APPENDIX E: RELEVANT PAGES FROM PROBE CALIBRATION REPORTS

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

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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 108

Client Nokia Salo TCC

Certificate No: ES3-3131_Sep11

CALIBRATION CERTIFICATE

Object: ES3DV3 - SN:3131

Calibration procedure(s): QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: September 14, 2011

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 E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 15, 2011

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3131

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	6.10	6.10	6.10	0.80	1.00	± 12.0 %
835	41.5	0.90	5.88	5.88	5.88	0.80	1.31	± 12.0 %
1750	40.1	1.37	5.14	5.14	5.14	0.80	1.25	± 12.0 %
1900	40.0	1.40	4.92	4.92	4.92	0.80	1.25	± 12.0 %
2450	39.2	1.80	4.32	4.32	4.32	0.79	1.25	± 12.0 %
2600	39.0	1.96	4.21	4.21	4.21	0.76	1.30	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY - Parameters of Probe: ES3DV3- SN:3131

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	5.97	5.97	5.97	0.80	1.00	± 12.0 %
835	55.2	0.97	5.92	5.92	5.92	0.80	1.34	± 12.0 %
1750	53.4	1.49	4.64	4.64	4.64	0.80	1.35	± 12.0 %
1900	53.3	1.52	4.44	4.44	4.44	0.80	1.28	± 12.0 %
2450	52.7	1.95	4.07	4.07	4.07	0.80	1.17	± 12.0 %
2600	52.5	2.16	3.97	3.97	3.97	0.80	1.00	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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Accreditation No.: SCS 108

Client **Nokia Salo TCC** **Certificate No: ES3-3165_Feb12**

CALIBRATION CERTIFICATE

Object: ES3DV3 - SN:3165

Calibration procedure(s): QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: February 21, 2012

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 E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 23, 2012

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3165

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	6.13	6.13	6.13	0.29	1.78	± 12.0 %
835	41.5	0.90	5.88	5.88	5.88	0.21	2.26	± 12.0 %
1750	40.1	1.37	5.51	5.51	5.51	0.49	1.46	± 12.0 %
1900	40.0	1.40	5.24	5.24	5.24	0.54	1.44	± 12.0 %
2450	39.2	1.80	4.37	4.37	4.37	0.70	1.37	± 12.0 %
2600	39.0	1.96	4.20	4.20	4.20	0.80	1.28	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3165

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	6.06	6.06	6.06	0.37	1.66	± 12.0 %
835	55.2	0.97	5.97	5.97	5.97	0.59	1.30	± 12.0 %
1750	53.4	1.49	4.84	4.84	4.84	0.52	1.61	± 12.0 %
1900	53.3	1.52	4.57	4.57	4.57	0.42	1.93	± 12.0 %
2450	52.7	1.95	4.14	4.14	4.14	0.73	1.08	± 12.0 %
2600	52.5	2.16	3.96	3.96	3.96	0.80	1.03	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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Accreditation No.: SCS 108

Client Nokia Salo TCC

Certificate No: EX3-3573_Feb12

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3573

Calibration procedure(s): QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: February 23, 2012

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 E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 23, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3573

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	8.71	8.71	8.71	0.20	1.24	± 12.0 %
835	41.5	0.90	8.33	8.33	8.33	0.14	1.71	± 12.0 %
1750	40.1	1.37	7.67	7.67	7.67	0.75	0.59	± 12.0 %
1900	40.0	1.40	7.43	7.43	7.43	0.80	0.59	± 12.0 %
2450	39.2	1.80	6.52	6.52	6.52	0.38	0.93	± 12.0 %
2600	39.0	1.96	6.30	6.30	6.30	0.37	0.89	± 12.0 %
5200	36.0	4.66	4.63	4.63	4.63	0.39	1.80	± 13.1 %
5300	35.9	4.76	4.46	4.46	4.46	0.35	1.80	± 13.1 %
5500	35.6	4.96	4.23	4.23	4.23	0.40	1.80	± 13.1 %
5600	35.5	5.07	3.96	3.96	3.96	0.45	1.80	± 13.1 %
5800	35.3	5.27	3.99	3.99	3.99	0.50	1.80	± 13.1 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3573

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	8.71	8.71	8.71	0.44	0.87	± 12.0 %
835	55.2	0.97	8.54	8.54	8.54	0.35	0.94	± 12.0 %
1750	53.4	1.49	7.07	7.07	7.07	0.38	0.93	± 12.0 %
1900	53.3	1.52	6.69	6.69	6.69	0.52	0.77	± 12.0 %
2450	52.7	1.95	6.45	6.45	6.45	0.80	0.57	± 12.0 %
2600	52.5	2.16	6.24	6.24	6.24	0.80	0.50	± 12.0 %
5200	49.0	5.30	3.99	3.99	3.99	0.50	1.90	± 13.1 %
5300	48.9	5.42	3.84	3.84	3.84	0.50	1.90	± 13.1 %
5500	48.6	5.65	3.64	3.64	3.64	0.50	1.90	± 13.1 %
5600	48.5	5.77	3.05	3.05	3.05	0.75	1.90	± 13.1 %
5800	48.2	6.00	3.71	3.71	3.71	0.55	1.90	± 13.1 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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Accreditation No.: SCS 108

Client Nokia Salo TCC

Certificate No: EX3-3834_Feb12

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3834

Calibration procedure(s): QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: February 7, 2012

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 E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 7, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3834

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	9.17	9.17	9.17	0.38	0.90	± 12.0 %
835	41.5	0.90	8.69	8.69	8.69	0.34	0.97	± 12.0 %
900	41.5	0.97	8.59	8.59	8.59	0.23	1.26	± 12.0 %
1750	40.1	1.37	7.84	7.84	7.84	0.51	0.70	± 12.0 %
1900	40.0	1.40	7.61	7.61	7.61	0.80	0.58	± 12.0 %
2450	39.2	1.80	6.82	6.82	6.82	0.45	0.78	± 12.0 %
2600	39.0	1.96	6.65	6.65	6.65	0.48	0.77	± 12.0 %
5200	36.0	4.66	4.81	4.81	4.81	0.40	1.80	± 13.1 %
5300	35.9	4.76	4.57	4.57	4.57	0.40	1.80	± 13.1 %
5500	35.6	4.96	4.60	4.60	4.60	0.38	1.80	± 13.1 %
5600	35.5	5.07	4.37	4.37	4.37	0.40	1.80	± 13.1 %
5800	35.3	5.27	4.14	4.14	4.14	0.50	1.80	± 13.1 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3834

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	9.03	9.03	9.03	0.26	1.22	± 12.0 %
835	55.2	0.97	8.75	8.75	8.75	0.21	1.58	± 12.0 %
900	55.0	1.05	8.72	8.72	8.72	0.46	0.83	± 12.0 %
1750	53.4	1.49	7.54	7.54	7.54	0.80	0.62	± 12.0 %
1900	53.3	1.52	7.17	7.17	7.17	0.52	0.77	± 12.0 %
2450	52.7	1.95	6.93	6.93	6.93	0.80	0.50	± 12.0 %
2600	52.5	2.16	6.65	6.65	6.65	0.80	0.50	± 12.0 %
5200	49.0	5.30	3.99	3.99	3.99	0.55	1.90	± 13.1 %
5300	48.9	5.42	3.75	3.75	3.75	0.60	1.90	± 13.1 %
5500	48.6	5.65	3.50	3.50	3.50	0.58	1.90	± 13.1 %
5600	48.5	5.77	3.28	3.28	3.28	0.60	1.90	± 13.1 %
5800	48.2	6.00	3.78	3.78	3.78	0.58	1.90	± 13.1 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

APPENDIX F: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORTS

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Accreditation No.: SCS 108

Client Nokia Salo TCC

Certificate No: D750V3-1034_Jul11

CALIBRATION CERTIFICATE

Object: D750V3 - SN:1034

Calibration procedure(s): QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: July 07, 2011

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 EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 11, 2011

DASY5 Validation Report for Head TSL

Date: 07.07.2011

Test Laboratory: SPEAG, Zurich, Switzerland

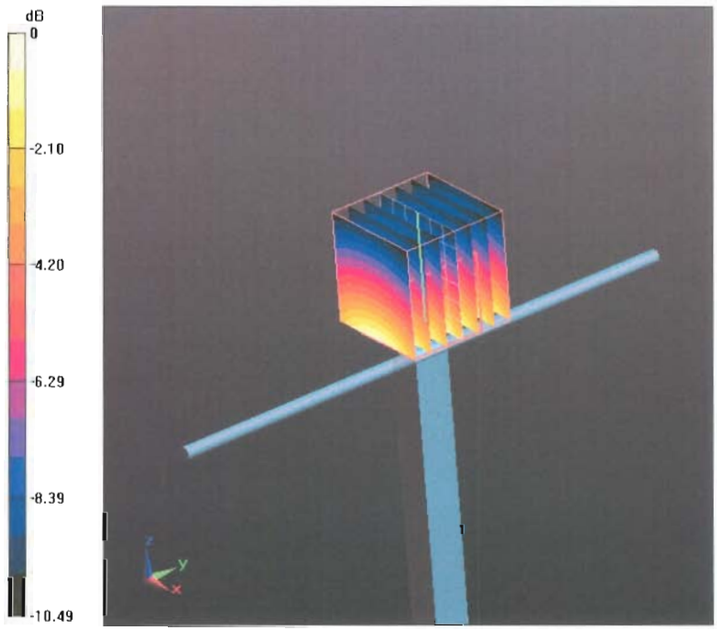
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1034

Communication System: CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.91 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.33, 6.33, 6.33); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250mW; dip=15mm; dist=3.0mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.065 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.205 W/kg
SAR(1 g) = 2.12 mW/g; SAR(10 g) = 1.39 mW/g
Maximum value of SAR (measured) = 2.487 mW/g



0 dB = 2.490mW/g

Date: 07.07.2011

Test Laboratory: SPEAG, Zurich, Switzerland

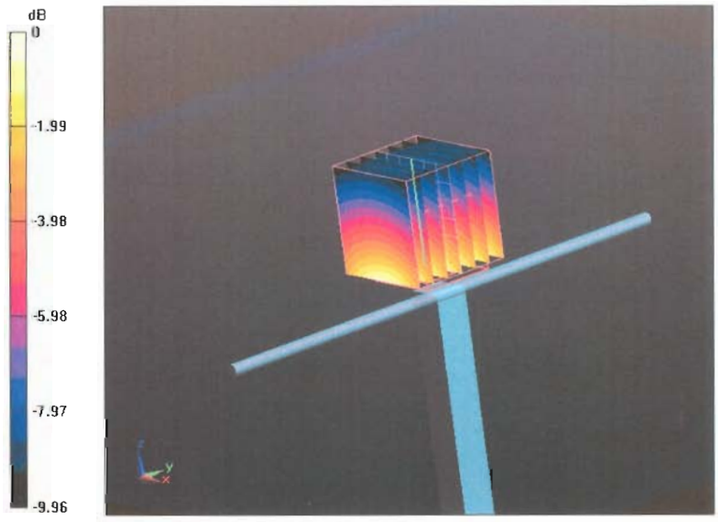
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1034

Communication System: CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.96 mho/m; ε_r = 55.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.12, 6.12, 6.12); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250mW; dip=15mm; dist=3.0mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.234 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.265 W/kg
SAR(1 g) = 2.2 mW/g; SAR(10 g) = 1.45 mW/g
Maximum value of SAR (measured) = 2.566 mW/g



0 dB = 2.570mW/g

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Client Nokia Salo TCC **Certificate No: D835V2-462_Sep11**

