

SAR Test Report

Project Number: 3044696
Report Number: 3044696EMC20 **Revision Level:** 4
Client: Intermec Technologies Corporation

Equipment Under Test: Mobile Computer with AE37 AC Adapter
Model Name: CN51

Applicable Standards: IEEE STD 1528: 2003
 EN 62209-1:2010, EN 62209-2:2010

Report issued on: 6 September 2013
Test Result: Compliant

Equipment Class	Mode	Band	Frequency (MHz)	Measured Conducted Power (dBm)	SAR	
					1g Head W/kg	1g Body W/kg
PCE	CDMA/EVDO	BC0	824.7 - 848.31	24.6	0.325	0.516
PCE	CDMA/EVDO	BC1	1851.25 - 1908.75	24.7	0.130	1.110
PCE	GSM	850	824.2 - 848.8	33.0	0.536	0.925
PCE	GSM	1950	1850.2 - 1909.8	29.8	0.138	1.110
PCE	WCDMA	Band V	826.4 - 846.6	25.1	0.334	0.508
PCE	WCDMA	Band II	1852.4 - 1907.6	24.9	0.200	1.300
DTS	WiFi	US	2412 - 2462	17.9	0.030	0.125
DSS/DTS	Bluetooth	US	2402 - 2480	7.0	NA	
Simultaneous SAR per KDB 690783 D01v01r02					0.566	1.425

Tested by:


 Fabian Nica, Engineering Technician

Reviewed by:


 David Schramm, EMC Manager

Remarks: This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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Table of Contents

1	GENERAL INFORMATION	3
1.1	CLIENT INFORMATION.....	3
1.2	TEST LABORATORY.....	3
1.3	GENERAL INFORMATION OF EUT	3
1.4	NOMINAL AND MAXIMUM POWER SPECIFICATIONS	4
1.5	EQUIPMENT UNDER TEST.....	4
1.6	ANTENNA LOCATIONS.....	5
1.7	DUT ACCESSORIES.....	6
2	TEST METHODOLOGY	9
3	TEST EQUIPMENT	10
3.1	TEST SYSTEM BLOCK DIAGRAM.....	11
4	LIQUID PARAMETERS CHECK	12
4.1	TABLE 3-2 TISSUE VERIFICATION MEASURED.....	13
5	SAR MEASUREMENT SYSTEM VERIFICATION.....	15
5.1	PERFORMANCE CHECK MEASUREMENT CONDITIONS	15
5.2	SAR REFERENCE VALUES FOR HEAD AND BODY CALIBRATION.....	15
	5.2.1 System Verification.....	16
6	SAR MEASUREMENT PROCEDURE	17
6.1	HEAD SAR CONFIGURATION	18
	6.1.1 SAM Specifications.....	18
	6.1.2 Handset Reference Points	18
	6.1.3 Ear reference	19
	6.1.4 Cheek positions.....	19
	6.1.5 Tilt Position	20
7	CONDUCTED OUTPUT POWER VERIFICATION	21
8	2G-3G HEAD SAR MEASUREMENT RESULTS	23
9	WI-FI HEAD SAR MEASUREMENT RESULTS	24
10	2G-3G BODY SAR MEASUREMENT RESULTS	25
11	WI-FI BODY SAR MEASUREMENT RESULTS.....	26
12	SIMULTANEOUS TRANSMISSIONS.....	27
13	UNCERTAINTY BUDGET 0.3 – 3 GHZ RANGE	29
14	REVISION HISTORY	31

1 GENERAL INFORMATION

1.1 CLIENT INFORMATION

Name: Intermec Technologies Corp.
 Address: 6001 36th Avenue W
 City, State, Zip, Country: Everett, WA 988203, USA

1.2 TEST LABORATORY

Name: SGS North America, Inc.
 Address: 620 Old Peachtree Road NW, Suite 100
 City, State, Zip, Country: Suwanee, GA 30024, USA

