SAR evaluation

Product Name	:	Smart Audio
FCC ID	:	2BFV2HFEMCDUR201CVY
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.

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

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_{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

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

Calculated Result and Limit (WORSE CASE IS AS BELOW)

BT

Directional antennaGain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (mW/cm^2)	Test Result
1.9dBi(1.549)	7.744	5.948 (8-DPSK 2480)	3060	Compiles

ERP=7.744+1.9-2.15=5.616 mW

BLE

Directional antennaGain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (mW/cm^2)	Test Result
1.9dBi(1.549)	5.331	3.413 (2480)	3060	Compiles

ERP=5.331+1.9-2.15=3.222 mW

2.4G WIFI

Directional antennaGain (Numeric)	Average Output Power (dBm)	Peak Output Power (mW)	Limit (mW/cm^2)	Test Result
2dBi(1.585)	24.141	259.478 (802.11n40 2422)	3060	Compiles

ERP=24.141+2-2.15=250.669 mW

5.1G WIFI

Directional antennaGain (Numeric)	Average Output Power (dBm)	Peak Output Power (mW)	Limit (mW/cm^2)	Test Result
3.3dBi(2.138)	23.494	223.563 (802.11a 5240)	3060	Compiles

ERP=23.494+3.3-2.15=291.340 mW

5.8G WIFI

Directional antennaGain (Numeric)	Average Output Power (dBm)	Peak Output Power (mW)	Limit (mW/cm^2)	Test Result
1.4dBi(1.380)	19.746	94.319 (802.11ac80 5775)	3060	Compiles

ERP=19.746+1.4-2.15=79.360 mW

$$\sum_{i=1}^{a} \frac{P_i}{P_{\text{th},i}} = 5.948/3060 + 3.413/3060 + 259.478/3060 + 223.563/3060 + 94.319/3060 = 0.1917 < 1$$

$$\sum_{j=1}^{b} \frac{ERP_j}{ERP_{\text{th},j}} = (5.616 + 3.222 + 250.669 + 291.340 + 79.360)/3060 = 0.2060 < 1$$