CALIBRATION CERTIFICATE

Object D835V2 - SN: 462

Calibration procedure(s) QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: September 13, 2011

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 EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 13, 2011

Date: 13.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 462

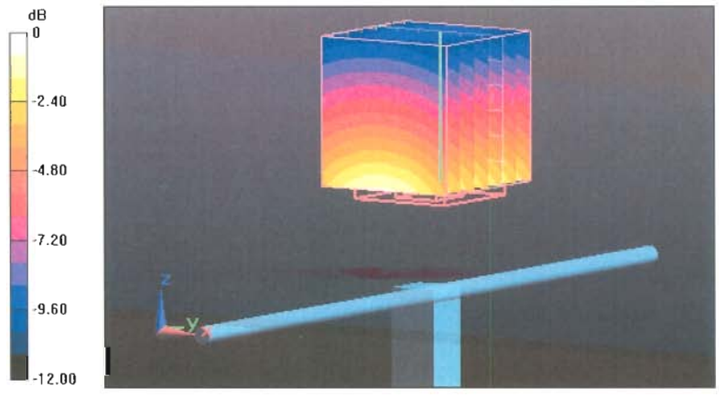
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.987 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.423 W/kg
SAR(1 g) = 2.33 mW/g; SAR(10 g) = 1.52 mW/g
Maximum value of SAR (measured) = 2.708 mW/g



0 dB = 2.710mW/g

DASY5 Validation Report for Body TSL

Date: 12.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 462

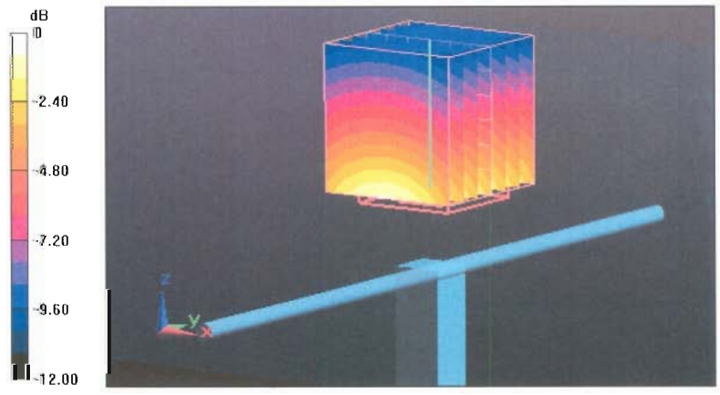
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

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 = 55.464 V/m; Power Drift = 0.0033 dB
Peak SAR (extrapolated) = 3.540 W/kg
SAR(1 g) = 2.45 mW/g; SAR(10 g) = 1.61 mW/g
Maximum value of SAR (measured) = 2.851 mW/g



0 dB = 2.850mW/g

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Accreditation No.: SCS 108

Client Nokia Salo TCC

Certificate No: D1800V2-2d065_Sep11

CALIBRATION CERTIFICATE

Object	D1800V2 - SN: 2d065
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	September 15, 2011

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 EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 15, 2011

Date: 15.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 2d065

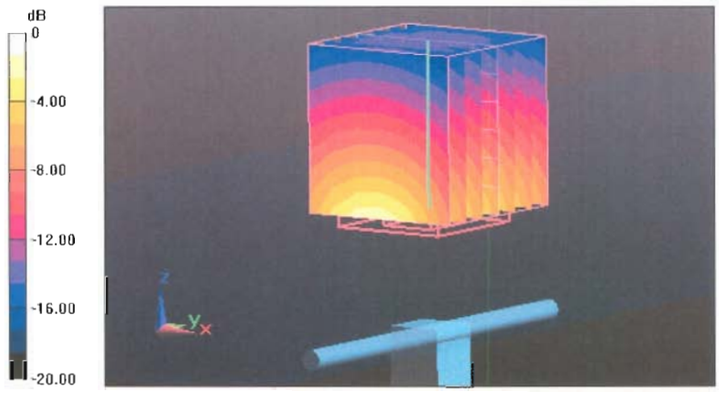
Communication System: CW; Frequency: 1800 MHz
Medium parameters used: f = 1800 MHz; σ = 1.37 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.07, 5.07, 5.07); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

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 = 96.966 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 16.764 W/kg
SAR(1 g) = 9.43 mW/g; SAR(10 g) = 4.98 mW/g
Maximum value of SAR (measured) = 11.819 mW/g



0 dB = 11.820mW/g

DASY5 Validation Report for Body TSL

Date: 14.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 2d065

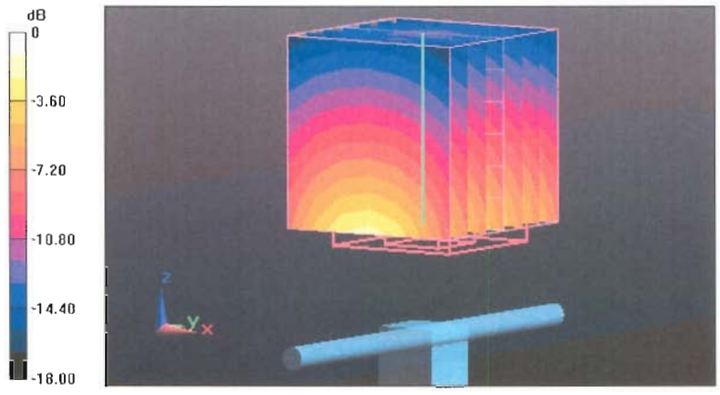
Communication System: CW; Frequency: 1800 MHz
Medium parameters used: f = 1800 MHz; σ = 1.52 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.74, 4.74, 4.74); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

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 = 94.166 V/m; Power Drift = -0.004 dB
Peak SAR (extrapolated) = 17.264 W/kg
SAR(1 g) = 9.86 mW/g; SAR(10 g) = 5.25 mW/g
Maximum value of SAR (measured) = 12.449 mW/g



0 dB = 12.450mW/g

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Accreditation No.: SCS 108

Client Nokia Salo TCC

Certificate No: D1900V2-5d030_Feb12

CALIBRATION CERTIFICATE

Object: D1900V2 - SN: 5d030

Calibration procedure(s): QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: February 22, 2012

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 EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5086 (20g)	29-Mar-11 (No. 217-01368)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
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
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	Israe El-Naouq
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 22, 2012

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.0 Ω + 5.3 jΩ
Return Loss	- 25.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.6 Ω + 5.4 jΩ
Return Loss	- 24.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.192 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
Manufactured on	December 17, 2002

DASY5 Validation Report for Head TSL

Date: 22.02.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d030

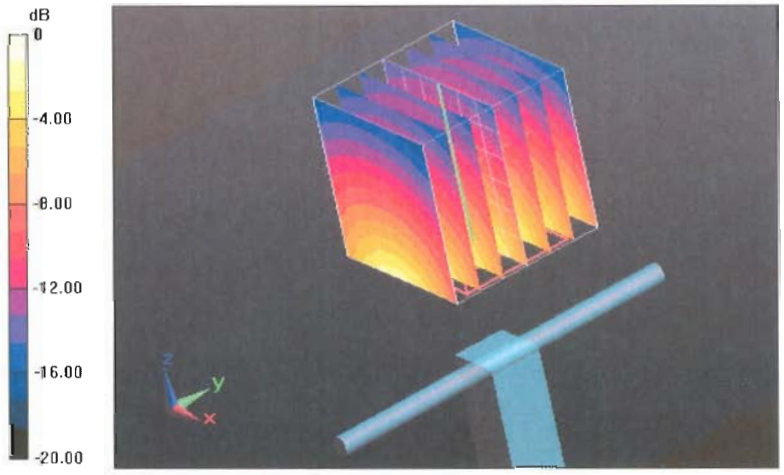
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.4 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

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 = 96.565 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 17.4270
SAR(1 g) = 9.79 mW/g; SAR(10 g) = 5.18 mW/g
Maximum value of SAR (measured) = 12.117 mW/g



0 dB = 12.120mW/g = 21.67 dB mW/g

DASY5 Validation Report for Body TSL

Date: 22.02.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d030

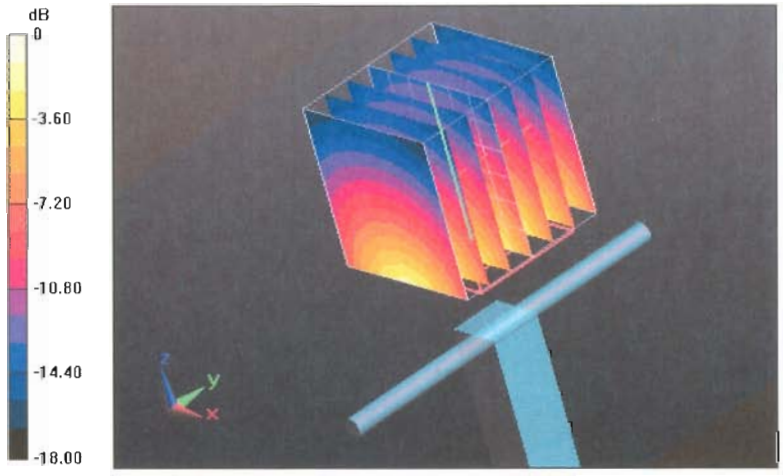
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.56 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

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 = 93.541 V/m; Power Drift = -0.0095 dB
Peak SAR (extrapolated) = 17.4260
SAR(1 g) = 9.87 mW/g; SAR(10 g) = 5.17 mW/g
Maximum value of SAR (measured) = 12.485 mW/g



0 dB = 12.480mW/g = 21.92 dB mW/g

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Accreditation No.: SCS 108

Client Nokia Salo TCC

Certificate No: D2450V2-729_Sep11

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 729
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	September 13, 2011

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 EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 13, 2011

Date: 13.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 729

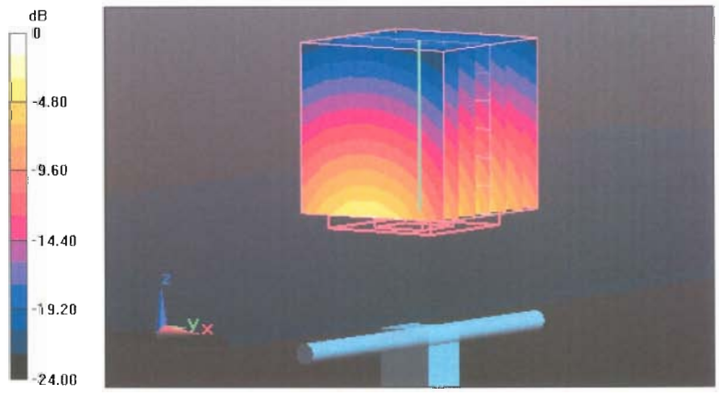
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.85 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

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 = 102.5 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 28.852 W/kg
SAR(1 g) = 13.9 mW/g; SAR(10 g) = 6.45 mW/g
Maximum value of SAR (measured) = 18.134 mW/g



0 dB = 18.130mW/g

Date: 12.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 729

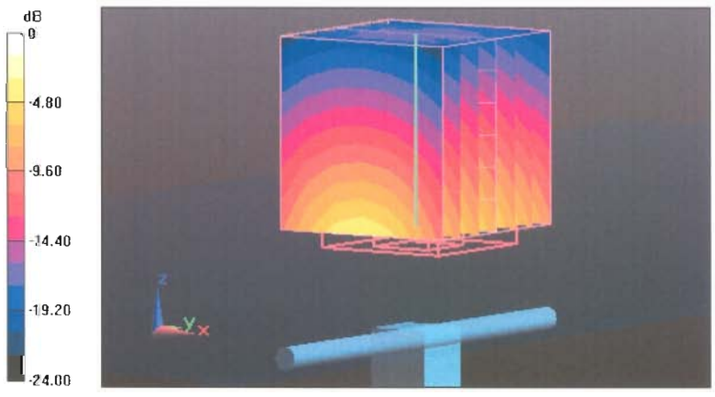
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.04 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.26, 4.26, 4.26); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

