

RF Exposure evaluation

Product Name : Machine entertainment system
 FCC ID : 2BACQ6125
 Test Standard : KDB447498D04 General RF Exposure Guidance v01

According to 447498 D04 Interim General RF Exposure Guidance v01

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

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

where

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

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ 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

BT/WIFI2.4G/5G:Ant gain = 2.73 dBi

BT:

Max Output power =2.14dBm @ 2480MHz

ERP = 2.14dBm+2.73dBi-2.15=2.72dBm

So

ERP is worse case

$10^{0.272}=1.8707 \text{ mW} < 3060 \text{ mW}$

2.4G:

Max Output power =17.217dBm @ 2462MHz

ERP = 17.217dBm+2.73dBi-2.15=17.797dBm

So

ERP is worse case

$10^{1.7797} = 60.2143 \text{ mW} < 3060 \text{ mW}$

5G:

Max Output power =18.286dBm @ 5700MHz

ERP = 18.286dBm+2.73dBi-2.15=18.8660dBm

So

ERP is worse case

$10^{1.8866} = 77.0194 \text{ mW} < 3060 \text{ mW}$

Comply with RF exposure exemption limit.