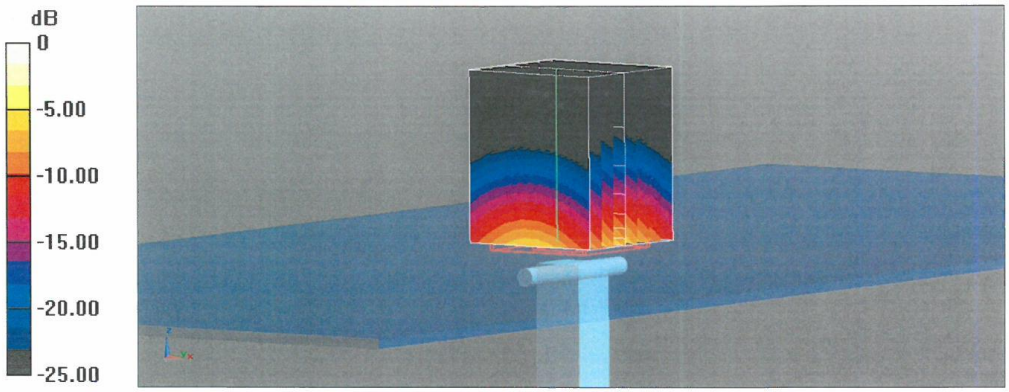
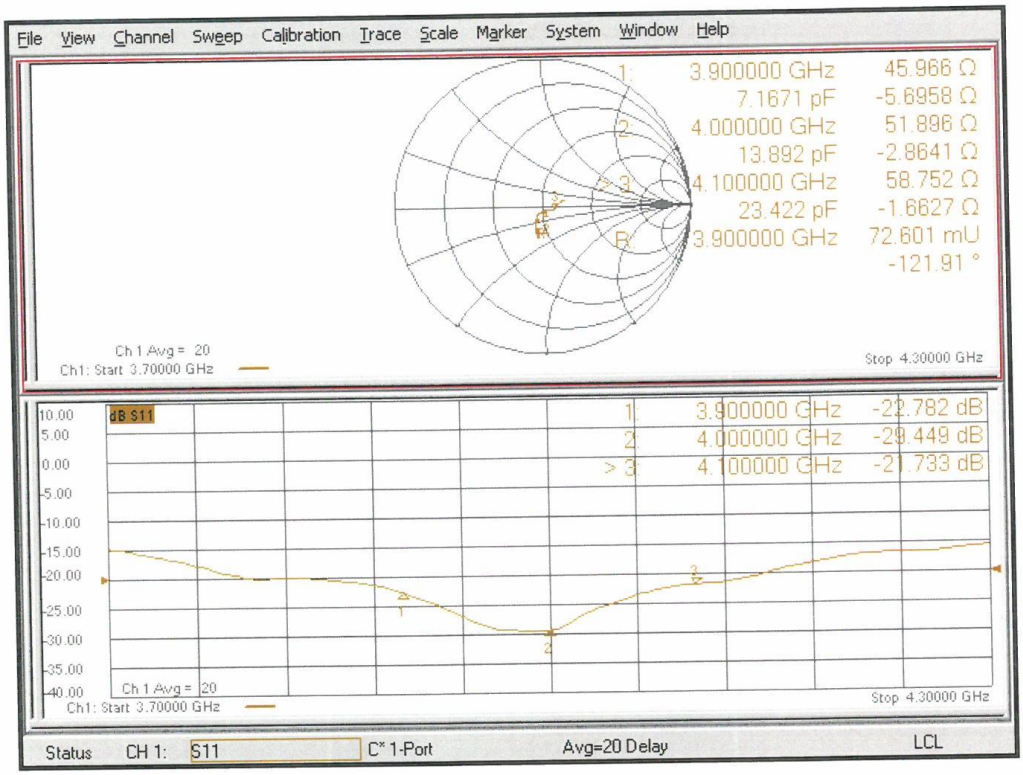
Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm, f=4100MHz/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 71.37 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 19.3 W/kg
SAR(1 g) = 6.82 W/kg; SAR(10 g) = 2.37 W/kg
Smallest distance from peaks to all points 3 dB below = 8 mm
Ratio of SAR at M2 to SAR at M1 = 75.1%
Maximum value of SAR (measured) = 13.5 W/kg



0 dB = 13.7 W/kg = 11.38 dBW/kg

Impedance Measurement Plot for Head TSL



5 GHz Dipole Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client CTTL (Auden)

Certificate No: D5GHzV2-1060_Jun21

CALIBRATION CERTIFICATE

Object	D5GHzV2 - SN:1060
Calibration procedure(s)	QA CAL-22.v6 Calibration Procedure for SAR Validation Sources between 3-10 GHz
Calibration date:	June 22, 2021

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	09-Apr-21 (No. 217-03291/03292)	Apr-22
Power sensor NRP-Z91	SN: 103244	09-Apr-21 (No. 217-03291)	Apr-22
Power sensor NRP-Z91	SN: 103245	09-Apr-21 (No. 217-03292)	Apr-22
Reference 20 dB Attenuator	SN: BH9394 (20k)	09-Apr-21 (No. 217-03343)	Apr-22
Type-N mismatch combination	SN: 310982 / 06327	09-Apr-21 (No. 217-03344)	Apr-22
Reference Probe EX3DV4	SN: 3503	30-Dec-20 (No. EX3-3503_Dec20)	Dec-21
DAE4	SN: 601	02-Nov-20 (No. DAE4-601_Nov20)	Nov-21

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-20)	In house check: Oct-22
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-21

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: June 22, 2021

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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Accreditation No.: SCS 0108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5200 MHz ± 1 MHz 5250 MHz ± 1 MHz 5300 MHz ± 1 MHz 5500 MHz ± 1 MHz 5600 MHz ± 1 MHz 5750 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.7 ± 6 %	4.54 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.04 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**79.7 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.29 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.7 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.71 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.6 ± 6 %	4.59 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5250 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.01 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**79.5 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.29 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.7 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5300 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.76 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.6 ± 6 %	4.64 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5300 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.25 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**81.8 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.2 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.3 ± 6 %	4.85 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5500 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.80 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**87.2 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.47 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.4 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.1 ± 6 %	4.95 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.45 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**83.8 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.40 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.7 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5750 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.4	5.22 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	33.9 ± 6 %	5.10 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5750 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.18 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**81.0 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.30 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.7 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	33.8 ± 6 %	5.15 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.19 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**81.1 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.31 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.8 W/kg ± 19.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	47.6 Ω - 6.2 jΩ
Return Loss	- 23.3 dB

Antenna Parameters with Head TSL at 5250 MHz

Impedance, transformed to feed point	46.9 Ω - 4.8 jΩ
Return Loss	- 24.5 dB

Antenna Parameters with Head TSL at 5300 MHz

Impedance, transformed to feed point	46.2 Ω - 3.3 jΩ
Return Loss	- 25.6 dB

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	49.1 Ω - 4.2 jΩ
Return Loss	- 27.3 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	53.9 Ω + 0.4 jΩ
Return Loss	- 28.4 dB

Antenna Parameters with Head TSL at 5750 MHz

Impedance, transformed to feed point	51.8 Ω - 0.8 jΩ
Return Loss	- 34.3 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	50.9 Ω - 2.7 jΩ
Return Loss	- 31.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.201 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

DASY5 Validation Report for Head TSL

Date: 22.06.2021

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1060

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5250 MHz, Frequency: 5300 MHz, Frequency: 5500 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; σ = 4.54 S/m; ε_r = 34.7; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5250 MHz; σ = 4.59 S/m; ε_r = 34.6; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5300 MHz; σ = 4.64 S/m; ε_r = 34.6; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5500 MHz; σ = 4.85 S/m; ε_r = 34.3; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5600 MHz; σ = 4.95 S/m; ε_r = 34.1; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5750 MHz; σ = 5.1 S/m; ε_r = 33.9; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5800 MHz; σ = 5.15 S/m; ε_r = 33.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.8, 5.8, 5.8) @ 5200 MHz, ConvF(5.5, 5.5, 5.5) @ 5250 MHz, ConvF(5.49, 5.49, 5.49) @ 5300 MHz, ConvF(5.25, 5.25, 5.25) @ 5500 MHz, ConvF(5.1, 5.1, 5.1) @ 5600 MHz, ConvF(5.08, 5.08, 5.08) @ 5750 MHz, ConvF(5.01, 5.01, 5.01) @ 5800 MHz; Calibrated: 30.12.2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.11.2020
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 78.84 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 28.2 W/kg
SAR(1 g) = 8.04 W/kg; SAR(10 g) = 2.29 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 69.1%
Maximum value of SAR (measured) = 18.5 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 80.04 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 27.2 W/kg
SAR(1 g) = 8.01 W/kg; SAR(10 g) = 2.29 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 70.3%
Maximum value of SAR (measured) = 18.2 W/kg

