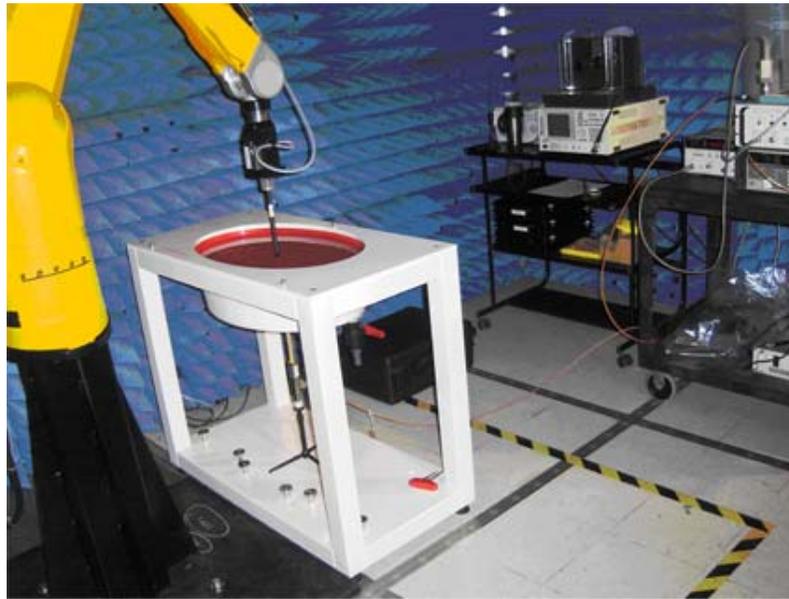
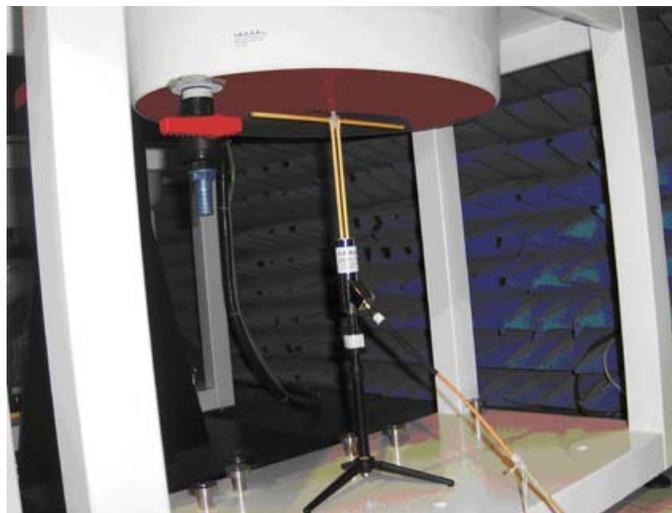


EXHIBIT 7. SAR MEASUREMENT SYSTEM VERIFICATION



7.1. STANDARD SOURCE

A half-wave dipole is positioned below the bottom of the phantom and centered with its axis parallel to the longest side of the phantom. The distance between the liquid filled phantom bottom surface and the center of the dipole axis, s , is chosen as specified IEEE 1528 at the specific test frequency (i.e. 15 mm at 835 MHz). A low loss and low dielectric constant spacer is used to establish the correct distance between the top surface of the dipole and the bottom surface of the phantom.



