SAR evaluation

FCC ID: 2A8QF-B5306

MPE Calculation Method

$E\ (V/m) = (30*P*G)^{0.5}/d$

Power Density: $Pd\ (W/m2) = E^2/377$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$Pd = (30*P*G) / (377*d^2)$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well

as the gain of the used antenna, the RF power density can be obtained.

Calculated WIFI Result and Limit (WORSE CASE IS AS BELOW)

Antenna Gain (Numeric)	Peak Output Power (mW)	Power Density (S) (mW/cm2)	Limit of Power Density (S) (mW/cm2)	Test Result
2.29 （3.6dBi）	8.55 （9.32dBm）	0.0039	1	Compiles

Note:

Antenna Gain: 3.6dBi

Antenna Gain (Numeric): 2.29

ERP=9.32+3.6-2.15=10.77 dBm(12mW<3060mW)

Calculated Bluetooth Result and Limit (WORSE CASE IS AS BELOW)

$eirp = pt\ x\ gt = (EXd)^2/30$

where:

pt = transmitter output power in watts,

gt = numeric gain of the transmitting antenna (unitless),

E = electric field strength in V/m, --- $10^{((dBuV/m)/20)}/10^6$

d = measurement distance in meters (m)---3m

So $pt = (EXd)^2/(30\ x\ gt)$

Ant gain =-0.58dBi so Ant numeric gain= 0.875

Field strength =83.19dBμV/m @3m@2480MHz

So Pt={[$10^{(83.19/20)}/10^6$ x3]^2/(30x0.875)}x1000 mW = 0.071mW

Antenna Gain (Numeric)	Peak Output Power (mW)	Power Density (S) (mW/cm2)	Limit of Power Density (S) (mW/cm2)	Test Result
0.875（-0.58dBi）	0.071 （-11.49dBm）	0.00001	1	Compiles

Note:

Antenna Gain: -0.58dBi
Antenna Gain (Numeric): 0.875

ERP=-11.49+0.875-2.15=-12.765dBm(0.053mW< 3060mW)

$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}}$ =8.55/3060 +0.071/3060=0.0028

$\sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}}$ =(12+0.053)/3060 =0.0039

$\sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k}$ =（0.0039+0.00001）/1=0.00391

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

0.0028+0.0039+0.00391=0.011<1