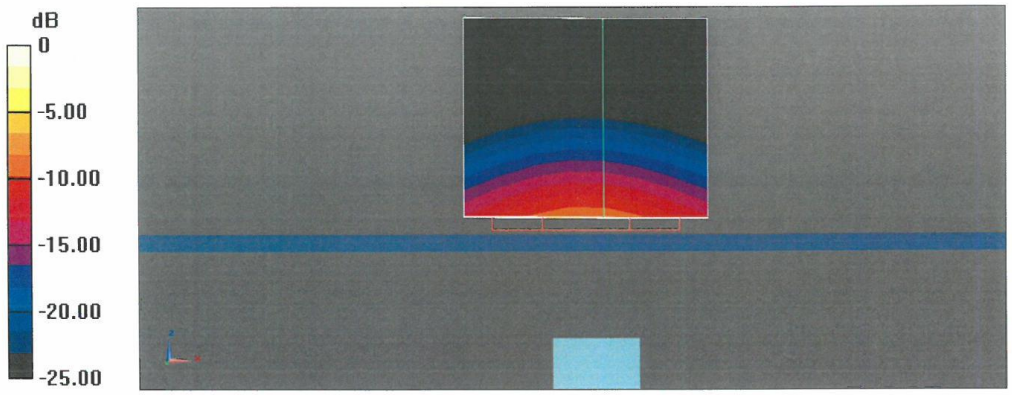
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 80.15 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 28.9 W/kg
SAR(1 g) = 8.25 W/kg; SAR(10 g) = 2.35 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 69.1%
Maximum value of SAR (measured) = 19.1 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 80.07 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 33.6 W/kg
SAR(1 g) = 8.80 W/kg; SAR(10 g) = 2.47 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 66.4%
Maximum value of SAR (measured) = 20.9 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 80.82 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 30.8 W/kg
SAR(1 g) = 8.45 W/kg; SAR(10 g) = 2.40 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 67.5%
Maximum value of SAR (measured) = 19.9 W/kg

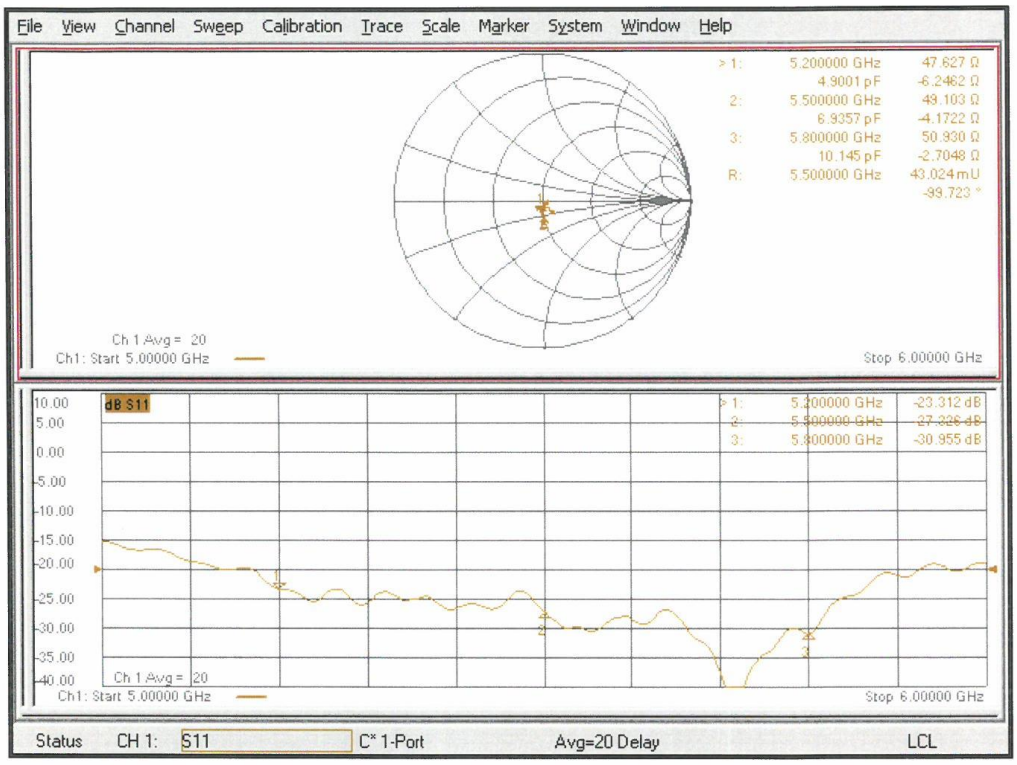
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 78.22 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 31.8 W/kg
SAR(1 g) = 8.18 W/kg; SAR(10 g) = 2.30 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 65.8%
Maximum value of SAR (measured) = 19.5 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 77.53 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 31.9 W/kg
SAR(1 g) = 8.19 W/kg; SAR(10 g) = 2.31 W/kg
Smallest distance from peaks to all points 3 dB below = 7.4 mm
Ratio of SAR at M2 to SAR at M1 = 65.4%
Maximum value of SAR (measured) = 19.2 W/kg

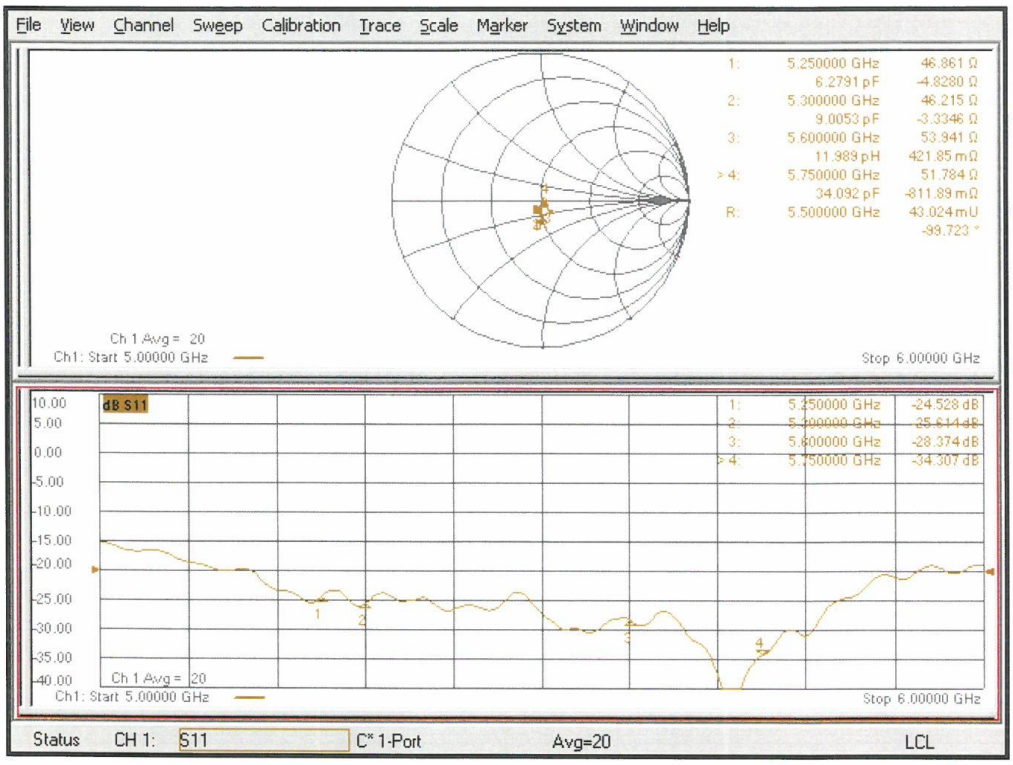


0 dB = 20.9 W/kg = 13.20 dBW/kg

Impedance Measurement Plot for Head TSL (5200, 5500, 5800 MHz)



Impedance Measurement Plot for Head TSL (5250, 5300, 5600, 5750 MHz)



ANNEX I SAR Sensor Triggering Data Summary

Per FCC KDB Publication 616217 D04v01r02, this device was tested by the manufacturer to determine the proximity sensor triggering distances for the rear and bottom edge of the device. The measured output power within ±5mm of the triggering points (or until touching the phantom) is included for rear and each applicable edge.

To ensure all production units are compliant it is necessary to test SAR at a distance 1mm less than the smallest distance from the device and SAR phantom (determined from these triggering tests according to the KDB 616217 D04v01r02) with the device at maximum output power without power reduction. These SAR tests are included in addition to the SAR tests for the device touching the SAR phantom, with reduced power.

Cell phones use SAR Sensor, receiver and Hotspot to reduce power. When the receiver is on, the power will be reduced. When the Hotspot is on, the power will be reduced. When the object in front of the mobile phone is less than 15mm, trigger the SAR sensor to reduce the power, otherwise the power is normal. When the object on the left of the mobile phone is less than 17mm, trigger the SAR sensor to reduce the power, otherwise the power is normal. When the object on the right of the mobile phone is less than 13mm, trigger the SAR sensor to reduce the power, otherwise the power is normal. When the object above the mobile phone is less than 9mm, trigger the SAR sensor to reduce the power, otherwise the power is normal. When the object under the mobile phone is less than 10mm, trigger the SAR sensor to reduce the power, otherwise the power is normal. When the object behind the phone is close to less than 16mm, trigger the SAR sensor to reduce the power, otherwise the power is normal.

