FCC OET BULLETIN 65 SUPPLEMENT C

SAR EVALUATION REPORT

For

Ruggedized Handheld PDA-type Device
W/dual-band GSM/GPRS/WCDMA/HSDPA
MODEL: CN4, CN4e
FCC ID: EHA-01CN4

REPORT NUMBER: 09U12493-5B

ISSUE DATE: June 16, 2009

Prepared for

INTERMEC TECHNOLOGIES CORPORATION
6001 – 36TH AVENUE WEST
EVERETT, WA 98203, USA

Prepared by

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	June 2, 2009	Initial Issue	--
A	June 10, 2009	Added battery information in section 5.	Chaoyen Lin
B	June 16, 2009	Additional test with standard battery pack (AB16) at UMTS Band II worst-case configuration. The following section has been updates. • Sec. 5 Battery pack information • Sec. 8.2 Liquid parameters check • Sec. 9.1 System check • Sec. 11.1.2 (Right hand side tilt position) and 11.1.4 (Body worn position) Summary of test results	Sunny Shih

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	INTERMEC TECHNOLOGIES CORPORATION 6001 – 36TH AVENUE WEST EVERETT, WA 98203, USA
EUT DESCRIPTION:	Ruggedized Handheld PDA-type Device W/dual-band GSM/GPRS/WCDMA/HSDPA
MODEL NUMBER:	CN4, CN4e
DEVICE CATEGORY:	Portable
EXPOSURE CATEGORY:	General Population/Uncontrolled Exposure
DATE TESTED:	May 14 - 18, 2009

THE HIGHEST SAR VALUES:

FCC / IC Rule Parts	Frequency Range [MHz]	The Highest SAR Values (1g_mW/g)	Limit (mW/g)
22H / RSS-132	824 - 849	Head: 0.511 mW/g; Body: 0.351 mW/g	1.6
24E / RSS-133	1850 - 1910	Head: 0.684 mW/g; Body: 0.987 mW/g	

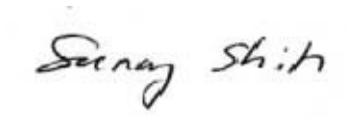
APPLICABLE STANDARDS AND TEST PROCEDURES:

STANDARDS AND TEST PROCEDURES	TEST RESULTS
• FCC OET Bulletin 65 Supplement C and the following specific Test Procedure: ○ KDB 941225 D01 SAR test for 3G devices	Pass

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For CCS By:



SUNNY SHIH
ENGINEERING SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

CHAO YEN LIN
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C, and the following specific FCC Test Procedure.

- KDB 941225 D01 SAR test for 3G devices

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://ts.nist.gov/Standards/scopes/2000650.htm.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due date		
				MM	DD	Year
Robot - Six Axes	Stäubli	RX90BL	N/A	N/A		
Robot Remote Control	Stäubli	CS7MB	3403-91535	N/A		
DASY4 Measurement Server	SPEAG	SEUMS001BA	1041	N/A		
Probe Alignment Unit	SPEAG	LB (V2)	261	N/A		
SAM Phantom (SAM1)	SPEAG	QD000P40CA	1185	N/A		
SAM Phantom (SAM2)	SPEAG	QD000P40CA	1050	N/A		
Oval Flat Phantom (ELI 4.0)	SPEAG	QD OVA001 B	1003	N/A		
Electronic Probe kit	HP	85070C	N/A	N/A		
S-Parameter Network Analyzer	Agilent	8753ES-6	MY40001647	11	14	2009
Signal Generator	Agilent	8753ES-6	MY40001647	11	14	2009
E-Field Probe	SPEAG	EX3DV4	3686	3	23	1010
Thermometer	ERTCO	639-1S	1718	5	28	2009
Data Acquisition Electronics	SPEAG	DAE3 V1	427	10	20	2009
System Validation Dipole	SPEAG	D835V2	4d002	6	22	2009
System Validation Dipole	SPEAG	D900V2	108	1	21	2010
System Validation Dipole	SPEAG	D1800V2	294	1	29	2010
System Validation Dipole	SPEAG	D1900V2	5d043	1	29	2010
System Validation Dipole	SPEAG	D2450V2	748	4	14	2010
System Validation Dipole	SPEAG	D5GHzV2	1003	11	21	2009
MXA Signal Analyzer	Agilent	N9020A	US48350984	10	23	2009
ESG Vector Signal Generator	Agilent	E4438C	US44271090	9	17	2010
Power Meter	Giga-tronics	8651A	8651404	1	11	2010
Power Sensor	Giga-tronics	80701A	1834588	1	11	2010
Amplifier	Mini-Circuits	ZVE-8G	90606	N/A		
Amplifier	Mini-Circuits	ZHL-42W	D072701-5	N/A		
Simulating Liquid	CCS	H1900	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M1900	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	H1800	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M1800	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	H1700	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M1700	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	H835	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M835	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	H900	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M900	N/A	Within 24 hrs of first test		
Simulating Liquid	SPAEG	H2450	N/A	Within 24 hrs of first test		
Simulating Liquid	SPAEG	M2450	N/A	Within 24 hrs of first test		

