SAR evaluation

Product Name	:	Smart Anti-Snore Pillow
FCC ID	:	2A85N-ZXL-US
Test Standard	:	KDB447498D04 General RF Exposure Guidance v01

According to 447498 D04 Interim General RF Exposure Guidance v01

Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

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

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).

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

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

Calculated Result and Limit (WORSE CASE IS AS BELOW)

BT

Directional antennaGain (Numeric)	Peak Output Power (mW)	Power Density (s) (mW/cm²)	Limit of Power Density (s) (mW/cm²)	Test Result
1.97dBi(1.574)	1.454 (GFSK 2480)	0.0046	1	Compiles

ERP=1.627+1.97-2.15=1.395 mW

BLE

Directional antennaGain (Numeric)	Peak Output Power (mW)	Power Density (s) (mW/cm²)	Limit of Power Density (s) (mW/cm²)	Test Result
1.97dBi(1.574)	1.642 (2442)	0.0051	1	Compiles

ERP=2.154+1.97-2.15=1.575 mW

WIFI

Directional antennaGain (Numeric)	Peak Output Power (mW)	Power Density (s) (mW/cm²)	Limit of Power Density (s) (mW/cm²)	Test Result
1.97dBi(1.574)	25.118 (802.11b 2412)	0.0789	1	Compiles

ERP=14.012+1.97-2.15=24.166 mW

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}}$$ =(1.454+1.642+25.118)/3060=0.00922

$$\sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}}$$ =(1.395+1.575+24.166)/3060=0.00887

$$\sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k}$$ =(0.0046+0.0051+0.0789)/1=0.0886

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

0.00922+0.00887+0.0886=0.10669＜1