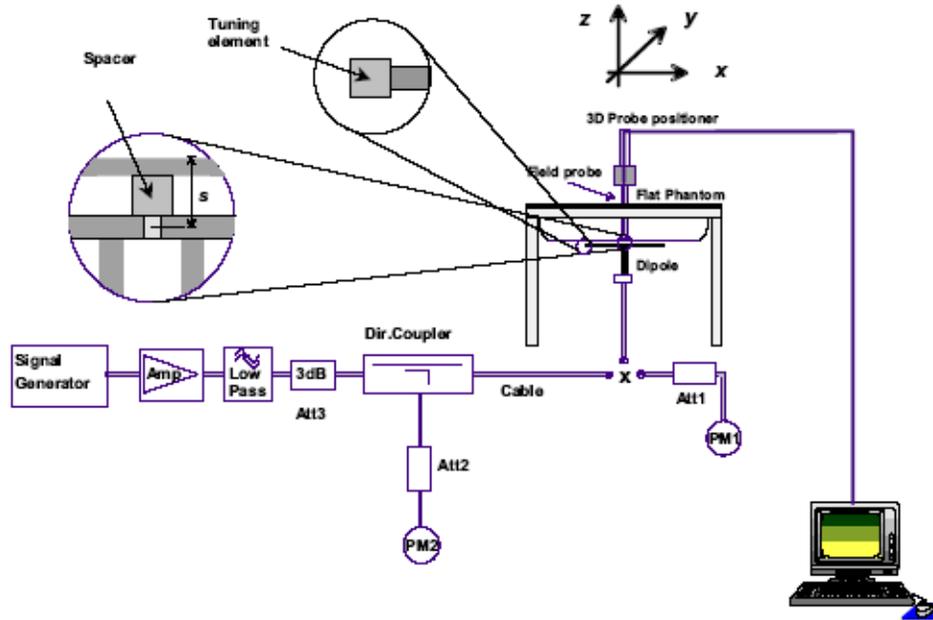
7.2. CONFINED LOOP ANTENNA (CLA150) 30MHZ-220MHZ

The confined loop antenna is used for system checking at frequencies below 300 MHz. The CLA series derived from the dipole antenna concept. The CLA which is compliant with the latest draft of the IEC 622209-2 standard, is a resonant loop antenna integrated into a metallic structure that minimizes reflections of the environment on the resonant structure. Each antenna is optimized for return losses at resonant frequencies of at least 10dB and typically better than 15 dB.



7.3. STANDARD SOURCE INPUT POWER MEASUREMENT

The system validation is performed as shown below or in Figure 7.1 in IEEE 1528.



First the power meter PM1 (including attenuator Att1) is connected to the cable to measure the forward power at the location of the dipole connector (X). The signal generator is adjusted for the desired forward power at the dipole connector (taking into account the attenuation of Att1) as read by power meter PM2. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2. If the signal generator does not allow adjustment in 0.01dB steps, the remaining difference at PM2 must be taken into consideration. PM3 records the reflected power from the dipole to ensure that the value is not changed from the previous value. The reflected power was verified to be at least 20dB below the forward power.

7.4. SYSTEM VALIDATION PROCEDURE

A complete 1g-averaged SAR measurement is performed. The measured 1g-averaged SAR value is normalized to a forward power of 1W to a half-wave dipole and compared with the reference SAR value for the reference dipole and flat phantom shown in columns 2 and 3 of Table 7.1 in IEEE 1528.

7.5. VERIFICATION RESULTS

7.5.1. Reference SAR values at 150 MHz*

	Head Tissue	Body Tissue
Reference SAR_{1g} [W/Kg]	3.74	2.95
Reference SAR_{10g} [W/Kg]	2.50	1.99
Measured SAR_{1g} [W/Kg]	3.70	3.06
Measured SAR_{10g} [W/Kg]	2.46	2.02

* SAR values are normalized to a forward power of 1 W.

7.5.2. Verification at 150 MHz

7.5.2.1. Verification for 150MHz Head Tissue:

Test Laboratory: Ultratech Group of Labs

File Name: [Sys.Ver.Check-CLA-150 Head-150MHz-3.da52:0](#)

DUT: CLA-150; Type: CLA-150; Serial: 4xxx

Communication System: UID 10000, CW; Frequency: 150 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 150$ MHz; $\sigma = 0.737$ S/m; $\epsilon_r = 53.123$; $\rho = 1000$ kg/m³; Phantom section: Flat Section; Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV3 - SN3208; ConvF(8.6, 8.6, 8.6); Calibrated: 3/13/2013;
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874; Calibrated: 3/11/2013
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

