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Maximum Permissible Exposure Evaluation

FCC ID: 2BEY4-E94

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:	Dual Band GPON ON/ Mesh Router
Trade Mark:	Innbox
Model/Type Reference:	E94
Listed Model(s):	G94
Model Differences:	E94 is a router, G94 is a light cat; G94 uses PON uplink, E94 uses WAN uplink; The appearance of the two products is completely consistent, the internal PCB version and circuit routing are completely consistent, and the WiFi module and antenna are completely consistent. And different is model number and Product Name.
Frequency Band (Operating)	WLAN: 2412MHz ~ 2462MHz U-NII-1: 5180MHz ~ 5240MHz U-NII-2A: 5260MHz ~ 5320MHz U-NII-2C: 5500MHz ~ 5700MHz U-NII-3: 5745MHz ~ 5825MHz
Device Category	☐Portable (<5mm separation) ☐Mobile (>20cm separation) ☒Fixed (>20cm separation) ☐Others ___
Exposure Classification	☐Occupational/Controlled exposure (S=5mW/cm^2) ☐General Population/Uncontrolled exposure (S=1mW/cm^2)
Antenna Diversity	☐Single antenna ☒Multiple antennas ☐Tx diversity ☐Rx diversity ☐Tx/Rx diversity
Antenna Gain (Max)	WLAN: 1.6dBi U-NII-1: 2.5dBi U-NII-2A: 2.5dBi U-NII-2C: 2.5dBi U-NII-3: 2.5dBi
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)	Averaging Time (minutes)
(A) Limits for Occupational/Controlled Exposure				
300-1500	--	--	F/300	<6
1500-100000	--	--	5	<6
(B) Limits for General Population/Uncontrolled Exposure				
300-1500	--	--	F/1500	<30
1500-100000	--	--	1	<30

Calculation Method

Friis transmission formula: $Pd=(P_{out}*G)/(4*Pi*R^2)$
Where:
Pd= Power density in mW/cm^2
P_{out}= 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 limit of MPE is $1mW/cm^2$. 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

Mode	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Tune Up Tolerance (dB)	Max. Tune Up Power (dBm)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)
WLAN 802.11a	2437	1.6	19.15	±1	20	0.02876	1
RLAN U-NII-1 802.11a	5240	2.5	18.47	±1	19	0.02810	1
RLAN U-NII-2A 802.11a	5320	2.5	19.02	±1	20	0.03538	1
RLAN U-NII-2C 802.11a	5580	2.5	18.74	±1	19	0.02810	1
RLAN U-NII-3 802.11a	5745	2.5	17.79	±1	18	0.02232	1

Worst case						
Type	Frequency (MHz)	Antenna Gain (dBi)	Power Density at 20cm (mW/cm^2)	WLAN+RLAN Power density at 20cm (mW/cm2)	Limit (mW/cm^2)	Result
WLAN 802.11a	2437	1.6	0.02876	0.06414	1	PASS
RLAN U-NII-2A 802.11a	5320	2.5	0.03538		1	PASS

Note:
1. Calculate in the worst-case mode.
2. Max. Tune Up Power is declared by manufacturer, and used to calculate.
3. For a more detailed features description, please refer to the RF Test Report.

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