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 = 96.035 V/m; Power Drift = -0.0016 dB
Peak SAR (extrapolated) = 27.393 W/kg
SAR(1 g) = 13.3 mW/g; SAR(10 g) = 6.18 mW/g
Maximum value of SAR (measured) = 17.569 mW/g



0 dB = 17.570mW/g

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 108

Client Nokia Salo TCC

Certificate No: D5GHzV2-1032_Feb12

CALIBRATION CERTIFICATE

Object: D5GHzV2 - SN: 1032

Calibration procedure(s): QA CAL-22.v1
Calibration procedure for dipole validation kits between 3-6 GHz

Calibration date: February 14, 2012

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 EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5086 (20g)	29-Mar-11 (No. 217-01368)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe EX3DV4	SN: 3503	30-Dec-11 (No. EX3-3503_Dec11)	Dec-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
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
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 14, 2012

Appendix

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	49.6 Ω - 8.3 jΩ
Return Loss	- 21.6 dB

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	52.0 Ω - 1.9 jΩ
Return Loss	- 31.3 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	58.9 Ω - 3.2 jΩ
Return Loss	- 21.2 dB

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	49.2 Ω - 7.7 jΩ
Return Loss	- 22.1 dB

Antenna Parameters with Body TSL at 5500 MHz

Impedance, transformed to feed point	52.6 Ω - 1.0 jΩ
Return Loss	- 31.3 dB

Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	59.8 Ω - 2.9 jΩ
Return Loss	- 20.6 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
Manufactured on	July 09, 2004

Date: 14.02.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1032

Communication System: CW; Frequency: 5200 MHz, Frequency: 5500 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; σ = 4.6 mho/m; ε_r = 35.3; ρ = 1000 kg/m^3 , Medium parameters used: f = 5500 MHz; σ = 4.89 mho/m; ε_r = 34.9; ρ = 1000 kg/m^3 , Medium parameters used: f = 5800 MHz; σ = 5.19 mho/m; ε_r = 34.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

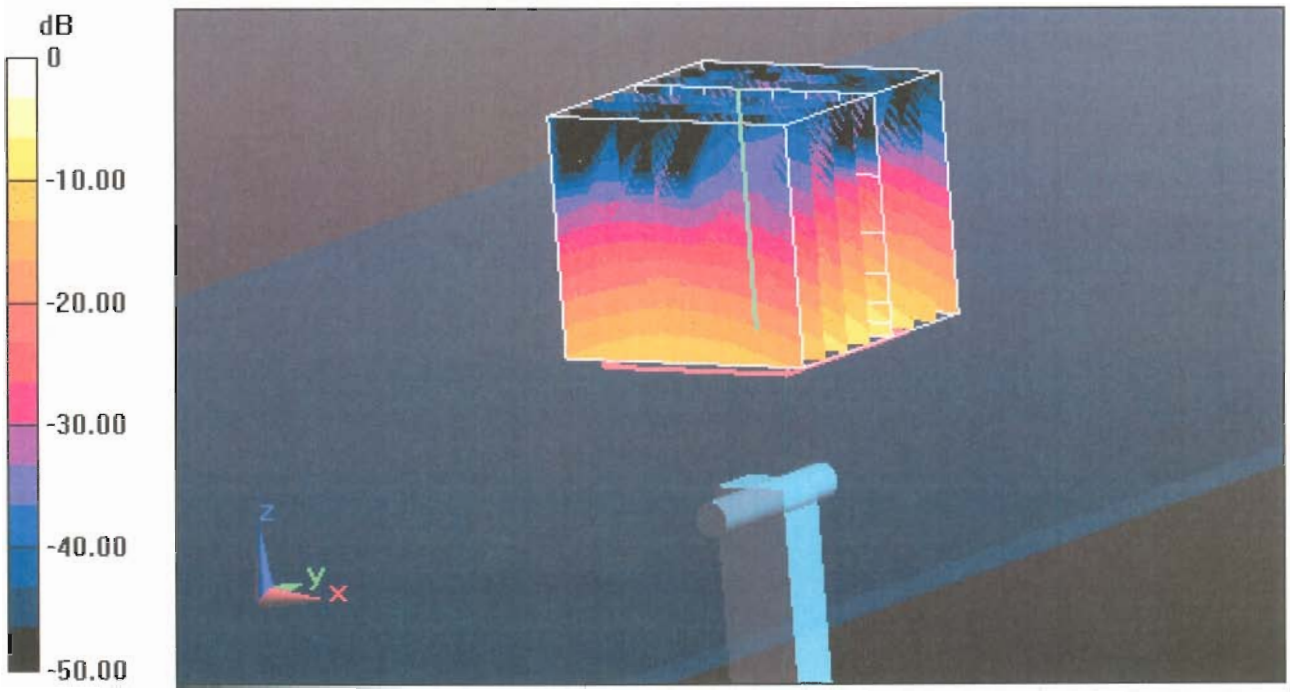
DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.41, 5.41, 5.41), ConvF(4.91, 4.91, 4.91), ConvF(4.81, 4.81, 4.81); Calibrated: 30.12.2011
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

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 = 65.348 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 30.0130
SAR(1 g) = 7.98 mW/g; SAR(10 g) = 2.28 mW/g
Maximum value of SAR (measured) = 19.030 mW/g

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 = 64.801 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 34.8980
SAR(1 g) = 8.65 mW/g; SAR(10 g) = 2.45 mW/g
Maximum value of SAR (measured) = 21.094 mW/g

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 = 60.873 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 33.7370
SAR(1 g) = 7.92 mW/g; SAR(10 g) = 2.25 mW/g
Maximum value of SAR (measured) = 19.840 mW/g



0 dB = 19.840mW/g = 25.95 dB mW/g

DASY5 Validation Report for Body TSL

Date: 13.02.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1032

Communication System: CW; Frequency: 5200 MHz, Frequency: 5500 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; σ = 5.48 mho/m; ε_r = 48.6; ρ = 1000 kg/m^3 , Medium parameters used: f = 5500 MHz; σ = 5.87 mho/m; ε_r = 48.1; ρ = 1000 kg/m^3 , Medium parameters used: f = 5800 MHz; σ = 6.28 mho/m; ε_r = 48.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

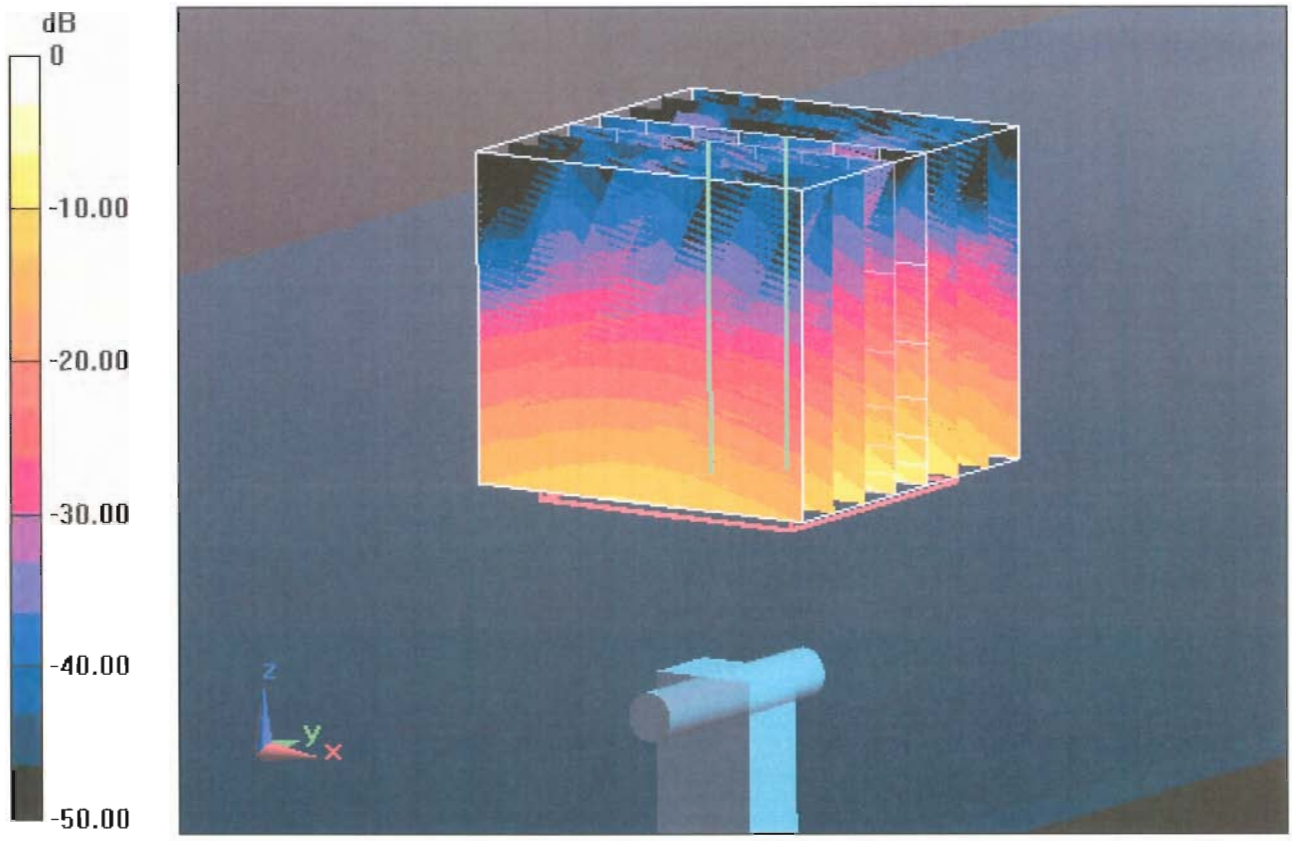
DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(4.91, 4.91, 4.91), ConvF(4.43, 4.43, 4.43), ConvF(4.38, 4.38, 4.38); Calibrated: 30.12.2011
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

Dipole Calibration for Body 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 = 57.401 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 28.2500
SAR(1 g) = 7.23 mW/g; SAR(10 g) = 2.03 mW/g
Maximum value of SAR (measured) = 16.493 mW/g

Dipole Calibration for Body 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 = 57.876 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 33.4980
SAR(1 g) = 7.78 mW/g; SAR(10 g) = 2.16 mW/g
Maximum value of SAR (measured) = 18.246 mW/g

Dipole Calibration for Body 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 = 54.089 V/m; Power Drift = -0.0018 dB
Peak SAR (extrapolated) = 33.8810
SAR(1 g) = 7.21 mW/g; SAR(10 g) = 1.99 mW/g
Maximum value of SAR (measured) = 17.435 mW/g



0 dB = 17.440mW/g = 24.83 dB mW/g

APPENDIX G: CONDUCTED POWER MEASUREMENTS FOR SUPPORTED LTE TRANSMISSION MODES

G.1 Power Tuning Targets

Tuning targets LTE			
Slot configuration	Low channel	Mid channel	High channel
LTE700 (Band 17)	-	23.0	-
LTE850 (Band 5)	-	23.0	-
LTE1700/2100 (Band 4)	-	23.0	-
LTE1900 (Band 2)	-	23.0	-

G.2 Conducted Power from the Samples used in the Testing

Type: RM-820; Serial number: 004402/13/870722/3 used for LTE700 (Band17) for SAR Head, Body-worn and Wireless Router measurements.

