

Applicant	Kyocera
FCC ID:	V65S2151
Report #:	CT-S2151-9D-1112-R0

EXHIBIT 9 APPENDIX D: SAR DIPOLE CALIBRATION CERTIFICATE

Total pages including cover page = 17

467 # 5d016

Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 42, 8004 Zurich, Switzerland





Schweizerischer Kalibrierdienst Service sulsse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

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Kyocera USA

Certificate No: D835V2-467_Sep12

		THE TAXABLE PROPERTY.	
Object	D835V2 - SN: 46	7	
Calibration procedure(s)	QA CAL-05.v8 Calibration proce	edure for dipole validation kits abo	ove 700 MHz
Calibration date:	September 12, 2	012	
The measurements and the unce	ertainties with confidence p	ional standards, which realize the physical uniformal standards, which realize the physical uniformality are given on the following pages and the facility: environment temperature (22 ± 3)%	nd are part of the certificate.
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rimary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
rimary Standards ower meter EPM-442A	ID # GB37480704	05-Oct-11 (No. 217-01461)	Oct-12
rimary Standards ower meter EPM-442A ower sensor HP 8481A	ID # GB37480704 U\$37292783	05-Oct-11 (No. 217-01461) 05-Oct-11 (No. 217-01451)	Oct-12 Oct-12
rimary Standards ower meter EPM-442A ower sensor HP 8481A eference 20 dB Attenuator	ID # GB37480704 US37292783 SN: 5058 (20k)	05-Oct-11 (No. 217-01461) 05-Oct-11 (No. 217-01451) 27-Mar-12 (No. 217-01530)	Oct-12 Oct-12 Apr-13
rimary Standards Yower meter EPM-442A Yower sensor HP 8481A Reference 20 dB Attenuator Ype-N mismatch combination	ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.2 / 06327	05-Oct-11 (No. 217-01461) 05-Oct-11 (No. 217-01451) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533)	Oct-12 Oct-12 Apr-13 Apr-13
rimary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Pope-N mismatch combination Reference Probe ES3DV3	ID # GB37480704 US37292783 SN: 5058 (20k)	05-Oct-11 (No. 217-01461) 05-Oct-11 (No. 217-01451) 27-Mar-12 (No. 217-01530)	Oct-12 Oct-12 Apr-13
rimary Standards fower meter EPM-442A fower sensor HP 8481A teference 20 dB Attenuator type-N mismatch combination teference Probe ES3DV3 JAE4	ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205	05-Oct-11 (No. 217-01461) 05-Oct-11 (No. 217-01451) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 30-Dec-11 (No. ES3-3205_Dec11)	Oct-12 Oct-12 Apr-13 Apr-13 Dec-12
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Recondary Standards Power sensor HP 8481A	ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601	05-Oct-11 (No. 217-01461) 05-Oct-11 (No. 217-01451) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 30-Dec-11 (No. ES3-3205_Dec11) 27-Jun-12 (No. DAE4-601_Jun12)	Oct-12 Oct-12 Apr-13 Apr-13 Dec-12 Jun-13
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Reference Probe ES3DV3 RAE4 Recondary Standards Power sensor HP 8481A RF generator R&S SMT-06	ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005	05-Oct-11 (No. 217-01461) 05-Oct-11 (No. 217-01461) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 30-Dec-11 (No. ES3-3205_Dec11) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house)	Oct-12 Oct-12 Apr-13 Apr-13 Dec-12 Jun-13 Scheduled Check
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Aftenuator Type-N mismatch combination Reference Probe ES3DV3 DAE4 Recondary Standards Power sensor HP 8481A RF generator R&S SMT-06 Retwork Analyzer HP 8753E	ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317	05-Oct-11 (No. 217-01461) 05-Oct-11 (No. 217-01461) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 30-Dec-11 (No. ES3-3205_Dec11) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house) 18-Oct-02 (in house check Oct-11)	Oct-12 Oct-12 Apr-13 Apr-13 Dec-12 Jun-13 Scheduled Check In house check; Oct-13
rimary Standards fower meter EPM-442A fower sensor HP 8481A teference 20 dB Attenuator type-N mismatch combination teference Probe ES3DV3 tAE4 tecondary Standards tower sensor HP 8481A tF generator R&S SMT-06 tetwork Analyzer HP 8753E	ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206 Name	05-Oct-11 (No. 217-01461) 05-Oct-11 (No. 217-01461) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 30-Dec-11 (No. ES3-3205_Dec11) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-11)	Oct-12 Oct-12 Apr-13 Apr-13 Dec-12 Jun-13 Scheduled Check In house check; Oct-13 In house check; Oct-13
rimary Standards lower meter EPM-442A lower sensor HP 8481A leference 20 dB Attenuator lype-N mismatch combination leference Probe ES3DV3 lAE4 lecondary Standards lower sensor HP 8481A lecondary R&S SMT-06 letwork Analyzer HP 8753E	ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206	05-Oct-11 (No. 217-01461) 05-Oct-11 (No. 217-01461) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 30-Dec-11 (No. ES3-3205_Dec11) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-11)	Oct-12 Oct-12 Apr-13 Apr-13 Dec-12 Jun-13 Scheduled Check In house check; Oct-13 In house check; Oct-13
rimary Standards lower meter EPM-442A lower sensor HP 8481A leference 20 dB Attenuator lype-N mismatch combination leference Probe ES3DV3 lAE4 lecondary Standards lower sensor HP 8481A lecondary R&S SMT-06 letwork Analyzer HP 8753E	ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206 Name	05-Oct-11 (No. 217-01461) 05-Oct-11 (No. 217-01461) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 30-Dec-11 (No. ES3-3205_Dec11) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-11)	Oct-12 Oct-12 Apr-13 Apr-13 Dec-12 Jun-13 Scheduled Check In house check; Oct-13 In house check; Oct-12
Primary Standards Power meter EPM-442A Power sensor HP 8481A Reference 20 dB Attenuator Reference Probe ES3DV3 RAE4 Recondary Standards Power sensor HP 8481A RF generator R&S SMT-06	ID # GB37480704 US37292783 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 3205 SN: 601 ID # MY41092317 100005 US37390585 S4206 Name	05-Oct-11 (No. 217-01461) 05-Oct-11 (No. 217-01461) 27-Mar-12 (No. 217-01530) 27-Mar-12 (No. 217-01533) 30-Dec-11 (No. ES3-3205_Dec11) 27-Jun-12 (No. DAE4-601_Jun12) Check Date (in house) 18-Oct-02 (in house check Oct-11) 04-Aug-99 (in house check Oct-11) 18-Oct-01 (in house check Oct-11)	Oct-12 Oct-12 Apr-13 Apr-13 Dec-12 Jun-13 Scheduled Check In house check; Oct-13 In house check; Oct-12

