

RF Exposure Report

FCC ID: 2AJYU-8PYA007

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)

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

F= Frequency in MHz

Friss Formula

Friss Transmission Formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 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.

LTE

Mode	LTE Band 2:1850~1910MHz LTE Band 4:1710~1755MHz LTE Band 5:824~849MHz LTE Band 12:699~716MHz LTE Band 13:777~787MHz LTE Band 25:1850~1915MHz LTE Band 26:814~849MHz LTE Band 41:2496~2690MHz LTE Band 66:1710~1780MHz
Detector	PEAK
Band 2	21±1dBm
Band 4	22±1dBm
Band 5	24±1dBm
Band 12	23±1dBm
Band 13	20±1dBm
Band 25	22±1dBm
Band 26	22±1dBm
Band 26(Part 90)	22±1dBm
Band 41	21±1dBm
Band 66	21±1dBm

ANT Gain (G)**Antenna gain :****Band 2:1.87dBi (gain of antenna in linear scale=1.54)****Band 4:3.12dBi (gain of antenna in linear scale=2.05)****Band 5:0.91dBi (gain of antenna in linear scale=1.23)****Band 12:0.95dBi (gain of antenna in linear scale=1.24)****Band13:2.23dBi (gain of antenna in linear scale=1.67)****Band 25:1.87dBi (gain of antenna in linear scale=1.54)****Band 26:0.91dBi (gain of antenna in linear scale=1.23)****Band 41:2.9dBi (gain of antenna in linear scale=1.94)****Band 66:3.12dBi (gain of antenna in linear scale=2.05)**

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)
Band2	1.54	1910	22	158.49	0.05	1.00
Band4	2.05	1755	23	199.53	0.06	1.00
Band5	1.23	849	25	316.23	0.13	1.00
Band12	1.24	716	24	251.19	0.06	0.48
Band13	1.67	787	21	158.49	0.03	0.52
Band25	1.54	1915	23	125.89	0.07	1.00
Band26	1.23	849	23	199.53	0.05	0.57
Band26(Part90)	1.23	849	23	199.53	0.05	0.57
Band41	1.94	2690	22	158.49	0.04	1.00
Band66	2.05	1780	22	158.49	0.07	1.00