SAR Evaluation Report

IN ACCORDANCE WITH THE REQUIREMENTS OF
FCC OET BULLETIN 65 SUPPLEMENT C

FOR

EMBEDDED WIRELESS RADIO MODEM INSTALLED IN A CN3 HANDHELD COMPUTER

MODEL: CN3

FCC ID: EHA-08CN3

REPORT NUMBER: 07U11154-4

ISSUE DATE: AUGUST 1, 2007

Prepared for

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Revision History

Rev.	Issued date	Revisions	Revised By
--	August 1, 2007	Initial issue	Sunny Shih

CERTIFICATE OF COMPLIANCE (SAR EVALUATION)

DATES OF TEST: July 20, 23, 25, and 26 2007

APPLICANT: ADDRESS:	Intermec Technologies Corporation 550 Second Street SE, Cedar Rapids, Iowa, 52401, USA
FCC ID: MODEL:	EHA-08CN3 CN3
DEVICE CATEGORY: EXPOSURE CATEGORY:	Portable Device General Population/Uncontrolled Exposure

Embedded wireless radio modem installed in a CN3 handheld computer includes MC75 GSM/GPRS/EDGE Module FCC ID: EHA-05CN3 along with 802.11 b/g and Bluetooth combination radio DHIB module FCC ID: EHA-06CN3 DHIB.

Test Sample is a:	Production unit		
FCC Rule Parts	Frequency Range [MHz]	The Highest SAR Values [1g_mW/g]	The Highest Multi-Band SAR Values [1g_mW/g]
22H	824-849	Head: 0.231 Body: 0.576	Head: 0.393 Body: 0.547
24E	1850-1910	Head: 0.079 Body: 0.572	Head: 0.313 Body: 0.542
15.247	2412-2462	Head: 0.651 Body: 0.065	N/A

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for General Population/Uncontrolled Exposure limits specified in ANSI/IEEE Std. C95.1-1992 and had been tested in accordance with the measurement procedures specified in FCC OET 65 Supplement C (Edition 01-01).

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 Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

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1 DEVICE UNDER TEST (DUT) DESCRIPTION

Embedded wireless radio modem installed in a CN3 handheld computer includes MC75 GSM/GPRS/EDGE Module FCC ID: EHA-05CN3 along with 802.11 b/g and Bluetooth combination radio DHIB module FCC ID: EHA-06CN3 DHIB.	
Normal operation:	Head and body position with holster
Accessories:	Holster: Koszegi Asia Limited PN# 815-061-001 Standard Holster: Koszegi Asia Limited PN# 815-062-001 with Scan Handle Scan Handle: PN# 203-839-001
Duty cycle:	GPRS/EGPRS: 1 Slot: 12.5% 2 Slots: 25% 3 Slots: 37.5% 4 Slots: 50% 802.11bg: 100%
Power supply:	3.7 V Nominal Lithium-Ion PN# 318-016-002 – High Capacity

2 FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, CA 94538 USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

NVLAP LAB CODE 200065-0

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

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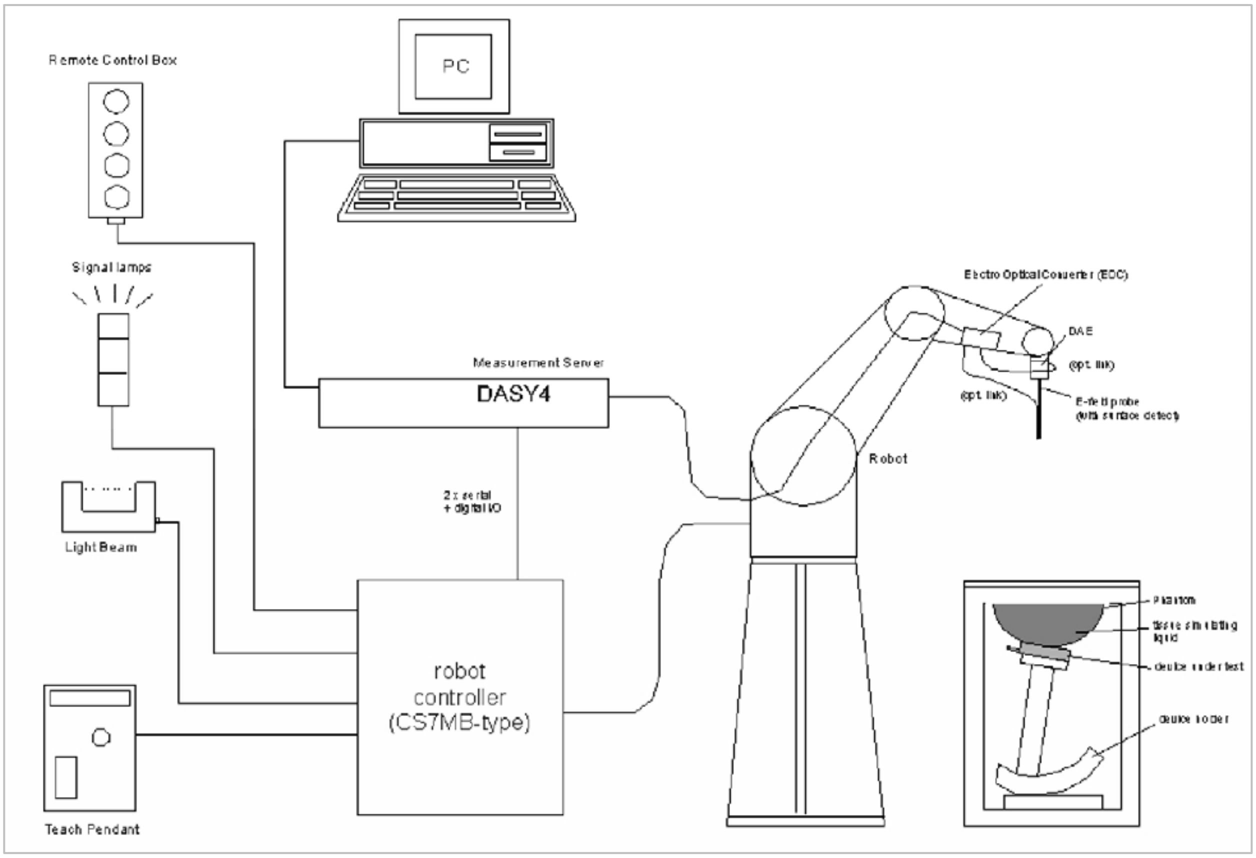
3 SYSTEM DESCRIPTION



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.

3.1 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.