Certificate No: D835V2-467_Sep12

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





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Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

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Multilateral Agreement for the recognition of calibration certificates

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 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) 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%.

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Measurement Conditions

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

DASY Version	DASY5	V52.8.2
Extrapolation	Advanced Extrapolation	PROPERTY THAN 17 L. THE
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	THE SPECIAL SECTION AND SECTION ASSESSMENT AND SECTION ASSESSMENT
Frequency	835 MHz ± 1 MHz	TOTAL PROGRAMMENT A LANCE TO THE PROGRAMMENT AND THE PROGRAMMENT A

Head TSL parameters
The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.0±6%	0.90 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	. U 14. 4.	

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	THE STATE OF THE S
SAR measured	250 mW input power	2.40 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.57 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	97-17-16-16-16-16-16-16-16-16-16-16-16-16-16-
SAR measured	250 mW input power	1.57 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.27 mW /g ± 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.3 ± 6 %	1.00 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		TERRITANIAN LIMANIAN LI

SAR result with Body TSL

SAR averaged over 1 cm3 (1 g) of Body TSL	Condition	TO THE POST OF THE
SAR measured	250 mW input power	2.47 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	9.58 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	to The Control of the
SAR measured	250 mW input power	1.62 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	6.33 mW / g ± 16.5 % (k=2)