Front Edge

Moving device toward the phantom:

sensor near or far(KDB 616217 6.2.6)											
Distance [mm]	**22**	**21**	**20**	**19**	**18**	**15**	**14**	**13**	**12**	**11**	**10**
Main antenna	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes

Moving device away from the phantom:

sensor near or far(KDB 616217 6.2.6)											
Distance [mm]	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Main antenna	Near	Near	Near	Near	Near	Near	Far	Far	Far	Far	Far

Rear Edge

Moving device toward the phantom:

sensor near or far(KDB 616217 6.2.6)											
Distance [mm]	**21**	**20**	**19**	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**
Main antenna	Far	Far	Far	Far	Far	Near	Near	Near	Near	Near	Near

Moving device away from the phantom:

sensor near or far(KDB 616217 6.2.6)											
Distance [mm]	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Main antenna	Near	Near	Near	Near	Near	Near	Far	Far	Far	Far	Far

Top Edge

Moving device toward the phantom:

sensor near or far(KDB 616217 6.2.6)											
Distance [mm]	**14**	**13**	**12**	**11**	**10**	**9**	**10**	**11**	**12**	**13**	**14**
Main antenna	Far	Far	Far	Far	Far	Near	Near	Near	Near	Near	Near

Moving device away from the phantom:

sensor near or far(KDB 616217 6.2.6)											
Distance [mm]	**15**	**14**	**13**	**12**	**11**	**9**	**10**	**11**	**12**	**13**	**14**
Main antenna	Near	Near	Near	Near	Near	Near	Far	Far	Far	Far	Far

Bottom Edge

Moving device toward the phantom:

sensor near or far(KDB 616217 6.2.6)											
Distance [mm]	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**
Main antenna	Far	Far	Far	Far	Far	Near	Near	Near	Near	Near	Near

Moving device away from the phantom:

sensor near or far(KDB 616217 6.2.6)											
Distance [mm]	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Main antenna	Near	Near	Near	Near	Near	Near	Far	Far	Far	Far	Far

Right Edge

Moving device toward the phantom:

sensor near or far(KDB 616217 6.2.6)											
Distance [mm]	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	9	8
Main antenna	Far	Far	Far	Far	Far	Near	Near	Near	Near	Near	Near

Moving device away from the phantom:

sensor near or far(KDB 616217 6.2.6)											
Distance [mm]	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
Main antenna	Near	Near	Near	Near	Near	Near	Far	Far	Far	Far	Far

Left Edge

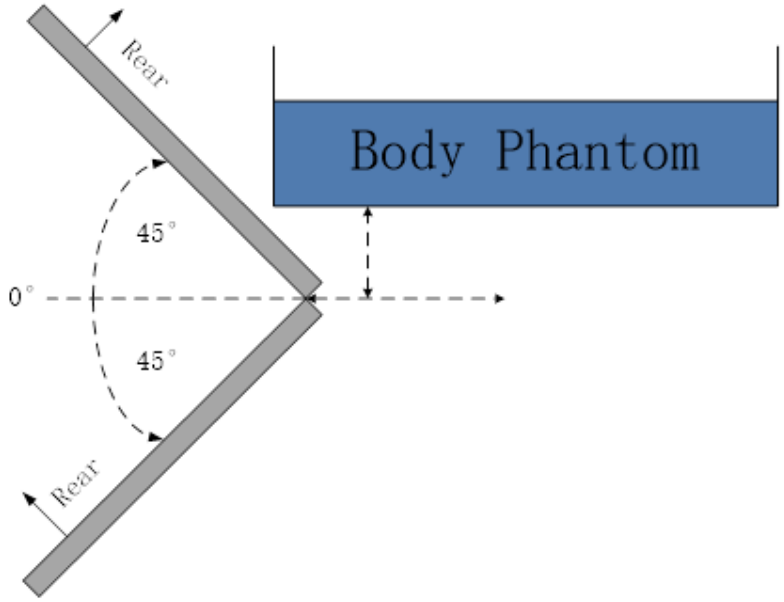
Moving device toward the phantom:

sensor near or far(KDB 616217 6.2.6)											
Distance [mm]	**22**	**21**	**20**	**19**	**18**	**17**	**16**	**15**	**14**	13	12
Main antenna	Far	Far	Far	Far	Far	Near	Near	Near	Near	Near	Near

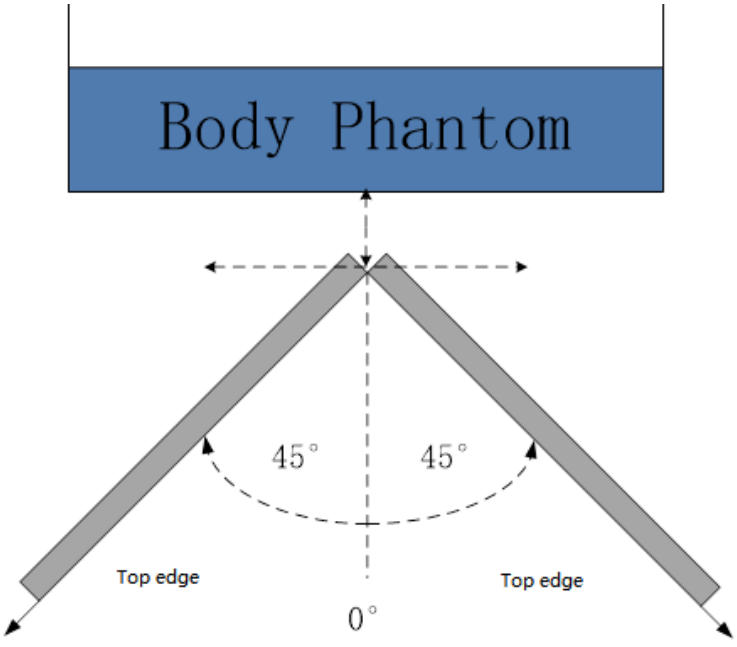
Moving device away from the phantom:

sensor near or far(KDB 616217 6.2.6)											
Distance [mm]	**24**	**23**	**22**	**21**	**20**	**19**	**18**	**19**	**20**	**21**	**22**
Main antenna	Near	Near	Near	Near	Near	Near	Far	Far	Far	Far	Far

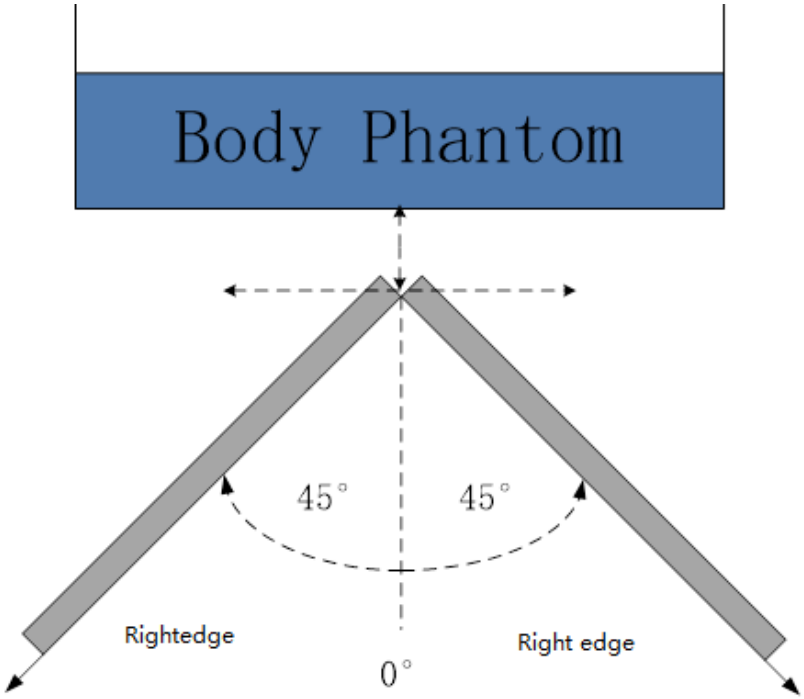
Per FCC KDB Publication 616217 D04v01r02, the influence of table tilt angles to proximity sensor triggering is determined by positioning each edge that contains a transmitting antenna, perpendicular to the flat phantom, at the smallest sensor triggering test distanceby rotating the device around the edge next to the phantom in ≤ 10° increments until the tablet is ±45° or more from the vertical position at 0°.



The front/rear edge evaluation



The bottom/top edge evaluation



The left/right edge evaluation

Based on the above evaluation, we come to the conclusion that the sensor triggering is not released and normal maximum output power is not restored within the ±45° range at the smallest sensor triggering test distance declared by manufacturer.