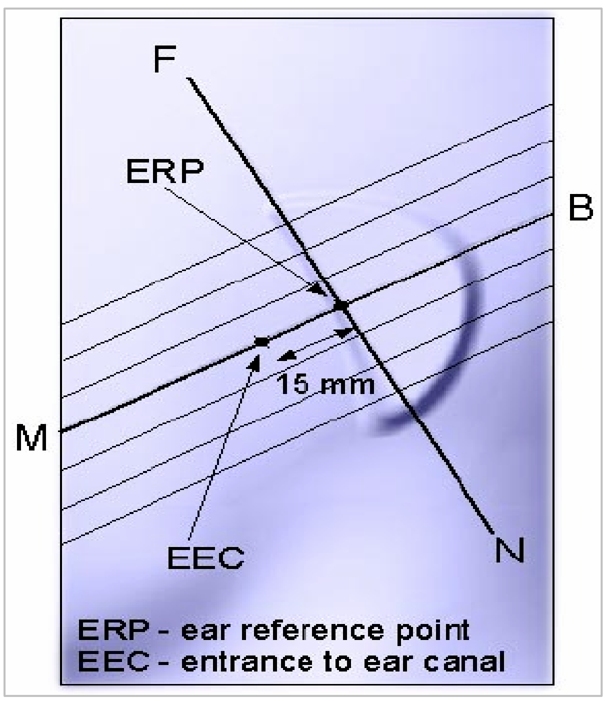
Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	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

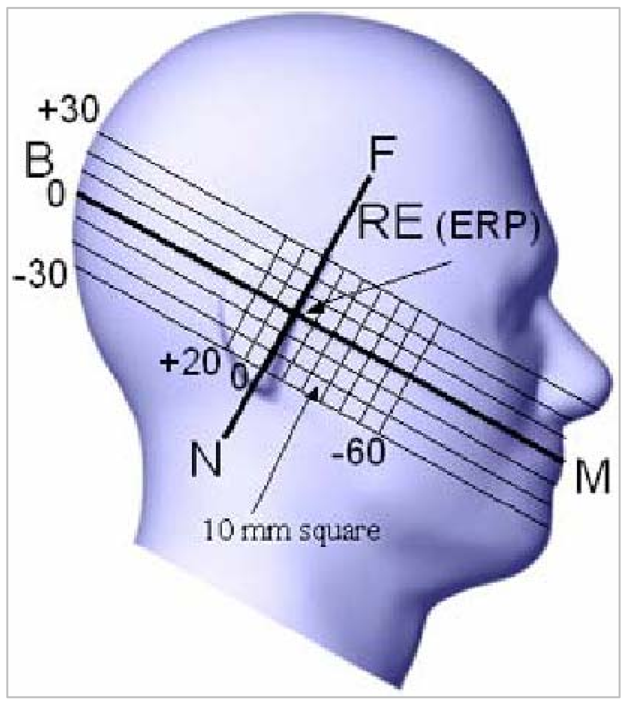
Salt: 99+% Pure Sodium Chloride Sugar: 98+% Pure Sucrose
Water: De-ionized, 16 MΩ+ resistivity HEC: Hydroxyethyl Cellulose
DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

4 TEST POSITIONS FOR DEVICES OPERATING NEXT TO A PERSON'S EAR

This category includes most wireless handsets with fixed, retractable or internal antennas located toward the top half of the device, with or without a foldout, sliding or similar keypad cover. The handset should have its earpiece located within the upper ¼ of the device, either along the centerline or off-centered, as perceived by its users. This type of handset should be positioned in a normal operating position with the "test device reference point" located along the "vertical centerline" on the front of the device aligned to the "ear reference point". The "test device reference point" should be located at the same level as the center of the earpiece region. The "vertical centerline" should bisect the front surface of the handset at its top and bottom edges. A "ear reference point" is located on the outer surface of the head phantom on each ear spacer. It is located 1.5 cm above the center of the ear canal entrance in the "phantom reference plane" defined by the three lines joining the center of each "ear reference point" (left and right) and the tip of the mouth.

A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom. For the SCC-34/SC-2 head phantom, the device should be positioned parallel to the "N-F" line defined along the base of the ear spacer that contains the "ear reference point". For interim head phantoms, the device should be positioned parallel to the cheek for maximum RF energy coupling. The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference plane". This is called the "initial ear position". While maintaining these three alignments, the body of the handset is gradually adjusted to each of the following positions for evaluating SAR:





4.1 CHEEK/TOUCH POSITION

The device is brought toward the mouth of the head phantom by pivoting against the “ear reference point” or along the “N-F” line for the SCC-34/SC-2 head phantom.

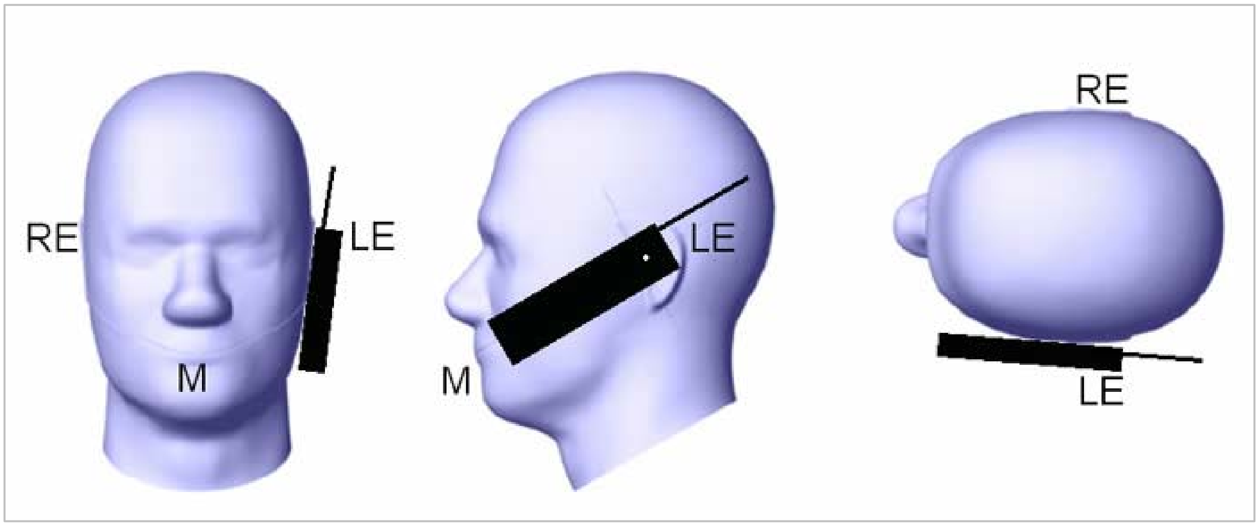
This test position is established:

i. When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.

ii. (or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.

For existing head phantoms – when the handset loses contact with the phantom at the pivoting point, rotation should continue until the device touches the cheek of the phantom or breaks its last contact from the ear spacer.

Cheek / Touch Position



4.2 EAR/TILT POSITION

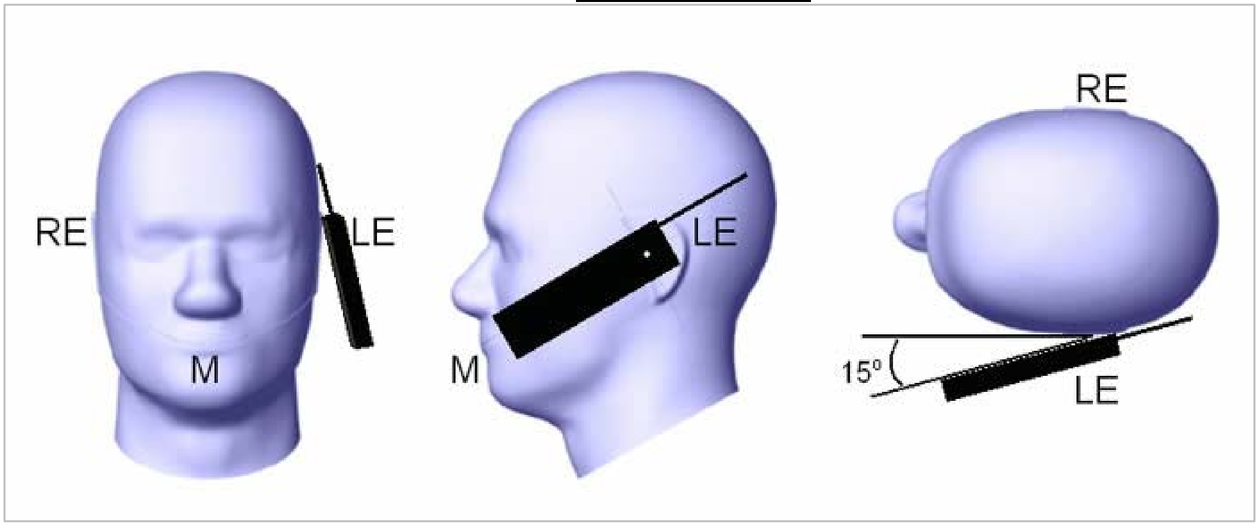
With the handset aligned in the "Cheek/Touch Position":

i. If the earpiece of the handset is not in full contact with the phantom's ear spacer (in the "Cheek/Touch position") and the peak SAR location for the "Cheek/Touch" position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the "initial ear position" by rotating it away from the mouth until the earpiece is in full contact with the ear spacer.

