FCC ID : 2AQPUAJ102C

1. 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).

Limits for Maximum Permissible Exposure (MPE).

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm^2)	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: Pd= (Pout*G)\ ($4*pi*R^2$)

Where

Pd= Power density in mW/cm^2.

Pout=output power to antenna in mW.

G= Numeric gain of the antenna relative to isotropic antenna.

Pi=3.1416.

R= distance between observation point and center of the radiator in 20cm.

Pd the limit of MPE, $1mW/cm^2$. If we know the maximum gain of the nd total. power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

2. EUT TECHNICAL DESCRIPTION

Product Name:	Data Concentrate Unit
Model Number:	AJ102C
Power Supply:	AC 120V/60Hz
Temperature Range:	-25℃~80℃

IEEE 802.11 WLAN Mode Supported:	IEEE 802.11b IEEE 802.11g IEEE 802.11n(20MHz channel bandwidth) IEEE 802.11n(40MHz channel bandwidth) IEEE 802.11ax(20MHz channel bandwidth) IEEE 802.11ax(40MHz channel bandwidth)
Modulation:	DSSS, OFDM, OFDMA
Frequency Range:	2412-2462MHz
Channels Step:	5MHz
Number of Channels:	11 channels
Antenna Type:	Integrated Antenna
Antenna Gain:	0.62dBi

Support Bands:	GPRS850 GPRS1900
Frequency Range:	GPRS850: Tx: 824~849MHz/ Rx: 869~894MHz GPRS1900: Tx: 1850~1910MHz/ Rx: 1930~1990MHz
Modulation Mode:	GMSK for GPRS
GPRS Class:	Class 12
Type of Antenna:	External Antenna
Antenna Gain:	GPRS850: 4.42dBi GPRS1900: 2.62dBi

Operation Band:	LTE Band41
Modulation:	UL: QPSK, 16QAM
Frequency Range:	LTE Band 41: Tx/Rx:2496~2690MHz
Antenna Type:	External Antenna
Antenna Gain:	LTE Band41: 4.25dBi

Device Type：	LoRa
Modulation:	CSS
Frequency Range:	915~918MHz
Number of Channels:	3 Channels
Antenna Type:	External Antenna
Antenna Gain:	3.05dBi

3. Measurement Result

Mode	Frequency （MHz）	Max Power (dBm)	Antenna gain (dBi)	Antenna Gain Numeric	R (cm)	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
2.4G WIFI	2412	24.32	0.62	1.15	20	0.062	1.0000
GPRS850	824.2	23.60	4.42	2.77	20	0.126	0.5495
GPRS1900	1850.2	20.58	2.62	1.83	20	0.042	1.0000
LTE Band41	2498.5	22.11	4.25	2.66	20	0.086	1.0000
LoRa	915.4	16.85	3.05	2.02	20	0.019	0.6103

NOTE: For time-average power, 1 uplink peak power subtract 9, 4 uplink peak power subtract 3.
For GPRS/EGPRS 900 max time-average power is 32.60-9=23.60dBm.
For GPRS/EGPRS 1800 max time-average power is 29.58-9=20.58dBm.

Conclusion of simultaneous transmitter:
Both of the module 1 and module 2 can transmit simultaneously, the formula of calculated the MPE is:

CPD1/LPD1+CPD2/LPD2+……etc. < 1
CPD = Calculation power density
LPD = Limit of power density

Therefore the worst-case situation is 0.062/1+ 0.126 /0.5495+0.002/0.6103 = 0.322, which is less than 1, this confirmed that the device comply with FCC 1.1310 MPE limit.

----- The End -----