

MPE ESTIMATION

FCC ID: 2BWHG-EC3201

1, According to §1.1310, Limit for General Population/ Uncontrolled Exposures

Frequency	Power density (mW/ cm ²)	Averaging time(minutes)
300MHz----1.5GHz	F/1500	30
1.5GHz---100GHz	1.0	30

Note: F= Frequency in MHz

2, Estimation Result

	Frequency (MHz)	Max PK Output power (dBm)	Tune Up Power (dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (numerical)	MPE (mW/cm ²)	Limit (mW/cm ²)	Ratios
BLE	2402	6.57	6±1(7)	5.012	5.84	3.837	0.00383	1.0	0.00383
EDR	2441	5.59	5±1(6)	3.981	5.84	3.837	0.00304	1.0	0.00304
2.4GWIFI	2412	14.30	14±1(15)	31.623	5.84	3.837	0.02415	1.0	0.02415
5.2GWIFI	5180	6.92	6±1(7)	5.012	6.81	4.797	0.00479	1.0	0.00479
5.3GWIFI	5320	6.99	6±1(7)	5.012	6.88	4.875	0.00486	1.0	0.00486
5.6GWIFI	5510	6.98	6±1(7)	5.012	6.23	4.198	0.00419	1.0	0.00419
5.8GWIFI	5795	6.36	6±1(7)	5.012	6.13	4.102	0.00409	1.0	0.00409

$$Pd = \frac{P_{out} * G}{4\pi r^2} ;$$

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power in mW.

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna in cm

Conducted power see the test report **DLE-260616020R/ DLE-260616021R/ DLE-260616022R/ DLE-260616023R/ DLE-260616024R/ DLE-260616025R**

BLE+EDR+2.4GWIFI antenna gain=5.84dBi, 5.2GWIFI antenna gain=6.81dBi, 5.3GWIFI antenna gain=6.88dBi, 5.6GWIFI antenna gain=6.23dBi, 5.8GWIFI antenna gain=6.13dBi.

Simultaneously MPE Ratios:

$$\text{BLE} + 2.4\text{WiFi} = 0.00383 + 0.02415 = 0.02798$$

$$\text{BLE} + 5.2\text{WiFi} = 0.00383 + 0.00479 = 0.00862$$

$$\text{BLE} + 5.3\text{WiFi} = 0.00383 + 0.00486 = 0.00869$$

$$\text{BLE} + 5.6\text{WiFi} = 0.00383 + 0.00419 = 0.00802$$

$$\text{BLE} + 5.8\text{WiFi} = 0.00383 + 0.00409 = 0.00792$$

$$\text{EDR} + 2.4\text{WiFi} = 0.00304 + 0.02415 = 0.02719$$

$$\text{EDR} + 5.2\text{WiFi} = 0.00304 + 0.00479 = 0.00783$$

$$\text{EDR} + 5.3\text{WiFi} = 0.00304 + 0.00486 = 0.00790$$

$$\text{EDR} + 5.6\text{WiFi} = 0.00304 + 0.00419 = 0.00723$$

$$\text{EDR} + 5.8\text{WiFi} = 0.00304 + 0.00409 = 0.00713$$

$$\text{BLE} + \text{EDR} = 0.00383 + 0.00304 = 0.00687$$

2.4WiFi and 5WiFi cannot be transmitted at the same time.

When the minimum test separation distance is >20 cm, a distance of 20 cm is applied to determine RF Exposure test exclusion. The test exclusion threshold is 0.02798 which is < 1.0; RF Exposure testing is not required.

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