ii. (otherwise) The handset should be moved (translated) away from the cheek perpendicular to the line passes through both "ear reference points" (note: one of these ear reference points may not physically exist on a split head model) for approximate 2-3 cm. While it is in this position, the device handset is tilted away from the mouth with respect to the "test device reference point" until the inside angle between the vertical centerline on the front surface of the phone and the horizontal line passing through the ear reference point is by 15°. After the tilt, it is then moved (translated) back toward the head perpendicular to the line passes through both "ear reference points" until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously. This test position may require a device holder or positioner to achieve the translation and tilting with acceptable positioning repeatability.

If a device is also designed to transmit with its keypad cover closed for operating in the head position, such positions should also be considered in the SAR evaluation. The device should be tested on the left and right side of the head phantom in the "Cheek/Touch" and "Ear/Tilt" positions. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions. These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tilt/Ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s). If the transmission band of the test device is less than 10 MHz, testing at the high and low frequency channels is optional.

Ear/Tilt 15° Position



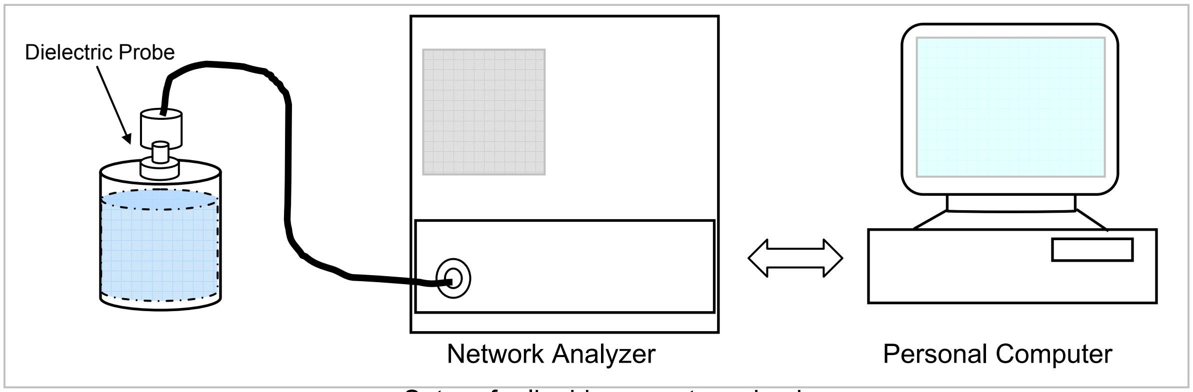
4.3 TEST POSITIONS FOR BODY-WORN AND OTHER SIMILAR CONFIGURATIONS

Without the belt-clips or holsters

Body-worn accessories may not always be supplied or available as options for some devices that are intended to be authorized for body-worn use. A separation distance of 1.5 cm between the back of the device and a flat phantom is recommended for testing body-worn SAR compliance under such circumstances. Other separation distances may be used, but they should not exceed 2.5 cm. In these cases, the device may use body-worn accessories that provide a separation distance greater than that tested for the device provided however that the accessory contains no metallic components.

5 SIMULATING 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.



Set-up for liquid parameters check

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	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

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

5.1 SIMULATING LIQUID PARAMETER CHECK RESULT

Simulating Liquid Dielectric Parameters Check Result @ Head 835 MHz

Room Ambient Temperature = 23°C; Relative humidity = 50% Measured by: Jonathan King

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
835	22	15	e'	40.6633	Relative Permittivity (ϵ_r):	40.6633	41.5	-2.02	± 5
			e"	18.6884	Conductivity (σ):	0.86812	0.90	-3.54	± 5

Liquid Check
Ambient temperature: 23 deg. C; Liquid temperature: 22 deg C
July 20, 2007 05:14 PM

Frequency	e'	e"
800000000.	41.0765	18.7058
805000000.	41.0266	18.6743
810000000.	40.9656	18.6782
815000000.	40.9192	18.6730
820000000.	40.8727	18.6838
825000000.	40.7918	18.6618
830000000.	40.7290	18.6825
835000000.	**40.6633**	**18.6884**
840000000.	40.6074	18.6500
845000000.	40.5314	18.6488
850000000.	40.4513	18.6284
855000000.	40.3966	18.6218
860000000.	40.3632	18.5788
865000000.	40.2860	18.5588
870000000.	40.2047	18.5201
875000000.	40.1283	18.5310
880000000.	40.0913	18.5007
885000000.	40.0367	18.4759
890000000.	40.0051	18.4943
895000000.	39.9649	18.4460
900000000.	39.9081	18.4571
905000000.	39.8474	18.4351
910000000.	39.7931	18.4651
915000000.	39.7337	18.4578
920000000.	39.6761	18.4212
925000000.	39.5807	18.4491
930000000.	39.5209	18.4475
935000000.	39.4768	18.4317
940000000.	39.3934	18.4090
945000000.	39.3804	18.3657
950000000.	39.2987	18.3434

The conductivity (σ) can be given as:

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

where $f = \text{target } f * 10^6$

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

Simulating Liquid Dielectric Parameters Check Result @ Head 1900 MHz

Room Ambient Temperature = 23°C; Relative humidity = 50% Measured by: Jonathan King

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
1900	22	15	e'	38.4506	Relative Permittivity (ε_r):	38.4506	40.0	-3.87	± 5
			e''	13.2440	Conductivity (σ):	1.39988	1.40	-0.01	± 5

Liquid Check
Ambient temperature: 23 deg. C; Liquid temperature: 22 deg C
July 20, 2007 09:47 AM

Frequency	e'	e''
1710000000.	39.1717	12.8455
1720000000.	39.1135	12.8712
1730000000.	39.0848	12.8925
1740000000.	39.0035	12.9103
1750000000.	38.9633	12.9231
1760000000.	38.9240	12.9355
1770000000.	38.8996	12.9454
1780000000.	38.8460	12.9603
1790000000.	38.8135	12.9630
1800000000.	38.7762	13.0016
1810000000.	38.7560	13.0062
1820000000.	38.7144	13.0384
1830000000.	38.6650	13.0753
1840000000.	38.6232	13.1078
1850000000.	38.5737	13.1450
1860000000.	38.5515	13.1568
1870000000.	38.5410	13.1763
1880000000.	38.5151	13.1933
1890000000.	38.4940	13.2162
1900000000.	**38.4506**	**13.2440**
1910000000.	38.4289	13.2672

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 Parameter Check Result @ Head 2450 MHz

Room Ambient Temperature = 24°C; Relative humidity =50% Measured by: Jonathan King