"Max Average Power (dBm)" column lists measured powers with MPR active. The "Reduced Power (dBm)" column lists measured powers with MPR and A-MPR active (as defined by 3GPP TS 36.101). A-MPR is not specified for LTE700 (Band 17) in this specification (Table 6.2.4-1).

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
706.5	23755	5	1	0	QPSK	22.16	-
706.5	23755	5	1	24	QPSK	21.85	-
706.5	23755	5	1	12	QPSK	21.85	-
706.5	23755	5	12	6	QPSK	21.23	-
706.5	23755	5	25	0	QPSK	21.22	-
706.5	23755	5	1	0	16QAM	21.22	-
706.5	23755	5	1	24	16QAM	21.16	-
706.5	23755	5	1	12	16QAM	21.1	-
706.5	23755	5	12	6	16QAM	20.32	-
706.5	23755	5	25	0	16QAM	20.35	-
710.0	23790	5	1	0	QPSK	21.78	-
710.0	23790	5	1	24	QPSK	22.17	-
710.0	23790	5	1	12	QPSK	22.15	-
710.0	23790	5	12	6	QPSK	21.45	-
710.0	23790	5	25	0	QPSK	21.31	-
710.0	23790	5	1	0	16QAM	21.05	-
710.0	23790	5	1	24	16QAM	21.95	-
710.0	23790	5	1	12	16QAM	21.67	-
710.0	23790	5	12	6	16QAM	20.47	-
710.0	23790	5	25	0	16QAM	20.36	-
713.5	23825	5	1	0	QPSK	21.8	-
713.5	23825	5	1	24	QPSK	22.88	-
713.5	23825	5	1	12	QPSK	22.31	-
713.5	23825	5	12	6	QPSK	21.76	-
713.5	23825	5	25	0	QPSK	21.73	-
713.5	23825	5	1	0	16QAM	21.42	-
713.5	23825	5	1	24	16QAM	22.1	-
713.5	23825	5	1	12	16QAM	21.74	-
713.5	23825	5	12	6	16QAM	20.67	-
713.5	23825	5	25	0	16QAM	20.67	-

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
709.0	23780	10	1	0	QPSK	22.35	-
709.0	23780	10	1	49	QPSK	22.33	-
709.0	23780	10	1	24	QPSK	22.14	-
709.0	23780	10	25	12	QPSK	21.21	-
709.0	23780	10	50	0	QPSK	21.1	-
709.0	23780	10	1	0	16QAM	21.39	-
709.0	23780	10	1	49	16QAM	21.24	-
709.0	23780	10	1	24	16QAM	21.35	-
709.0	23780	10	25	12	16QAM	19.98	-
709.0	23780	10	50	0	16QAM	20.08	-
710.0	23790	10	1	0	QPSK	21.8	-
710.0	23790	10	1	49	QPSK	22.08	-
710.0	23790	10	1	24	QPSK	21.97	-
710.0	23790	10	25	12	QPSK	21.25	-
710.0	23790	10	50	0	QPSK	21.02	-
710.0	23790	10	1	0	16QAM	21.17	-
710.0	23790	10	1	49	16QAM	21.61	-
710.0	23790	10	1	24	16QAM	21.05	-
710.0	23790	10	25	12	16QAM	20.12	-
710.0	23790	10	50	0	16QAM	19.92	-
711.0	23800	10	1	0	QPSK	21.61	-
711.0	23800	10	1	49	QPSK	22.58	-
711.0	23800	10	1	24	QPSK	22.07	-
711.0	23800	10	25	12	QPSK	21.4	-
711.0	23800	10	50	0	QPSK	21.13	-
711.0	23800	10	1	0	16QAM	21.21	-
711.0	23800	10	1	49	16QAM	21.82	-
711.0	23800	10	1	24	16QAM	21.34	-
711.0	23800	10	25	12	16QAM	20.28	-
711.0	23800	10	50	0	16QAM	20.1	-

Type: RM-820; Serial number: 004402/13/870751/2 used for LTE850 (Band 5) SAR Head, Body-worn and Wireless Router measurements.

"Max Average Power (dBm)" column lists measured powers with MPR active. The "Reduced Power (dBm)" column lists measured powers with MPR and A-MPR active (as defined by 3GPP TS 36.101). A-MPR is not specified for LTE850 (Band 5) in this specification (Table 6.2.4-1).

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
824.7	20407	1.4	1	0	QPSK	21.1	-
824.7	20407	1.4	1	5	QPSK	21.26	-
824.7	20407	1.4	1	2	QPSK	21.36	-
824.7	20407	1.4	3	2	QPSK	21.18	-
824.7	20407	1.4	6	0	QPSK	20.42	-
824.7	20407	1.4	1	0	16QAM	20.33	-
824.7	20407	1.4	1	5	16QAM	20.58	-
824.7	20407	1.4	1	2	16QAM	20.79	-
824.7	20407	1.4	3	2	16QAM	20.43	-
824.7	20407	1.4	6	0	16QAM	19.56	-
836.5	20525	1.4	1	0	QPSK	21.06	-
836.5	20525	1.4	1	5	QPSK	20.95	-
836.5	20525	1.4	1	2	QPSK	21	-
836.5	20525	1.4	3	2	QPSK	21.34	-
836.5	20525	1.4	6	0	QPSK	20.24	-
836.5	20525	1.4	1	0	16QAM	20.59	-
836.5	20525	1.4	1	5	16QAM	20.51	-
836.5	20525	1.4	1	2	16QAM	20.49	-
836.5	20525	1.4	3	2	16QAM	20.31	-
836.5	20525	1.4	6	0	16QAM	19.4	-
848.3	20643	1.4	1	0	QPSK	20.96	-
848.3	20643	1.4	1	5	QPSK	20.73	-
848.3	20643	1.4	1	2	QPSK	20.8	-
848.3	20643	1.4	3	2	QPSK	21.11	-
848.3	20643	1.4	6	0	QPSK	20.14	-
848.3	20643	1.4	1	0	16QAM	20.31	-
848.3	20643	1.4	1	5	16QAM	20.31	-
848.3	20643	1.4	1	2	16QAM	20.35	-
848.3	20643	1.4	3	2	16QAM	20.17	-
848.3	20643	1.4	6	0	16QAM	19.29	-

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
825.5	20415	3	1	0	QPSK	21.31	-
825.5	20415	3	1	14	QPSK	21.16	-
825.5	20415	3	1	7	QPSK	21.36	-
825.5	20415	3	8	3	QPSK	20.45	-
825.5	20415	3	15	0	QPSK	20.38	-
825.5	20415	3	1	0	16QAM	20.52	-
825.5	20415	3	1	14	16QAM	20.63	-
825.5	20415	3	1	7	16QAM	20.61	-
825.5	20415	3	8	3	16QAM	19.5	-
825.5	20415	3	15	0	16QAM	19.31	-
836.5	20525	3	1	0	QPSK	20.96	-
836.5	20525	3	1	14	QPSK	20.57	-
836.5	20525	3	1	7	QPSK	21.05	-
836.5	20525	3	8	3	QPSK	20.39	-
836.5	20525	3	15	0	QPSK	20.37	-
836.5	20525	3	1	0	16QAM	20.2	-
836.5	20525	3	1	14	16QAM	20.04	-
836.5	20525	3	1	7	16QAM	20.62	-
836.5	20525	3	8	3	16QAM	19.76	-
836.5	20525	3	15	0	16QAM	19.3	-
847.5	20635	3	1	0	QPSK	20.82	-
847.5	20635	3	1	14	QPSK	20.94	-
847.5	20635	3	1	7	QPSK	20.93	-
847.5	20635	3	8	3	QPSK	20.38	-
847.5	20635	3	15	0	QPSK	20.34	-
847.5	20635	3	1	0	16QAM	20.24	-
847.5	20635	3	1	14	16QAM	20.23	-
847.5	20635	3	1	7	16QAM	20.16	-
847.5	20635	3	8	3	16QAM	19.64	-
847.5	20635	3	15	0	16QAM	19.18	-

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
826.5	20425	5	1	0	QPSK	21.34	-
826.5	20425	5	1	24	QPSK	21.06	-
826.5	20425	5	1	12	QPSK	21.15	-
826.5	20425	5	12	6	QPSK	20.41	-
826.5	20425	5	25	0	QPSK	20.43	-
826.5	20425	5	1	0	16QAM	20.36	-
826.5	20425	5	1	24	16QAM	20.37	-
826.5	20425	5	1	12	16QAM	20.51	-
826.5	20425	5	12	6	16QAM	19.39	-
826.5	20425	5	25	0	16QAM	19.46	-
836.5	20525	5	1	0	QPSK	21.02	-
836.5	20525	5	1	24	QPSK	21.13	-
836.5	20525	5	1	12	QPSK	21.13	-
836.5	20525	5	12	6	QPSK	20.38	-
836.5	20525	5	25	0	QPSK	20.26	-
836.5	20525	5	1	0	16QAM	20.17	-
836.5	20525	5	1	24	16QAM	20.26	-
836.5	20525	5	1	12	16QAM	20.39	-
836.5	20525	5	12	6	16QAM	19.61	-
836.5	20525	5	25	0	16QAM	19.49	-
846.5	20625	5	1	0	QPSK	20.88	-
846.5	20625	5	1	24	QPSK	20.93	-
846.5	20625	5	1	12	QPSK	20.82	-
846.5	20625	5	12	6	QPSK	20.32	-
846.5	20625	5	25	0	QPSK	20.38	-
846.5	20625	5	1	0	16QAM	20	-
846.5	20625	5	1	24	16QAM	20.15	-
846.5	20625	5	1	12	16QAM	19.91	-
846.5	20625	5	12	6	16QAM	19.13	-
846.5	20625	5	25	0	16QAM	19.36	-

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
829.0	20450	10	1	0	QPSK	21.06	-
829.0	20450	10	1	49	QPSK	21.04	-
829.0	20450	10	1	24	QPSK	21.17	-
829.0	20450	10	25	12	QPSK	20.35	-
829.0	20450	10	50	0	QPSK	20.39	-
829.0	20450	10	1	0	16QAM	20.31	-
829.0	20450	10	1	49	16QAM	20.23	-
829.0	20450	10	1	24	16QAM	20.42	-
829.0	20450	10	25	12	16QAM	19.55	-
829.0	20450	10	50	0	16QAM	19.32	-
836.5	20525	10	1	0	QPSK	20.73	-
836.5	20525	10	1	49	QPSK	21.02	-
836.5	20525	10	1	24	QPSK	21.23	-
836.5	20525	10	25	12	QPSK	20.4	-
836.5	20525	10	50	0	QPSK	20.56	-
836.5	20525	10	1	0	16QAM	19.78	-
836.5	20525	10	1	49	16QAM	20.43	-
836.5	20525	10	1	24	16QAM	20.61	-
836.5	20525	10	25	12	16QAM	19.29	-
836.5	20525	10	50	0	16QAM	19.5	-
844.0	20600	10	1	0	QPSK	21.25	-
844.0	20600	10	1	49	QPSK	20.92	-
844.0	20600	10	1	24	QPSK	20.91	-
844.0	20600	10	25	12	QPSK	20.23	-
844.0	20600	10	50	0	QPSK	20.01	-
844.0	20600	10	1	0	16QAM	20.86	-
844.0	20600	10	1	49	16QAM	20.45	-
844.0	20600	10	1	24	16QAM	20.16	-
844.0	20600	10	25	12	16QAM	19.19	-
844.0	20600	10	50	0	16QAM	19.08	-

Type: RM-820; Serial number: 004402/13/870728/0 used for LTE1700/2100 (Band 4) SAR Head, Body-worn and Wireless Router measurements.

