RF Exposure Report

FCC ID: 2AYEZ-M6L

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: $Pd = (Pout * G) / (4*pi*r^2)$

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 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.

Turn up Result:

Mode	Turn up Power
GSM 850	33±1dBm
GSM 1900	32±1dBm
WCDMA B2	23±1dBm
WCDMA B4	22.5±1dBm
WCDMA B5	23.5±1dBm
LTE B2	23.5±1dBm
LTE B4	23±1dBm
LTE B5	23.5±1dBm
LTE B7	24.5±1dBm
LTE B12	23.5±1dBm
LTE B13	23.5±1dBm
LTE B17	23.5±1dBm
LTE B41	24±1dBm
LTE B66	23±1dBm
BT-GFSK	4.5±1dBm
BT-π/4-DQPSK	3.5±1dBm
BT-8DPSK	3.5±1dBm
BLE-GFSK	4±1dBm
2.4G WIFI-802.11b	13.5±1dBm
2.4G WIFI-802.11g	15±1dBm
2.4G WIFI-802.11n(HT20)	15±1dBm
2.4G WIFI-802.11n(HT40)	15±1dBm
5G WIFI-802.11a	12.5±1dBm
5G WIFI-802.11n(HT20)	12.5±1dBm
5G WIFI-802.11n(HT40)	12±1dBm
5G WIFI-802.11ac(VHT20)	11.5±1dBm
5G WIFI-802.11ac(VHT40)	12±1dBm

The MPE result of worst mode:

RF Function	Frequency (MHz)	Max Turn up Power (dBm)	Duty cycle factor	Max Power (dBm)	Max Power (mW)	ANT Gain (dBi)	ANT Gain (gain of antenna in linear scale)	Power Density (mW/cm²)	Limit (mW/ cm²)	Ratio	Result
GSM (1Slot)	848.8	34	-9.03	24.97	314.05	2.1	1.62	0.101	0.566	0.178	Pass
WCDMA	846.6	24.5	0.00	24.5	281.84	2.1	1.62	0.091	0.564	0.161	Pass
LTE	2595	25	-1.99	23.01	199.99	2.8	1.91	0.076	1	0.076	Pass

RF Function	Frequency (MHz)	Max Turn up Power (dBm)	Max Turn up Power (mW)	ANT Gain (dBi)	ANT Gain (gain of antenna in linear scale)	Power Density (mW/cm²)	Limit (mW/ cm²)	Ratio	Result
BT	2480	5.5	3.55	2.9	1.95	0.0014	1	0.0014	Pass
2.4G WIFI	2422	16	39.81	2.9	1.95	0.0154	1	0.0154	Pass
5G WIFI	5180	14.5	28.18	4.3	2.69	0.0151	1	0.0151	Pass

The max MPE of simultaneous transmission:

GSM(0.178)+2.4G WIFI(0.0154)=0.1934 < 1

Note:

1. **The Bluetooth and WLAN can't simultaneous transmission at the same time.**
2. **The Maximum Power Density is less than the limit, complies with the exemption requirements.**