RF Exposure Compliance Requirement

E (V/m)=(30*P*G)$^{0.5}$/d
E=Electric Field (V/m)
Remark: E(V/m)=10X$^{(dBUV/m)/20}$ *10^{-6}
P=Peak RF output Power (W)
G=EUT Antenna numeric gain (numeric)
d= Separation distance between radiator and human body (m)
in the formula above:
d=3m, E =53dBuV/m (max. value provided by client), antenna gain=0dBi
P=0.0000599mW

In KDB 447498 D01 v06: 4.3.1 Standalone SAR test exclusion considerations:

a) For 100 MHz to 6 GHz and *test separation distances* ≤ 50 mm, the 1-g and 10-g *SAR test exclusion thresholds* are determined by the following:
[(*max. power of channel, including tune-up tolerance, mW*) / (*min. test separation distance, mm*)] · [√$f_{(GHz)}$] ≤ 3.0 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR,[30] where
- $f_{(GHz)}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation[31]
- The result is rounded to one decimal place for comparison
- The values 3.0 and 7.5 are referred to as *numeric thresholds* in step b) below

The test exclusions are applicable only when the minimum *test separation distance* is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

b) For 100 MHz to 6 GHz and *test separation distances* > 50 mm, the 1-g and 10-g *SAR test exclusion thresholds* are determined by the following (also illustrated in Appendix B):[32]
1) {[Power allowed at *numeric threshold* for 50 mm in step a)] + [(test separation distance – 50 mm)·($f_{(MHz)}$/150)]} mW, for 100 MHz to 1500 MHz
2) {[Power allowed at *numeric threshold* for 50 mm in step a)] + [(test separation distance – 50 mm)·10]} mW, for > 1500 MHz and ≤ 6 GHz

c) For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C):[33]
1) For *test separation distances* > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by [1 + log(100/$f_{(MHz)}$)]
2) For *test separation distances* ≤ 50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by ½
3) SAR measurement procedures are not established below 100 MHz.

Formulas as below:

P ≤ (3 x m)/√$f_{(GHz)}$ a)

P is the max. power of channel, including tune-up tolerance, mW

m is min.test separation distance, mm

$f_{(GHZ)}$ is the RF channel transmit frequency in GHz

$P \leq (3 \times 50)/\sqrt{f_{(GHZ)}} + (m-50) \times f_{(MHZ)}/150$ b)1)

$P \leq [(3x50)/\sqrt{0.1} + (m-50)x100/150] \times [1+lg(100/f_{(MHZ)})]$ c)1)

$P \leq \{[(3x50)/\sqrt{0.1} + (50-50)x100/150] \times (1+lg100/100)\} \times 1/2$ c)2)

$P \leq 237.19mW$

The SAR Test Exclusion Threshold is calculated from:

[(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR.

The worst case test separation distance is **5mm.**

The transmission frequencies of the device are below 100 MHz.

The SAR Test Exclusion Threshold (mW) are listed below:

Transmit frequency (MHz)	ERP (mW)	SAR Test Exclusion Threshold (mW)
13.56	0.0000599	237.19