4.2. MEASUREMENT UNCERTAINTY

Measurement uncertainty for 300 MHz – 3000 MHz

Uncertainty component	Tol. (±%)	Probe Dist.	Div.	Ci (1g)	Ci (10g)	Std. Unc.(±%)	
						Ui (1g)	Ui(10g)
Measurement System							
Probe Calibration	4.80	N	1	1	1	4.80	4.80
Axial Isotropy	4.70	R	1.732	0.707	0.707	1.92	1.92
Hemispherical Isotropy	9.60	R	1.732	0.707	0.707	3.92	3.92
Boundary Effects	1.00	R	1.732	1	1	0.58	0.58
Linearity	4.70	R	1.732	1	1	2.71	2.71
System Detection Limits	1.00	R	1.732	1	1	0.58	0.58
Readout Electronics	1.00	N	1	1	1	1.00	1.00
Response Time	0.80	R	1.732	1	1	0.46	0.46
Integration Time	2.60	R	1.732	1	1	1.50	1.50
RF Ambient Conditions - Noise	1.59	R	1.732	1	1	0.92	0.92
RF Ambient Conditions - Reflections	0.00	R	1.732	1	1	0.00	0.00
Probe Positioner Mechnical Tolerance	0.40	R	1.732	1	1	0.23	0.23
Probe Positioning With Respect to Phantom Shell	2.90	R	1.732	1	1	1.67	1.67
Extrapolation, interpolation, and integration algorithms for max. SAR evaluation	3.90	R	1.732	1	1	2.25	2.25
Test sample Related							
Test Sample Positioning	1.10	N	1	1	1	1.10	1.10
Device Holder Uncertainty	3.60	N	1	1	1	3.60	3.60
Power and SAR Drift Measurement	5.00	R	1.732	1	1	2.89	2.89
Phantom and Tissue Parameters							
Phantom Uncertainty	4.00	R	1.732	1	1	2.31	2.31
Liquid Conductivity - Target	5.00	R	1.732	0.64	0.43	1.85	1.24
Liquid Conductivity - Meas.	8.60	N	1	0.64	0.43	5.50	3.70
Liquid Permittivity - Target	5.00	R	1.732	0.6	0.49	1.73	1.41
Liquid Permittivity - Meas.	3.30	N	1	0.6	0.49	1.98	1.62
Combined Standard Uncertainty	RSS					11.44	10.49
Expanded Uncertainty (95% Confidence Interval)	K=2					22.87	20.98

Notesfor table
1. Tol. - tolerance in influence quaitity
2. N - Nomal
3. R - Rectangular
4. Div. - Divisor used to obtain standard uncertainty
5. Ci - is te sensitivity coefficient

5. EQUIPMENT UNDER TEST

Ruggedized Handheld PDA-type Device

W/dual-band GSM/GPRS/WCDMA/HSDPA

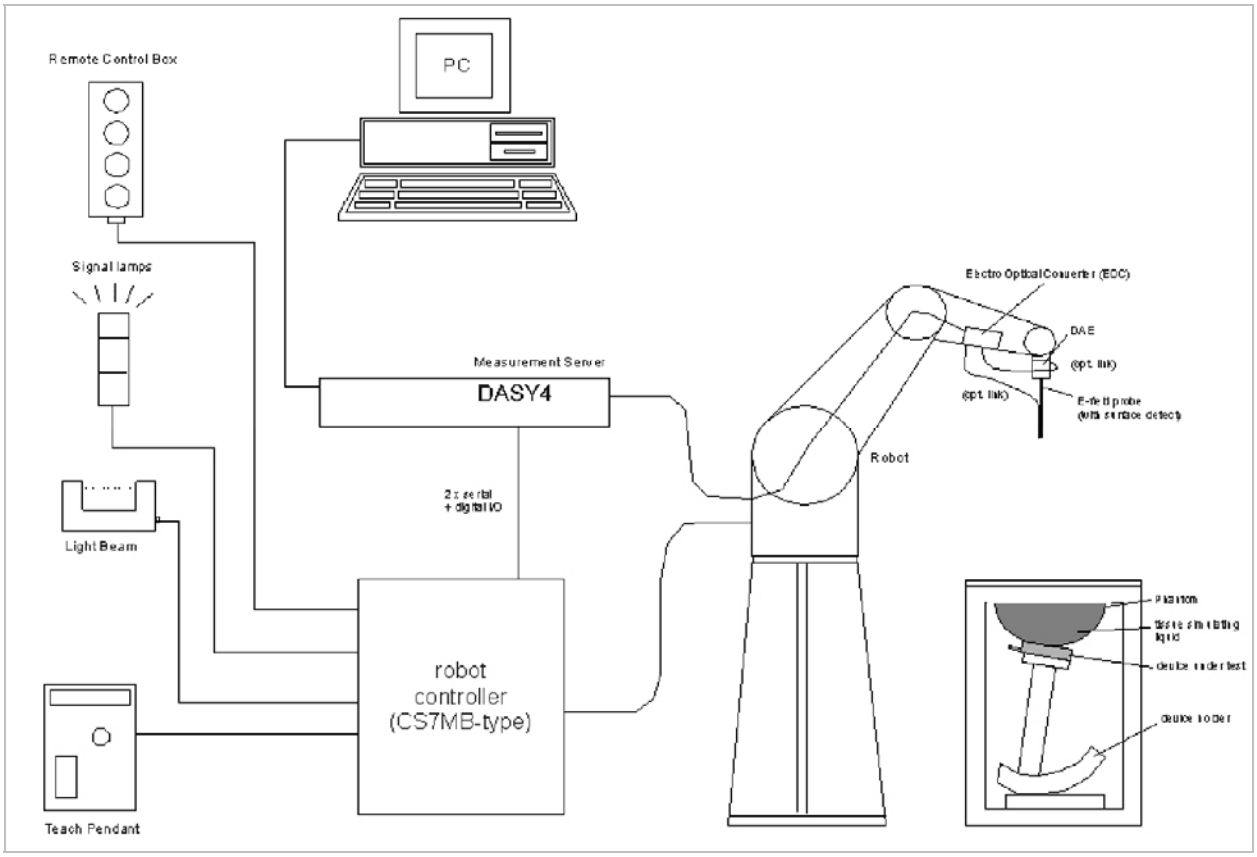
Model: CN4, CN4e

Model differences:

- Body Styles: CN4 is standard and CN4e is extended
- Both are available with numeric or QWERTY keypads

Normal operation:	• Held to head • Worn on body (LCD facing-up; LCD facing-down) with holster w/ belt-clip
Battery Pack:	Li-ion Battery. • Standard - AB8 and AB15 The AB8 and AB15 batteries are identical except that they come from different suppliers • Extended - AB9 and AB16 The AB9 and AB16 batteries are identical except that they come from different suppliers The AB9/AB16 batteries have extended capacity Extended battery AB16 is used for all SAR testing. Additional SAR test with standard battery (AB15) at worst-case test configurations.

6. SYSTEM SPECIFICATIONS



The DASY4 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- DASY4 software.
- Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.

7. COMPOSITION OF INGREDIENTS FOR TISSUE SIMULATING LIQUIDS

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Salt: 99+% Pure Sodium Chloride Sugar: 98+% Pure Sucrose
Water: De-ionized, 16 MΩ+ resistivity HEC: Hydroxyethyl Cellulose
DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

8. LIQUID PARAMETERS CHECK

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectric parameters are within the tolerances of the specified target values. The relative permittivity and conductivity of the tissue material should be within ± 5% of the values given in the table below.