ANNEX J Newly add bands and Spot Check

J.1 Dielectric Performance and System Validation

Table J.1-1: Dielectric Performance of Head Tissue Simulating Liquid

Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2022-7-06	Head	750MHz	44.32	5.67%	0.8351	-6.17%
2022-7-06	Head	900MHz	43.92	5.83%	0.9003	-7.19%
2022-7-06	Head	1800MHz	41.73	4.32%	1.408	0.57%
2022-7-07	Head	1900 MHz	41.58	3.95%	1.473	5.21%
2022-7-07	Head	2450 MHz	40.49	3.29%	1.905	5.83%
2022-7-07	Head	2600 MHz	41.48	6.33%	2.035	3.83%
2022-7-27	Head	3500 MHz	38.53	1.29%	2.874	2.28%
2022-7-27	Head	3900 MHz	37.75	0.43%	3.26	1.24%
2022-7-28	Head	5250 MHz	36.16	0.64%	4.819	2.31%
2022-7-28	Head	5600 MHz	35.43	-0.28%	5.207	2.70%

Table J.1-2: System Validation of Head

Measurement Date (yyyy-mm-dd)	Frequency	Target value (W/kg)		Measured value(W/kg)		Deviation	
		10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average
2022-7-06	750MHz	5.65	8.68	5.60	8.68	-0.88%	0.00%
2022-7-06	900MHz	7.01	11.00	6.88	11.24	-1.85%	2.18%
2022-7-06	1800MHz	19.9	38.3	20.2	39.1	1.51%	2.04%
2022-7-07	1900 MHz	20.9	40.1	21.2	40.1	1.63%	0.05%
2022-7-07	2450 MHz	24.9	53.3	24.6	54.2	-1.20%	1.76%
2022-7-07	2600 MHz	25.5	57.1	25.5	58.6	-0.08%	2.63%
2022-7-27	3500 MHz	25.2	67.3	24.5	65.0	-2.78%	-3.42%
2022-7-27	3900 MHz	24.1	69.3	23.5	67.2	-2.49%	-3.03%
2022-7-28	5250 MHz	23.1	80.9	22.4	78.9	-3.03%	-2.47%
2022-7-28	5600 MHz	23.9	84.4	23.5	82.3	-1.67%	-2.49%

J.2 Conductive output power

Maximum Target Power for Production Unit

Band	Tune up (dBm)					
	DSI1 Sar senser off+ Hotspot off	**DSI2 Sar senser on**	**DSI3 Receiver on**	**DSI4 Hotspot on**	**DSI5 Sar senser on+WIFI on**	**DSI6 Receiver on+WIFI on**
	Power Level A1	**Power Level B1**	**Power Level C1**	**Power Level D1**	**Power Level E1**	**Power Level F1**
n77	27	23.5	20	24.5	23.5	20

5G n77(3450-3550MHz)-Power Level A1								
SCS (kHz)	NR BW (MHz)	Modulation	RB allocation		NR Test Freq. (MHz)	NR Test CH.	Tune up	Power Results (dBm)
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3540	636000	27.00	26.12
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3500.01	633334	27.00	25.93
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3460.02	630668	27.00	25.95
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3499.98	633332	27.00	25.67
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3500.01	633334	27.00	25.66
30	20	DFT-s-OFDM PI/2 BPSK1	Inner_Full	25@12	3540	636000	27.00	25.93
30	20	DFT-s-OFDM 16QAM	Inner_Full	25@12	3540	636000	26.00	24.92
30	20	DFT-s-OFDM 64QAM	Inner_Full	25@12	3540	636000	24.50	23.47
30	20	DFT-s-OFDM 256QAM	Inner_Full	25@12	3540	636000	22.50	21.45
30	20	CP-OFDM QPSK	Inner_Full	25@12	3540	636000	25.00	24.47
30	20	CP-OFDM 16QAM	Inner_Full	25@12	3540	636000	25.50	23.95
30	20	CP-OFDM 64QAM	Inner_Full	25@12	3540	636000	23.50	22.46
30	20	CP-OFDM 256QAM	Inner_Full	25@12	3540	636000	20.50	19.46
30	20	DFT-s-OFDM QPSK	Edge_Full_Right	2@49	3540	636000	23.50	22.56
30	20	DFT-s-OFDM QPSK	Edge_Full_Left	2@0	3540	636000	23.50	22.57
30	20	DFT-s-OFDM QPSK	Inner_1RB_Right	1@49	3540	636000	27.00	26.00
30	20	DFT-s-OFDM QPSK	Inner_1RB_Left	1@1	3540	636000	27.00	26.02
30	20	DFT-s-OFDM QPSK	Outer_Full	50@0	3540	636000	26.00	25.00
30	40	DFT-s-OFDM QPSK	Inner_Full	50@25	3529.98	635332	27.00	26.01
30	50	DFT-s-OFDM QPSK	Inner_Full	64@32	3525	635000	27.00	25.82
30	60	DFT-s-OFDM QPSK	Inner_Full	81@40	3519.99	634666	27.00	25.80
30	80	DFT-s-OFDM QPSK	Inner_Full	108@54	3514.98	634332	27.00	25.66
30	90	DFT-s-OFDM QPSK	Inner_Full	120@60	3495	633000	27.00	25.67

5G n77(3700-3980MHz)-Power Level A1								
SCS (kHz)	NR BW (MHz)	Modulation	RB allocation		NR Test Freq. (MHz)	NR Test CH.	Tune up	Power Results (dBm)
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3969.990	664666	27.00	25.15
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3918.000	661200	27.00	26.17
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3866.000	657733	27.00	26.31
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3814.000	654267	27.00	26.39
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3762.000	650800	27.00	26.37
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3710.010	647334	27.00	26.36
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3930.000	662000	27.00	25.82
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3894.000	659600	27.00	26.02
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3858.000	657200	27.00	26.08
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3822.000	654800	27.00	26.18
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3786.000	652400	27.00	26.13
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3750.000	650000	27.00	26.34
30	20	DFT-s-OFDM PI/2 BPSK1	Inner_Full	25@12	3814.000	654267	27.00	26.38
30	20	DFT-s-OFDM 16QAM	Inner_Full	25@12	3814.000	654267	26.00	25.40
30	20	DFT-s-OFDM 64QAM	Inner_Full	25@12	3814.000	654267	24.50	23.92
30	20	DFT-s-OFDM 256QAM	Inner_Full	25@12	3814.000	654267	22.50	21.92
30	20	CP-OFDM QPSK	Inner_Full	25@12	3814.000	654267	25.00	24.86
30	20	CP-OFDM 16QAM	Inner_Full	25@12	3814.000	654267	25.50	24.31
30	20	CP-OFDM 64QAM	Inner_Full	25@12	3814.000	654267	23.50	22.82
30	20	CP-OFDM 256QAM	Inner_Full	25@12	3814.000	654267	20.50	19.82
30	20	DFT-s-OFDM QPSK	Edge_Full_Right	2@49	3814.000	654267	23.50	22.92
30	20	DFT-s-OFDM QPSK	Edge_Full_Left	2@0	3814.000	654267	23.50	22.94
30	20	DFT-s-OFDM QPSK	Inner_1RB_Right	1@49	3814.000	654267	27.00	26.37
30	20	DFT-s-OFDM QPSK	Inner_1RB_Left	1@1	3814.000	654267	27.00	26.38
30	20	DFT-s-OFDM QPSK	Outer_Full	50@0	3814.000	654267	26.00	25.43
30	40	DFT-s-OFDM QPSK	Inner_Full	50@25	3814.000	654267	27.00	26.37
30	50	DFT-s-OFDM QPSK	Inner_Full	64@32	3814.000	654267	27.00	26.27
30	60	DFT-s-OFDM QPSK	Inner_Full	81@40	3814.000	654267	27.00	26.28
30	80	DFT-s-OFDM QPSK	Inner_Full	108@54	3814.000	654267	27.00	26.19
30	90	DFT-s-OFDM QPSK	Inner_Full	120@60	3814.000	654267	27.00	26.18

5G n77(3450-3550MHz)-Power Level C1/F1							
SCS (kHz)	NR BW (MHz)	Modulation	RB allocation		NR Test Freq. (MHz)	NR Test CH.	Power Results (dBm)
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3540	636000	18.98
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3500.01	633334	18.68
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3460.02	630668	18.54
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3499.98	633332	18.59
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3500.01	633334	18.57
30	20	DFT-s-OFDM PI/2 BPSK1	Inner_Full	25@12	3540	636000	18.91
30	20	DFT-s-OFDM 16QAM	Inner_Full	25@12	3540	636000	18.92
30	20	DFT-s-OFDM 64QAM	Inner_Full	25@12	3540	636000	18.97
30	20	DFT-s-OFDM 256QAM	Inner_Full	25@12	3540	636000	18.96
30	20	CP-OFDM QPSK	Inner_Full	25@12	3540	636000	18.92
30	20	CP-OFDM 16QAM	Inner_Full	25@12	3540	636000	18.89
30	20	CP-OFDM 64QAM	Inner_Full	25@12	3540	636000	18.97
30	20	CP-OFDM 256QAM	Inner_Full	25@12	3540	636000	18.96
30	20	DFT-s-OFDM QPSK	Edge_Full_Right	2@49	3540	636000	18.93
30	20	DFT-s-OFDM QPSK	Edge_Full_Left	2@0	3540	636000	18.97
30	20	DFT-s-OFDM QPSK	Inner_1RB_Right	1@49	3540	636000	18.96
30	20	DFT-s-OFDM QPSK	Inner_1RB_Left	1@1	3540	636000	18.95
30	20	DFT-s-OFDM QPSK	Outer_Full	50@0	3540	636000	18.92
30	10	DFT-s-OFDM QPSK	Inner_1RB_Left	1@1	3540	636000	18.78
30	15	DFT-s-OFDM QPSK	Inner_1RB_Left	1@1	3540	636000	18.75
30	40	DFT-s-OFDM QPSK	Inner_Full	50@25	3529.98	635332	18.97
30	50	DFT-s-OFDM QPSK	Inner_Full	64@32	3525	635000	18.77
30	60	DFT-s-OFDM QPSK	Inner_Full	81@40	3519.99	634666	18.78
30	80	DFT-s-OFDM QPSK	Inner_Full	108@54	3514.98	634332	18.68
30	90	DFT-s-OFDM QPSK	Inner_Full	120@60	3495	633000	18.71

