

FCC ID:2BFQY-PT-42

RF Exposure Evaluation

Limits

According to KDB 447498 D01 General RF Exposure Guidance v06 and part 2.1091

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)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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
300–1500			f/300	6
1500–100,000			5	6
(B) 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
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz

Friis transmission formula: $Pd = (P_{out} * G) / (4 * \pi * r^2)$

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 center of the radiator in cm

Pd is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

Test Result of RF Exposure Evaluation

	Modulation	Frequency (MHz)	Output power to antenna (dBm)	Output power to antenna (mW)	Power Density at R=20cm (mW/cm ²)	Limit (mW/cm ²)	Result
BR/EDR	GFSK	2402	-1.563	0.697750	0.000177	1.0	PASS
		2441	-2.227	0.598825	0.000152	1.0	PASS
		2480	-3.031	0.497622	0.000126	1.0	PASS
	Π/4-DQPSK	2402	-0.937	0.805935	0.000205	1.0	PASS
		2441	-1.429	0.719615	0.000183	1.0	PASS
		2480	-2.233	0.597998	0.000152	1.0	PASS
	8DPSK	2402	-0.608	0.869361	0.000221	1.0	PASS
		2441	-0.620	0.866962	0.000220	1.0	PASS
		2480	-1.243	0.751104	0.000191	1.0	PASS
BLE	GFSK	2402	-0.740	0.843335	0.000214	1.0	PASS
		2440	-0.563	0.878416	0.000223	1.0	PASS
		2480	-0.481	0.895159	0.000227	1.0	PASS

FM					
Channel (MHz)	Electric Field (dBuV/m)	Output power to antenna (mW)	Power Density at R=20cm (mW/cm ²)	Limit (mW/cm ²)	Result
88.1	53.90	0.000138	0.00000003	0.2	PASS
Remark: Test data from page 22 of the FM report.					

In the case of simultaneous launches for BR/EDR and BLE and FM:

Calc. Thresholds : $0.000221 + 0.000227 + 0.00000015 = 0.00044815 < 1$

Remark: 1. BT Antenna gain is 1.06 dBi, FM Antenna gain is 0 dBi.

So a SAR test is not required