Reference Values of Tissue Dielectric Parameters for Head and Body Phantom (for 150 – 3000 MHz and 5800 MHz)

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in IEEE Standard 1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations and extrapolated according to the head parameters specified in IEEE Standard 1528.

Target Frequency (MHz)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.8
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.9	55.2	0.97
900	41.5	0.97	55	1.05
915	41.5	0.98	55	1.06
1450	40.5	1.2	54	1.3
1610	40.3	1.29	53.8	1.4
1800 – 2000	40	1.4	53.3	1.52
2450	39.2	1.8	52.7	1.95
3000	38.5	2.4	52	2.73
5800	35.3	5.27	48.2	6

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

8.1. LIQUID CHECK RESULTS FOR 835 MHZ

Simulating Liquid Dielectric Parameters for Muscle 835 MHz

Room Ambient Temperature = 24°C; Relative humidity = 35% Measured by: Chaoyen Lin

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
835	e'	53.58	Relative Permittivity (ε_r):	53.576	55.2	-2.94	± 5
	e"	20.92	Conductivity (σ):	0.972	0.97	0.17	± 5
900	e'	53.13	Relative Permittivity (ε_r):	53.130	55.0	-3.40	± 5
	e"	20.68	Conductivity (σ):	1.035	1.05	-1.38	± 5

Liquid temperature: 23 deg. C
May 14, 2009 05:10 PM

Frequency	e'	e"
800000000.	54.0514	21.1012
805000000.	53.9562	21.0766
810000000.	53.8908	21.0365
815000000.	53.8237	21.0199
820000000.	53.7634	20.9566
825000000.	53.7168	20.9445
830000000.	53.6438	20.9477
835000000.	**53.5760**	**20.9162**
840000000.	53.5094	20.8847
845000000.	53.4763	20.8523
850000000.	53.4449	20.8521
855000000.	53.3874	20.8075
860000000.	53.3508	20.7879
865000000.	53.3279	20.7740
870000000.	53.2859	20.7353
875000000.	53.2588	20.7339
880000000.	53.2382	20.7193
885000000.	53.2069	20.7299
890000000.	53.1842	20.7056
895000000.	53.1475	20.6973
900000000.	**53.1297**	**20.6817**
905000000.	53.0705	20.6512
910000000.	53.0148	20.6403
915000000.	52.9273	20.6114
920000000.	52.8960	20.5659
925000000.	52.8476	20.5276
930000000.	52.8044	20.4621
935000000.	52.7324	20.4494
940000000.	52.6874	20.4261
945000000.	52.6554	20.4078
950000000.	52.6326	20.3859

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters for Muscle 835 MHz

Room Ambient Temperature = 24°C; Relative humidity = 35% Measured by: Chaoyen Lin

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
835	e'	53.45	Relative Permittivity (ε_r):	53.447	55.2	-3.18	± 5
	e"	20.47	Conductivity (σ):	0.951	0.97	-1.98	± 5
900	e'	52.84	Relative Permittivity (ε_r):	52.840	55.0	-3.93	± 5
	e"	20.59	Conductivity (σ):	1.031	1.05	-1.81	± 5

Liquid temperature: 23 deg. C
May 16, 2009 09:19 AM

Frequency	e'	e"
805000000.	53.7788	20.9581
810000000.	53.6912	20.8539
815000000.	53.6151	20.7637
820000000.	53.5559	20.6408
825000000.	53.5396	20.5591
830000000.	53.4781	20.4888
835000000.	**53.4466**	**20.4687**
840000000.	53.4256	20.4450
845000000.	53.3800	20.4412
850000000.	53.3484	20.4431
855000000.	53.2903	20.4871
860000000.	53.2512	20.4916
865000000.	53.2295	20.5110
870000000.	53.1526	20.5509
875000000.	53.1177	20.5854
880000000.	53.0965	20.6250
885000000.	53.0325	20.6595
890000000.	52.9591	20.6660
895000000.	52.9163	20.6401
900000000.	**52.8395**	**20.5911**
905000000.	52.8049	20.4747
910000000.	52.8068	20.4120
915000000.	52.7924	20.2944
920000000.	52.7684	20.1915
925000000.	52.7623	20.1332
930000000.	52.7801	20.0961
935000000.	52.7825	20.0953
940000000.	52.7524	20.0874
945000000.	52.7058	20.0861
950000000.	52.6398	20.1329
955000000.	52.5078	20.1368
960000000.	52.4268	20.1401
965000000.	52.3759	20.1413
970000000.	52.3110	20.1780

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters for Head 835 MHz

Room Ambient Temperature = 24°C; Relative humidity = 35% Measured by: Chaoyen Lin

f (MHz)	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
835	e'	43.39	Relative Permittivity (ε_r):	43.386	41.5	4.55	± 5
	e"	18.75	Conductivity (σ):	0.871	0.90	-3.25	± 5
900	e'	42.65	Relative Permittivity (ε_r):	42.645	41.5	2.76	± 5
	e"	18.76	Conductivity (σ):	0.939	0.97	-3.18	± 5

Liquid temperature: 23 deg. C
May 17, 2009 09:27 AM

Frequency	e'	e"
805000000.	43.7545	18.9602
810000000.	43.6878	18.9139
815000000.	43.6095	18.8984
820000000.	43.5400	18.8541
825000000.	43.5101	18.8148
830000000.	43.4327	18.7738
835000000.	**43.3864**	**18.7455**
840000000.	43.3011	18.7604
845000000.	43.2566	18.7321
850000000.	43.2338	18.7392
855000000.	43.1338	18.7279
860000000.	43.0466	18.7544
865000000.	43.0141	18.7543
870000000.	42.9365	18.7372
875000000.	42.8742	18.7666
880000000.	42.8285	18.7807
885000000.	42.7901	18.7825
890000000.	42.7313	18.7807
895000000.	42.6980	18.7611
900000000.	**42.6454**	**18.7576**
905000000.	42.5988	18.7228
910000000.	42.5644	18.7092
915000000.	42.5073	18.6833
920000000.	42.4661	18.6283
925000000.	42.4415	18.5783
930000000.	42.4126	18.5591
935000000.	42.3494	18.5511
940000000.	42.3016	18.5288
945000000.	42.2830	18.5355
950000000.	42.2394	18.5218
955000000.	42.1480	18.5048
960000000.	42.0719	18.5022
965000000.	42.0236	18.4955
970000000.	41.9450	18.5082
975000000.	41.9024	18.5419

