Appendix G: **MPE Calculation**

KDB 447498

Section 4.3 General SAR test reduction and exclusion guidance

For Standalone SAR exclusion consideration, when the considering SAR exclusion Threshold requirement in KDB 447498 is satisfied standalone SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required.

In the frequency range below 100 MHz and test separation distance ≤ 50mm, the SAR Test Exclusion Threshold will be determined as follows

SAR Exclusion Threshold

$$NT = \{ [(MP/TSD) * \sqrt{f_{GHz}}] + (TSD - 50mm) * f_{(MHz)}/150] \} * \{1 + Log [100 / f_{MHz}] \} * {}^{½}$$

Where:

MP	=	Max Power of channel (mW) (inc tune up)
NT	=	Numeric Threshold (3mW for 1-g SAR and 7.5 for 10-g SAR)
TSD	=	Min Test separation Distance (mm) = 50
f_{GHz}	=	Transmit frequency (or 100MHz if lower)
F_{MHz}	=	Transmit frequency

We can transpose this formula to allow us to find the maximum power of a channel allowed and compare this to the measured maximum power.

$$MP = \{ [(NT \times TSD) / \sqrt{f_{GHz}}] + (50 - 50) * [100/150] \} * \{1 + Log [100 / F_{MHz}] * {}^{1}/_{2}\}$$
$$MP = \{ [(3.0 \times 50) / \sqrt{0.1}] + (50 - 50) * [100/150] \} * \{1 + Log [100 / F_{MHz}] * {}^{1}/_{2}\}$$
$$MP = 474 * \{1 + Log [100 / 10.6] * {}^{1}/_{2}\}$$
$$MP = 468 \text{ mW}$$

The calculated output power is 1.64×10^{-10}mW (eirp) is less than the SAR Exclusion Threshold of 468mW, at 5mm test separation distance, for general population and uncontrolled exposure. Therefore standalone SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required.

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{EIRP}{4\pi R^2} \quad \text{re-arranged } R = \sqrt{\frac{EIRP}{S4\pi}}$$

Where:

S = power density
R = distance to the centre of radiation of the antenna
EIRP = EUT Maximum power

Note:

The EIRP value was determined using the peak E Field measurement.

Result

Prediction Frequency (MHz)	Maximum EIRP (mW)	Power density limit (S) (mW/cm^2)	Distance (R) cm required to be less than $1.67mW/cm^2$
10.39	$1.64x10^{-10}$	1.67	2.80×10^{-6}