

## FCC RF Exposure

EUT Description: Weather station

ModelNo.:marco

Series Model: N/A

FCC ID: 2BL4L-MARCO

Equipment type: Mobile Device equipment

Test procedures according to the technical standards: KDB 447498 D01 V06 and FCC 2.1091.

### 1. Limits

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)

#### 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> )	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

F = frequency in MHz

Formula:  $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$

Where :

Pd = power density in mW/cm<sup>2</sup>,

Pout = output power to antenna in mW;

G = gain of antenna in linear scale,

$\pi = 3.14$ ;

R = distance between observation point and center of the radiator in cm

Pd is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

### 2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

### 3. Test Result of RF Exposure Evaluation

#### WIFI

Modulation	Channel Freq. (MHz)	Conducted power (dBm)	Max tune-up power (mW)	Antenna Gain (dBi)	Antenna gain numeric	Evaluation result (mW/cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
802.11b	2412	16.78	47.64	2.06	1.61	0.015267792	1
	2437	16.28	42.46	2.06	1.61	0.013607434	1
	2462	16.82	48.09	2.06	1.61	0.015409064	1
802.11g	2412	15.73	37.41	2.06	1.61	0.011988815	1
	2437	15.49	35.40	2.06	1.61	0.011344262	1
	2462	15.16	32.81	2.06	1.61	0.0105142	1
802.11n	2412	15.80	38.019	2.06	1.61	0.012183617	1
	2437	15.58	36.14	2.06	1.61	0.011581805	1
	2462	15.27	33.65	2.06	1.61	0.01078391	1

#### BLE

Modulation	Channel Freq. (MHz)	Conducted power (dBm)	Max tune-up power (mW)	Antenna Gain (dBi)	Antenna gain numeric	Evaluation result (mW/cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
GFSK	2402	1.30	1.348962	2.06	1.61	0.000432291	1
	2440	1.69	1.475706	2.06	1.61	0.000472908	1
	2480	1.79	1.510080	2.06	1.61	0.000483923	1

Wifi: Conclusion: the max result 0.015409064:  $\leq$  1.0 compliance with FCC's RF Exposure.

BLE: Conclusion: the max result 0.000483923:  $\leq$  1.0 compliance with FCC's RF Exposure.

Wifi:0.015409064+BLE: 0.000483923=0.015892987  $\leq$  1.0 compliance with FCC's RF Exposure.

Conclusion: No SAR is required