FCC ID: 2A93S-SMARTTIP

## RF Exposure evaluation

According to 447498 D04 Interim General RF Exposure Guidance v01

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

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

where

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

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)

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	
	450 835 1900 2450 3600	300 39 450 22 835 9 1900 3 2450 3 3600 2	300 39 65 450 22 44 835 9 25 1900 3 12 2450 3 10 3600 2 8	300 39 65 88   450 22 44 67   835 9 25 44   1900 3 12 26   2450 3 10 22   3600 2 8 18	5     10     15     20       300     39     65     88     110       450     22     44     67     89       835     9     25     44     66       1900     3     12     26     44       2450     3     10     22     38       3600     2     8     18     32	5     10     15     20     25       300     39     65     88     110     129       450     22     44     67     89     112       835     9     25     44     66     90       1900     3     12     26     44     66       2450     3     10     22     38     59       3600     2     8     18     32     49	5     10     15     20     25     30       300     39     65     88     110     129     148       450     22     44     67     89     112     135       835     9     25     44     66     90     116       1900     3     12     26     44     66     92       2450     3     10     22     38     59     83       3600     2     8     18     32     49     71	5     10     15     20     25     30     35       300     39     65     88     110     129     148     166       450     22     44     67     89     112     135     158       835     9     25     44     66     90     116     145       1900     3     12     26     44     66     92     122       2450     3     10     22     38     59     83     111       3600     2     8     18     32     49     71     96	5     10     15     20     25     30     35     40       300     39     65     88     110     129     148     166     184       450     22     44     67     89     112     135     158     180       835     9     25     44     66     90     116     145     175       1900     3     12     26     44     66     92     122     157       2450     3     10     22     38     59     83     111     143       3600     2     8     18     32     49     71     96     125	5     10     15     20     25     30     35     40     45       300     39     65     88     110     129     148     166     184     201       450     22     44     67     89     112     135     158     180     203       835     9     25     44     66     90     116     145     175     207       1900     3     12     26     44     66     92     122     157     195       2450     3     10     22     38     59     83     111     143     179       3600     2     8     18     32     49     71     96     125     158	

 $ERP/EIRP = P_T + G_T - L_C$ 

ERP/EIRP is the equivalent (or effective) radiated power [in same units as P<sub>T</sub>, typically dBW, dBm, or power spectral density (psd)], relative to either a dipole antenna (ERP) or an isotropic antenna (EIRP).

P<sub>T</sub> is the transmitter output power, in dBW, dBm, or psd (power over a specified reference bandwidth).

 $\ensuremath{G_T}$  is the gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP).

L<sub>C</sub> is the signal attenuation in the connecting cable between the transmitter and the antenna, in dB.

## For BLE mode

Frequency (MHz)	Output power (dBm)	Output power (mw)	Ant gain (dBi)	EIRP (dBm)	ERP(dBm)	ERP (mw)	Distance (cm)	P <sub>th</sub> (mW)
2402	-2.07	0.62	3.7	1.63	-0.52	0.89	0.5	2.7

ERP = EIRP - 2.15 dB

**WORSE CASE** 

0.89mW<2.7Mw

So the SAR evaluation is not required