"Max Average Power (dBm)" column lists measured powers with MPR active. The "Reduced Power (dBm)" column lists measured powers with MPR and A-MPR active (as defined by 3GPP TS 36.101). A-MPR is not specified for LTE1700/2100 (Band 4) in 1.4MHz Channel BW in this specification (Table 6.2.4-1).

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
1710.7	19957	1.4	1	0	QPSK	22.04	-
1710.7	19957	1.4	1	5	QPSK	22.35	-
1710.7	19957	1.4	1	2	QPSK	22.23	-
1710.7	19957	1.4	3	2	QPSK	22.14	-
1710.7	19957	1.4	6	0	QPSK	21.52	-
1710.7	19957	1.4	1	0	16QAM	21.3	-
1710.7	19957	1.4	1	5	16QAM	21.2	-
1710.7	19957	1.4	1	2	16QAM	21.46	-
1710.7	19957	1.4	3	2	16QAM	21.61	-
1710.7	19957	1.4	6	0	16QAM	20.62	-
1732.5	20175	1.4	1	0	QPSK	21.98	-
1732.5	20175	1.4	1	5	QPSK	21.98	-
1732.5	20175	1.4	1	2	QPSK	21.97	-
1732.5	20175	1.4	3	2	QPSK	22.29	-
1732.5	20175	1.4	6	0	QPSK	21.42	-
1732.5	20175	1.4	1	0	16QAM	21.06	-
1732.5	20175	1.4	1	5	16QAM	21.12	-
1732.5	20175	1.4	1	2	16QAM	21.29	-
1732.5	20175	1.4	3	2	16QAM	21.5	-
1732.5	20175	1.4	6	0	16QAM	20.46	-
1754.3	20393	1.4	1	0	QPSK	22.13	-
1754.3	20393	1.4	1	5	QPSK	22.15	-
1754.3	20393	1.4	1	2	QPSK	22.07	-
1754.3	20393	1.4	3	2	QPSK	22.27	-
1754.3	20393	1.4	6	0	QPSK	21.34	-
1754.3	20393	1.4	1	0	16QAM	21.18	-
1754.3	20393	1.4	1	5	16QAM	21.24	-
1754.3	20393	1.4	1	2	16QAM	21.55	-
1754.3	20393	1.4	3	2	16QAM	21.58	-
1754.3	20393	1.4	6	0	16QAM	20.55	-

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
1711.5	19965	3	1	0	QPSK	22.11	22.14
1711.5	19965	3	1	14	QPSK	22.34	22.41
1711.5	19965	3	1	7	QPSK	22.35	22.29
1711.5	19965	3	8	3	QPSK	21.58	20.71
1711.5	19965	3	15	0	QPSK	21.59	20.75
1711.5	19965	3	1	0	16QAM	21.57	21.67
1711.5	19965	3	1	14	16QAM	21.93	21.86
1711.5	19965	3	1	7	16QAM	21.72	21.89
1711.5	19965	3	8	3	16QAM	20.77	19.84
1711.5	19965	3	15	0	16QAM	20.71	19.63
1732.5	20175	3	1	0	QPSK	22.08	22.03
1732.5	20175	3	1	14	QPSK	22.03	22.03
1732.5	20175	3	1	7	QPSK	22.09	22.02
1732.5	20175	3	8	3	QPSK	21.45	20.56
1732.5	20175	3	15	0	QPSK	21.57	20.58
1732.5	20175	3	1	0	16QAM	21.51	21.39
1732.5	20175	3	1	14	16QAM	21.33	21.37
1732.5	20175	3	1	7	16QAM	21.82	21.42
1732.5	20175	3	8	3	16QAM	20.87	19.58
1732.5	20175	3	15	0	16QAM	20.61	19.28
1753.5	20385	3	1	0	QPSK	22.15	22.13
1753.5	20385	3	1	14	QPSK	22.07	22.13
1753.5	20385	3	1	7	QPSK	22.08	22.08
1753.5	20385	3	8	3	QPSK	21.44	20.61
1753.5	20385	3	15	0	QPSK	21.46	20.57
1753.5	20385	3	1	0	16QAM	21.55	21.48
1753.5	20385	3	1	14	16QAM	21.66	21.52
1753.5	20385	3	1	7	16QAM	21.3	21.39
1753.5	20385	3	8	3	16QAM	20.7	19.77
1753.5	20385	3	15	0	16QAM	20.49	19.54

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
1712.5	19975	5	1	0	QPSK	22.12	22.08
1712.5	19975	5	1	24	QPSK	22.3	22.22
1712.5	19975	5	1	12	QPSK	22.38	22.29
1712.5	19975	5	12	6	QPSK	21.52	20.77
1712.5	19975	5	25	0	QPSK	21.69	20.82
1712.5	19975	5	1	0	16QAM	21.71	21.19
1712.5	19975	5	1	24	16QAM	21.61	21.38
1712.5	19975	5	1	12	16QAM	21.45	21.36
1712.5	19975	5	12	6	16QAM	20.76	19.76
1712.5	19975	5	25	0	16QAM	20.68	19.84
1732.5	20175	5	1	0	QPSK	22.15	21.99
1732.5	20175	5	1	24	QPSK	22.01	21.92
1732.5	20175	5	1	12	QPSK	21.99	21.97
1732.5	20175	5	12	6	QPSK	21.48	20.57
1732.5	20175	5	25	0	QPSK	21.48	20.55
1732.5	20175	5	1	0	16QAM	21.47	21.20
1732.5	20175	5	1	24	16QAM	21.67	21.17
1732.5	20175	5	1	12	16QAM	21.26	21.26
1732.5	20175	5	12	6	16QAM	20.43	19.35
1732.5	20175	5	25	0	16QAM	20.56	19.36
1752.5	20375	5	1	0	QPSK	22.04	21.99
1752.5	20375	5	1	24	QPSK	22.06	22.04
1752.5	20375	5	1	12	QPSK	22.18	22.08
1752.5	20375	5	12	6	QPSK	21.41	20.64
1752.5	20375	5	25	0	QPSK	21.48	20.64
1752.5	20375	5	1	0	16QAM	21.63	21.38
1752.5	20375	5	1	24	16QAM	21.69	21.30
1752.5	20375	5	1	12	16QAM	21.45	21.34
1752.5	20375	5	12	6	16QAM	20.72	19.58
1752.5	20375	5	25	0	16QAM	20.55	19.66

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
1715.0	20000	10	1	0	QPSK	22.32	22.26
1715.0	20000	10	1	49	QPSK	22.2	22.30
1715.0	20000	10	1	24	QPSK	22.33	22.30
1715.0	20000	10	25	12	QPSK	21.64	20.73
1715.0	20000	10	50	0	QPSK	21.59	20.80
1715.0	20000	10	1	0	16QAM	21.6	21.59
1715.0	20000	10	1	49	16QAM	21.37	21.63
1715.0	20000	10	1	24	16QAM	21.75	21.62
1715.0	20000	10	25	12	16QAM	20.87	19.79
1715.0	20000	10	50	0	16QAM	20.84	19.79
1732.5	20175	10	1	0	QPSK	22.16	22.07
1732.5	20175	10	1	49	QPSK	21.93	21.85
1732.5	20175	10	1	24	QPSK	21.96	21.96
1732.5	20175	10	25	12	QPSK	21.53	20.56
1732.5	20175	10	50	0	QPSK	21.53	20.59
1732.5	20175	10	1	0	16QAM	21.69	21.68
1732.5	20175	10	1	49	16QAM	21.29	21.44
1732.5	20175	10	1	24	16QAM	21.51	21.49
1732.5	20175	10	25	12	16QAM	20.66	19.42
1732.5	20175	10	50	0	16QAM	20.52	19.44
1750.0	20350	10	1	0	QPSK	21.83	21.75
1750.0	20350	10	1	49	QPSK	22.01	21.84
1750.0	20350	10	1	24	QPSK	22.03	21.88
1750.0	20350	10	25	12	QPSK	21.36	20.52
1750.0	20350	10	50	0	QPSK	21.48	20.53
1750.0	20350	10	1	0	16QAM	21.09	21.40
1750.0	20350	10	1	49	16QAM	21.23	21.35
1750.0	20350	10	1	24	16QAM	21.44	21.39
1750.0	20350	10	25	12	16QAM	20.74	19.54
1750.0	20350	10	50	0	16QAM	20.49	19.42

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
1717.5	20025	15	1	0	QPSK	22.41	22.38
1717.5	20025	15	1	74	QPSK	22.15	22.18
1717.5	20025	15	1	36	QPSK	22.31	22.34
1717.5	20025	15	37	18	QPSK	21.68	20.84
1717.5	20025	15	75	0	QPSK	21.56	20.76
1717.5	20025	15	1	0	16QAM	21.61	21.62
1717.5	20025	15	1	74	16QAM	21.89	21.60
1717.5	20025	15	1	36	16QAM	21.96	21.78
1717.5	20025	15	37	18	16QAM	20.82	19.74
1717.5	20025	15	75	0	16QAM	20.74	19.63
1732.5	20175	15	1	0	QPSK	22.11	22.11
1732.5	20175	15	1	74	QPSK	21.77	21.71
1732.5	20175	15	1	36	QPSK	22	21.98
1732.5	20175	15	37	18	QPSK	21.49	20.52
1732.5	20175	15	75	0	QPSK	21.42	20.53
1732.5	20175	15	1	0	16QAM	21.63	21.59
1732.5	20175	15	1	74	16QAM	21.36	21.21
1732.5	20175	15	1	36	16QAM	21.76	21.56
1732.5	20175	15	37	18	16QAM	20.64	19.44
1732.5	20175	15	75	0	16QAM	20.51	19.39
1747.5	20325	15	1	0	QPSK	21.82	21.81
1747.5	20325	15	1	74	QPSK	21.99	21.90
1747.5	20325	15	1	36	QPSK	22.05	21.86
1747.5	20325	15	37	18	QPSK	21.35	20.44
1747.5	20325	15	75	0	QPSK	21.26	20.33
1747.5	20325	15	1	0	16QAM	21.48	21.33
1747.5	20325	15	1	74	16QAM	21.42	21.26
1747.5	20325	15	1	36	16QAM	21.21	21.36
1747.5	20325	15	37	18	16QAM	20.66	19.35
1747.5	20325	15	75	0	16QAM	20.34	19.27

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
1720.0	20050	20	1	0	QPSK	22.48	22.38
1720.0	20050	20	1	99	QPSK	21.97	22.00
1720.0	20050	20	1	49	QPSK	22.25	22.33
1720.0	20050	20	50	24	QPSK	21.57	20.82
1720.0	20050	20	100	0	QPSK	21.6	20.74
1720.0	20050	20	1	0	16QAM	21.94	21.74
1720.0	20050	20	1	99	16QAM	21.12	21.38
1720.0	20050	20	1	49	16QAM	21.41	21.69
1720.0	20050	20	50	24	16QAM	20.77	19.68
1720.0	20050	20	100	0	16QAM	20.68	19.64
1732.5	20175	20	1	0	QPSK	22.23	22.20
1732.5	20175	20	1	99	QPSK	21.72	21.73
1732.5	20175	20	1	49	QPSK	22.02	21.91
1732.5	20175	20	50	24	QPSK	21.48	20.58
1732.5	20175	20	100	0	QPSK	21.43	20.53
1732.5	20175	20	1	0	16QAM	21.37	21.67
1732.5	20175	20	1	99	16QAM	21.17	21.35
1732.5	20175	20	1	49	16QAM	21.58	21.53
1732.5	20175	20	50	24	16QAM	20.63	19.39
1732.5	20175	20	100	0	16QAM	20.44	19.30
1745.0	20300	20	1	0	QPSK	21.93	21.93
1745.0	20300	20	1	99	QPSK	22	21.87
1745.0	20300	20	1	49	QPSK	21.92	21.82
1745.0	20300	20	50	24	QPSK	21.26	20.36
1745.0	20300	20	100	0	QPSK	21.32	20.43
1745.0	20300	20	1	0	16QAM	21.61	21.49
1745.0	20300	20	1	99	16QAM	21.24	21.26
1745.0	20300	20	1	49	16QAM	21.06	21.27
1745.0	20300	20	50	24	16QAM	20.4	19.29
1745.0	20300	20	100	0	16QAM	20.4	19.21

Type: RM-820; Serial number: 004402/13/870748/8 used for LTE1900 (Band 2) SAR Head, Body-worn and Wireless Router measurements.

