

NRT302 (EUT) RF Exposure:-

The NRT302 is intended as a portable device. A person's extremity (hand) generally holds the device in the hand. The Unit can only operate one of its transmitters at a time, and this is fixed in the firmware/software.

Evaluation is for exposure potential against the Exclusion limits given in KDB447498 section 4.3.1.

Exclusion requirements are based upon 10g SAR exclusion for extremities.

Equation of 4.3.1. part 1A Transposed is:

$$\text{Exclusion in mW} = ((\text{Threshold} / (\sqrt{F})) * D$$

where: Threshold = 7.5 for 10g SAR Extremities (or 3 for 1g SAR Body worn)

F = Frequency in GHz (0.1GHz)

D = Separation distance in mm (50mm)

Threshold in mW for 13.56MHz is based on equation above and 4.3.1. part2A

$$= \mathbf{1185.854123 \text{ mW}}$$

Further modified by 4.3.1. part 3A

$$= \mathbf{2215 \text{ mW}} \text{ (at 50mm)}$$

And further modified by part 4.3.1. part 3B (<50mm distance under 100MHz)

$$= \mathbf{2215 / 2} \quad (50\text{mm exclusion value divided by 2})$$

Therefore exclusion for 13.56MHz and <5mm separation distance is

$$= 1108\text{mW}.$$

As measured values for the NRT302 EUT were:

Worst case Peak power, P = 0.000000261mW (-65.8dBm).

And antenna gain included in field strength measurement, the EUT RFID part is excluded from RF Exposure / SAR testing requirements.

As the EUT also has a 915MHz transmitter and the maximum output power measured including antenna was 0.4mW, the following is used to determine exclusion requirements:

Equation of 4.3.1. part 1

$$(\text{Max power mW} / 5\text{mm}) * (\sqrt{F_{\text{GHz}}}) = \leq 7.5\text{g. (Extremities)}$$

$$(0.4/5) * (\sqrt{0.915}) = 0.0765.$$

Therefore, 915MHz transmitter is also excluded.