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
2450	23	15	e'	38.5981	Relative Permittivity (ϵ_r):	38.5981	39.2	-1.54	± 5
			e"	13.6804	Conductivity (σ):	1.86459	1.80	3.59	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C
July 26, 2007 12:16 PM

Frequency	e'	e"
2400000000.	38.8058	13.5446
2405000000.	38.7747	13.5430
2410000000.	38.7610	13.5688
2415000000.	38.7269	13.5865
2420000000.	38.7128	13.6045
2425000000.	38.7098	13.6189
2430000000.	38.6838	13.6220
2435000000.	38.6519	13.6244
2440000000.	38.6272	13.6486
2445000000.	38.6068	13.6610
2450000000.	**38.5981**	**13.6804**
2455000000.	38.5775	13.6821
2460000000.	38.5590	13.6960
2465000000.	38.5271	13.7101
2470000000.	38.5058	13.7430
2475000000.	38.4873	13.7461
2480000000.	38.4768	13.7618
2485000000.	38.4600	13.7829
2490000000.	38.4347	13.8001
2495000000.	38.4178	13.8269
2500000000.	38.4077	13.8647

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 Check Result @ Muscle 835 MHz

Room Ambient Temperature = 24°C; Relative humidity = 50% Measured by: Jonathan King

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
835	23	15	e'	52.856	Relative Permittivity (ϵ_r):	52.8560	55.2	-4.25	± 5
			e"	20.7473	Conductivity (σ):	0.96376	0.97	-0.64	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C
July 25, 2007 010:30 PM

Frequency	e'	e"
800000000.	53.2041	20.8513
805000000.	53.1704	20.8319
810000000.	53.1310	20.8258
815000000.	53.0705	20.7881
820000000.	53.0247	20.7735
825000000.	52.9715	20.7506
830000000.	52.8868	20.7447
835000000.	**52.8560**	**20.7473**
840000000.	52.8184	20.6977
845000000.	52.7631	20.6875
850000000.	52.6924	20.6615
855000000.	52.6522	20.6571
860000000.	52.6085	20.6111
865000000.	52.5385	20.6073
870000000.	52.4849	20.5871
875000000.	52.4392	20.5854
880000000.	52.3875	20.5649
885000000.	52.3253	20.5696
890000000.	52.2882	20.5545
895000000.	52.2428	20.5427
900000000.	52.2043	20.4922
905000000.	52.1568	20.4972
910000000.	52.1405	20.5005
915000000.	52.0960	20.4684
920000000.	52.0418	20.4354
925000000.	52.0102	20.4194
930000000.	51.9355	20.4204
935000000.	51.8862	20.4318
940000000.	51.8381	20.3925
945000000.	51.8011	20.3792
950000000.	51.7304	20.3796

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 Check Result @ Muscle 1900 MHz

Room Ambient Temperature = 24°C; Relative humidity = 50% Measured by: Jonathan King

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
1900	23	15	e'	50.9629	Relative Permittivity (ϵ_r):	50.9629	53.3	-4.38	± 5
			e"	14.2369	Conductivity (σ):	1.50483	1.52	-1.00	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C
July 25, 2007 11:15 AM

Frequency	e'	e"
1710000000.	51.6400	13.5966
1720000000.	51.6300	13.6335
1730000000.	51.5871	13.6715
1740000000.	51.5751	13.7098
1750000000.	51.5245	13.7506
1760000000.	51.5021	13.7973
1770000000.	51.4645	13.8315
1780000000.	51.4321	13.8651
1790000000.	51.3985	13.9035
1800000000.	51.3521	13.9455
1810000000.	51.3277	13.9942
1820000000.	51.2738	13.9969
1830000000.	51.2108	14.0538
1840000000.	51.1845	14.0764
1850000000.	51.1307	14.1227
1860000000.	51.0990	14.1470
1870000000.	51.0823	14.1620
1880000000.	51.0295	14.1944
1890000000.	51.0093	14.2094
1900000000.	**50.9629**	**14.2369**
1910000000.	50.9267	14.2699

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 Parameter Check Result @ Muscle 2450 MHz

Room Ambient Temperature = 24°C; Relative humidity = 50% Measured by: Jonathan King

Simulating Liquid			Parameters			Measured	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)							
2450	23	15	e'	51.878	Relative Permittivity (ε_r):	51.8780	52.7	-1.56	± 5
			e''	14.6259	Conductivity (σ):	1.99346	1.95	2.23	± 5

Liquid Check
Ambient temperature: 24 deg. C; Liquid temperature: 23 deg C
July 23, 2007 11:44 AM

Frequency	e'	e''
2400000000.	52.0740	14.4222
2405000000.	52.0525	14.4374
2410000000.	52.0312	14.4675
2415000000.	52.0131	14.4787
2420000000.	52.0004	14.5060
2425000000.	51.9773	14.5427
2430000000.	51.9651	14.5546
2435000000.	51.9440	14.5741
2440000000.	51.9344	14.5906
2445000000.	51.8970	14.6085
2450000000.	**51.8780**	**14.6259**
2455000000.	51.8566	14.6617
2460000000.	51.8488	14.6842
2465000000.	51.8200	14.6959
2470000000.	51.7885	14.7111
2475000000.	51.7729	14.7442
2480000000.	51.7535	14.7594
2485000000.	51.7327	14.7731
2490000000.	51.7132	14.7965
2495000000.	51.7010	14.8221
2500000000.	51.6750	14.8545

The conductivity (σ) can be given as:

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

where $f = \text{target } f * 10^6$

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

6 SYSTEM PERFORMANCE 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 Body & Body simulating liquid of the following parameters.
- The DASY4 system with an Isotropic E-Field Probe EX3DV3-SN: 3554 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 5 x 5 x 7 fine cube was chosen for cube integration(dx=dy=7.5mm; dz=5mm).
  For 5 GHz band - Special 8x8x8 fine cube was chosen for cube integration(dx=dy=4.3mm; dz=3mm)
- Distance between probe sensors and phantom surface was set to 4 mm.
  For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.0mm
- The dipole input power (forward power) was 250 mW±3%.
- The results are normalized to 1 W input power.

Reference SAR Values

In the table below, the numerical reference SAR values of a SPEAG validation dipoles placed below the flat phantom filled with body-tissue simulating liquid are given. The reference SAR values were calculated using the finite-difference time-domain method and the geometry parameters.

Dipole Type	Distance (mm)	Frequency (MHz)	SAR (1g) [W/kg]	SAR (10g) [W/kg]	SAR (peak) [W/kg]
D835V2	15	835	9.71	6.38	14.1
D900V2	15	900	11.1	7.17	16.3
D1800V2	10	1800	38.5	20.3	67.5
D1900V2	10	1900	39.8	20.8	69.6
D2450V2	10	2450	51.2	23.7	97.6

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

IEEE Standard 1528-2003 Recommended Reference Value.