5G n77(3700-3980MHz)-Power Level C1/F1							
SCS (kHz)	NR BW (MHz)	Modulation	RB allocation		NR Test Freq. (MHz)	NR Test CH.	Power Results (dBm)
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3969.990	664666	18.57
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3918.000	661200	18.76
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3866.000	657733	18.83
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3814.000	654267	18.99
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3762.000	650800	18.97
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3710.010	647334	18.95
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3930.000	662000	18.48
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3894.000	659600	18.57
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3858.000	657200	18.64
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3822.000	654800	18.68
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3786.000	652400	18.73
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3750.000	650000	18.87
30	20	DFT-s-OFDM PI/2 BPSK1	Inner_Full	25@12	3814.000	654267	18.94
30	20	DFT-s-OFDM 16QAM	Inner_Full	25@12	3814.000	654267	18.93
30	20	DFT-s-OFDM 64QAM	Inner_Full	25@12	3814.000	654267	18.92
30	20	DFT-s-OFDM 256QAM	Inner_Full	25@12	3814.000	654267	18.91
30	20	CP-OFDM QPSK	Inner_Full	25@12	3814.000	654267	18.87
30	20	CP-OFDM 16QAM	Inner_Full	25@12	3814.000	654267	18.86
30	20	CP-OFDM 64QAM	Inner_Full	25@12	3814.000	654267	18.93
30	20	CP-OFDM 256QAM	Inner_Full	25@12	3814.000	654267	18.89
30	20	DFT-s-OFDM QPSK	Edge_Full_Right	2@49	3814.000	654267	18.94
30	20	DFT-s-OFDM QPSK	Edge_Full_Left	2@0	3814.000	654267	18.93
30	20	DFT-s-OFDM QPSK	Inner_1RB_Right	1@49	3814.000	654267	18.91
30	20	DFT-s-OFDM QPSK	Inner_1RB_Left	1@1	3814.000	654267	18.93
30	20	DFT-s-OFDM QPSK	Outer_Full	50@0	3814.000	654267	18.91
30	40	DFT-s-OFDM QPSK	Inner_Full	50@25	3814.000	654267	18.92
30	50	DFT-s-OFDM QPSK	Inner_Full	64@32	3814.000	654267	18.82
30	60	DFT-s-OFDM QPSK	Inner_Full	81@40	3814.000	654267	18.83
30	80	DFT-s-OFDM QPSK	Inner_Full	108@54	3814.000	654267	18.73
30	90	DFT-s-OFDM QPSK	Inner_Full	120@60	3814.000	654267	18.72

5G n77(3450-3550MHz)-Power Level B1/D1/E1							
SCS (kHz)	NR BW (MHz)	Modulation	RB allocation		NR Test Freq. (MHz)	NR Test CH.	Power Results (dBm)
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3540	636000	23.39
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3500.01	633334	23.08
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3460.02	630668	22.88
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3499.98	633332	22.99
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3500.01	633334	22.93
30	20	DFT-s-OFDM PI/2 BPSK1	Inner_Full	25@12	3540	636000	23.34
30	20	DFT-s-OFDM 16QAM	Inner_Full	25@12	3540	636000	22.30
30	20	DFT-s-OFDM 64QAM	Inner_Full	25@12	3540	636000	22.34
30	20	DFT-s-OFDM 256QAM	Inner_Full	25@12	3540	636000	21.34
30	20	CP-OFDM QPSK	Inner_Full	25@12	3540	636000	22.26
30	20	CP-OFDM 16QAM	Inner_Full	25@12	3540	636000	22.26
30	20	CP-OFDM 64QAM	Inner_Full	25@12	3540	636000	22.30
30	20	CP-OFDM 256QAM	Inner_Full	25@12	3540	636000	19.32
30	20	DFT-s-OFDM QPSK	Edge_Full_Right	2@49	3540	636000	22.30
30	20	DFT-s-OFDM QPSK	Edge_Full_Left	2@0	3540	636000	22.24
30	20	DFT-s-OFDM QPSK	Inner_1RB_Right	1@49	3540	636000	23.23
30	20	DFT-s-OFDM QPSK	Inner_1RB_Left	1@1	3540	636000	23.35
30	20	DFT-s-OFDM QPSK	Outer_Full	50@0	3540	636000	22.35
30	10	DFT-s-OFDM QPSK	Inner_1RB_Left	1@1	3540	636000	-0.60
30	15	DFT-s-OFDM QPSK	Inner_1RB_Left	1@1	3540	636000	-0.60
30	40	DFT-s-OFDM QPSK	Inner_Full	50@25	3529.98	635332	23.23
30	50	DFT-s-OFDM QPSK	Inner_Full	64@32	3525	635000	23.36
30	60	DFT-s-OFDM QPSK	Inner_Full	81@40	3519.99	634666	23.35
30	80	DFT-s-OFDM QPSK	Inner_Full	108@54	3514.98	634332	23.23
30	90	DFT-s-OFDM QPSK	Inner_Full	120@60	3495	633000	23.28

5G n77(3700-3980MHz)-Power Level B1/D1/E1							
SCS (kHz)	NR BW (MHz)	Modulation	RB allocation		NR Test Freq. (MHz)	NR Test CH.	Power Results (dBm)
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3969.990	664666	22.83
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3918.000	661200	22.98
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3866.000	657733	23.16
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3814.000	654267	23.40
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3762.000	650800	23.27
30	20	DFT-s-OFDM QPSK	Inner_Full	25@12	3710.010	647334	23.25
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3930.000	662000	22.74
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3894.000	659600	22.86
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3858.000	657200	23.00
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3822.000	654800	22.99
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3786.000	652400	22.86
30	100	DFT-s-OFDM QPSK	Inner_Full	135@67	3750.000	650000	22.98
30	20	DFT-s-OFDM PI/2 BPSK1	Inner_Full	25@12	3814.000	654267	23.30
30	20	DFT-s-OFDM 16QAM	Inner_Full	25@12	3814.000	654267	22.23
30	20	DFT-s-OFDM 64QAM	Inner_Full	25@12	3814.000	654267	22.18
30	20	DFT-s-OFDM 256QAM	Inner_Full	25@12	3814.000	654267	21.20
30	20	CP-OFDM QPSK	Inner_Full	25@12	3814.000	654267	22.32
30	20	CP-OFDM 16QAM	Inner_Full	25@12	3814.000	654267	22.23
30	20	CP-OFDM 64QAM	Inner_Full	25@12	3814.000	654267	22.20
30	20	CP-OFDM 256QAM	Inner_Full	25@12	3814.000	654267	19.29
30	20	DFT-s-OFDM QPSK	Edge_Full_Right	2@49	3814.000	654267	22.19
30	20	DFT-s-OFDM QPSK	Edge_Full_Left	2@0	3814.000	654267	22.23
30	20	DFT-s-OFDM QPSK	Inner_1RB_Right	1@49	3814.000	654267	23.18
30	20	DFT-s-OFDM QPSK	Inner_1RB_Left	1@1	3814.000	654267	23.14
30	20	DFT-s-OFDM QPSK	Outer_Full	50@0	3814.000	654267	22.22
30	40	DFT-s-OFDM QPSK	Inner_Full	50@25	3814.000	654267	23.11
30	50	DFT-s-OFDM QPSK	Inner_Full	64@32	3814.000	654267	23.24
30	60	DFT-s-OFDM QPSK	Inner_Full	81@40	3814.000	654267	23.22
30	80	DFT-s-OFDM QPSK	Inner_Full	108@54	3814.000	654267	23.24
30	90	DFT-s-OFDM QPSK	Inner_Full	120@60	3814.000	654267	23.20