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

ε_0 = 8.854 * 10^{-12}

8.2. LIQUID CHECK RESULTS FOR 1900 MHZ

Simulating Liquid Dielectric Parameters for Muscle 1900 MHz

Room Ambient Temperature = 24°C; Relative humidity = 35% Measured by: Chaoyen Lin

f (MHz)	Muscle Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
1900	e'	53.429	Relative Permittivity (ε_r):	53.4292	53.3	0.24	± 5
	e"	14.457	Conductivity (σ):	1.52805	1.52	0.53	± 5

Liquid temperature: 23 deg. C
May 14, 2009 05:20 PM

Frequency	e'	e"
1710000000.	54.0633	13.8600
1720000000.	54.0416	13.9364
1730000000.	54.0682	14.0275
1740000000.	54.0838	14.0978
1750000000.	54.1007	14.1406
1760000000.	54.0242	14.1670
1770000000.	53.9480	14.1567
1780000000.	53.8584	14.1035
1790000000.	53.7600	14.0850
1800000000.	53.6904	14.1268
1810000000.	53.6061	14.1785
1820000000.	53.5364	14.2401
1830000000.	53.5135	14.3267
1840000000.	53.5059	14.4439
1850000000.	53.5137	14.5178
1860000000.	53.4708	14.5493
1870000000.	53.4474	14.5232
1880000000.	53.4663	14.4658
1890000000.	53.4430	14.4252
1900000000.	**53.4292**	**14.4566**
1910000000.	53.3272	14.5524

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters for Head 1900 MHz

Room Ambient Temperature = 24°C; Relative humidity = 35% Measured by: Chaoyen Lin

f MHz	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
1900	e'	41.662	Relative Permittivity (ε_r):	41.6616	40.0	4.15	± 5
	e"	13.261	Conductivity (σ):	1.40170	1.40	0.12	± 5

Liquid temperature: 23 deg. C
May 18, 2009 09:43 AM

Frequency	e'	e"
1710000000.	42.4114	12.7041
1720000000.	42.3685	12.7757
1730000000.	42.3498	12.8477
1740000000.	42.3429	12.9405
1750000000.	42.3336	12.9869
1760000000.	42.2879	12.9932
1770000000.	42.2414	12.9720
1780000000.	42.1773	12.9219
1790000000.	42.1186	12.9126
1800000000.	42.0338	12.9426
1810000000.	41.9385	12.9922
1820000000.	41.8524	13.0578
1830000000.	41.7691	13.1436
1840000000.	41.7287	13.2352
1850000000.	41.7153	13.2905
1860000000.	41.7099	13.3370
1870000000.	41.7081	13.3226
1880000000.	41.7145	13.2964
1890000000.	41.7044	13.2630
1900000000.	**41.6616**	**13.2612**
1910000000.	41.5947	13.2761

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters for Head 1900 MHz

Room Ambient Temperature = 24°C; Relative humidity = 40% Measured by: Sunny Shih

f MHz	Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
1900	e'	40.725	Relative Permittivity (ε_r):	40.7249	40.0	1.81	± 5
	e"	13.393	Conductivity (σ):	1.41562	1.40	1.12	± 5

Liquid temperature: 23 deg. C
June 16, 2009 09:32 AM

Frequency	e'	e"
1710000000.	41.6755	12.7691
1720000000.	41.6433	12.8088
1730000000.	41.6243	12.8780
1740000000.	41.5951	12.9531
1750000000.	41.5654	13.0346
1760000000.	41.4734	13.0734
1770000000.	41.3902	13.0884
1780000000.	41.3252	13.0708
1790000000.	41.2827	13.0674
1800000000.	41.2217	13.0914
1810000000.	41.1562	13.1062
1820000000.	41.0803	13.1219
1830000000.	41.0489	13.1616
1840000000.	41.0377	13.2493
1850000000.	40.9933	13.3399
1860000000.	40.9143	13.4072
1870000000.	40.8273	13.4222
1880000000.	40.7778	13.3950
1890000000.	40.7591	13.3721
1900000000.	**40.7249**	**13.3929**
1910000000.	40.6839	13.3972

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

$\varepsilon_0 = 8.854 * 10^{-12}$

Simulating Liquid Dielectric Parameters for Muscle 1900 MHz

Room Ambient Temperature = 24°C; Relative humidity = 40% Measured by: Sunny Shih

f (MHz)	Muscle Liquid Parameters			Measured	Target	Delta (%)	Limit (%)
1900	e'	53.187	Relative Permittivity (ε_r):	53.1870	53.3	-0.21	± 5
	e"	14.575	Conductivity (σ):	1.54053	1.52	1.35	± 5

Liquid temperature: 23 deg. C
June 16, 2009 09:37 AM

Frequency	e'	e"
1710000000.	53.9517	13.9266
1720000000.	53.9352	13.9732
1730000000.	53.9220	14.0651
1740000000.	53.9073	14.1432
1750000000.	53.8876	14.2035
1760000000.	53.8156	14.2344
1770000000.	53.7392	14.2402
1780000000.	53.6833	14.2290
1790000000.	53.6302	14.2234
1800000000.	53.5762	14.2485
1810000000.	53.5197	14.2726
1820000000.	53.4575	14.3170
1830000000.	53.4414	14.3612
1840000000.	53.4118	14.4618
1850000000.	53.3882	14.5497
1860000000.	53.3141	14.5991
1870000000.	53.2517	14.5983
1880000000.	53.2302	14.5681
1890000000.	53.2030	14.5582
1900000000.	**53.1870**	**14.5746**
1910000000.	53.1400	14.5873

The conductivity (σ) can be given as:

$$\sigma = \omega \varepsilon_0 e'' = 2 \pi f \varepsilon_0 e''$$

where f = target f * 10^6

$\varepsilon_0 = 8.854 * 10^{-12}$

9. SYSTEM CHECK

The system performance check is performed prior to any usage of the system in order to guarantee reproducible results. The system performance check verifies that the system operates within its specifications of ±10%.

System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the SAM twin phantom filled with Head or Body simulating liquid of the following parameters.
- The DASY4 system with an Isotropic E-Field Probe EX3DV3 was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
  For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 fine cube was chosen for cube
- Distance between probe sensors and phantom surface was set to 3 mm.
  For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was 250 mW±3%.
- The results are normalized to 1 W input power.

