

8.1 MEASUREMENT PROCESS

8.2 System Verification

Prior to SAR assessment, the system is verified to the $\pm 5\%$ of the brain or muscle specifications at 835MHz & 1900MHz by using the system validation kit.

Validation Kit: D835V2, S/N: 406	Brain	Targeted SAR _{1g} (mW/g) 2.11	Measured SAR _{1g} (mW/g) 2.12
Conversion Factor: 5.7	Muscle	Targeted SAR _{1g} (mW/g) 2.11	Measured SAR _{1g} (mW/g) 2.21
Validation Kit: D1900V2, S/N: 502	Brain	Targeted SAR _{1g} (mW/g) 10.7	Measured SAR _{1g} (mW/g) 10.5
Conversion Factor: 4.3	Muscle	Targeted SAR _{1g} (mW/g) 10.7	Measured SAR _{1g} (mW/g) 10.6

8.3 Dosimetric Assessment Setup

The evaluation was performed with the following procedure:

1. The SAR value at a fixed location above the ear point was measured and was used as a reference value for assessing the power drop.
2. The SAR distribution at the exposed side of the head was measured at a distance of 3.9mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 20mm x 20mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.
3. Around this point, a volume of 32mm x 32mm x 34mm was assessed by measuring 5 x 5 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:
 - a. The data at the surface were extrapolated, since the center of the dipoles is 2.7mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. The extrapolation was based on a least square algorithm [13]. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
 - b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x,y, and z directions) [13][14]. The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.
 - c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR value, at the same location as procedure #1, was re-measured. If the value changed by more than 5%, the evaluation is repeated.

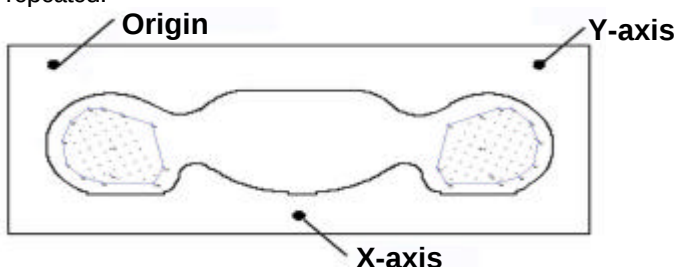


Fig 10. SAR Measurement Points in Area Scan