Accrediting Body: A2LA
 Type of lab: Testing Laboratory
 Certificate Number: 3212.01

1.3 GENERAL INFORMATION OF EUT

Serial Number: 077X1200001
 Build Version: 2.00.00.0371
 Firmware Version: 02.893
 Antenna: Integral
 Rated Voltage: 3.7 VDC Rechargeable Battery

Sample Received Date: 13 June 2013
 Dates of testing: 19 June to 18 July 2013

Equipment Class	Mode	Band	Frequency (MHz)	Operating Modes
PCE	CDMA/EVDO	BC0	824.7 - 848.31	Voice / Data
PCE	CDMA/EVDO	BC1	1851.25 - 1908.75	Voice / Data
PCE	GSM/GPRS/EDGE	850	824.2 - 848.8	Voice / Data
PCE	GSM/GPRS/EDGE	1900	1850.2 - 1908.8	Voice / Data
PCE	WCDMA	Band V	826.4 - 846.6	Voice / Data
PCE	WCDMA	Band II	1852.4 - 1907.6	Voice / Data
DTS	WiFi	US	2412 - 2462	Data
DSS/DTS	Bluetooth	US	2402 - 2480	Data

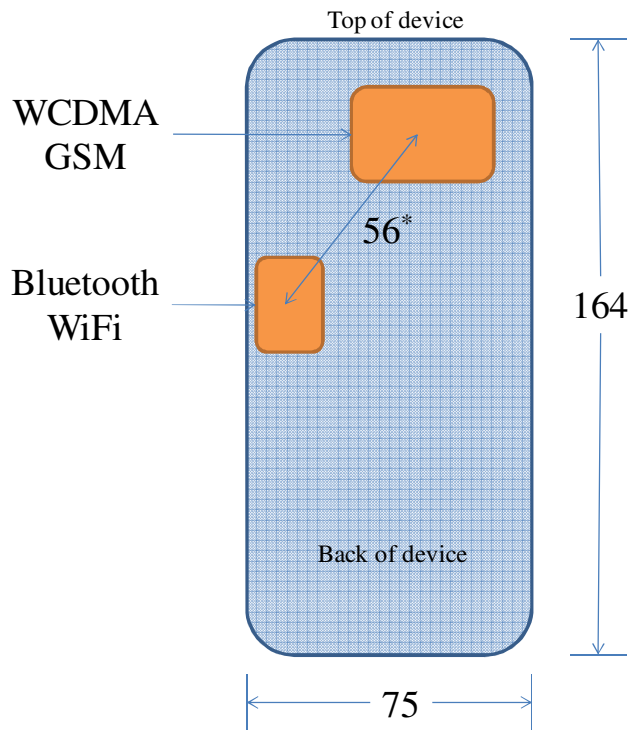
1.4 NOMINAL AND MAXIMUM POWER SPECIFICATIONS

Mode / Band		Type	Modulated Average dBm
CDMA/EVDO	BC0 / Cell	Maximum	24.5
		Nominal	24.0
CDMA/EVDO	BC1 / PCS	Maximum	24.5
		Nominal	24.0
GSM/GPRS/EDGE	850	Maximum	33.0
		Nominal	32.5
GSM/GPRS/EDGE	1900	Maximum	30.0
		Nominal	29.5
WCDMA	V	Maximum	24.5
		Nominal	24.0
WCDMA	II	Maximum	24.5
		Nominal	24.0
IEEE 802.11b	US/2.4GHz	Maximum	18.0
		Nominal	17.5
IEEE 802.11g	US/2.4GHz	Maximum	13.0
		Nominal	12.5
IEEE 802.11n	US/2.4GHz	Maximum	13.0
		Nominal	12.5
Bluetooth	US/2.4GHz	Maximum	7.0
		Nominal	6.5