IEEE Standard 1528-2003 Numerical reference SAR values (W/kg) for reference dipole and flat phantom

Frequency (MHz)	Distance (mm)	1g SAR [W/kg]	10g SAR [W/kg]	Local SAR at surface (above feed-point)
300	15	3	2	4.4
450	15	4.9	3.3	7.2
835	15	9.5	6.2	4.1
900	15	10.8	6.9	16.4
1450	10	29	16	5.02
1800	10	38.1	19.8	69.5
1900	10	39.7	20.5	72.1
2000	10	41.1	21.1	74.6
2450	10	52.4	24	104.2
3000	10	63.8	25.7	104.2

Note: All SAR values normalized to 1 W forward power.

9.1. SYSTEM CHECK RESULTS FOR D1900V2

System Validation Dipole: D1900V2 SN: 5d043

Date: May 14, 2009

Ambient Temperature = 24°C; Relative humidity = 35% Measured by: Chaoyen Lin

Medium	CW Signal (MHz)	Forward power (mW)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
Body	1900	250	1g SAR:	39.4	39.8	-1.01	±10
			10g SAR:	20.7	20.8	-0.48	

Date: May 18, 2009

Ambient Temperature = 24°C; Relative humidity = 35% Measured by: Chaoyen Lin

Medium	CW Signal (MHz)	Forward power (mW)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
Head	1900	250	1g SAR:	38.7	39.7	-2.52	±10
			10g SAR:	20.1	20.5	-1.95	

Date: June 16, 2009

Ambient Temperature = 24°C; Relative humidity = 40% Measured by: Sunny Shih

Medium	CW Signal (MHz)	Forward power (mW)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
Head	1900	250	1g SAR:	38.3	39.7	-3.53	±10
			10g SAR:	19.9	20.5	-2.93	

9.2. SYSTEM CHECK RESULTS FOR D835V2

System Validation Dipole: D835V2 SN:4d002

Date: May 14, 2009

Ambient Temperature = 24°C; Relative humidity = 35% Measured by: Chaoyen Lin

Medium	CW Signal (MHz)	Forward power (mW)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
Body	835	250	1g SAR:	10.2	9.71	5.05	±10
			10g SAR:	6.68	6.38	4.70	

Date: May 16, 2009

Ambient Temperature = 24°C; Relative humidity = 35% Measured by: Chaoyen Lin

Medium	CW Signal (MHz)	Forward power (mW)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
Body	835	250	1g SAR:	9.82	9.71	1.13	±10
			10g SAR:	6.44	6.38	0.94	

Date: May 17, 2009

Ambient Temperature = 24°C; Relative humidity = 35% Measured by: Chaoyen Lin

Medium	CW Signal (MHz)	Forward power (mW)	Measured (Normalized to 1 W)		Target	Delta (%)	Tolerance (%)
Head	835	250	1g SAR:	9.32	9.5	-1.89	±10
			10g SAR:	6.11	6.2	-1.45	

10. OUTPUT POWER VERIFICATION

10.1. GSM

GSM (GMSK)

Band	Ch No.	Frequency	Conducted output power (dBm)	
			Average	Peak
GSM850	128	824.2	31.6	
	190	836.6	31.5	
	251	848.8	31.6	
GSM1900	512	1850.2	29.4	
	661	1880	29.3	
	810	1909.8	29.4	

GPRS (GMSK) - Coding Scheme: MCS4

Band	Ch No.	Frequency	Average Conducted output power (dBm)			
			1 slot	2 slot	3 slot	4 slot
GSM850	128	824.2	31.6	30.0		
	190	836.6	31.5	29.8		
	251	848.8	31.6	30.1		
GSM1900	512	1850.2	28.4	27.8		
	661	1880	29.3	27.7		
	810	1909.8	29.4	27.7		

EGPRS (8PSK) - Coding Scheme: MCS9

Band	Ch No.	Frequency	Conducted output power (dBm)			
			1 slot	2 slot	3 slot	4 slot
GSM850	128	824.2	26.6	26.5		
	190	836.6	26.5	26.5		
	251	848.8	26.6	26.5		
GSM1900	512	1850.2	26.1	26.0		
	661	1880	26.0	26.0		
	810	1909.8	26.1	26.0		

10.2. UMTS RELEASE 99

The following 4 Sub-tests were completed according to procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	Rel99
	Subtest	-
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	HSDPA FRC	Not Applicable
	HSUPA Test	Not Applicable
	Power Control Algorithm	Algorithm2
	βc	Not Applicable
	βd	Not Applicable
	βec	Not Applicable
	βc/βd	8/15
	βhs	Not Applicable
	βed	Not Applicable

Results

Rel 99 (12.2kps RMC)

Band	Mode	UL Ch No.	DL Ch No.	f (MHz)	O/P Power (dBm)
UMTS850 (Band V)	Rel 99 12.2kps RMC	4132	4357	826.4	23.26
		4183	4408	836.6	23.34
		4233	4458	846.6	23.64
UMTS1900 (Band II)	Rel 99 12.2kps RMC	9262	9662	1852.4	23.02
		9400	9800	1880.0	23.29
		9538	9938	1907.6	22.95

10.3. UMTS HSDPA

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	Rel 5 HSDPA	Rel 5 HSDPA	Rel 5 HSDPA	Rel 5 HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	HSUPA Test	Not Applicable			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βec	-	-	-	-
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	βed	Not Applicable			
		0	1	1.5	1.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs = βhs/βc	30/15			

Results

Rel 6 HSDPA

Band	Mode	UL Ch No.	DL Ch No.	f (MHz)	O/P Power (dBm)
UMTS850 (Band V)	Subtest 1	4132	4357	826.4	23.30
		4183	4408	836.6	23.43
		4233	4458	846.6	23.72
	Subtest 2	4132	4357	826.4	22.24
		4183	4408	836.6	22.39
		4233	4458	846.6	22.63
	Subtest 3	4132	4357	826.4	22.29
		4183	4408	836.6	22.40
		4233	4458	846.6	22.67
	Subtest 4	4132	4357	826.4	22.26
		4183	4408	836.6	22.40
		4233	4458	846.6	22.73
UMTS1900 (Band II)	Subtest 1	9262	9662	1852.4	22.30
		9400	9800	1880.0	22.84
		9538	9938	1907.6	22.54
	Subtest 2	9262	9662	1852.4	21.33
		9400	9800	1880.0	21.93
		9538	9938	1907.6	21.50
	Subtest 3	9262	9662	1852.4	21.35
		9400	9800	1880.0	21.96
		9538	9938	1907.6	21.58
	Subtest 4	9262	9662	1852.4	21.43
		9400	9800	1880.0	21.96
		9538	9938	1907.6	21.53

11. SUMMARY OF TEST RESULTS

If the SAR measured at the middle channel for each test configuration is at least 3.0 dB (0.8 mW/g) lower than the SAR limit (1.6 mW/g), testing at the high and low channels is optional for such test configuration(s).