J.3 SAR Test Results

Table J.3-1: SAR Values - Spot Check

Frequency Band	Channel Number	Frequency (MHz)	Mode/RB	Distance	Figure No./Note	Test Position	EUT Measured Power (dBm)	Tune up (dBm)	Measured SAR 1g (W/kg)	Calculated SAR 1g (W/kg)	Measured SAR 10g (W/kg)	Calculated SAR 10g (W/kg)	Power Drift
GSM850	251	848.8	GPRS(4TX)	0mm	/	Left Cheek	26.92	28	0.451	**0.58**	0.35	**0.45**	-0.06
GSM850	190	836.6	GPRS(4TX)	0mm	1	Left Cheek	27.1	28	0.513	**0.63**	0.4	**0.49**	-0.09
GSM850	128	824.2	GPRS(4TX)	0mm	/	Left Cheek	26.99	28	0.365	**0.46**	0.28	**0.35**	0.16
GSM850	251	848.8	GPRS(4TX)	10mm	2	Rear GPRS (4TX)	26.92	28.00	0.737	**0.94**	0.469	**0.60**	-0.13
GSM850	190	836.6	GPRS(4TX)	10mm	2	Rear GPRS (4TX)	27.1	28.00	0.711	**0.87**	0.454	**0.56**	0.09
GSM850	128	824.2	GPRS(4TX)	10mm	2	Rear GPRS (4TX)	26.99	28.00	0.702	**0.89**	0.448	**0.57**	0.09
GSM1900	810	1909.8	GPRS(4TX)	0mm	3	Right Cheek	24.13	26	0.401	**0.62**	0.25	**0.38**	-0.01
GSM1900	661	1880	GPRS(4TX)	10mm	4	Rear GPRS (4TX)	24.51	25	0.231	**0.26**	0.135	**0.15**	-0.18
WCDMA1900	9262	1852.4	RMC	0mm	5	Right Cheek	22.68	24.5	0.161	**0.24**	0.101	**0.15**	0.10
WCDMA1900	9538	1907.6	RMC	10mm	/	Rear	22.53	24	0.458	**0.64**	0.278	**0.39**	-0.05
WCDMA1900	9400	1880	RMC	10mm	/	Rear	22.51	24	0.471	**0.66**	0.27	**0.38**	-0.11
WCDMA1900	9262	1852.4	RMC	10mm	6	Rear	22.68	24	0.497	**0.67**	0.293	**0.40**	0.14
WCDMA 850	4233	846.6	RMC	0mm	/	Left Cheek	23.21	25.5	0.119	**0.20**	0.092	**0.16**	0.19
WCDMA 850	4183	836.6	RMC	0mm	7	Left Cheek	23.24	25.5	0.154	**0.26**	0.119	**0.20**	-0.13
WCDMA 850	4132	826.4	RMC	0mm	/	Left Cheek	23.38	25.5	0.135	**0.22**	0.106	**0.17**	0.17
WCDMA 850	4233	846.6	RMC	10mm	8	Rear	23.21	24.5	0.228	**0.31**	0.145	**0.20**	0.11
LTE Band5	20600	844	1RB-Low	0mm	9	Left Cheek	23.44	24.5	0.143	**0.18**	0.109	**0.14**	0.09
LTE Band5	20525	836.5	1RB-Low	0mm	/	Left Cheek	23.28	24.5	0.131	**0.17**	0.101	**0.13**	-0.05
LTE Band5	20450	829	1RB-Low	0mm	/	Left Cheek	23.48	24.5	0.133	**0.17**	0.102	**0.13**	-0.04
LTE Band5	20450	829	1RB-Low	10mm	10	Rear	23.73	24	0.162	**0.17**	0.104	**0.11**	-0.04
LTE Band7 ANT8	21350	2560	1RB-High	0mm	11	Left Cheek	16.59	18	0.861	**1.19**	0.4	**0.55**	0.11
LTE Band7 ANT8	21100	2535	1RB-High	0mm	/	Left Cheek	16.42	18	0.808	**1.16**	0.375	**0.54**	-0.14
LTE Band7 ANT8	20850	2510	1RB-High	0mm	/	Left Cheek	16.48	18	0.829	**1.18**	0.366	**0.52**	0.12
LTE Band7 ANT8	21100	2535	1RB-High	10mm	12	Front	23.36	24	0.674	**0.78**	0.342	**0.40**	0.10
LTE Band41 PC2	41490	2680	1RB-Low	0mm	/	Left Cheek	19.22	20.5	0.733	**0.98**	0.339	**0.46**	-0.16
LTE Band41 PC2	41055	2636.5	1RB-Low	0mm	13	Left Cheek	19.4	20.5	0.782	**1.01**	0.366	**0.47**	0.06
LTE Band41 PC2	40620	2593	1RB-Low	0mm	/	Left Cheek	19.56	20.5	0.725	**0.90**	0.331	**0.41**	-0.05
LTE Band41 PC2	40185	2549.5	1RB-Low	0mm	/	Left Cheek	19.37	20.5	0.643	**0.83**	0.304	**0.39**	-0.01
LTE Band41 PC2	39750	2506	1RB-Mid	0mm	/	Left Cheek	19.35	20.5	0.663	**0.86**	0.309	**0.40**	0.03
LTE Band41 PC2	40620	2593	1RB-High	10mm	14	Front	26.34	27	0.359	**0.42**	0.182	**0.21**	-0.16
N5	169300	846.5	/	0mm	15	Left Cheek	22.7	24	0.111	**0.15**	0.086	**0.12**	-0.08
N5	167300	836.5	/	0mm	/	Left Cheek	23.06	24	0.108	**0.13**	0.083	**0.10**	-0.07
N5	165300	826.5	/	0mm	/	Left Cheek	22.99	24	0.103	**0.13**	0.08	**0.10**	-0.13
N5	167300	836.5	/	10mm	16	Rear	23.06	24.00	0.207	**0.26**	0.13	**0.16**	0.09
N7	513500	2567.5	/	0mm	17	Left Cheek	16.62	17	0.708	**0.77**	0.341	**0.37**	-0.11
N7	507000	2535	/	0mm	/	Left Cheek	16.29	17	0.645	**0.76**	0.301	**0.35**	0.07
N7	500500	2502.5	/	0mm	/	Left Cheek	16.44	17	0.633	**0.72**	0.289	**0.33**	-0.06
N7	513500	2567.5	/	10mm	18	Front	22.47	23.00	0.553	**0.62**	0.278	**0.31**	-0.05
N41	527298	2636.49	/	0mm	19	Left Cheek	18.02	18.5	0.604	**0.67**	0.286	**0.32**	0.01
N41	509902	2549.51	/	10mm	20	Front	22.72	23.50	0.284	**0.34**	0.138	**0.17**	0.16
N78	653000	3795	/	0mm	21	Left Cheek	18.78	19.00	0.224	**0.24**	0.079	**0.08**	-0.05
N78	653000	3795	/	10mm	22	Right	22.92	23.50	0.249	**0.28**	0.083	**0.09**	0.01
WIFI 2.4G	6	2437	/	0mm	23	Left Tilt	13.69	14.00	0.172	**0.18**	0.068	**0.07**	0.09
WIFI 2.4G	6	2437	/	10mm	24	Top	18.59	19.00	0.129	**0.14**	0.061	**0.07**	-0.03
WIFI 5G	116	5580	/	0mm	25	Left Tilt	14.07	14.50	0.174	**0.19**	0.048	**0.05**	-0.03
WIFI 5G	64	5320	/	10mm	26	Rear	14.02	14.50	0.201	**0.22**	0.070	**0.08**	0.01

Table J.3-2: SAR Values - N77(SA)

Test Position	Phantom position L/R/F	Frequency Band	Channel Number	Frequency (MHz)	Postion	Figure No.	EUT Measured Power (dBm)	Tune up (dBm)	Measured SAR 1g (W/kg)	Calculated SAR 1g (W/kg)	Measured SAR 10g (W/kg)	Calculated SAR 10g (W/kg)	Power Drift
N77 DFT-s-OFDM QPSK 30k 20M 25@12 185 40% ANT8													
Cheek	L	N77	636000	3540	Left Cheek	/	18.98	20	0.116	**0.15**	0.033	**0.04**	0.12
Tilt	L	N77	636000	3540	Left Tilt	/	18.98	20	0.051	**0.06**	0.016	**0.02**	-0.02
Cheek	R	N77	636000	3540	Right Cheek	/	18.98	20	0.024	**0.03**	0.017	**0.02**	0.14
Tilt	R	N77	636000	3540	Right Tilt	/	18.98	20	<0.01	<0.01	<0.01	<0.01	/
Cheek	L	N77	654267	3814	Left Cheek	27	18.99	20	0.207	**0.26**	0.063	**0.08**	0.06
Tilt	L	N77	654267	3814	Left Tilt	/	18.99	20	0.138	**0.17**	0.043	**0.05**	-0.11
Cheek	R	N77	654267	3814	Right Cheek	/	18.99	20	0.039	**0.05**	0.014	**0.02**	-0.03
Tilt	R	N77	654267	3814	Right Tilt	/	18.99	20	0.042	**0.05**	0.014	**0.02**	0.03
N77 DFT-s-OFDM QPSK 30k 20M 25@12 260 40% ANT8													
Body	F	N77	636000	3540	Front 15mm	/	26.12	27	0.115	**0.14**	0.045	**0.06**	-0.12
Body	F	N77	636000	3540	Rear 15mm	/	26.12	27	0.249	**0.30**	0.097	**0.12**	-0.03
Body	F	N77	654267	3814	Front 15mm	/	26.39	27	0.312	**0.36**	0.116	**0.13**	-0.09
Body	F	N77	654267	3814	Rear 15mm	28	26.39	27	0.408	**0.47**	0.161	**0.19**	-0.10
N77 DFT-s-OFDM QPSK 30k 20M 25@12 235 40% ANT8													
Body	F	N77	636000	3540	Front 10mm	/	23.39	23.5	0.112	**0.11**	0.037	**0.04**	-0.08
Body	F	N77	636000	3540	Rear 10mm	/	23.39	23.5	0.211	**0.22**	0.075	**0.08**	0.07
Body	F	N77	636000	3540	Right Edge 10mm	/	23.39	23.5	0.273	**0.28**	0.095	**0.10**	0.01
Body	F	N77	636000	3540	Top Edge 10mm	/	23.39	23.5	0.07	**0.07**	0.028	**0.03**	-0.14
Body	F	N77	654267	3814	Front 10mm	/	23.4	23.5	0.19	**0.19**	0.075	**0.08**	0.05
Body	F	N77	654267	3814	Rear 10mm	/	23.4	23.5	0.327	**0.33**	0.128	**0.13**	0.06
Body	F	N77	654267	3814	Right Edge 10mm	29	23.4	23.5	0.397	**0.41**	0.15	**0.15**	0.19
Body	F	N77	654267	3814	Top Edge 10mm	/	23.4	23.5	0.122	**0.12**	0.052	**0.05**	-0.14