"Max Average Power (dBm)" column lists measured powers with MPR active. The "Reduced Power (dBm)" column lists measured powers with MPR and A-MPR active (as defined by 3GPP TS 36.101). A-MPR is not specified for LTE1900 (Band 2) in 1.4MHz Channel BW in this specification (Table 6.2.4-1).

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
1850.7	18607	1.4	1	0	QPSK	22.72	-
1850.7	18607	1.4	1	5	QPSK	22.71	-
1850.7	18607	1.4	1	2	QPSK	22.71	-
1850.7	18607	1.4	3	2	QPSK	22.74	-
1850.7	18607	1.4	6	0	QPSK	21.86	-
1850.7	18607	1.4	1	0	16QAM	22.07	-
1850.7	18607	1.4	1	5	16QAM	22.04	-
1850.7	18607	1.4	1	2	16QAM	21.78	-
1850.7	18607	1.4	3	2	16QAM	21.8	-
1850.7	18607	1.4	6	0	16QAM	20.93	-
1880.0	18900	1.4	1	0	QPSK	22.38	-
1880.0	18900	1.4	1	5	QPSK	22.36	-
1880.0	18900	1.4	1	2	QPSK	22.52	-
1880.0	18900	1.4	3	2	QPSK	22.59	-
1880.0	18900	1.4	6	0	QPSK	21.7	-
1880.0	18900	1.4	1	0	16QAM	21.73	-
1880.0	18900	1.4	1	5	16QAM	21.71	-
1880.0	18900	1.4	1	2	16QAM	21.97	-
1880.0	18900	1.4	3	2	16QAM	21.81	-
1880.0	18900	1.4	6	0	16QAM	20.56	-
1909.3	19193	1.4	1	0	QPSK	22.84	-
1909.3	19193	1.4	1	5	QPSK	23.03	-
1909.3	19193	1.4	1	2	QPSK	22.84	-
1909.3	19193	1.4	3	2	QPSK	23.16	-
1909.3	19193	1.4	6	0	QPSK	22.15	-
1909.3	19193	1.4	1	0	16QAM	21.77	-
1909.3	19193	1.4	1	5	16QAM	22.16	-
1909.3	19193	1.4	1	2	16QAM	21.83	-
1909.3	19193	1.4	3	2	16QAM	22.24	-
1909.3	19193	1.4	6	0	16QAM	21.09	-

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
1851.5	18615	3	1	0	QPSK	22.54	22.64
1851.5	18615	3	1	14	QPSK	22.8	22.82
1851.5	18615	3	1	7	QPSK	22.73	22.75
1851.5	18615	3	8	3	QPSK	21.91	20.90
1851.5	18615	3	15	0	QPSK	22.06	20.82
1851.5	18615	3	1	0	16QAM	21.44	21.75
1851.5	18615	3	1	14	16QAM	21.88	21.86
1851.5	18615	3	1	7	16QAM	21.91	21.82
1851.5	18615	3	8	3	16QAM	21.04	20.07
1851.5	18615	3	15	0	16QAM	20.71	19.76
1880.0	18900	3	1	0	QPSK	22.53	22.44
1880.0	18900	3	1	14	QPSK	22.33	22.33
1880.0	18900	3	1	7	QPSK	22.28	22.35
1880.0	18900	3	8	3	QPSK	21.76	20.58
1880.0	18900	3	15	0	QPSK	21.79	20.62
1880.0	18900	3	1	0	16QAM	21.77	21.74
1880.0	18900	3	1	14	16QAM	21.46	21.76
1880.0	18900	3	1	7	16QAM	21.68	21.62
1880.0	18900	3	8	3	16QAM	21.02	19.78
1880.0	18900	3	15	0	16QAM	20.64	19.57
1908.5	19185	3	1	0	QPSK	22.82	22.72
1908.5	19185	3	1	14	QPSK	22.72	22.69
1908.5	19185	3	1	7	QPSK	22.8	22.71
1908.5	19185	3	8	3	QPSK	22.02	20.91
1908.5	19185	3	15	0	QPSK	21.98	20.98
1908.5	19185	3	1	0	16QAM	21.86	22.04
1908.5	19185	3	1	14	16QAM	21.91	22.09
1908.5	19185	3	1	7	16QAM	21.96	22.05
1908.5	19185	3	8	3	16QAM	21.25	20.02
1908.5	19185	3	15	0	16QAM	20.9	19.86

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
1852.5	18625	5	1	0	QPSK	22.65	22.64
1852.5	18625	5	1	24	QPSK	22.81	22.82
1852.5	18625	5	1	12	QPSK	22.78	22.75
1852.5	18625	5	12	6	QPSK	21.81	20.83
1852.5	18625	5	25	0	QPSK	21.97	20.91
1852.5	18625	5	1	0	16QAM	21.76	21.56
1852.5	18625	5	1	24	16QAM	21.77	21.65
1852.5	18625	5	1	12	16QAM	22.04	21.74
1852.5	18625	5	12	6	16QAM	20.72	19.76
1852.5	18625	5	25	0	16QAM	20.85	19.86
1880.0	18900	5	1	0	QPSK	22.35	22.37
1880.0	18900	5	1	24	QPSK	22.4	22.42
1880.0	18900	5	1	12	QPSK	22.39	22.23
1880.0	18900	5	12	6	QPSK	21.66	20.63
1880.0	18900	5	25	0	QPSK	21.76	20.67
1880.0	18900	5	1	0	16QAM	21.96	21.71
1880.0	18900	5	1	24	16QAM	21.69	21.57
1880.0	18900	5	1	12	16QAM	21.6	21.58
1880.0	18900	5	12	6	16QAM	20.79	19.60
1880.0	18900	5	25	0	16QAM	20.51	19.64
1907.5	19175	5	1	0	QPSK	22.68	22.52
1907.5	19175	5	1	24	QPSK	22.64	22.61
1907.5	19175	5	1	12	QPSK	22.69	22.68
1907.5	19175	5	12	6	QPSK	22.03	20.97
1907.5	19175	5	25	0	QPSK	22.04	21.01
1907.5	19175	5	1	0	16QAM	22.09	22.15
1907.5	19175	5	1	24	16QAM	22.1	21.85
1907.5	19175	5	1	12	16QAM	22.04	22.02
1907.5	19175	5	12	6	16QAM	20.97	19.88
1907.5	19175	5	25	0	16QAM	20.96	19.93

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
1855.0	18650	10	1	0	QPSK	22.67	22.66
1855.0	18650	10	1	49	QPSK	22.68	22.82
1855.0	18650	10	1	24	QPSK	22.71	22.75
1855.0	18650	10	25	12	QPSK	21.94	20.90
1855.0	18650	10	50	0	QPSK	22.07	20.96
1855.0	18650	10	1	0	16QAM	21.73	21.89
1855.0	18650	10	1	49	16QAM	21.92	22.00
1855.0	18650	10	1	24	16QAM	21.99	21.91
1855.0	18650	10	25	12	16QAM	20.93	19.89
1855.0	18650	10	50	0	16QAM	20.75	19.94
1880.0	18900	10	1	0	QPSK	22.46	22.37
1880.0	18900	10	1	49	QPSK	22.28	22.32
1880.0	18900	10	1	24	QPSK	22.29	22.25
1880.0	18900	10	25	12	QPSK	21.74	20.66
1880.0	18900	10	50	0	QPSK	21.84	20.69
1880.0	18900	10	1	0	16QAM	21.78	21.93
1880.0	18900	10	1	49	16QAM	21.62	21.77
1880.0	18900	10	1	24	16QAM	21.68	21.58
1880.0	18900	10	25	12	16QAM	20.73	19.64
1880.0	18900	10	50	0	16QAM	20.68	19.71
1905.0	19150	10	1	0	QPSK	22.64	22.62
1905.0	19150	10	1	49	QPSK	22.66	22.56
1905.0	19150	10	1	24	QPSK	22.65	22.55
1905.0	19150	10	25	12	QPSK	21.96	20.92
1905.0	19150	10	50	0	QPSK	22	20.96
1905.0	19150	10	1	0	16QAM	22.26	22.06
1905.0	19150	10	1	49	16QAM	22.04	21.97
1905.0	19150	10	1	24	16QAM	21.99	21.93
1905.0	19150	10	25	12	16QAM	21	19.85
1905.0	19150	10	50	0	16QAM	20.94	19.96

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
1857.5	18675	15	1	0	QPSK	22.69	22.69
1857.5	18675	15	1	74	QPSK	22.94	22.92
1857.5	18675	15	1	36	QPSK	22.83	22.80
1857.5	18675	15	37	18	QPSK	22	20.96
1857.5	18675	15	75	0	QPSK	21.99	20.89
1857.5	18675	15	1	0	16QAM	21.88	21.89
1857.5	18675	15	1	74	16QAM	22.35	22.10
1857.5	18675	15	1	36	16QAM	22.08	21.95
1857.5	18675	15	37	18	16QAM	21.03	19.93
1857.5	18675	15	75	0	16QAM	20.77	19.95
1880.0	18900	15	1	0	QPSK	22.62	22.53
1880.0	18900	15	1	74	QPSK	22.17	22.17
1880.0	18900	15	1	36	QPSK	22.28	22.27
1880.0	18900	15	37	18	QPSK	21.8	20.62
1880.0	18900	15	75	0	QPSK	21.74	20.68
1880.0	18900	15	1	0	16QAM	22.15	22.08
1880.0	18900	15	1	74	16QAM	22.05	21.69
1880.0	18900	15	1	36	16QAM	22	21.60
1880.0	18900	15	37	18	16QAM	20.97	19.66
1880.0	18900	15	75	0	16QAM	20.65	19.72
1902.5	19125	15	1	0	QPSK	22.67	22.72
1902.5	19125	15	1	74	QPSK	22.65	22.59
1902.5	19125	15	1	36	QPSK	22.73	22.68
1902.5	19125	15	37	18	QPSK	22.07	21.04
1902.5	19125	15	75	0	QPSK	22	20.94
1902.5	19125	15	1	0	16QAM	22.41	22.21
1902.5	19125	15	1	74	16QAM	22.19	21.97
1902.5	19125	15	1	36	16QAM	22.02	22.12
1902.5	19125	15	37	18	16QAM	21.18	20.03
1902.5	19125	15	75	0	16QAM	21.11	20.00