11.1. UMTS BAND II (1900 MHZ)

11.1.1. LEFT HAND SIDE – CN4e

Test position	Mode	UL Ch No.	DL Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
Touch	Rel 99 12.2kps RMC	9262	9662	1852.4		1.6
		9400	9800	1880.0	0.340	
		9538	9938	1907.6		
Tilt (15°)	Rel 99 12.2kps RMC	9262	9662	1852.4		1.6
		9400	9800	1880.0	0.468	
		9538	9938	1907.6		

11.1.2. RIGHT HAND SIDE – CN4e

Test position	Mode	UL Ch No.	DL Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
Touch	Rel 99 12.2kps RMC	9262	9662	1852.4		1.6
		9400	9800	1880.0	0.363	
		9538	9938	1907.6		
Tilt (15°)	Rel 99 12.2kps RMC	9262	9662	1852.4		1.6
		9400	9800	1880.0	0.684	
		9538	9938	1907.6		
	w/ standard battery pack (AB15)	9400	9800	1880.0	0.553	

11.1.3. RIGHT HAND SIDE – CN4

Test position	Mode	UL Ch No.	DL Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
Tilt (15°)	Rel 99 12.2kps RMC	9262	9662	1852.4		1.6
		9400	9800	1880.0	0.482	
		9538	9938	1907.6		

11.1.4. BODY WORN – CN4e

Test position	Mode	Sep. dist. (cm)	UL Ch No.	DL Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
LCD down	Rel 99 12.2kps RMC	With Holster	9262	9662	1852.4	0.708	1.6
			9400	9800	1880.0	0.939	
			9538	9938	1907.6	0.987	
		w/ standard battery pack (AB15)	9538	9938	1907.6	0.937	
LCD up	Rel 99 12.2kps RMC	With Holster	9262	9662	1852.4		1.6
			9400	9800	1880.0	0.058	
			9538	9938	1907.6		

11.1.5. BODY WORN – CN4

Test position	Mode	Sep. dist. (cm)	UL Ch No.	DL Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
LCD down	Rel 99 12.2kps RMC	With Holster	9262	9662	1852.4		1.6
			9400	9800	1880.0		
			9538	9938	1907.6	0.602	

11.2. GSM1900

11.2.1. LEFT HAND SIDE – CN4e

Test position	Mode	Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
Touch	GSM	512	1850.2		1.6
		661	1880.0	0.117	
		810	1909.8		
Tilt (15°)	GSM	512	1850.2		1.6
		661	1880.0	0.161	
		810	1909.8		

11.2.2. RIGHT HAND SIDE – CN4e

Test position	Mode	Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
Touch	GSM	512	1850.2		1.6
		661	1880.0	0.114	
		810	1909.8		
Tilt (15°)	GSM	512	1850.2		1.6
		661	1880.0	0.168	
		810	1909.8		

11.2.3. BODY WORN – CN4e

Test position	Mode	Sep. dist. (cm)	Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
LCD down	GPRS 2 slots	With Holster	512	1850.2		1.6
			661	1880.0	0.416	
			810	1909.8		
LCD up	GPRS 2 slots	With Holster	512	1850.2		1.6
			661	1880.0	0.032	
			810	1909.8		

11.3. UMTS BAND V (850 MHZ)

11.3.1. LEFT HAND SIDE – CN4e

Test position	Mode	UL Ch No.	DL Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
Touch	Rel 99 12.2kps RMC	4132	4357	826.4		1.6
		4183	4408	836.6	0.383	
		4233	4458	846.6		
Tilt (15°)	Rel 99 12.2kps RMC	4132	4357	826.4		1.6
		4183	4408	836.6	0.415	
		4233	4458	846.6		

11.3.2. RIGHT HAND SIDE – CN4e

Test position	Mode	UL Ch No.	DL Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
Touch	Rel 99 12.2kps RMC	4132	4357	826.4		1.6
		4183	4408	836.6	0.391	
		4233	4458	846.6		
Tilt (15°)	Rel 99 12.2kps RMC	4132	4357	826.4		1.6
		4183	4408	836.6	0.492	
		4233	4458	846.6		

11.3.3. BODY WORN – CN4e

Test position	Mode	Sep. dist. (cm)	UL Ch No.	DL Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
LCD up	Rel 99 12.2kps RMC	With Holster	4132	4357	826.4		1.6
			4183	4408	836.6	0.139	
			4233	4458	846.6		
LCD down	Rel 99 12.2kps RMC	With Holster	4132	4357	826.4		1.6
			4183	4408	836.6	0.351	
			4233	4458	846.6		

11.3.4. BODY WORN – CN4

Test position	Mode	Sep. dist. (cm)	UL Ch No.	DL Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
LCD down	Rel 99 12.2kps RMC	With Holster	4132	4357	826.4		1.6
			4182	4407	836.6	0.350	
			4233	4458	846.6		

11.4. GSM850

11.4.1. LEFT HAND SIDE – CN4e

Test position	Mode	Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
Touch	GSM	128	824.2		1.6
		190	836.6	0.511	
		251	848.8		
Tilt (15°)	GSM	128	824.2		1.6
		190	836.6	0.502	
		251	848.8		

11.4.2. LEFT HAND SIDE – CN4

Test position	Mode	Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
Touch	GSM	190	836.6	0.365	1.6

11.4.3. RIGHT HAND SIDE – CN4e

Test position	Mode	Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
Touch	GSM	128	824.2		1.6
		190	836.6	0.345	
		251	848.8		
Tilt (15°)	GSM	128	824.2		1.6
		190	836.6	0.423	
		251	848.8		

11.4.4. BODY WORN – CN4e

Test position	Mode	Sep. dist. (cm)	Ch No.	f (MHz)	1g SAR (mW/g)	Limit (mW/g)
LCD Face down	GSPS 2 slots	With Holster	128 (Low)	824.2		1.6
			190 (Mid)	836.6	0.341	
			251 (High)	848.8		
LCD Face up	GSPS 2 slots	With Holster	128 (Low)	824.2		1.6
			190 (Mid)	836.6	0.141	
			251 (High)	848.8		