1.5 EQUIPMENT UNDER TEST

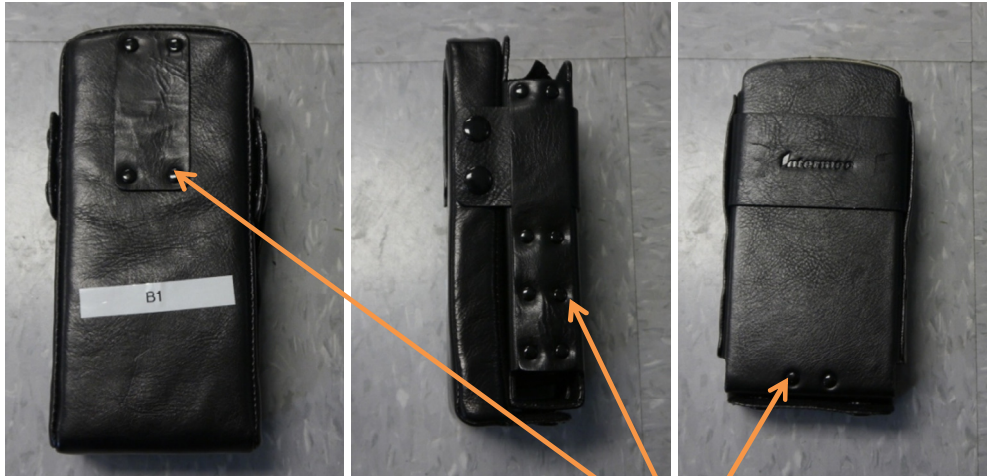
EUT	Mobile Computer
Normal operation:	Held to head, Worn on body (LCD facing-up; LCD facing-down) with 18.5 mm separation distance
Body Worn Accessory	<ol style="list-style-type: none"> Case B1 (X11148-V3), Can be worn left or right side, EUT can be seated in Position 1(P1) screen towards body or Position 2(P2) screen away from body Case B2 (X11956-V1) Can be worn on left or right side. EUT can be seated in only one position. Left side of EUT towards body for both left and right side of body. Case B3 (X11954-V1) Can be worn on left or right side. EUT can be seated in Position 1(P1) screen towards body or Position 2(P2) screen away from body.
Device category:	Portable
Exposure category:	General Population/Uncontrolled Exposure

1.6 ANTENNA LOCATIONS

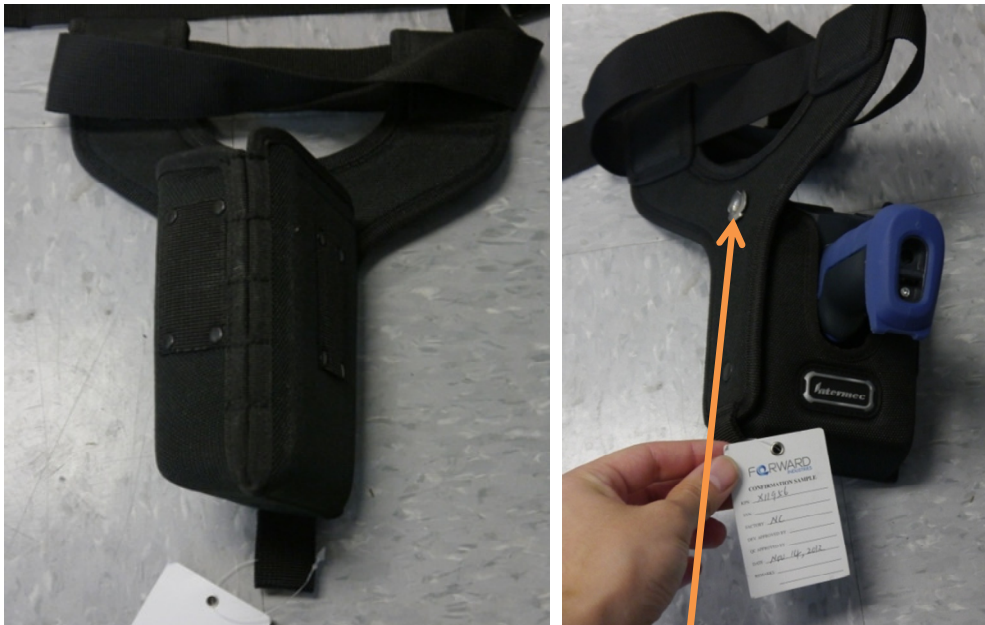


* Distance between geometric centers is 56mm. The distance between antenna feedpoints is 64mm.