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	The state of the s
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Return Loss	33.0 dB
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Antenna Parameters with Body TSL

	The state of the s
i Impedance, transformed to feed point	$44.4 \Omega + 0.5 i\Omega$
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Return Loss	
	- 24.5 dB
The state of the s	A

General Antenna Parameters and Design

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Electrical Delay (one direction)	1 GGC ma
l , ,	1.365 ns
The state of the s	

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

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,	SPEAG
	The state of the s
lanufactured on	
andractored off	August 27, 2002
TOTAL	ALT PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF TH

Date: 12.09.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 467

Communication System: CW; Frequency: 835 MHz

Medium parameters used: f = 835 MHz; $\sigma = 0.9$ mho/m; $\varepsilon_r = 41$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 30.12.2011;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 27.06.2012

Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001

DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm 2/Zoom Scan (7x7x7)/Cube 0:

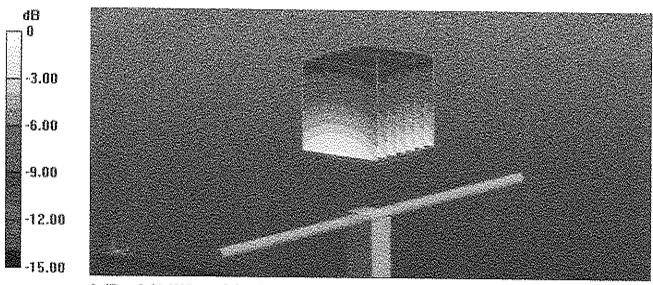
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.500 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 3.552 mW/g

SAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.57 mW/g

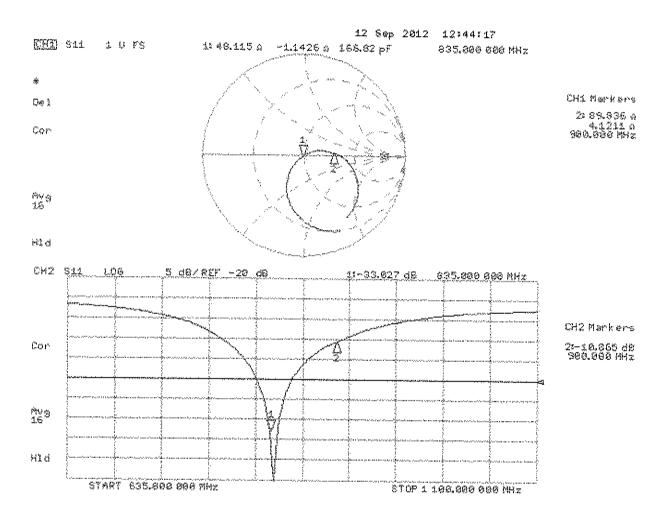
Maximum value of SAR (measured) = 2.80 W/kg



0 dB = 2.80 W/kg = 8.94 dB W/kg

Certificate No: D835V2-467_Sep12

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 12.09.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 467

Communication System: CW; Frequency: 835 MHz

Medium parameters used: f = 835 MHz; $\sigma = 1$ mho/m; $\varepsilon_r = 53.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 30.12.2011;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 27.06.2012

Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001

DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

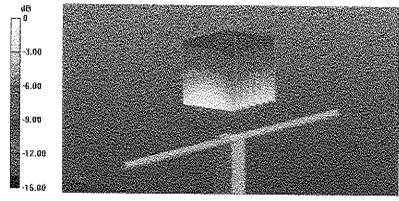
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.564 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.600 mW/g

