

FCC ID : 2AX5J-AM550GB

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/cm²)	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: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

P_d = Power density in mW/cm².

P_{out} =output power to antenna in mW.

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

π =3.1416.

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

P_d the limit of MPE, 1mW/cm². 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.

2. EUT TECHNICAL DESCRIPTION

Product Name:	Wireless Bridge
Model Number:	RG-AirMetro550G-B
Power Supply:	DC:12.0Vdc 1.0A or POE: 24Vdc 0.5A POE Information: Model: RP023-2400500ZG Input: 100-240V~50/60Hz, 0.5A Max Output: 24V, 0.5A, 12W (Note: The EUT has two power supplies, Pre testing all power supplies, and find the POE is the worst, so only the worst data is shown in the report.)

IEEE 802.11 WLAN Mode Supported:	802.11b 802.11g 802.11n(20MHz channel bandwidth) 802.11n(40MHz channel bandwidth)
Modulation:	DSSS/OFDM
Operating Frequency Range:	2412-2462MHz
Number of Channels:	11 channels for 802.11b/g/n(20) 7 Channels for 802.11n(40)
Antenna Type:	PCB antenna
Antenna Gain:	-0.48dBi (Note: The antenna information is provided by the customers, which will have a certain impact on the test results.)
Smart system:	SISO

WIFI Type:	UNII-1: 5150MHz-5250MHz Band UNII-2A: 5250MHz-5350MHz Band UNII-2C: 5470MHz-5725MHz Band UNII-3: 5725MHz-5850MHz Band
WLAN Supported:	IEEE 802.11a IEEE 802.11n(20MHz channel bandwidth) IEEE 802.11n(40MHz channel bandwidth) IEEE 802.11ac(20MHz channel bandwidth) IEEE 802.11ac(40MHz channel bandwidth) IEEE 802.11ac(80MHz channel bandwidth)
Frequency Range:	5150MHz-5250MHz Band: 5180-5240MHz for 802.11a 5180-5240MHz for 802.11n(20) 5190-5230MHz for 802.11n(40) 5180-5240MHz for 802.11ac(20) 5190-5230MHz for 802.11ac(40) 5210MHz for 802.11ac(80)
	5250MHz-5350MHz Band: 5260-5320MHz for 802.11a

	5260-5320MHz for 802.11n(20) 5270-5310MHz for 802.11n(40) 5260-5320MHz for 802.11ac(20) 5270-5310MHz for 802.11ac(40) 5290MHz for 802.11ac(80)
	5470MHz-5725MHz Band: 5500-5700MHz for 802.11a 5500-5700MHz for 802.11n(20) 5510-5670MHz for 802.11n(40) 5500-5700MHz for 802.11ac(20) 5510-5670MHz for 802.11ac(40) 5530-5610MHz for 802.11ac(80)
	5725MHz-5850MHz Band: 5745-5825MHz for 802.11a 5745-5825MHz for 802.11n(20) 5755-5795MHz for 802.11n(40) 5745-5825MHz for 802.11ac(20) 5755-5795MHz for 802.11ac(40) 5775MHz for 802.11ac(80)
Modulation:	OFDM
TPC Function:	Support
Beamforming:	Not Support
DFS Function:	Master
Antenna Type:	External Antenna
Antenna Gain:	RG-ANT20S-90 Antenna: B1: 5150-5250MHz: Ant1: 17.78dBi, Ant2: 17.31dBi B2: 5250-5350MHz: Ant1: 18.02dBi, Ant2: 17.57dBi B3: 5470-5725MHz: Ant1: 18.77dBi, Ant2: 18.25dBi B4: 5725-5850MHz: Ant1: 18.98dBi, Ant2: 18.31dBi RG-ANT13-360 Antenna: B1: 5150-5250MHz: Ant1: 11.96dBi, Ant2: 10.44dBi B2: 5250-5350MHz: Ant1: 11.96dBi, Ant2: 10.42dBi B3: 5470-5725MHz: Ant1: 12.07dBi, Ant2: 10.79dBi B4: 5725-5850MHz: Ant1: 12.22dBi, Ant2: 10.89dBi (Note1: The EUT has two 5G WIFI antennas, RG-ANT20S-90 and RG-ANT13-360 antenna, Pre testing all antennas, and find the RG-ANT20S-90 antenna is the worst, so only the worst data is shown in the report.) (Note2: The antenna information is provided by the customers, which will have a certain impact on the test results.)
Smart System:	MIMO

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	12.21	-0.48	0.90	20	0.003	1.0000
5G WIFI	5745	11.15	21.66	146.55	20	0.380	1.0000

NOTE1:

B1: 5150-5250MHz: Ant1: 17.78dBi, Ant2: 17.31dBi, Directional gain = 20.56dBi

B2: 5250-5350MHz: Ant1: 18.02dBi, Ant2: 17.57dBi, Directional gain = 20.81dBi

B3: 5470-5725MHz: Ant1: 18.77dBi, Ant2: 18.25dBi, Directional gain = 21.52dBi

B4: 5725-5850MHz: Ant1: 18.98dBi, Ant2: 18.31dBi, Directional gain = 21.66dBi

NOTE2: All the modes are tested, only the worst data are described in the table.

Conclusion of simultaneous transmitter:

They can transmit simultaneously, the formula of calculated the MPE is:

$CPD1/LPD1 + CPD2/LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

Therefore the worst-case situation is $0.003/1 + 0.380/1 = 0.383$, which is less than 1, this confirmed that the device comply with FCC 1.1310 MPE limit.

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