Appendix G: **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 at 915.08, 921.50 and 927.90MHz MHz 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 915.08 MHz

MP=   [(3.0 x 50) / √0.91508] + {(50 − 50) * [915.08/150] }
MP=   [150 / 0.91508] + { 0 * 6.02 }
MP=   156.08 mW

Operating Frequency 921.50 MHz

MP=   [(3.0 x 50) / √0.9215] + { (50 − 50) * [921.5/150] }
MP=   [150 / √0.9215 +{ 0 * 6.11 }
MP=   156.25mW

Operating Frequency 927.90 MHz

MP=   { [(3.0 x 50) / √0.9279] + (50 − 50) * [927.9/150] }
MP=   { [150 / √0.9279] + { 0 * 6.18 }
MP=   155.72mW

Therefore standalone SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required. Section 4.3 General SAR test reduction and exclusion guidance

Channel Frequency (MHz)	Field Strength (dBµV/m)	Calculated Output Power (dBm)	Calculated Output Power (mW)	SAR Exclusion Limit (mW)	Result
915.08	90.05	-5.10	0.31	156.08	Compliant
921.50	89.88	-5.27	0.29	156.25	Compliant
927.90	90.20	-4.96	0.32	155.72	Compliant

As per ANSI C63.10

$$EIRP = E + 20\log d - 104.7 \quad (22)$$

where
EIRP is the equivalent isotropically radiated power, in dBm
EMeas is the field strength of the emission at the measurement distance, in dBµV/m
dMeas is the measurement distance, in m