ 5.2G}$$

$$= 0.0022/1 + 0.0225/1$$

$$= 0.0247$$

$$< 1.0$$

**Result:** No Standalone SAR test is required.

