# Annex E. Calibration Certificates

| ID | Device | Type/Model | Serial Number | Manufacturer | Calibration Certificate |
|---|---|---|---|---|---|
| 004-006 | Dosimetric E-field Probe | EX3DV4 | 7604 | SPEAG | See attached files |
| 071-000 | 750 MHz System Validation Dipole | D750V3 | 1136 | SPEAG | See attached files |
| 072-000 | 835 MHz System Validation Dipole | D835V2 | 4d192 | SPEAG | See attached files |
| 073-000 | 1750 MHz System Validation Dipole | D1750V2 | 1133 | SPEAG | See attached files |
| 074-000 | 1900 MHz System Validation Dipole | D1900V2 | 5d197 | SPEAG | See attached files |
| 075-000 | 2300 MHz System Validation Dipole | D2300V2 | 1046 | SPEAG | See attached files |
| 076-000 | 2600 MHz System Validation Dipole | D2600V2 | 1100 | SPEAG | See attached files |
| 404-000 | 3700 MHz System Validation Dipole | D3700V2 | 1093 | SPEAG | See attached files |

**Dipole calibration**

According to the KDB 865664 D01, a dipole must be calibrated using a fully validated SAR system according to the tissue dielectric parameters and SAR probe calibration frequency required for device testing. However, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the SAR target, impedance and return loss of a dipole have remain stable according to the following requirements.

When the most recent return-loss result, measured at least annually, deviates by less than 20% from the previous measurement (i.e. value in dB × 0.2) or not meeting the required 20 dB minimum return-loss requirement.

When the most recent measurement of the real or imaginary parts of the impedance, measured at least annually, deviates by less than 5 Ω from the previous measurement

The below results show the latest return loss and impedance measurements for each dipole performed by the lab:

| ID #071-000 Dipole 750 MHz Body TSL | | | |
|---|---|---|---|
| | Return Loss [dB] | Impedance [Ω] | Date |
| Original Calibration | -27.9 | 49.4 – 4.0 j | 2021-01-21 |
| WRF Lab verification | -29.9 | 49.1 – 3.1 j | 2022-01-17 |
| WRF Lab verification | -30.3 | 48.4 – 2.6 j | 2022-11-30 |
| ID #072-000 Dipole 835 MHz Body TSL | | | |
| | Return Loss [dB] | Impedance [Ω] | Date |
| Original Calibration | -22.9 | 46.9 – 6.2 j | 2021-01-21 |
| WRF Lab verification | -20.6 | 43.7 – 6.0 j | 2022-01-18 |
| WRF Lab verification | -20.3 | 49.8 – 9.7 j | 2022-11-29 |
| ID #073-000 Dipole 1750 MHz Body TSL | | | |
| | Return Loss [dB] | Impedance [Ω] | Date |
| Original Calibration | -28.5 | 46.5 – 0.7 j | 2021-01-14 |
| WRF Lab verification | -29.3 | 46.7 + 0.0 j | 2022-01-18 |
| WRF Lab verification | -29.8 | 49.8 + 3.2 j | 2022-11-29 |
| ID #074-000 Dipole 1900 MHz Body TSL | | | |
| | Return Loss [dB] | Impedance [Ω] | Date |
| Original Calibration | -24.1 | 49.2 + 6.1 j | 2021-01-14 |
| WRF Lab verification | -21.9 | 50.6 + 8.1 j | 2022-01-18 |
| WRF Lab verification | -24.5 | 46.4 + 4.7 j | 2022-11-30 |
| ID #075-000 Dipole 2300 MHz Body TSL | | | |
| | Return Loss [dB] | Impedance [Ω] | Date |
| Original Calibration | -25.1 | 45.6 – 3.0 j | 2021-01-13 |
| WRF Lab verification | -26.6 | 48.3 – 4.3 j | 2022-01-17 |
| WRF Lab verification | -26.6 | 45.5 + 0.0 j | 2022-11-29 |
| ID #076-000 Dipole 2600 MHz Body TSL | | | |
| | Return Loss [dB] | Impedance [Ω] | Date |
| Original Calibration | -24.0 | 46.0 – 4.6 j | 2021-01-13 |
| WRF Lab verification | -24.9 | 46.6 – 4.3 j | 2022-01-14 |
| WRF Lab verification | -24.2 | 45.7 – 4.0 j | 2022-11-29 |
| ID #404-000 Dipole 3700 MHz Body TSL | | | |
| | Return Loss [dB] | Impedance [Ω] | Date |
| Original Calibration | -20.1 | 41.3 +2.3 j | 2021-05-21 |
| WRF Lab verification | -23.8 | 46.3 +5.0 j | 2022-05-19 |