3. 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)

Frequency range (MHz)	Electric field strength(V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Average time
(A) Limits for occupational /Control exposures				
300 – 1500	--	--	F/300	6
1500 - 100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300 – 1500	--	--	F/1500	6
1500 - 100000	--	--	1	30

3.1. 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 = gain of antenna in linear scale

Pi = 3.1416

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

Pd the limit of MPE, 1 mW/cm^2. 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 where the MPE limit is reached.

3.2. EUT operating condition

A software provided by client enabled the EUT to transmit and receive data at low, middle and high channel individually.

3.3. Test result of RF Exposure evaluation

Test Item : RF Exposure evaluation data
Test Mode : Normal operation

3.3.1. Output power into antenna & RF Exposure evaluation distance :

Operating mode	Channel	Frequency (MHz)	E.R.P. or E.I.RP. (dBm)	Antenna Gain (dBi)	Power Density at 20cm (mW/cm^2)	Limit ($mW/cm^{2)}$
GSM850	Low	824.2	25.41	-0.5	0.06162	1
	Middle	836.6	26.31	-0.5	0.07581	
	High	848.8	27.43	-0.5	0.09811	
GSM850 (GPRS)	Low	824.2	24.02	-0.5	0.04474	1
	Middle	836.6	25.85	-0.5	0.06819	
	High	848.8	27.46	-0.5	0.09879	
GSM1900	Low	1850.2	25.16	4.47	0.18270	1
	Middle	1880.0	28.34	4.47	0.37995	
	High	1909.8	29.65	4.47	0.51372	
GSM1900 (GPRS)	Low	1850.2	25.41	4.47	0.19352	1
	Middle	1880.0	28.41	4.47	0.38613	
	High	1909.8	29.77	4.47	0.52812	

▣Note
The power density Pd (4th column) at a distance of 20cm calculated from the friis transmission formula is far below the limit of 1 mW/ cm^2.