Frequency (MHz)	Distance (mm)	1g SAR [W/kg]	10g SAR [W/kg]
835	15	9.5	6.2
900	15	10.8	6.9
1800	10	38.1	19.8
1900	10	39.7	20.5
2000	10	41.1	21.1
2450	10	52.4	24.0

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

6.1 SYSTEM PERFORMANCE CHECK RESULTS

System Validation Dipole: D835V2 SN:4d002

Date: July 20, 2007

Ambient Temperature = 23°C; Relative humidity = 50% Measured by: Jonathan King

Head Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
835	22	15	1g	2.45	9.8	9.5	3.16	± 10
			10g	1.61	6.44	6.2	3.87	± 10

Date: July 25, 2007

Ambient Temperature = 24°C; Relative humidity = 50% Measured by: Jonathan King

Body Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
835	23	15	1g	2.42	9.68	9.71	-0.31	± 10
			10g	1.6	6.4	6.38	0.31	± 10

System Validation Dipole: D1900V2 SN:5d043

Date: July 20, 2007

Ambient Temperature = 23°C; Relative humidity = 50% Measured by: Jonathan King

Head Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
1900	22	15	1g	10.40	41.6	39.7	4.79	± 10
			10g	5.37	21.48	20.5	4.78	± 10

Date: July 25, 2007

Ambient Temperature = 24°C; Relative humidity = 50% Measured by: Jonathan King

Body Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
1900	23	15	1g	9.88	39.52	39.8	-0.70	± 10
			10g	5.17	20.68	20.8	-0.58	± 10

System Validation Dipole: D2450V2 SN: 706

Date: July 23, 2007

Ambient Temperature = 24°C; Relative humidity = 50% Measured by: Jonathan King

Body Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
2450	23	15	1g	13.60	54.4	51.2	6.25	± 10
			10g	6.33	25.32	23.7	6.84	± 10

Date: July 26, 2007

Ambient Temperature = 24°C; Relative humidity = 50% Measured by: Jonathan King

Head Simulating Liquid			SAR (mW/g)		Normalized to 1 W	Target	Deviation (%)	Limit (%)
f (MHz)	Temp. (°C)	Depth (cm)						
2450	23	15	1g	14.10	56.4	52.4	7.63	± 10
			10g	6.39	25.56	24.0	6.50	± 10

7 SAR MEASURMENT PROCEDURE

A summary of the procedure follows:

a) A measurement of the SAR value at a fixed location is used as a reference value for assessing the power drop of the EUT. The SAR at this point is measured at the start of the test, and then again at the end of the test.

b) The SAR distribution at the exposed flat section of the flat phantom is measured at a distance of 4 mm from the inner surface of the shell. The area covers the entire dimension of the EUT and the horizontal grid spacing is 15 mm x 15 mm. Based on this data, the area of the maximum absorption is determined by Spline interpolation. The first Area Scan covers the entire dimension of the EUT to ensure that the hotspot was correctly identified.

For 5 GHz band - The SAR distribution at the exposed flat section of the flat phantom is measured at a distance of 2.0 mm from the inner surface of the shell. The area covers the entire dimension of the EUT and the horizontal grid spacing is 10 mm x 10 mm. Based on this data, the area of the maximum absorption is determined by Spline interpolation. The first Area Scan covers the entire dimension of the EUT to ensure that the hotspot was correctly identified.

c) Around this point, a volume of X=Y= 30 and Z=21 mm is assessed by measuring 5 x 5 x 7 mm points. On the basis of this data set, the spatial peak SAR value is evaluated with the following procedure:

For 5 GHz band - Around this point, a volume of X=Y=24 and Z=20 mm is assessed by measuring 7 x 7 x 9 mm points. On the basis of this data set, the spatial peak SAR value is evaluated with the following procedure:

(i) The data at the surface are extrapolated, since the centre of the dipoles is 1.2 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. The extrapolation is based on a least square algorithm. A polynomial of the fourth order is calculated through the points in z-axes. This polynomial is then used to evaluate the points between the surface and the probe tip.

(ii) The maximum interpolated value is searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g and 10 g) are computed using the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one-dimensional splines with the “Not a knot”- condition (in x, y and z-direction). The volume is integrated with the trapezoidal – algorithm. One thousand points (10 x 10 x 10) are interpolated to calculate the averages.

(iii) All neighbouring volumes are evaluated until no neighbouring volume with a higher average value is found.

(iv) The SAR value at the same location as in Step (a) is again measured to evaluate the actual power drift.

7.1 DASY4 SAR MEASURMENT PROCEDURE

Step 1: Power Reference Measurement
The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties (for example, 1.2 mm for an EX3DV3 probe type).

Step 2: Area Scan
The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY4 software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528, EN 50361 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Step 3: Zoom Scan
Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures 5 x 5 x 7 points within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.
For 5 GHz band – Same as above except the Zoom Scan measures 7 x 7 x 9 points.

Step 4: Power drift measurement
The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan
The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation, the extrapolated distance should not be larger than the step size in Z-direction.

7.2 DASY4 MULTIBAND SAR MEASURMENT PROCEDURE

Step 1: Power Reference Measurement
The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties (for example, 1.2 mm for an EX3DV3 probe type).

Step 2: Volume Scan Job
Volume Scans are used to assess peak SAR and averaged SAR measurement in largely extended 3-deimensional volumes within any phantom. This measurement does not need any previous area scan. The grid can be anchored to a user specific point or to the current probe location. The steps in horizontal and vertical directions are 15mm.

Step 3: Power drift measurement
The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan
The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation, the extrapolated distance should not be larger than the step size in Z-direction.

Step 5: Multiband Data Extractions
After SAR measurements in each liquid, SEMCAD tool is used to evaluate the combined SAR from different bands.

8 PROCEDURE USED TO ESTABLISH TEST SIGNAL

The following procedures had been used to prepare the EUT for the SAR test.

The client provided a special driver and program, FCC Test Utility, which enables a user to control the frequency and output power of the module.

The cable assembly insertion loss of 20.0 dB (including 19.8 dB attenuator and 0.2dB connectors) was entered as an offset in the power meter to allow for direct reading of power.

802.11b

Channel	Frequency (MHz)	Power (dBm)
Low	2412	14.4
Middle	2437	14.5
High	2462	14.3

802.11g

Channel	Frequency (MHz)	Power (dBm)
Low	2412	11.6
Middle	2437	11.7
High	2462	11.6

The following procedures had been used to prepare the EUT for the SAR test.

The client provided a special driver and program, Broad Test , which enables a user to control the frequency and output power of the module.

The cable assembly insertion loss of 20.0 dB (including 19.8 dB attenuator and 0.2dB connectors) was entered as an offset in the power meter to allow for direct reading of power.

Bluetooth

Channel	Frequency (MHz)	Power (dBm)
Low	2404	2.3
Middle	2441	2.5
High	2480	2.4

The following setting is used to configure the CMU 200 to establish the link for SAR testing.

Service selection ➔ Test Mode A – Auto Slot Config. ➔ off
Main Service ➔ Circuit Switched for GSM mode
Packet Data for GPRS and EGPRS mode
Network Support ➔ GSM+GPRS
Slot Config ➔ 33 dBm for GPRS 850
27 dBm for EGPRS 850
30 dBm for GPRS1800
26 dBm for EGPRS 850

The cable insertion loss of 1 dB was entered as an offset in the CMU 200 to allow for direct reading of power.