Frequency (MHz)	Channel Number	Bandwidth (MHz)	RB Number	RB Offset	Modulation	Max Average Power (dBm)	Reduced Power (dBm)
1860.0	18700	20	1	0	QPSK	22.67	22.65
1860.0	18700	20	1	99	QPSK	22.76	22.77
1860.0	18700	20	1	49	QPSK	22.98	23.00
1860.0	18700	20	50	24	QPSK	22.08	21.13
1860.0	18700	20	100	0	QPSK	22.19	21.06
1860.0	18700	20	1	0	16QAM	21.68	21.85
1860.0	18700	20	1	99	16QAM	21.72	22.04
1860.0	18700	20	1	49	16QAM	22.33	22.21
1860.0	18700	20	50	24	16QAM	21.01	20.10
1860.0	18700	20	100	0	16QAM	20.86	19.99
1880.0	18900	20	1	0	QPSK	22.53	22.52
1880.0	18900	20	1	99	QPSK	22.25	22.28
1880.0	18900	20	1	49	QPSK	22.32	22.23
1880.0	18900	20	50	24	QPSK	21.8	20.68
1880.0	18900	20	100	0	QPSK	21.77	20.65
1880.0	18900	20	1	0	16QAM	21.82	21.87
1880.0	18900	20	1	99	16QAM	21.84	21.68
1880.0	18900	20	1	49	16QAM	21.9	21.65
1880.0	18900	20	50	24	16QAM	20.63	19.71
1880.0	18900	20	100	0	16QAM	20.61	19.71
1900.0	19100	20	1	0	QPSK	22.41	22.50
1900.0	19100	20	1	99	QPSK	22.71	22.59
1900.0	19100	20	1	49	QPSK	22.8	22.64
1900.0	19100	20	50	24	QPSK	22.13	21.06
1900.0	19100	20	100	0	QPSK	22.21	21.09
1900.0	19100	20	1	0	16QAM	22.32	21.85
1900.0	19100	20	1	99	16QAM	21.69	22.10
1900.0	19100	20	1	49	16QAM	22.13	22.17
1900.0	19100	20	50	24	16QAM	21.21	20.03
1900.0	19100	20	100	0	16QAM	21.1	20.08

APPENDIX H: CONDUCTED POWER MEASUREMENTS FOR SUPPORTED GSM/GPRS/EGPRS TRANSMISSION MODES

H.1 Power Tuning Targets

Tuning targets GSM850			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	-	32.5	-
GPRS 2-slot	-	32.5	-
EGRPS 1-slot	-	26.5	-
EGPRS 2-slot	-	26.5	-

Tuning targets GSM1900			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	-	29.5	-
GPRS 2-slot	-	29.5	-
EGRPS 1-slot	-	25.5	-
EGPRS 2-slot	-	25.5	-

H.2 Conducted Power from the Samples used in the Testing

Type: RM-820; Serial number: 004402/13/870752/0 used for GSM/GPRS/EGPRS850 SAR Head, Body-worn and Wireless Router measurements.

GSM850			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	31.57	31.60	31.82
GPRS 2-slot	31.32	31.34	31.57
EGRPS 1-slot	25.58	25.81	25.81
EGPRS 2-slot	25.67	25.73	26.03

GSM1900			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	29.01	28.90	28.90
GPRS 2-slot	28.68	28.85	28.82
EGRPS 1-slot	24.95	25.06	25.09
EGPRS 2-slot	24.94	25.02	25.22

APPENDIX I: CONDUCTED POWER MEASUREMENTS FOR SUPPORTED WCDMA TRANSMISSION MODES

I.1 Power Tuning Targets

Tuning targets			
Mode	Low channel	Mid channel	High channel
WCDMA850	-	23.5	-
WCDMA1700/2100	-	23.5	-
WCDMA1900	-	23.5	-

I.2 Conducted Power from the Samples used in the Testing

Type: RM-820; Serial number: 004402/13/870734/8 used for WCDMA850/1900 SAR Head, Body-worn and Wireless Router measurements.

Type: RM-820; Serial number: 004402/13/870738/9 used for WCDMA1700/2100 SAR Head, Body-worn and Wireless Router measurements.

WCDMA850 (Band 5)			
Mode	Low channel	Mid channel	High channel
WCDMA	23.93	23.48	23.94

WCDMA1700/2100 (Band 4)			
Mode	Low channel	Mid channel	High channel
WCDMA	23.66	23.47	23.57

WCDMA1900 (Band 2)			
Mode	Low channel	Mid channel	High channel
WCDMA	23.44	23.33	23.49

WCDMA and HSUPA Subtest mode conducted powers, measured from as separate, fully representative sample are presented in Appendix D.

APPENDIX J: CONDUCTED POWER RESULTS FOR WLAN2450 AND WLAN5000

J.1 Power Tuning Targets

Tuning targets for WLAN 2.4 GHz					
Modulation mode	Ch 1	Ch 2	Ch 6	Ch 10	Ch 11
b-mode WLAN DSSS 1 Mbps	16	16	16	16	16
b-mode WLAN DSSS 2 Mbps	16	16	16	16	16
b-mode WLAN DSSS 5.5 Mbps	16	16	16	16	16
b-mode WLAN DSSS 11 Mbps	16	16	16	16	16
g-mode WLAN OFDM 6 Mbps	15	15	15	15	15
g-mode WLAN OFDM 9 Mbps	15	15	15	15	15
g-mode WLAN OFDM 12 Mbps	15	15	15	15	15
g-mode WLAN OFDM 18 Mbps	15	15	15	15	15
g-mode WLAN OFDM 24 Mbps	13	13	13	13	13
g-mode WLAN OFDM 36 Mbps	13	13	13	13	13
g-mode WLAN OFDM 48 Mbps	12	12	12	12	12
g-mode WLAN OFDM 54 Mbps	12	12	12	12	12
n-mode MCS 0: OFDM 6.5 / 7.25 Mbps	15	15	15	15	15
n-mode MCS 1: OFDM 13.0 / 14.4 Mbps	15	15	15	15	15
n-mode MCS 2: OFDM 19.5 / 21.7 Mbps	15	15	15	15	15
n-mode MCS 3: OFDM 26.0 / 28.9 Mbps	13	13	13	13	13
n-mode MCS 4: OFDM 39.0 / 43.3 Mbps	13	13	13	13	13
n-mode MCS 5: OFDM 52.0 / 57.8 Mbps	11	11	11	11	11
n-mode MCS 6: OFDM 58.5 / 65.0 Mbps	11	11	11	11	11
n-mode MCS 7: OFDM 65.0 / 72.2 Mbps	11	11	11	11	11

WLAN 5 GHz	
Mode	Channel
	All channels
WLAN OFDM 6 Mbps	14
WLAN OFDM 9 Mbps	14
WLAN OFDM 12 Mbps	14
WLAN OFDM 18 Mbps	14
WLAN OFDM 24 Mbps	12
WLAN OFDM 36 Mbps	12
WLAN OFDM 48 Mbps	11
WLAN OFDM 54 Mbps	11
MCS 0: OFDM 6.5 / 7.25 Mbps	14
MCS 1: OFDM 13.0 / 14.4 Mbps	14
MCS 2: OFDM 19.5 / 21.7 Mbps	14
MCS 3: OFDM 26.0 / 28.9 Mbps	12
MCS 4: OFDM 39.0 / 43.3 Mbps	12
MCS 5: OFDM 52.0 / 57.8 Mbps	11
MCS 6: OFDM 58.5 / 65.0 Mbps	11
MCS 7: OFDM 65.0 / 72.2 Mbps	10
MCS 0: OFDM13.5 / 15.0 Mbps	14
MCS 1: OFDM 27.0 / 30.0 Mbps	14
MCS 2: OFDM 40.5 / 45.0 Mbps	14
MCS 3: OFDM 54.0 / 60.0 Mbps	12
MCS 4: OFDM 81.0 / 90.0 Mbps	12
MCS 5: OFDM 108.0 / 120.0 Mbps	11
MCS 6: OFDM 121.5 / 135.0 Mbps	11
MCS 7: OFDM 135.0 / 150.0 Mbps	10

J.2 Conducted Power from the Samples used in the Testing

Type: RM-820; Serial number: 004402/13/870750/4 used for WLAN2450 SAR Head, Body-worn and Wireless Router measurements.

WLAN 2.4 GHz					
Modulation mode	Ch 1	Ch 2	Ch 6	Ch 10	Ch 11
b-mode WLAN DSSS 1 Mbps	15.55	15.74	16.28	16.09	15.77
b-mode WLAN DSSS 2 Mbps	15.60	15.77	16.32	16.10	15.78
b-mode WLAN DSSS 5.5 Mbps	15.92	16.13	16.55	16.27	15.94
b-mode WLAN DSSS 11 Mbps	15.79	15.99	16.50	16.22	15.91
g-mode WLAN OFDM 6 Mbps	15.13	15.43	15.94	15.65	15.40
g-mode WLAN OFDM 9 Mbps	15.16	15.42	15.94	15.66	15.46
g-mode WLAN OFDM 12 Mbps	15.16	15.46	15.98	15.70	15.47
g-mode WLAN OFDM 18 Mbps	15.19	15.51	16.05	15.76	15.47
g-mode WLAN OFDM 24 Mbps	13.78	14.22	14.55	14.32	14.00
g-mode WLAN OFDM 36 Mbps	13.94	14.28	14.54	14.36	14.08
g-mode WLAN OFDM 48 Mbps	12.27	12.69	13.01	12.47	12.18
g-mode WLAN OFDM 54 Mbps	12.23	12.60	12.98	12.54	12.33
n-mode MCS 0: OFDM 6.5 / 7.25 Mbps	14.44	14.73	15.20	14.84	14.61
n-mode MCS 1: OFDM 13.0 / 14.4 Mbps	14.45	14.76	15.19	14.92	14.63
n-mode MCS 2: OFDM 19.5 / 21.7 Mbps	14.53	14.86	15.33	14.99	14.68
n-mode MCS 3: OFDM 26.0 / 28.9 Mbps	13.76	14.08	14.46	14.15	13.87
n-mode MCS 4: OFDM 39.0 / 43.3 Mbps	13.81	14.17	14.53	14.15	13.86
n-mode MCS 5: OFDM 52.0 / 57.8 Mbps	12.24	12.46	12.78	12.37	12.18
n-mode MCS 6: OFDM 58.5 / 65.0 Mbps	12.21	12.49	12.91	12.49	12.20
n-mode MCS 7: OFDM 65.0 / 72.2 Mbps	10.30	10.70	11.00	10.45	10.13

Type: RM-820; Serial number: 004402/13/870740/5 used for WLAN5000 SAR Head and Body-worn measurements.

