RF Exposure evaluation

Product Name	:	Wireless Mouse
FCC ID	:	2AHYV-EPICM2
Test Standard	:	KDB447498D04 General RF Exposure Guidance v01

According to 447498 D04 Interim General RF Exposure Guidance v01

$$P_{th} \text{ (mW)} = ERP_{20\,cm} \text{ (mW)} = \begin{cases} 2040f & 0.3\,\text{GHz} \le f < 1.5\,\text{GHz} \\ 3060 & 1.5\,\text{GHz} \le f \le 6\,\text{GHz} \end{cases} \quad (B.1)$$

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20\,cm}(d/20\,cm)^x & d \le 20\,\text{cm} \\ ERP_{20\,cm} & 20\,\text{cm} < d \le 40\,\text{cm} \end{cases} \quad (B.2)$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,cm}\sqrt{f}}\right)$$

and f is in GHz, d is the separation distance (cm), and ERP_{20cm} is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)									
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

BLE:

Ant gain = **-0.71** dBi

MAX output power : 2.166dBm@2480MHz

ERP=2.166-0.71-2.15=-0.648dBm

WORSE CASE:

10^0.2166=1.647mW < 2.715 mW

Then SAR evaluation is not required

2.4G:
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
Sopt = $(EXd)^2/30$ x gt
Ant gain = -0.71 dBi [-2.86dBd(0.518)]
Field strength = **97.82** dBμV/m @3m @2402MHz
So Pt={ [$10^{(97.82 /20)}/10^6$ x3]^2/30}x1000 mW =1.816mW<2.781mW
So ERP=1.816x0.518=0.941<2.781mW
Then SAR evaluation is not required