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Maximum Permissible Exposure Evaluation

FCC ID: 2AR9L0081

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:	Router
Trade Mark:	Claro, NEWLAND
Model/Type reference:	NL-81
Listed Model(s):	NL-82, NL-WR8103
Frequency band (Operating)	☐BT: 2.402GHz ~ 2.480GHz ☒WLAN: 2.412GHz ~ 2.462GHz ☒RLAN: 5.150GHz ~ 5.250GHz ☐RLAN: 5.250GHz ~ 5.350GHz ☐RLAN: 5.470GHz ~ 5.725GHz ☒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)	2.4G WIFI ANT1: 4.44dBi, ANT2: 4.03dBi, Directional gain: 7.25dBi 5G WIFI ANT1: U-NII-1: 3.84dBi, U-NII-3: 4.44dBi 5G WIFI ANT2: U-NII-1: 4.04dBi, U-NII-3: 3.81dBi 5G WIFI Directional gain: U-NII-1: 7.16dBi, U-NII-3: 6.94dBi
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.

2.4G WIFI - 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)
802.11 B	2412	17.67	18.00	4.44	0.0349	1

5G WIFI U-NII-1 - 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)
802.11 A	5200	17.32	18.00	4.04	0.0318	1

5G WIFI U-NII-3 - 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)
802.11 N40	5795	17.70	18.00	6.94	0.0621	1

The 2.4G or 5G WIFI can transmit simultaneously.

Worst case					
Type	Channel Frequency (MHz)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	2.4G/5G WIFI Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
802.11 B	2412	4.44	0.0349	0.0970	1
802.11 N40	5795	6.94	0.0621		

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.

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