WLAN 5 GHz						
Mode	Channel					
	36	40	44	48	52	56
WLAN OFDM 6 Mbps	13.43173	13.46397	13.60755	13.61472	13.52216	13.49326
WLAN OFDM 9 Mbps	13.45555	13.52314	13.58275	13.65596	13.51175	13.52266
WLAN OFDM 12 Mbps	13.44276	13.52372	13.52774	13.63886	13.48987	13.57378
WLAN OFDM 18 Mbps	13.39611	13.40168	13.45538	13.52601	13.40191	13.49464
WLAN OFDM 24 Mbps	11.35927	11.41108	11.48259	11.54366	11.42526	11.47458
WLAN OFDM 36 Mbps	11.43555	11.47476	11.55114	11.6049	11.46372	11.52746
WLAN OFDM 48 Mbps	10.33163	10.35814	10.49131	10.5592	10.42142	10.40668
WLAN OFDM 54 Mbps	10.38657	10.41121	10.50885	10.55861	10.43545	10.47322
MCS 0: OFDM 6.5 / 7.25 Mbps	15.0809	14.9249	14.61729	14.78782	14.87765	14.90307
MCS 1: OFDM 13.0 / 14.4 Mbps	15.10138	14.94589	14.648	14.92244	14.87464	14.94807
MCS 2: OFDM 19.5 / 21.7 Mbps	15.2226	14.93014	14.79599	14.92916	15.0459	14.94226
MCS 3: OFDM 26.0 / 28.9 Mbps	14.10439	13.93672	13.80081	13.89353	13.99577	13.921
MCS 4: OFDM 39.0 / 43.3 Mbps	14.09823	13.9433	13.95691	13.88381	14.24691	14.1074
MCS 5: OFDM 52.0 / 57.8 Mbps	11.26902	11.10697	10.89645	10.94825	11.073	11.16357
MCS 6: OFDM 58.5 / 65.0 Mbps	11.3494	11.22303	10.92159	11.02458	11.00403	10.99301
MCS 7: OFDM 65.0 / 72.2 Mbps	11.28332	11.12572	11.00341	11.10805	11.00255	11.1024
MCS 0: OFDM13.5 / 15.0 Mbps	11.45731	11.45925	11.54341	11.58083	11.43267	11.49596
MCS 1: OFDM 27.0 / 30.0 Mbps	11.39173	11.44861	11.51905	11.5529	11.4933	11.49642
MCS 2: OFDM 40.5 / 45.0 Mbps	11.41036	11.41903	11.56729	11.56291	11.46059	11.46816
MCS 3: OFDM 54.0 / 60.0 Mbps	11.38572	11.402	11.53207	11.56229	11.44243	11.4621
MCS 4: OFDM 81.0 / 90.0 Mbps	10.4554	10.51878	10.55333	10.60989	10.45309	10.51186
MCS 5: OFDM 108.0 / 120.0 Mbps	9.450951	9.504999	9.588676	9.604453	9.459779	9.579563
MCS 6: OFDM 121.5 / 135.0 Mbps	9.360207	9.391034	9.514529	9.550073	9.421082	9.462117
MCS 7: OFDM 135.0 / 150.0 Mbps	9.36074	9.4605	9.603123	9.60242	9.466378	9.462104

(5GHz Table continues)

(5GHz Table continues)

WLAN 5 GHz						
Mode						
	60	64	100	104	108	112
WLAN OFDM 6 Mbps	13.53923	13.28664	13.88438	13.57196	13.74769	13.62832
WLAN OFDM 9 Mbps	13.53864	13.31804	13.88618	13.56894	13.74889	13.65269
WLAN OFDM 12 Mbps	13.52512	13.30699	13.87682	13.53322	13.76922	13.61976
WLAN OFDM 18 Mbps	13.47015	13.28174	13.80106	13.48441	13.61988	13.51119
WLAN OFDM 24 Mbps	11.44736	11.26126	11.80132	11.41552	11.70028	11.51055
WLAN OFDM 36 Mbps	11.50188	11.3475	11.89857	11.50644	11.72734	11.63401
WLAN OFDM 48 Mbps	10.42742	10.26905	10.80291	10.47037	10.67489	10.55861
WLAN OFDM 54 Mbps	10.47434	10.23375	10.81342	10.4767	10.64971	10.5332
MCS 0: OFDM 6.5 / 7.25 Mbps	14.83528	14.69675	14.91728	14.80897	14.78607	14.78607
MCS 1: OFDM 13.0 / 14.4 Mbps	14.84203	14.83314	15.00301	14.87599	14.78683	14.78683
MCS 2: OFDM 19.5 / 21.7 Mbps	14.80119	14.83252	15.00224	14.88579	14.93355	14.93355
MCS 3: OFDM 26.0 / 28.9 Mbps	13.98031	13.76868	14.04154	13.9341	13.81527	13.81527
MCS 4: OFDM 39.0 / 43.3 Mbps	13.90764	13.82617	14.06835	14.01138	13.77918	13.77918
MCS 5: OFDM 52.0 / 57.8 Mbps	10.95245	10.83788	11.16781	11.14675	10.84406	10.84406
MCS 6: OFDM 58.5 / 65.0 Mbps	11.09818	10.98522	11.0005	11.00178	10.91588	10.91588
MCS 7: OFDM 65.0 / 72.2 Mbps	10.95448	10.75725	11.0598	11.11479	10.98278	10.98278
MCS 0: OFDM13.5 / 15.0 Mbps	11.54417	11.27369	11.85826	11.47511	11.72142	11.58428
MCS 1: OFDM 27.0 / 30.0 Mbps	11.49495	11.33987	11.84992	11.49352	11.73163	11.61286
MCS 2: OFDM 40.5 / 45.0 Mbps	11.48967	11.31308	11.82129	11.51994	11.62832	11.53099
MCS 3: OFDM 54.0 / 60.0 Mbps	11.46714	11.2495	11.80616	11.49516	11.61585	11.5657
MCS 4: OFDM 81.0 / 90.0 Mbps	10.51523	10.30655	10.89466	10.57401	10.74989	10.69113
MCS 5: OFDM 108.0 / 120.0 Mbps	9.507649	9.337188	9.889624	9.496985	9.749938	9.663239
MCS 6: OFDM 121.5 / 135.0 Mbps	9.498587	9.302504	9.833207	9.517883	9.730447	9.608568
MCS 7: OFDM 135.0 / 150.0 Mbps	9.483187	9.30229	9.854378	9.548397	9.681602	9.623245

(5GHz Table continues)

(5GHz Table continues)

WLAN 5 GHz						
Mode						
	116	120	124	128	132	136
WLAN OFDM 6 Mbps	13.35312	13.48648	13.60578	13.41155	13.29273	13.48637
WLAN OFDM 9 Mbps	13.345	13.57218	13.60125	13.48223	13.3843	13.54193
WLAN OFDM 12 Mbps	13.33369	13.52639	13.63655	13.46931	13.28866	13.53162
WLAN OFDM 18 Mbps	13.2444	13.44284	13.57826	13.33691	13.21658	13.42257
WLAN OFDM 24 Mbps	11.20677	11.49636	11.52326	11.39059	11.29018	11.43068
WLAN OFDM 36 Mbps	11.31685	11.52196	11.64532	11.46232	11.32938	11.51125
WLAN OFDM 48 Mbps	10.30139	10.43331	10.58293	10.37198	10.24941	10.45829
WLAN OFDM 54 Mbps	10.29809	10.4513	10.53678	10.33377	10.24375	10.50929
MCS 0: OFDM 6.5 / 7.25 Mbps	14.67254	14.5913	14.26243	14.31269	14.18	13.92501
MCS 1: OFDM 13.0 / 14.4 Mbps	14.74496	14.56426	14.42337	14.43181	14.26753	13.96361
MCS 2: OFDM 19.5 / 21.7 Mbps	14.71661	14.67677	14.51081	14.56833	14.32489	14.03478
MCS 3: OFDM 26.0 / 28.9 Mbps	13.72518	13.60581	13.51983	13.43674	13.25467	13.03976
MCS 4: OFDM 39.0 / 43.3 Mbps	13.80367	13.64256	13.55275	13.63645	13.33865	13.0488
MCS 5: OFDM 52.0 / 57.8 Mbps	10.99537	10.70374	10.53569	10.4595	10.51753	10.07302
MCS 6: OFDM 58.5 / 65.0 Mbps	10.96561	10.64974	10.46552	10.5794	10.39569	10.13843
MCS 7: OFDM 65.0 / 72.2 Mbps	10.93153	10.75575	10.57195	10.52777	10.50591	10.03211
MCS 0: OFDM13.5 / 15.0 Mbps	11.27529	11.51026	11.60894	11.40444	11.35445	11.46257
MCS 1: OFDM 27.0 / 30.0 Mbps	11.3229	11.50929	11.60457	11.43052	11.29247	11.49392
MCS 2: OFDM 40.5 / 45.0 Mbps	11.29617	11.51701	11.55349	11.34528	11.30526	11.51854
MCS 3: OFDM 54.0 / 60.0 Mbps	11.2799	11.47727	11.55082	11.31353	11.24932	11.49872
MCS 4: OFDM 81.0 / 90.0 Mbps	10.3783	10.58952	10.69297	10.43567	10.3032	10.56911
MCS 5: OFDM 108.0 / 120.0 Mbps	9.340265	9.523248	9.620555	9.411578	9.300032	9.523989
MCS 6: OFDM 121.5 / 135.0 Mbps	9.326642	9.486102	9.547861	9.353039	9.258253	9.461518
MCS 7: OFDM 135.0 / 150.0 Mbps	9.30428	9.497435	9.623785	9.382137	9.344789	9.473339

(5GHz Table continues)

(5GHz Table continues)

WLAN 5 GHz						
Mode						
	140	149	153	157	161	165
WLAN OFDM 6 Mbps	13.41015	13.59262	13.41163	13.6372	13.437	13.31378
WLAN OFDM 9 Mbps	13.47857	13.6344	13.46912	13.60423	13.48023	13.33878
WLAN OFDM 12 Mbps	13.47418	13.57903	13.43504	13.66347	13.4453	13.29276
WLAN OFDM 18 Mbps	13.35992	13.57026	13.36112	13.55079	13.37192	13.2492
WLAN OFDM 24 Mbps	11.35005	11.56876	11.33476	11.59266	11.34081	11.24415
WLAN OFDM 36 Mbps	11.48925	11.64661	11.40704	11.66043	11.4965	11.38704
WLAN OFDM 48 Mbps	10.38941	10.56304	10.31597	10.50369	10.39472	10.28413
WLAN OFDM 54 Mbps	10.35741	10.57556	10.3156	10.54508	10.34381	10.26069
MCS 0: OFDM 6.5 / 7.25 Mbps	13.89497	14.24845	14.16684	14.28305	14.21374	14.16702
MCS 1: OFDM 13.0 / 14.4 Mbps	14.01512	14.41159	14.33359	14.46924	14.39567	14.30861
MCS 2: OFDM 19.5 / 21.7 Mbps	14.13244	14.4585	14.3049	14.49851	14.34517	14.31205
MCS 3: OFDM 26.0 / 28.9 Mbps	13.06173	13.36998	13.22688	13.52935	13.31778	13.26756
MCS 4: OFDM 39.0 / 43.3 Mbps	13.08473	13.56537	13.44641	13.50512	13.54015	13.41211
MCS 5: OFDM 52.0 / 57.8 Mbps	10.06331	10.39612	10.30865	10.3899	10.41813	10.27987
MCS 6: OFDM 58.5 / 65.0 Mbps	10.17034	10.30426	10.27349	10.4636	10.3725	10.28846
MCS 7: OFDM 65.0 / 72.2 Mbps	10.07984	10.41607	10.43071	10.46761	10.46549	10.2847
MCS 0: OFDM13.5 / 15.0 Mbps	11.3985	11.59439	11.42346	11.64955	11.36971	11.29217
MCS 1: OFDM 27.0 / 30.0 Mbps	11.3753	11.64967	11.39982	11.64774	11.39753	11.31047
MCS 2: OFDM 40.5 / 45.0 Mbps	11.37511	11.55148	11.38635	11.60245	11.33965	11.31482
MCS 3: OFDM 54.0 / 60.0 Mbps	11.35654	11.5847	11.32375	11.52339	11.33226	11.26678
MCS 4: OFDM 81.0 / 90.0 Mbps	10.45363	10.60604	10.4877	10.63985	10.40491	10.30016
MCS 5: OFDM 108.0 / 120.0 Mbps	9.418285	9.652134	9.402306	9.655453	9.393447	9.327486
MCS 6: OFDM 121.5 / 135.0 Mbps	9.428343	9.580743	9.393187	9.590198	9.33456	9.306752
MCS 7: OFDM 135.0 / 150.0 Mbps	9.406297	9.590188	9.423273	9.636625	9.394372	9.352439