Conducted power:

GSM850

Channel	Frequency (MHz)	GPRS			
		1 slot Power (dBm)	2 slots Power (dBm)	3 slots Power (dBm)	4 slots Power (dBm)
128	824.2	33.1	30.8	29.0	27.2
190	836.6	33.1	30.8	29.0	27.2
251	848.8	33.1	30.8	29.0	27.2

Channel	Frequency (MHz)	EGPRS			
		1 slot Power (dBm)	2 slots Power (dBm)	3 slots Power (dBm)	4 slots Power (dBm)
128	824.2	27.4	27.3	27.3	27.2
190	836.6	27.4	27.3	27.3	27.2
251	848.8	27.4	27.3	27.3	27.2

GSM1900

Channel	Frequency (MHz)	GPRS			
		1 slot Power (dBm)	2 slots Power (dBm)	3 slots Power (dBm)	4 slots Power (dBm)
512	1850.2	29.9	27.8	26.1	24.4
661	1880.0	29.9	27.8	26.1	24.4
810	1909.8	29.9	27.8	26.1	24.4

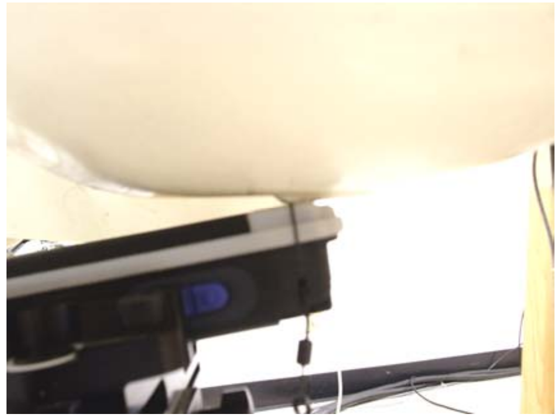
Channel	Frequency (MHz)	EGPRS			
		1 slot Power (dBm)	2 slots Power (dBm)	3 slots Power (dBm)	4 slots Power (dBm)
512	1850.2	26.3	26.2	26.1	24.4
661	1880.0	26.3	26.2	26.1	24.4
810	1909.8	26.3	26.2	26.1	24.4

9 SAR MEASURMENT RESULTS

9.1 CELL BAND

9.1.1 LEFT HAND SIDE

Touch Position



Tilt (15°) Position

GSM850

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
Touch	128 190 251	824.2 836.6 848.8	0.192	-0.009	0.192
Tilt (15°)	128 190 251	824.2 836.6 848.8	0.121	0.000	0.121

Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacturer's instructions prior to SAR measurements.

9.1.2 RIGHT HAND SIDE

Touch Position

Tilt (15°) Position

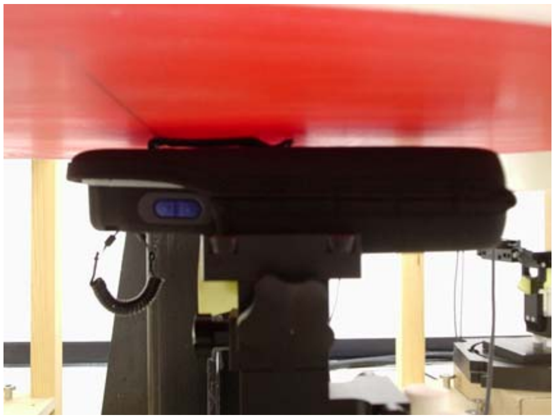
GSM850					
Test Position	**Channel**	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1)] SAR 1g (mW/g)**
Touch	128	824.2	0.151	0.000	0.151
	190	836.6	0.207	0.000	0.207
	251[5)]	**848.8**	**0.231**	**0.000**	**0.231**
Tilt (15°)	128 190 251	824.2 836.6 848.8	0.143	0.000	0.143

Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacturer's instructions prior to SAR measurements.
5) This position was chosen for Multi-Band for the head positions.

9.1.3 BODY POSITION - HOLSTER WITH BELTCLIP

Due to the different conducted power levels and duty cycles for the different slot settings, the following position was chosen for a preliminary scan in order to determine the worst slot settings.

	
LCD Facing Up	LCD Facing Down

LCD Facing Up

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
GPRS 1 Slot	128 190 251	824.2 836.6 848.8	0.060	-0.147	0.062
GPRS 2 Slots	128 190 251	824.2 836.6 848.8	**0.073**	-0.080	**0.074**
GPRS 3 Slots	128 190 251	824.2 836.6 848.8	0.064	-0.032	0.065
GPRS 4 Slots	128 190 251	824.2 836.6 848.8	0.059	-0.073	0.060

LCD Facing Down

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
GPRS 2 Slots	128 190 **251[5)]**	824.2 836.6 **848.8**	0.339 0.442 **0.576**	-0.014 0.000 **0.000**	0.340 0.442 **0.576**

Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacturer's instructions prior to SAR measurements.
5) This position was chosen for Multi-Band for the body positions.

9.1.4 BODY POSITION - HOLSTER WITH SCAN HANDLE

Right Side

Left Side

GPRS 2 slots

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
Right Side	128 190 251	824.2 836.6 848.8	0.077	0.000	0.077
Left Side	128 190 251	824.2 836.6 848.8	0.116	0.000	0.116

Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacturer’s instructions prior to SAR measurements.

9.2 PCS BAND

9.2.1 LEFT HAND SIDE

Touch Position

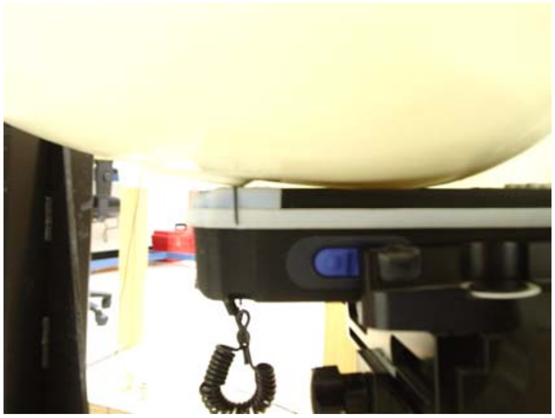
Tilt (15°) Position

GSM1900

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
Touch	512 661 810	1850.2 1880.0 1909.8	0.058	0.000	0.058
Tilt (15°)	512 661 810	1850.2 1880.0 1909.8	0.064	-0.066	0.065

Notes:
1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacturer's instructions prior to SAR measurements.

9.2.2 RIGHT HAND SIDE



Touch Position

Tilt (15°) Position

GSM1900

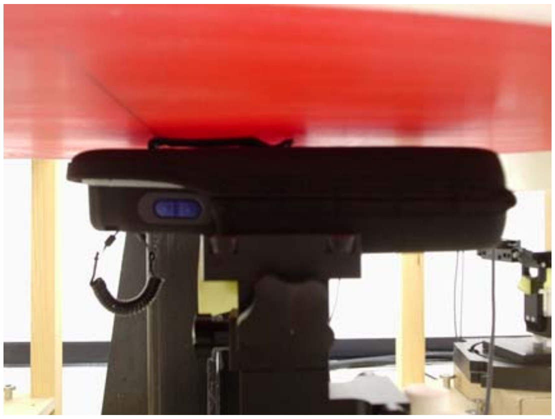
Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
Touch	512 661 810	1850.2 1880.0 1909.8	0.057	0.000	0.057
Tilt (15°)	512 661 **810[5)]**	1850.2 1880.0 **1909.8**	0.054 0.070 **0.079**	0.000 0.000 **-0.024**	0.054 0.070 **0.079**

Notes:

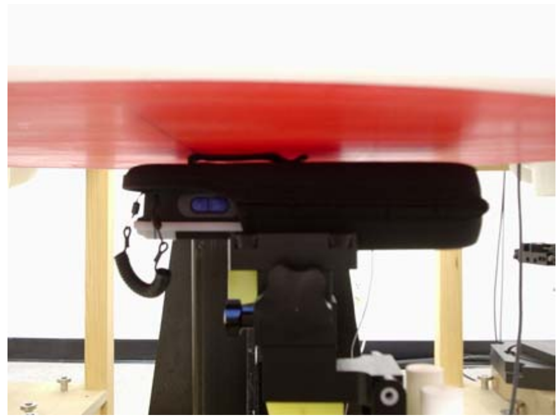
1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacturer’s instructions prior to SAR measurements.
5) This position was chosen for Multi-Band for the body positions.