SAR(1 g) = 2.47 mW/g; SAR(10 g) = 1.62 mW/g

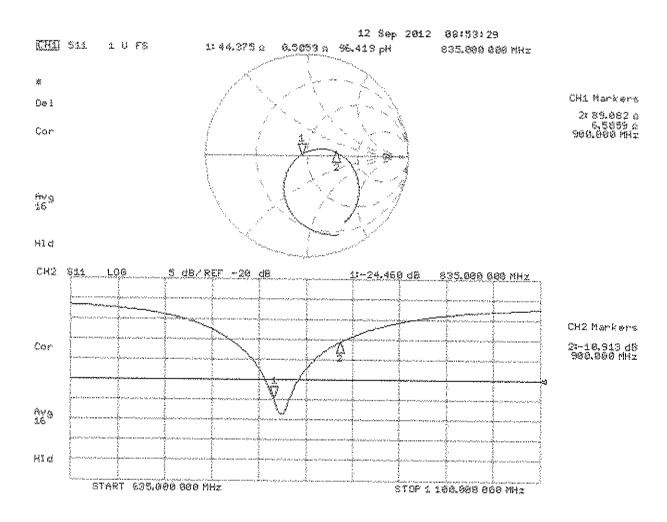
Maximum value of SAR (measured) = 2.87 W/kg



0 dB = 2.87 W/kg = 9.16 dB W/kg

Certificate No: D835V2-467_Sep12

Impedance Measurement Plot for Body TSL



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Issued: September 14, 2012

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Client

Kyocera USA

Certificate No.: D1900V2-5d016 Sep12

Accreditation No.: SCS 108

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CALIBRATION CERTIFICATE D1900V2 - SN: 5d016 Object QA CAL-05.v8 Calibration procedure(s) Calibration procedure for dipole validation kits above 700 MHz September 14, 2012 Calibration date: 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) (E) # Cal Date (Certificate No.) Scheduled Calibration Primary Standards GB37480704 05-Oct-11 (No. 217-01451) Oct-12 Power meter EPM-442A US37292783 Oct-12 Power sensor HP 8481A 05-Oct-11 (No. 217-01451) Reference 20 dB Attenuator SN: 5058 (20k) 27-Mar-12 (No. 217-01530) Apr-13 Type-N mismatch combination SN: 5047.2 / 06327 27-Mar-12 (No. 217-01533) Apr-13 Reference Probe #S3DV3 SN: 3205 30-Dec-11 (No. ES3-3205_Dec11) Dac-12 SN: 601 27-Jun-12 (No. DAE4-601_Jun12) Jun-13 DAE4 (D # Scheduled Check Secondary Standards Check Date (in house) Power sensor HP 8481A MY41092317 18-Oct-02 (in house check Oct-11) In house check: Oct-13 RF generator R&S SMT-06 100005 04-Aug-99 (in house check Oct-11) In house check: Oct-13 In house check: Oct-12 Network Analyzer HP 8753E US37390585 S4206 18-Oct-01 (in house check Oct-11) Name Function Signature Jeton Kastrati Calibrated by: Laboratory Technician Katja Pokovic Technical Manager Approved by:

Certificate No: D1900V2-5d016_Sep12 Page 1 of 8

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of Schmid & Partner

Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland





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Servizio svizzero di taratura
S Swiss Calibration Service

Accreditation No.: SCS 108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multifateral Agreement for the recognition of calibration certificates

Glossary:

TSL

tissue simulating liquid

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003

 b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)",

February 2005

c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) 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%.

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Certificate No: D1900V2-5d016_Sep12

Measurement Conditions

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

DASY Version	DASY5	V52.8.2
Extrapolation	Advanced Extrapolation	A SAN A STANDARD CONTROL OF THE SAN
Phantom	Modular Flat Phantom	- ALEXANDER OF THE CONTROL OF THE CO
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	4414-0414-0414-0414-0414-0414-0414-0414
Frequency	1900 MHz ± 1 MHz	No-many constraints

Head TSL parameters

The following parameters and calculations were applied.

THE FOILOWING DETERMINE THE PROPERTY OF THE PR	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.6 ± 6 %	1.37 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	.e A190 FF	19 (1) 19 (1)

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.79 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	39.8 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAFt measured	250 mW Input power	5.19 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	21.0 mW /g ± 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

A SAME AND	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.5 ± 6 %	1.54 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	Local Account Report Account of the Control of the
SAR measured	250 mW input power	10.4 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	41.1 mW/g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	A SALIVA MATERIAL MAT
SAR measured	250 mW input power	5.48 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	21.8 mW / g ± 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

