

## RF Exposure evaluation

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 |

$$ERP/EIRP = P_T + G_T - L_C$$

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

$P_T$  is the transmitter output power, in dBW, dBm, or psd (power over a specified reference bandwidth).

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

$L_C$  is the signal attenuation in the connecting cable between the transmitter and the antenna, in dB.

### For BLE mode

| Frequency (MHz) | Output power to antenna (dBm) | Ant gain(dBi) | EIRP(dBm) | ERP(dBm) | ERP(mw) | Distance (cm) | $P_{th}$ (mW) |
|-----------------|-------------------------------|---------------|-----------|----------|---------|---------------|---------------|
| 2402            | 4.17                          | 1.935         | 6.105     | 3.955    | 2.49    | 0.5           | 2.79          |

$$ERP = EIRP - 2.15 \text{ dB}$$

WORSE CASE

$$2.49 \text{ mW} < 2.79 \text{ mW}$$

**For BT EDR mode**

| Frequency<br>(MHz) | Output<br>power to<br>antenna<br>(dBm) | Ant<br>gain(dBi) | EIRP(dBm) | ERP(dBm) | ERP(mw) | Distance<br>(cm) | P <sub>th</sub> (mW) |
|--------------------|--|------------------|-----------|----------|---------|------------------|----------------------|
| 2402               | 4.33                                   | 1.935            | 6.265     | 4.115    | 2.579   | 0.5              | 2.79                 |

ERP = EIRP -2.15 dB

WORSE CASE

2.579mW<2.79mW

Remark:

Then SAR evaluation is not required