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Maximum Permissible Exposure Evaluation

FCC ID: 2AR24-AIBOX410

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

Product Name:	LED Multimedia Processor
Trade Mark:	/
Model/Type reference:	Ai Box 410
Listed Model(s):	/
Model Difference:	/
Frequency band (Operating)	☒BT: 2.402GHz ~ 2.480GHz ☒BLE: 2.402GHz ~ 2.480GHz ☒WLAN: 2.412GHz ~ 2.462GHz ☒RLAN: 5.150GHz ~ 5.250GHz ☒RLAN: 5.725GHz ~ 5.850GHz ☐Others ___
Device category	☐Portable (<5mm separation) ☐Mobile (>20cm separation) ☒fixed (>20cm separation) ☐Others ___
Exposure classification	☐Occupational/Controlled exposure (S=5mW/cm2) ☒General Population/Uncontrolled exposure (S=1mW/cm2)
Antenna diversity	☐Single antenna ☒Multiple antenna ☐Tx diversity ☐Rx diversity ☐Tx/Rx diversity
Antenna gain (Max)	5dBi
Evaluation applied	☒MPE Evaluation ☐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^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= gain of antenna in linear scale
Pi= 3.1416
R= distance between observation point and center of the radiator in cm
Pd the limit of MPE 1mW/cm^2. 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.

Measurement Result

Only show the value of the worst antenna

BLE - Worst case						
Type	Channel frequency (MHz)	Max. Measured Power (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
GFSK	2480	-5.29	-5	5	0.00020	1

EDR - Worst case						
Type	Channel frequency (MHz)	Max. Measured Power (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
GFSK	2480	4.32	5	5	0.00199	1

Type	Channel frequency (MHz)	Antenna	Max. Measured Power (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
802.11 b	2462	Ant2	16.89	17	5	0.03153	1

5G WIFI U-NII-1(5150-5250MHz) - Worst case									
Type	Antenna	Channel frequency (MHz)	Max. Measured Power (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Directional gain	Total Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
802.11 n40	Ant1	5230	13.60	14	5	0.01580	8	0.06291	1
	Ant2	5230	13.92	14	5	0.01580			

5G WIFI U-NII-3(5745-5850MHz) - Worst case									
Type	Antenna	Channel frequency (MHz)	Max. Measured Power (dBm)	Max. Tune up Power (dBm	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Directional gain	Total Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
802.11 n40	Ant1	5795	13.96	14	5	0.01580	8	0.06291	1
	Ant2	5795	13.86	14	5	0.01580			

The WiFi and BT can transmit simultaneously.

Worst case					
Type	Frequency (MHz)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	BT+WIFI Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
GFSK	2480	5	0.00199	0.0649	1
802.11 n40	5795	5	0.06291		

Note:

1. Calculate by Worst-case mode
2. Max. Tune Up Power by Manufacturer's Declaration, and Max. Tune Up Power is used to calculate.
3. For a more detailed features description, please refer to the RF Test Report.
4. RF Modules RTL8822BU and ZK-7632A cannot transmit simultaneously.

**********THE END**********