FCC ID : 2BEA6TPC101

RF EXPOSURE EVALUATION

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)

Limits for Maximum Permissible Exposure (MPE)

Table 1 to § 1.1310(e)(1)—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)
(i) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*($900/f^2$)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*($180/f^2$)	<30
30-300	27.5	0.073	0.2	<30
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

11.1 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= Numeric gain of the antenna relative to isotropic antenna

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 nd total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

RF Exposure Information: The radiated output power of this device meets the limits of FCC/IC radio frequency exposure limits.This device should be operated with a minimum separation distance of 20cm (8 inches) between the equipment and a person's body.

11.2 Measurement Result

BT
Antenna gain: 3.40 dBi

Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
6.78	5 to 7	7	2.19	0.00218	1

BLE:
Antenna gain: 3.40 dBi

Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
5.95	4 to 6	6	2.19	0.00173	1

WiFi 2.4G
Antenna gain: 3.40 dBi

Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
18.40	17 to 19	19	2.19	0.03457	1

WiFi 5G
Antenna gain: 8.3 dBi

Frequency band	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
5150MHz-5250MHz	14.66	13 to15	15	6.76	0.04253	1
5250MHz-5350MHz	15.01	14 to 16	16	6.76	0.05355	1
5470MHz-5725MHz	15.01	14 to 16	16	6.76	0.05355	1
5725MHz-5850MHz	14.88	13 to 15	15	6.76	0.04253	1

NFC(13.56MHz)

Operation Mode	Channel Number	Channel Frequency (MHz)	Emission Level(dBuV/m)	EIRP (dBm)	Max power (mW)
RFID	1	13.56	46.52	-48.71	0
Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)		
0	1	0.00020	*(180/f2)		
EIRP[dBm] = E[dBμV/m] + 20 log(d[meters]) - 104.77					

WIFI and Bluetooth support for simultaneous delivery:

MAX RF EXPOSURE EVALUATION

WIFI2.4G (mW/cm2)	BT (mW/cm2)	Summation of Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
0.03457	0.00218	0.03675	1

WIFI5G (mW/cm2)	BT (mW/cm2)	Summation of Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
0.05355	0.00218	0.05573	1

WIFI2.4G (mW/cm2)	BLE (mW/cm2)	Summation of Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
0.03457	0.00173	0.06914	1

WIFI5G (mW/cm2)	BLE (mW/cm2)	Summation of Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
0.05355	0.00173	0.05528	1