9.2.3 BODY POSITION - HOLSTER WITH BELTCLIP

Due to the different conducted power levels and duty cycles for the different slot settings, the following position was chosen for a preliminary scan in order to determine the worst slot settings.



LCD Facing Up



LCD Facing Down

GSM1900 LCD Facing Up					
Test Position	**Channel**	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1)] SAR 1g (mW/g)**
GPRS 1 Slot	512 661 810	1850.2 1880.0 1909.8	0.026	-0.008	0.026
GPRS 2 Slots	512 **661** 810	1850.2 **1880.0** 1909.8	**0.034**	**-0.042**	**0.034**
GPRS 3 Slots	512 661 810	1850.2 1880.0 1909.8	0.032	0.000	0.032
GPRS 4 Slots	512 661 810	1850.2 1880.0 1909.8	0.031	0.000	0.031
GSM1900 LCD Facing Down					
Test Position	**Channel**	**f (MHz)**	**Measured SAR 1g (mW/g)**	**Power Drift (dB)**	**Extrapolated[1)] SAR 1g (mW/g)**
GPRS 2 Slot	512 661 **810[5)]**	1850.2 1880.0 **1909.8**	0.467 0.512 **0.568**	-0.032 0.000 **-0.034**	0.470 0.512 **0.572**

Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacturer's instructions prior to SAR measurements.
5) This position was chosen for Multi-Band for the body positions.

9.2.4 BODY POSITION - HOLSTER WITH SCAN HANDLE

	
Right Side	Left Side

GPRS 2 Slots

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
Right Side	512 661 810	1850.2 1880.0 1909.8	0.071	0.000	0.071
Left Side	512 661 810	1850.2 1880.0 1909.8	0.181	0.000	0.181

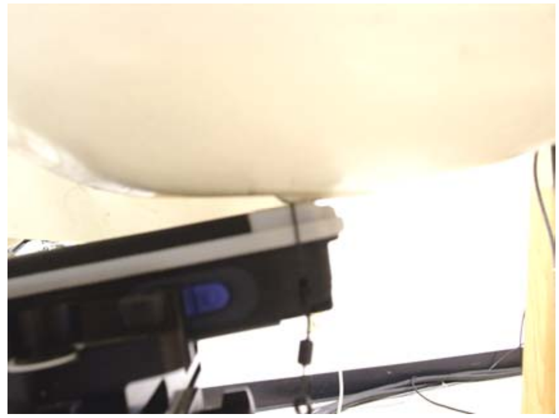
Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacturer’s instructions prior to SAR measurements.

9.3 WLAN

9.3.1 LEFT HAND SIDE

Touch Position



Tilt (15°) Position

802.11 b mode

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
Touch	1 6 11	2412 2437 2462	0.506	-0.113	0.519
Tilt (15°)	**1**	**2412**	**0.651**	**0.000**	**0.651**
	6	2437	0.533	0.000	0.533
	11	2462	0.616	-0.025	0.620

Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacturer's instructions prior to SAR measurements.

9.3.2 RIGHT HAND SIDE

Touch Position

Tilt (15°) Position

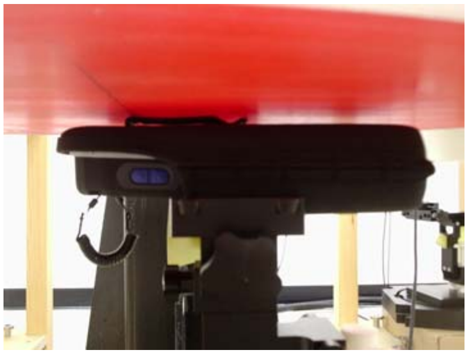
802.11 b mode

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1] SAR 1g (mW/g)
Touch	1 6 11[5]	2412 2437 2462	0.274	-0.125	0.282
Tilt (15°)	1 6 11[6]	2412 2437 2462	0.305	0.000	0.305

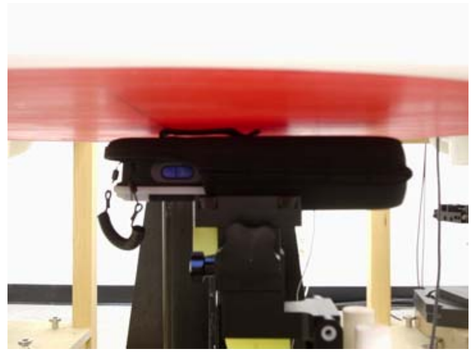
Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacturer's instructions prior to SAR measurements.
5) This position was chosen for Multi-Band for the Cell Band.
6) This position was chosen for Multi-Band for the PCS Band.

9.3.3 HOLSTER WITH BELTCLIP



LCD Facing Up



LCD Facing Down

802.11 b mode

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
LCD Up	**1** 6 11[5)]	**2412** 2437 2462	**0.065** 0.058 0.062	**0.000** -0.086 0.000	**0.065** 0.060 0.062
LCD Down	1 6 11	2412 2437 2462	0.019	-0.131	0.020

802.11 g mode

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
LCD Up	1 6 11	2412 2437 2462	0.031	0.000	0.031
LCD Down	1 6 11	2412 2437 2462	0.011	0.000	0.011

Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacturer's instructions prior to SAR measurements.
5) This position was chosen for Multi-Band for the both the Cell and PCS Bands.

9.3.4 HOLSTER WITH SCAN HANDLE

Right Side

Left Side

802.11 b mode

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
Right Side	1	2412	0.054	0.000	0.054
	6	2437	0.046	0.000	0.046
	11	2462	0.048	0.000	0.048
Left Side	1	2412			
	6	2437	0.020	-0.052	0.020
	11	2462			

802.11 g mode

Test Position	Channel	f (MHz)	Measured SAR 1g (mW/g)	Power Drift (dB)	Extrapolated[1)] SAR 1g (mW/g)
Right Side	1	2412			
	6	2437	0.021	-0.089	0.021
	11	2462			
Left Side	1	2412			
	6	2437	0.009	-0.039	0.009
	11	2462			

Notes:

1) The exact method of extrapolation is Measured SAR x 10^(-drift/10). The SAR reported at the end of the measurement process by the DASY4 system can be scaled up by the Power drift to determine the SAR at the beginning of the measurement process.
2) The SAR measured at the middle channel for this configuration is at least 3 dB lower (0.8 mW/g) than SAR limit (1.6 mW/g), thus testing at low & high channel is optional.
3) Please see attachments for the detailed measurement data and plots showing the maximum SAR location of the EUT.
4) The battery was fully charged in accordance with manufacturer's instructions prior to SAR measurements.

9.4 MULTI-BAND EVALUATIONS

9.4.1 WORST CASE CONFIUGURATIONS

The following SAR results are from the previous zoom scans in order to determine the worst case:

Frequency Band	Test Position	f (MHz)	Zoom Scan SAR 1g (mW/g)
GSM 850	Right Hand Side: Touch	848.8	0.231
(Part 22 Cell Band)	Body-Worn: LCD Faces Down	848.8	0.576
GSM 1900	Right Hand Side: Tilt	1909.8	0.079
(Part 24 PCS Band)	Body-Worn: LCD Faces Down	1909.8	0.572

The following SAR values are evaluated in the same frequency & position in two different liquids using Dasy4 Multi-Band method in order to use SEMCAD tool to evaluate the combined SAR.

