

RF Exposure Report

FCC ID:T58NX30R

RF Exposure Measurement

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached. Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

RF Exposure Limit

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b)

Limits for Maximum Permissible Exposure (MPE)

F= Frequency in MHz

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)
Limits for Occupational / controlled Exposures			
300 - 1500	--	--	F/300
1500 – 100000	--	--	5.0
Limits for General population / Uncontrolled Exposure			
300 - 1500	--	--	F/1500
1500 – 100000	--	--	1.0

Friss Formula

Friss Transmission Formula: $Pd = (Pout * G) / (4 * \pi * r^2)$

Where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = Distance between observation point and the center of radiator in cm

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.

EUT Operation condition

EUT was enabled to transmit and receive at lowest, middle and highest channels.

Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance from the antenna should be included in the User manual. So, this device is classified as Mobile device.

2.4G WIFI

Mode	2412~2462 MHz
Detector	PEAK
802.11b	15±1dBm
802.11g	16±1dBm
802.11n20	18±1dBm
802.11n40	18±1dBm
802.11ax20	17±1dBm
802.11ax40	19±1dBm

ANT Gain (G)

Antenna number:3

Antenna gain:ANT1:4.96dBi;ANT2:5.55dBi;MIMO:8.27dBi.

Protocol	ANT Gain(gain of antenna in linear scale)	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Output Power to Antenna (mW)	Power Density (mW/cm ²)	Limit (mW/cm ²)
802.11b	3.589	2412	16	39.8107	0.02844	1
802.11g	3.133	2462	17	50.1187	0.03580	1
802.11n20	6.714	2462	19	79.4328	0.10615	1
802.11n40	6.714	2437	19	79.4328	0.10615	1
802.11ax20	6.714	2462	18	63.0957	0.08432	1
802.11ax40	6.714	2437	20	100.0000	0.13364	1

5G WIFI

Mode	5180~5825MHz
Detector	PEAK
a	9±1dBm
n20	13±1dBm
n40	13±1dBm
ac80	12.5±1dBm
ac160	14±1dBm
ax80	13±1dBm
ax160	15±1dBm

ANT Gain (G)

Antenna number:3

Antenna gain: ANT1: 5.15dBi;ANT2: 5.5dBi;ANT3: 5.85dBi,MiNO:10.28dBi.

Protocol	ANT Gain(gain of antenna in linear scale)	Channel Frequency (MHz)	Output Power to Antenna (dBm)	Output Power to Antenna (mW)	Power Density (mW/cm ²)	Limit (mW/cm ²)
a	3.592	5785	10	10.0000	0.00715	1
n20	10.666	5240	14	25.1189	0.01796	1
n40	10.666	5230	14	25.1189	0.05333	1
ac80	10.666	5210	13.5	22.3872	0.04753	1
ac160	10.666	5250	15	31.6228	0.06714	1
ax80	10.666	5210	14	25.1189	0.05333	1
ax160	10.666	5250	16	39.8107	0.08452	1