CLA Calibration for HSL-LF Tissue_CLA150/touch configuration, Pin=1W, dist=3.4mm (ES-Probe)/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 4.01 W/kg

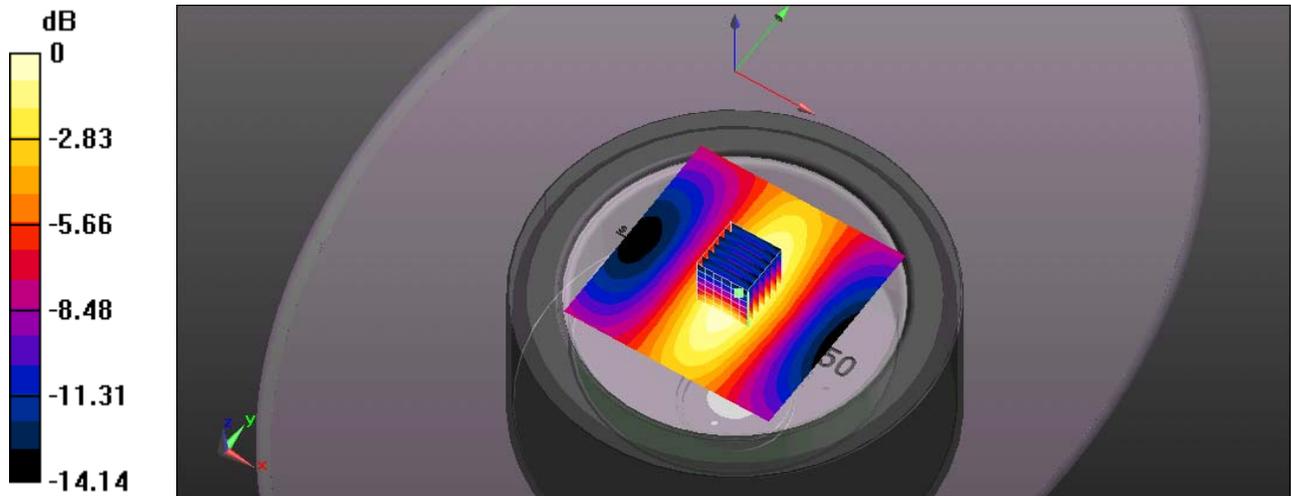
CLA Calibration for HSL-LF Tissue_CLA150/touch configuration, Pin=1W, dist=3.4mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 69.800 V/m; Power Drift = 0.21 dB