Note: The Bluetooth radio produces signals that are within the noise floor. Therefore for the purpose of this report the Bluetooth radio was not included for the Multi-Band analysis.

9.4.2 MULTI-BAND SAR RESULTS (CELL BAND)

Head

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
GSM 850	Right Hand Side: Touch	848.8	0.235
WLAN	Right Hand Side: Touch	2437.0	0.260
		Multi Band Result:	**0.393**

Body

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
GSM 850	LCD Faces Down	848.8	0.544
WLAN	LCD Faces Down	2437.0	0.016
		Multi Band Result:	**0.547**

9.4.3 MULTI-BAND SAR RESULTS (PCS BAND)

Head

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
GSM 1900	Right Hand Side: Touch	1909.8	0.079
WLAN	Right Hand Side: Touch	2437.0	0.246
		Multi Band Result:	**0.313**

Body

Wireless Transmitter	Test Position	f (MHz)	Volume scan 1g SAR (mW/kg)
GSM 1900	LCD Faces Down	1909.8	0.537
WLAN	LCD Faces Down	2437.0	0.016
		Multi Band Result:	**0.542**

10 MEASURMENT UNCERTAINTY

10.1 MEASURMENT 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

11 EQUIPMENT LIST AND CALIBRATION

Name of Equipment	Manufacturer	Type/Model	Serial Number	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	US39173569	2	14	2008
E-Field Probe	SPEAG	EX3DV4	3554	4	24	2008
Thermometer	ERTCO	639-1S	1718	11	7	2007
Data Acquisition Electronics	SPEAG	DAE3 V1	427	11	16	2007
System Validation Dipole	SPEAG	D835V2	4d002	1	19	2008
System Validation Dipole	SPEAG	D1900V2	5d043	1	23	2008
System Validation Dipole	SPEAG	D2450V2	706	4	27	2008
Signal Generator	R&S	SMP 04	DE34210	10	9	2007
Power Meter	Giga-tronics	8651A	8651404	4	3	2008
Amplifier	Mini-Circuits	ZHL-42W	D072701-5	N/A		
Radio Communication Tester	R &S	CMU 200	106291	4	16	2008
Simulating Liquid	CCS	H835	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	H1900	N/A	Within 24 hrs of first test		
Simulating Liquid	CCS	M835	N/A	Within 24 hrs of first test		

12 PHOTOS

EUT

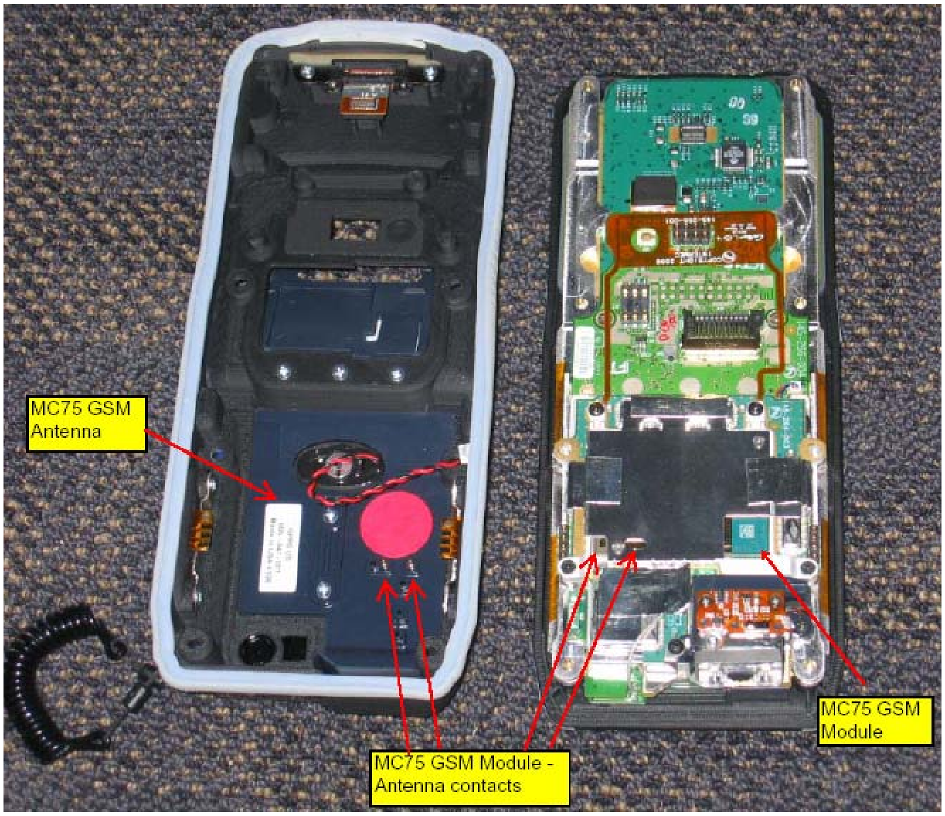
CN3 with Battery

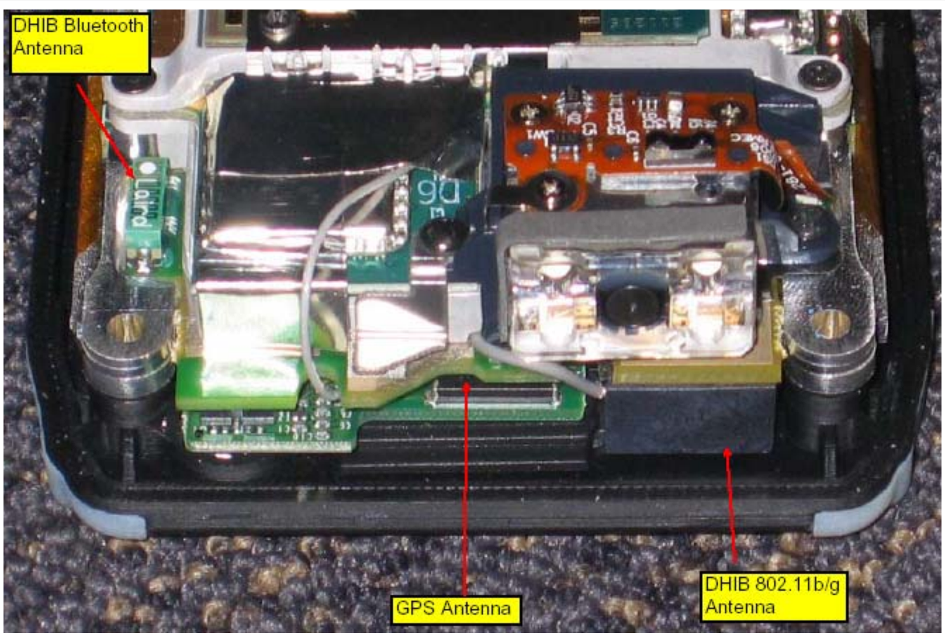
CN3 with Scan Handle

Holster with Belt-clip

Holster with Scan Handle

Antenna Locations





13 ATTACHMENTS

No.	Contents	No. Of Pages
1	System Performance Check Plots	12
2-1	SAR Test Plots – Cell Band	17
2-2	SAR Test Plots – PCS Band	17
2-3	SAR Test Plots – WLAN	20
2-4	SAR Test Plots – Multi-Band	8
3	Certificate of E-Field Probe - EX3DV4SN3554	10
4	Certificate of System Validation Dipole - D835V2 SN:4d002	9
5	Certificate of System Validation Dipole - D1900V2 SN:5d043	9
6	Certificate of System Validation Dipole - D2450 SN:706	9

END OF REPORT