J.4 Reported SAR Comparison

Band	Position	Reported SAR 1g (W/Kg): original Reported SAR	Reported SAR 1g(W/Kg):spot check
GSM 850	Head	**0.97**	**0.63**
	Body	**0.83**	**0.94**
DCS 1900	Head	**0.67**	**0.62**
	Body	**0.54**	**0.26**
WCDMA 1900	Head	**0.31**	**0.24**
	Body	**0.63**	**0.67**
WCDMA 850	Head	**0.24**	**0.26**
	Body	**0.31**	**0.31**
LTE Band 5	Head	**0.14**	**0.18**
	Body	**0.28**	**0.17**
LTE Band 7(ANT8)	Head	**1.30**	**1.19**
	Body	**0.78**	**0.78**
LTE Band 41 PC2	Head	**1.03**	**1.01**
	Body	**0.61**	**0.42**
5G NR n5	Head	**0.16**	**0.15**
	Body	**0.28**	**0.26**
5G NR n7	Head	**0.69**	**0.77**
	Body	**0.63**	**0.62**
5G NR n41	Head	**0.76**	**0.67**
	Body	**0.36**	**0.34**
5G NR n78	Head	**0.70**	**0.24**
	Body	**0.79**	**0.28**
WIFI2.4G	Head	**0.18**	**0.18**
	Body	**0.17**	**0.14**
WIFI5G	Head	**0.27**	**0.19**
	Body	**0.29**	**0.22**

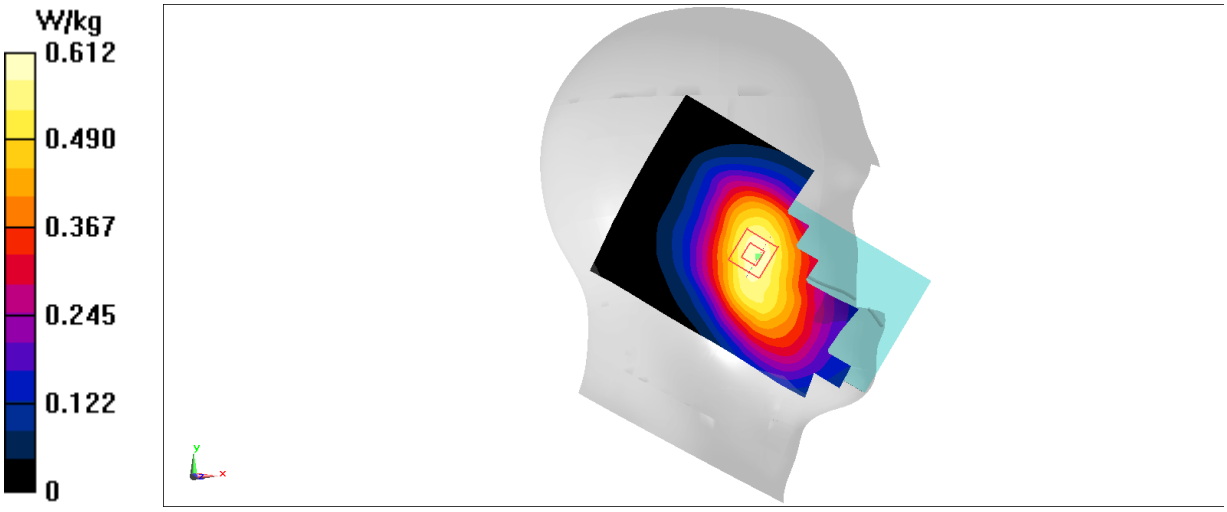
Note: All the spot check results marked blue are larger than the original result. So it replace the original results and others are shared.

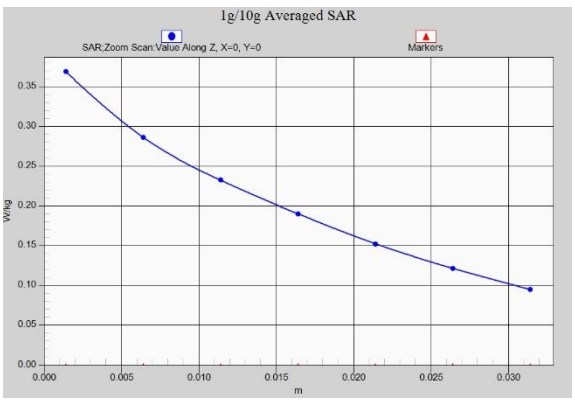
J.5 Graph results

GSM850 Head
Date: 7/6/2022
Electronics: DAE4 Sn1331
Medium: Head 750M
Medium parameters used: f = 836.6 MHz; σ = 0.871 S/m; ε_r = 44.12; ρ = 1000 kg/m^3
Ambient Temperature:23.3ºC Liquid Temperature: 22.5ºC
Communication System: GSM850 4TX 836.6 MHz Duty Cycle: 1:1.99986
Probe: EX3DV4 - SN7464 ConvF(10.26, 10.26, 10.26)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.612 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.787 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.683 W/kg
SAR(1 g) = 0.513 W/kg; SAR(10 g) = 0.400 W/kg
Maximum value of SAR (measured) = 0.617 W/kg

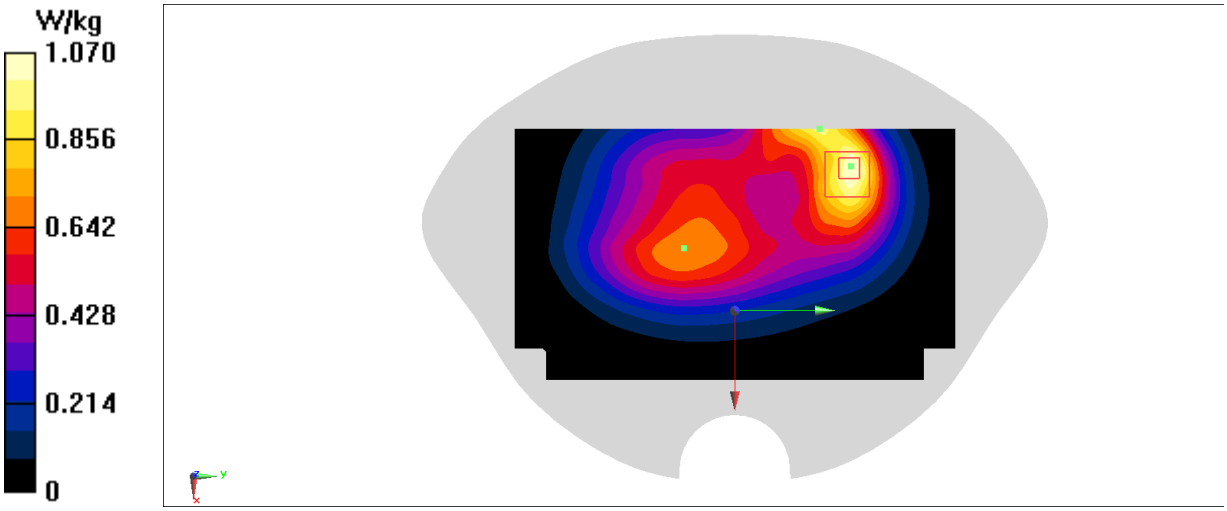


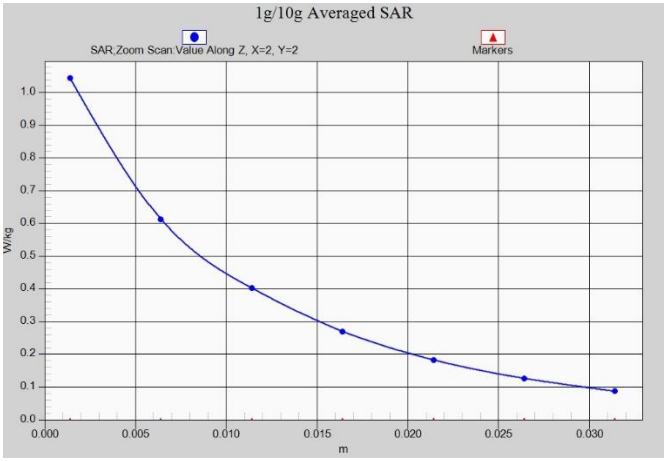


GSM850 Body
Date: 7/6/2022
Electronics: DAE4 Sn1331
Medium: Head 750M
Medium parameters used: f = 848.8 MHz; σ = 0.87 S/m; ε_r = 45.693; ρ = 1000 kg/m^3
Ambient Temperature:23.3ºC Liquid Temperature: 22.5ºC
Communication System: GSM850 4TX 848.8 MHz Duty Cycle: 1:1.99986
Probe: EX3DV4 - SN7464 ConvF(10.26, 10.26, 10.26)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.07 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.93 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.737 W/kg; SAR(10 g) = 0.469 W/kg
Maximum value of SAR (measured) = 1.04 W/kg