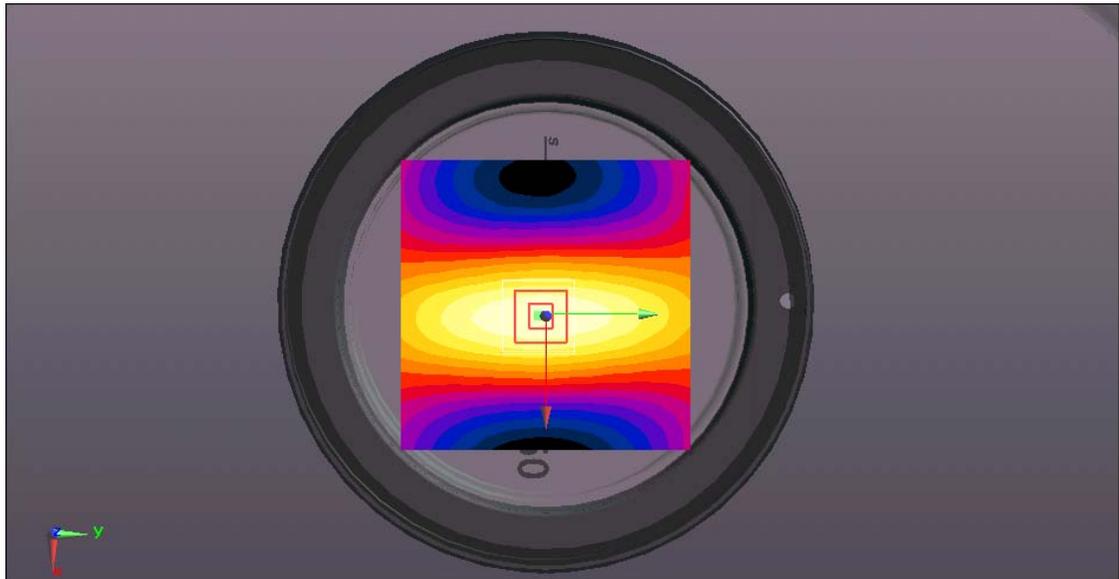
Peak SAR (extrapolated) = 5.84 W/kg

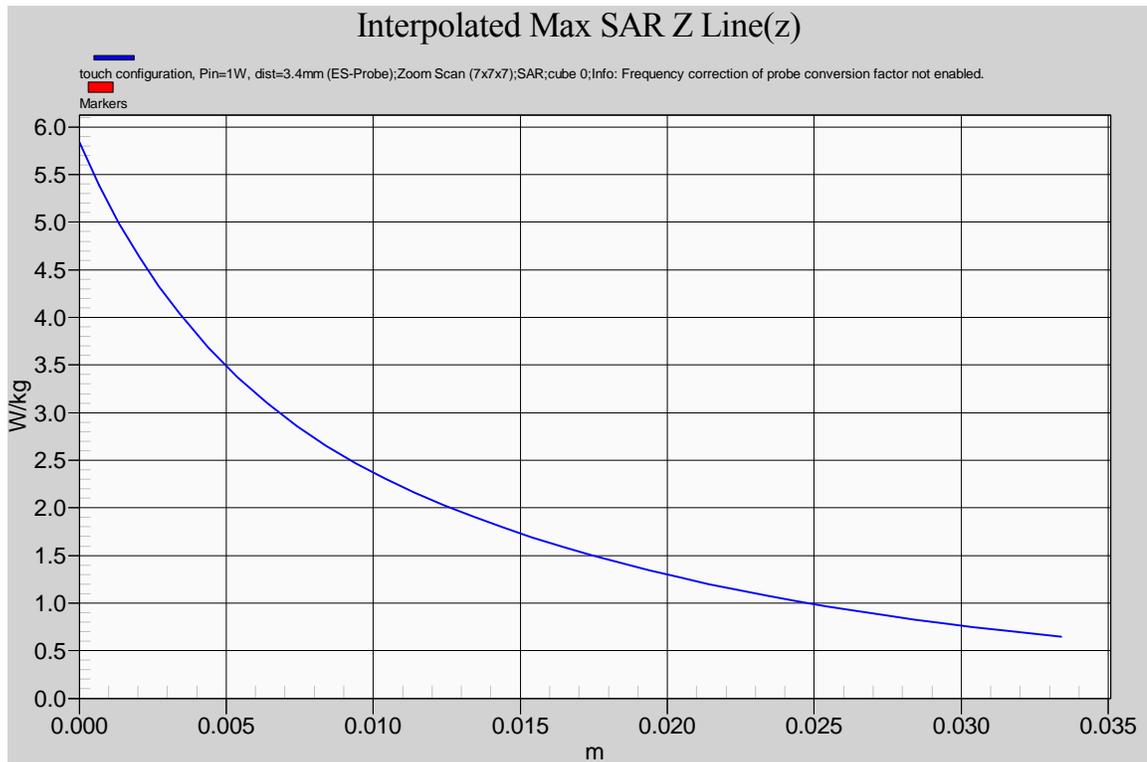
SAR(1 g) = 3.7 W/kg; SAR(10 g) = 2.46 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 4.05 W/kg



0 dB = 4.01 W/kg = 6.03 dBW/kg





7.5.2.2. Verification for 150MHz Body Tissue:

Test Laboratory: Ultratech Group of Labs

File Name: [Sys.Ver.Check-CLA-150 Body-150MHz-4.da52:0](#)