12. WORST-CASE SAR TEST PLOTS

WORST-CASE SAR PLOT for GSM/UMTS1900 **HEAD** POSITION

Date/Time: 5/18/2009 5:36:33 PM

Test Laboratory: Compliance Certification Services

UMTS 1900 RHS With CN4e

DUT: Intermec; Type: CN4e; Serial: 03590990180

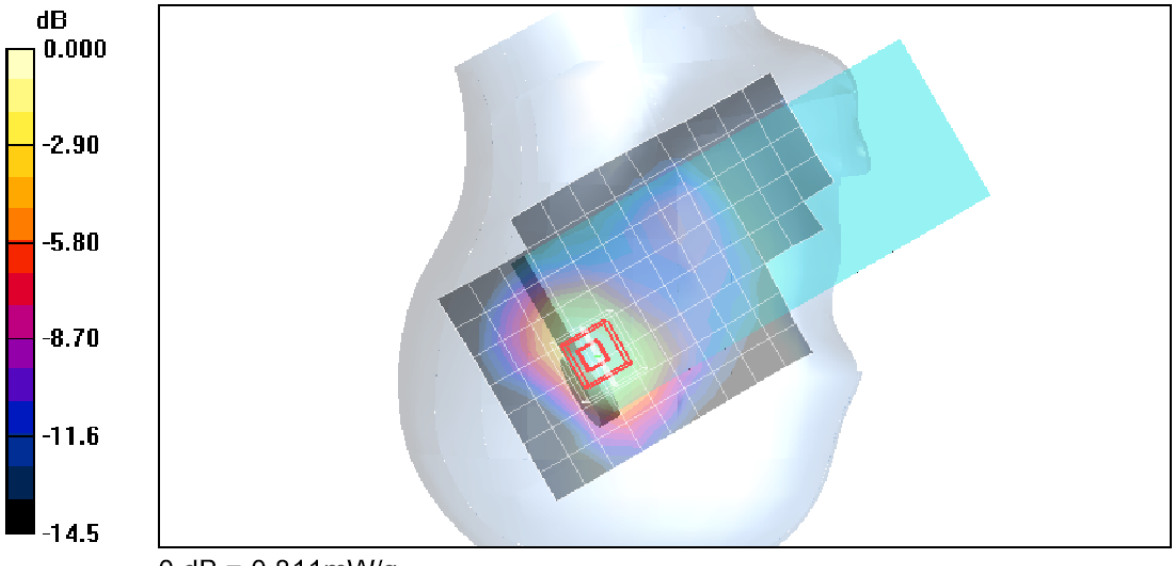
Communication System: UMTS Band II; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.39 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Right Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3686; ConvF(7.51, 7.51, 7.51); Calibrated: 3/23/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 10/20/2008
- Phantom: SAM 2 (Twin); Type: SAM 2; Serial: 1050
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

R-Tilt - UMTS850 M-ch/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.762 mW/g

R-Tilt - UMTS850 M-ch/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 17.1 V/m; Power Drift = 0.363 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.684 mW/g; SAR(10 g) = 0.403 mW/g
Maximum value of SAR (measured) = 0.811 mW/g



0 dB = 0.811mW/g

WORST-CASE SAR PLOT for GSM/UMTS1900 **BODY** POSITION

Date/Time: 5/15/2009 1:42:01 PM

Test Laboratory: Compliance Certification Services

UMTS1900 Body CN4e

DUT: Intermec; Type: CN4e; Serial: 03590990180

Communication System: UMTS Band II; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1907.6 MHz; σ = 1.54 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3686; ConvF(6.85, 6.85, 6.85); Calibrated: 3/23/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 10/20/2008
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

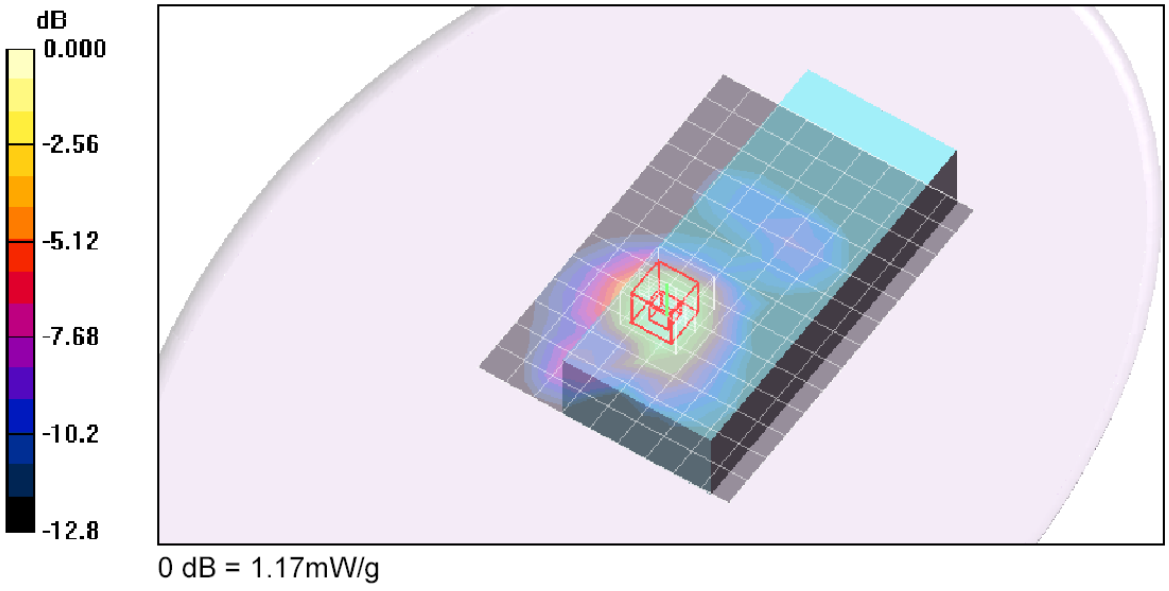
Face down, W/holster R99 H-ch/Area Scan (10x14x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.05 mW/g

Face down, W/holster R99 H-ch/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 10.4 V/m; Power Drift = -0.419 dB
Peak SAR (extrapolated) = 1.52 W/kg
SAR(1 g) = 0.987 mW/g; SAR(10 g) = 0.607 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.17 mW/g