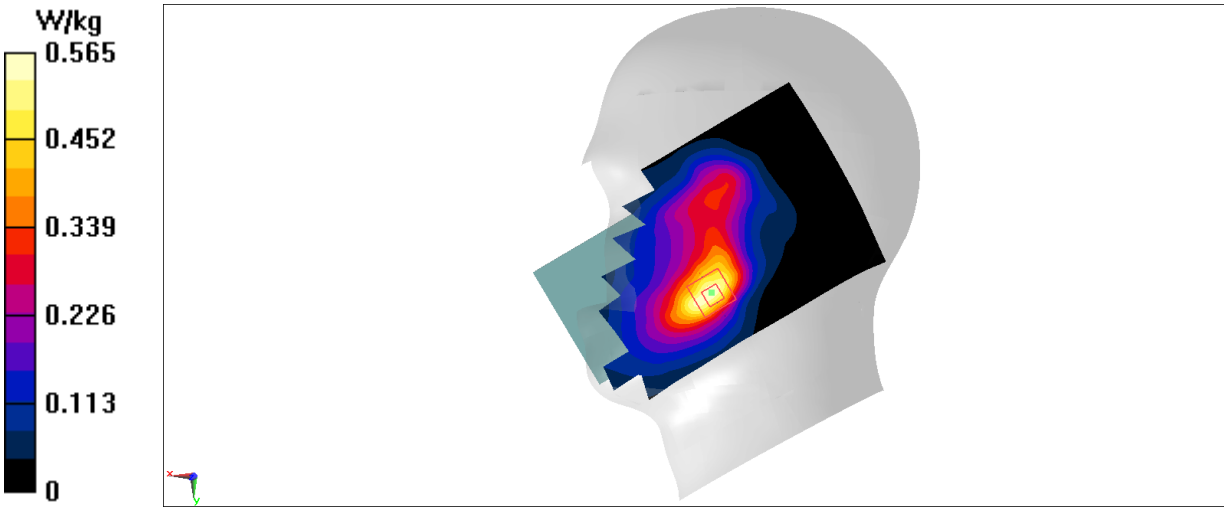


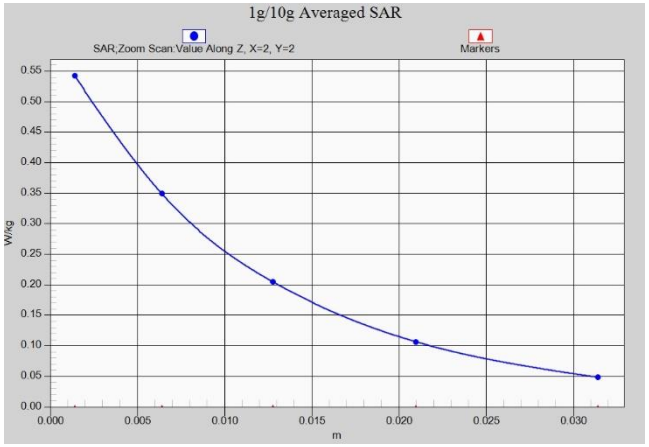


GSM1900 Head
Date: 7/7/2022
Electronics: DAE4 Sn1331
Medium: Head 1900M
Medium parameters used: f = 1910 MHz; σ = 1.481 S/m; ε_r = 41.57; ρ = 1000 kg/m^3
Ambient Temperature:23.3ºC Liquid Temperature: 22.5ºC
Communication System: GSM1900 4TX 1909.8 MHz Duty Cycle: 1:1.99986
Probe: EX3DV4 - SN7464 ConvF(8.18, 8.18, 8.18)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.565 W/kg

Zoom Scan (5x5x5)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.433 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.648 W/kg
SAR(1 g) = 0.401 W/kg; SAR(10 g) = 0.250 W/kg
Maximum value of SAR (measured) = 0.542 W/kg

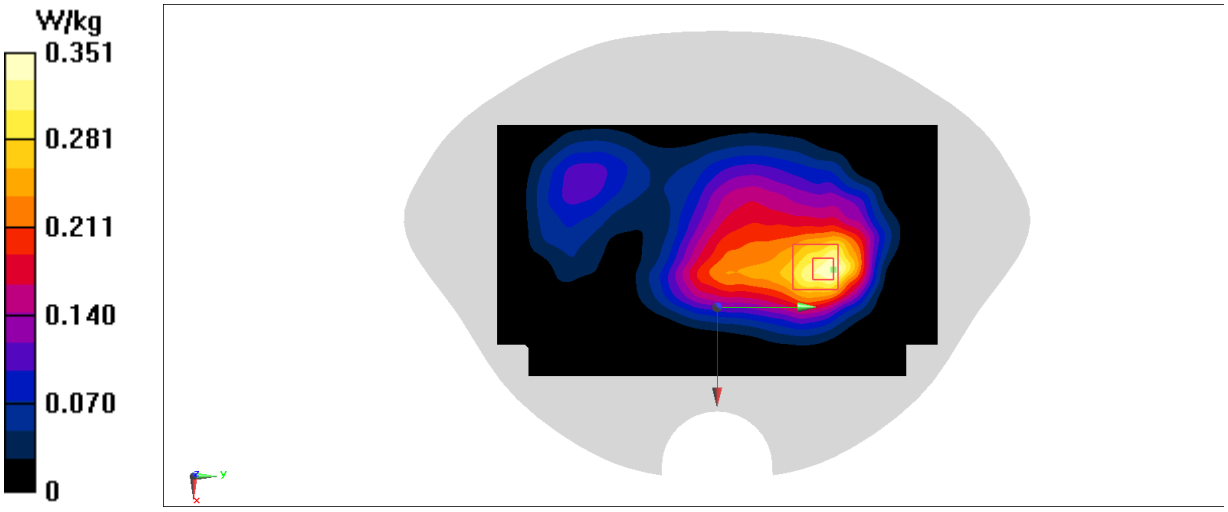


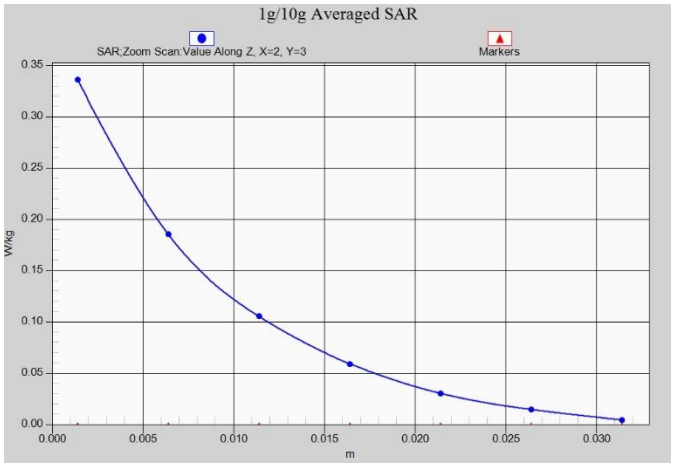


GSM1900 Body
Date: 7/7/2022
Electronics: DAE4 Sn1331
Medium: Head 1900M
Medium parameters used: f = 1880 MHz; σ = 1.481 S/m; ε_r = 43.17; ρ = 1000 kg/m^3
Ambient Temperature:23.3ºC Liquid Temperature: 22.5ºC
Communication System: GSM1900 4TX 1880 MHz Duty Cycle: 1:1.99986
Probe: EX3DV4 - SN7464 ConvF(8.18, 8.18, 8.18)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.351 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.66 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.410 W/kg
SAR(1 g) = 0.231 W/kg; SAR(10 g) = 0.135 W/kg
Maximum value of SAR (measured) = 0.336 W/kg





WCDMA850 Head
Date: 7/6/2022
Electronics: DAE4 Sn1331
Medium: Head 750M
Medium parameters used: f = 836.6 MHz; σ = 0.871 S/m; ε_r = 44.12; ρ = 1000 kg/m^3
Ambient Temperature:23.3ºC Liquid Temperature: 22.5ºC
Communication System: WCDMA850(B5) 836.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7464 ConvF(10.26, 10.26, 10.26)

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.185 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.077 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.203 W/kg
SAR(1 g) = 0.154 W/kg; SAR(10 g) = 0.119 W/kg
Maximum value of SAR (measured) = 0.185 W/kg