# RF Exposure evaluation

According to 447498 D04 Interim General RF Exposure Guidance v01

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

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).
The example values shown in Table B.2 are for illustration only.

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

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 |

eirp = pt x gt = $(EXd)^2/30$
where:
pt = transmitter output power in watts,
gt = numeric gain of the transmitting antenna (unitless),
E = electric field strength in V/m, --- $10^{((dBuV/m)/20)}/10^6$
d = measurement distance in meters (m)---3m
Sopt = $(EXd)^2/30$ x gt

Ant gain =2.34dBi  so Ant numeric gain= 1.714

Ant gain =0.19dBd  so Ant numeric gain= 1.0447

Field strength =76.32dBμV/m @3m@2402MHz

So Pt={ $[10^{(76.32/20)}/10^6$  x3]$^2$/30x1.714}x1000 mW = 0.01mW

ERP=0.01X1.0447=0.0104mW

<2.79 mW

Then SAR evaluation is not required