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	impedance, transformed to feed point	$47.2 \Omega + 4.5 j\Omega$
١	UNIVERSAL CONTROL CONT	NATE OF THE PROPERTY OF THE PR
-	Datum Loca	- 25,2 dB
	Return Loss	LERVINIA PROGRAMMENT AND

Antenna Parameters with Body TSL

ŧ	PROPERTY - INC. LANGUAGE CONTROL - ANNOTATION - PROPERTY OF THE PROPERTY OF TH	ALLEGATION AND AND AND AND AND AND AND AND AND AN
i	Impedance, transformed to feed point	46.8 Ω + 4.7 jΩ
١		AND THE PROPERTY OF THE PROPER
	Return Loss	- 24.6 dB
	100000111	A CONTRACTOR OF THE CONTRACTOR

General Antenna Parameters and Design

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	Electrical Delay (one direction)	1.196 ns
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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

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Manufactured by	SPEAG
A CONTRACTOR OF THE PROPERTY O	The state of the s
Manufactured on	June 04, 2002

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Date: 14.09.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d016

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: f = 1900 MHz; $\sigma = 1.37 \text{ mho/m}$; $\epsilon_r = 40.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

Probe: ES3DV3 - SN3205; ConvF(5.01, 5.01, 5.01); Calibrated: 30.12.2011;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 27.06.2012

Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001

DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

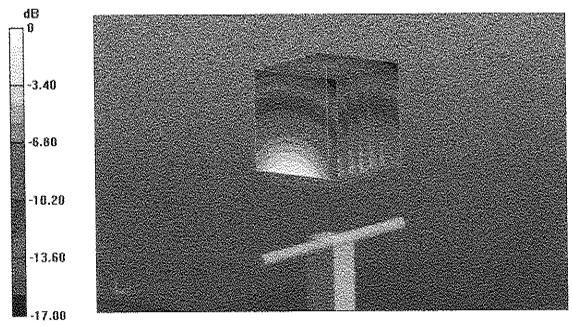
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.784 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 17.342 mW/g

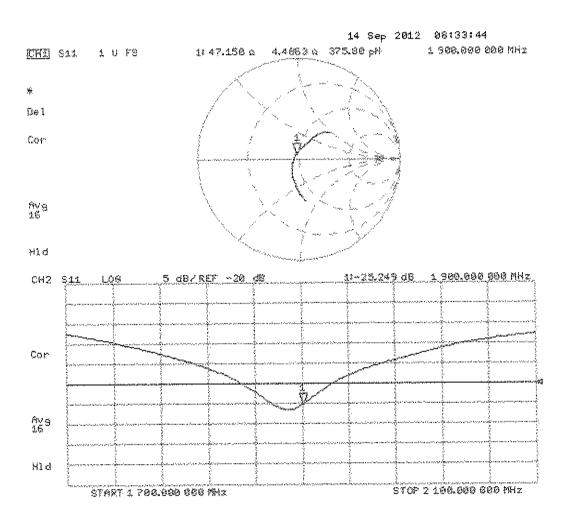
SAR(1 g) = 9.79 mW/g; SAR(10 g) = 5.19 mW/g

Maximum value of SAR (measured) = 12.0 W/kg



0 dB = 12.0 W/kg = 21.58 dB W/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 14.09.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d016

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: f = 1900 MHz; $\sigma = 1.54$ mho/m; $\varepsilon_r = 52.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

Probe: ES3DV3 - SN3205; ConvF(4.62, 4.62, 4.62); Calibrated: 30.12.2011;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 27.06.2012

Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002

DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

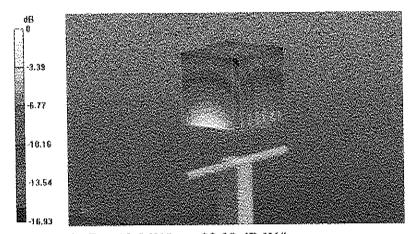
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.784 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 18.122 mW/g

SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.48 mW/g

Maximum value of SAR (measured) = 13.0 W/kg



0 dB = 13.0 W/kg = 22.28 dB W/kg

impedance Measurement Plot for Body TSL