0 dB = 1.17mW/g

WORST-CASE SAR PLOT for GSM/UMTS850 - **HEAD** POSITION

Date/Time: 5/17/2009 10:49:02 AM

Test Laboratory: Compliance Certification Services

GSM850 - Left Hand Side CN4e

DUT: Intermec; Type: CN4e; Serial: 03590990180

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.873 mho/m; ε_r = 43.4; ρ = 1000 kg/m^3
Phantom section: Left Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3686; ConvF(8.72, 8.72, 8.72); Calibrated: 3/23/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 10/20/2008
- Phantom: SAM 2 (Twin); Type: SAM 2; Serial: 1050
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

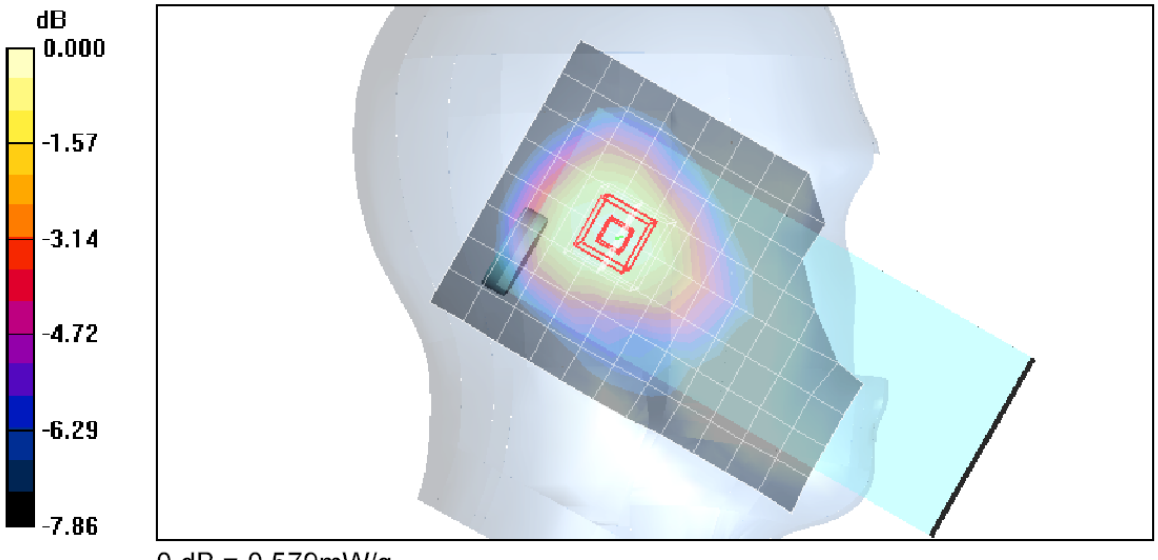
L-Touch - M-ch/Area Scan (9x12x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.556 mW/g

L-Touch - M-ch/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 24.4 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 0.699 W/kg
SAR(1 g) = 0.511 mW/g; SAR(10 g) = 0.365 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.579 mW/g



0 dB = 0.579mW/g

WORST-CASE SAR PLOT for GSM/UMTS850 - **BODY** POSITION

Date/Time: 5/16/2009 3:27:40 PM

Test Laboratory: Compliance Certification Services

UMTS850 Body CN4e

DUT: Intermec; Type: CN4e; Serial: 03590990180

Communication System: UMTS850; Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.952 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:
- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV4 - SN3686; ConvF(8.7, 8.7, 8.7); Calibrated: 3/23/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn427; Calibrated: 10/20/2008
- Phantom: SAM 2 (Twin); Type: SAM 2; Serial: 1050
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

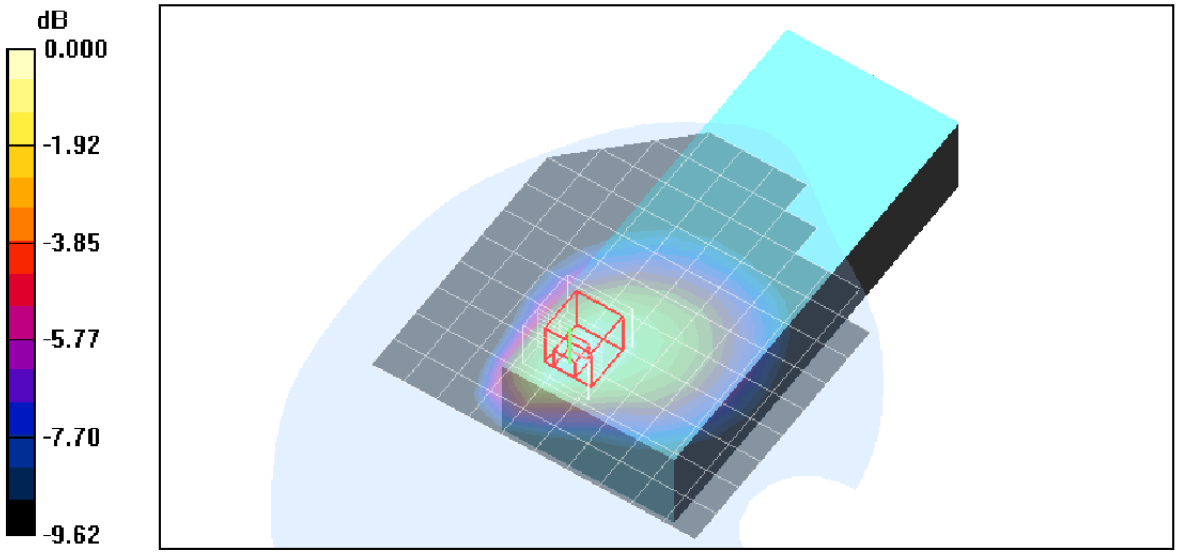
Face down, UMTS R99 M-ch/Area Scan (11x14x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.407 mW/g

Face down, UMTS R99 M-ch/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=3mm

Reference Value = 12.7 V/m; Power Drift = 0.445 dB
Peak SAR (extrapolated) = 0.526 W/kg
SAR(1 g) = 0.351 mW/g; SAR(10 g) = 0.234 mW/g

Info: Interpolated medium parameters used for SAR evaluation.



0 dB = 0.407mW/g

13. ATTACHMENTS

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