Appendix G: **SAR Exclusion & MPE Calculation**

KDB 447498

Section 4.3 General SAR test reduction and exclusion guidance

For Standalone SAR exclusion consideration, when 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 to 6 GHz and test separation distance of 50mm, the SAR Test Exclusion Threshold for operation in the 2400 – 2483.5 MHz band will be determined as follows

SAR Exclusion Threshold (SARET)

SAR Exclusion Threshold   =   Step 1 + Step 2

Step 1

$$NT = [(MP/TSD^A) * \sqrt{f_{GHz}}]$$

NT   =   Numeric Threshold (3.0 for 1-g SAR and 7.5 for 10-g SAR)
MP   =   Max Power of channel (mW) (inc tune up)
TSD^A =   Min Test separation Distance or 50mm (whichever is lower) = 50

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.

$$= [(NT \times TSD^A) / \sqrt{f_{GHz}}]$$

For Distances Greater than 50 mm Step 2 applies

Step 2

$$(TSD^B – 50mm) * 10\}$$

Where:
     TSD^B =   Min Test separation Distance (mm) = 50

Operating Frequency 2.455 GHz

SARET   =   [(3.0 x 50) / √2.412] + { (50 – 50) * 10 }
SARET   =   [150 / 1.55] + (0 * 10 }
SARET   =   96.77mW

Operating Frequency 2.465 GHz

SARET   =   [(3.0 x 50) / √2.437] + { (50 – 50) * 10 }
SARET   =   [150 / 1.56] + (0 * 10 }
SARET   =   96.15mW

Operating Frequency 2.475 GHz

SARET   =   [(3.0 x 50) / √2.462] + { (50 – 50) * 10 }
SARET   =   [150 / 1.57] + (0 * 10 }
SARET   =   95.54mW

Channel Frequency (MHz)	Conducted Carrier Power (dBm)	Maximum Antenna Gain (dBi)	EIRP (mW)	SAR Exclusion Threshold	SAR Evaluation
2455	2.17	15	52.12	96.77	Not Required
2465	2.15	15	51.88	96.15	Not Required
2475	2.14	15	51.76	95.54	Not Required

Therefore standalone SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required.

where:

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

Note:

The EIRP was calculated by addition on the maximum conducted carrier power 7.95 dBm (6.24 mW) and based on a antenna gain of 0 dBi

Result

Prediction Frequency (MHz)	Maximum EIRP (mW)	Power density limit (S) (mW/cm^2)	Distance (R) cm required to be less than 1 mW/cm^2
2455	52.12	1	2.04