DUT: CLA-150; Type: CLA-150; Serial: 4xxx

Communication System: UID 10000, CW; Frequency: 150 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 150$ MHz; $\sigma = 0.781$ S/m; $\epsilon_r = 61.249$; $\rho = 1000$ kg/m³; Phantom section: Flat Section; Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV3 - SN3208; ConvF(8.4, 8.4, 8.4); Calibrated: 3/13/2013;
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn874; Calibrated: 3/11/2013
- Phantom: ELI 4.0; Type: QD OVA 001 BB; Serial: 1057
- DASYS 52.8.7(1137); SEMCAD X 14.6.10(7164)

CLA Calibration for MSL-LF Tissue_CLA150/touch configuration, Pin=1W, dist=3.4mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

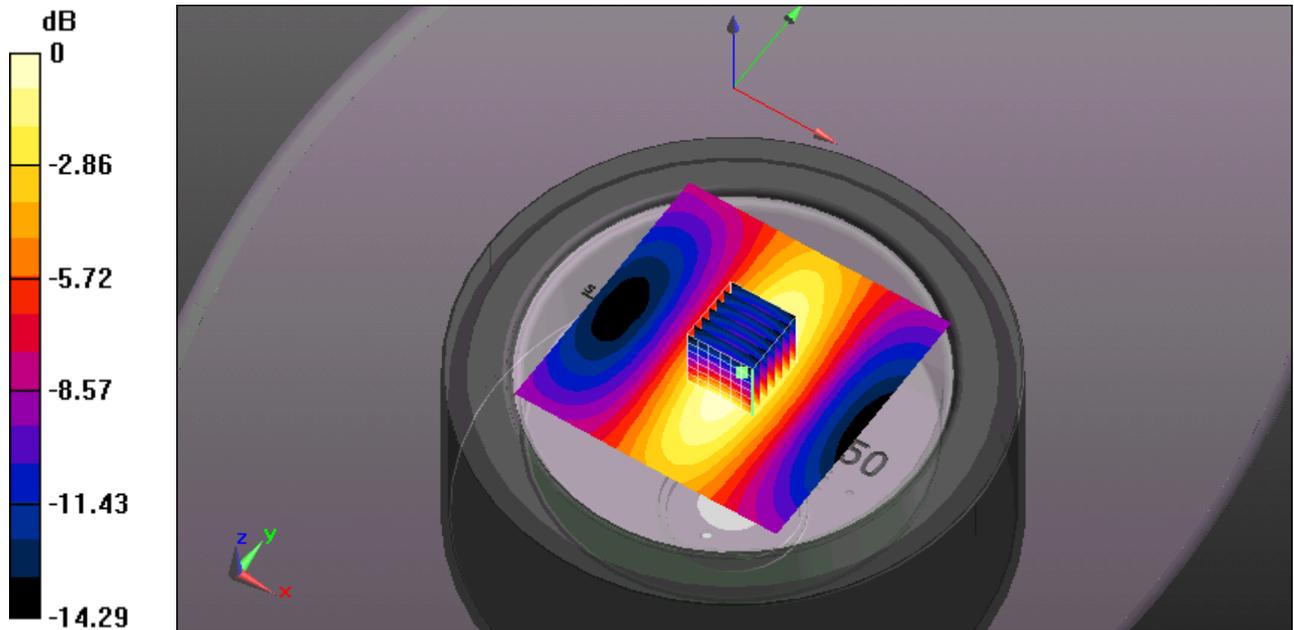
Reference Value = 62.829 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 4.89 W/kg

SAR(1 g) = 3.06 W/kg; SAR(10 g) = 2.02 W/kg (SAR corrected for target medium)

Maximum value of SAR (measured) = 3.38 W/kg

CLA Calibration for MSL-LF Tissue_CLA150/touch configuration, Pin=1W, dist=3.4mm (ES-Probe)/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.41 W/kg



0 dB = 3.41 W/kg = 5.33 dBW/kg

