

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 BT EDR mode

| Frequency (MHz) | Output power to antenna (dBm) | Output power to antenna (mw) | Ant gain(dBi) | EIRP(dBm) | ERP(dBm) | ERP(mw) | Distance (cm) | P_{th} (mW) |
|-----------------|-------------------------------|------------------------------|---------------|-----------|----------|---------|---------------|---------------|
| 2441 | 3.37 | 2.17 | 1.7 | 5.07 | 2.92 | 1.96 | 0.5 | 2.75 |

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

WORSE CASE

$$2.17 \text{ mW} < 2.75 \text{ mW}$$

Remark:

Then SAR evaluation is not required