1.7 DUT ACCESSORIES



Designated B1 (contains metal parts)
Model: X11148-V3
28mm spacing to user



Designated B2 (contains metal parts)
Model: X11956-V1
19.8mm spacing to user



Designated B3 (Contains metal parts)

Model: X11954-V1

18.25mm spacing to user

2 TEST METHODOLOGY

Testing was performed in accordance with the FCC OET Bulletin 65 Supplement C 01-01, IEEE STD 1528: 2003, IC RSS 102 Issue 4, as well as the following:

- IEC 62209-2
- FCC KDB 865664 D02 RF Exposure Reporting v01r01
- FCC KDB 450824 D02 Dipole SAR Validation Verification v01r01
- FCC KDB 447498 D01 General RF Exposure Guidance v05r01
- FCC KDB 648474 D04 Handset SAR v01r01
- FCC KDB 941225 D01 SAR test for 3G devices v02
- FCC KDB 941225 D02 HSPA and 1x Advanced v02r02
- FCC KDB 941225 D03 SAR Test Reduction GSM GPRS EDGE vo1

3 TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial Number	Cal Due Date
Dasy5 Controller	SP1D	Stäubli	S-1188	NA
Probe Alignment Light Beam	LB5/80	Speag	SEUKS030AA	NA
Data Acquisition Electronics	DAE4	Speag	1287	NA
Phantom	Twin Sam	Speag	1665	NA
Oval Phantom	ELI5	Speag	1146	NA
System Validation Dipole	D835V2	Speag	4d123	26 Sep 2014
System Validation Dipole	D1900V2	Speag	5d144	26 Sep 2014
System Validation Dipole	D2450V2	Speag	890	11 May 2015
E-Field Probe	EX3DV4	Speag	3812	11 March 2014
Head Simulating Liquid	HSL2450	SGS	NSN	Prior to testing
Body Simulating Liquid	BSL2450	SGS	NSN	Prior to testing
Head Simulating Liquid	HSL835	SGS	NSN	Prior to testing
Body Simulating Liquid	BSL835	SGS	NSN	Prior to testing
Head Simulating Liquid	HSL1900	SGS	NSN	Prior to testing
Body Simulating Liquid	BSL1900	SGS	NSN	Prior to testing
Device Holder	SD 00 HO1 HA	Speag	NA	NA
Network Analyzer	E5062A	Agilent	MY44102097	8 Aug 2013
Power Meter	E4419B	Agilent	G839511059	13 Aug 2013
Power Meter	E4419B	Agilent	G839511059	13 Aug 2013
Dual Directional Coupler	778D	Hewlett Packard	2604A13577	22 Oct 2013
Dual Directional Coupler	11692D	Hewlett Packard	1212A02572	22 Sep 2013
Signal Generator	SMB100A	Rohde & Schwarz	104999	18 June 2013
Thermometer	87	Fluke	17130305	10 Aug 2013
Dielectric Probe Kit	85070E	Agilent	MY44300638	NA
Dielectric Probe Kit	Dak-3.5	Speag	1109	19 Mar 2014
PC	HP Compaq 8000 Elite	HP	CZC1231RWS	NA

Note: The calibration period equipment is 1 year and 3 years for Dipoles. The dipoles are validated annually according to FCC KDB 450824 D02 Dipole SAR Validation Verification v01r01.

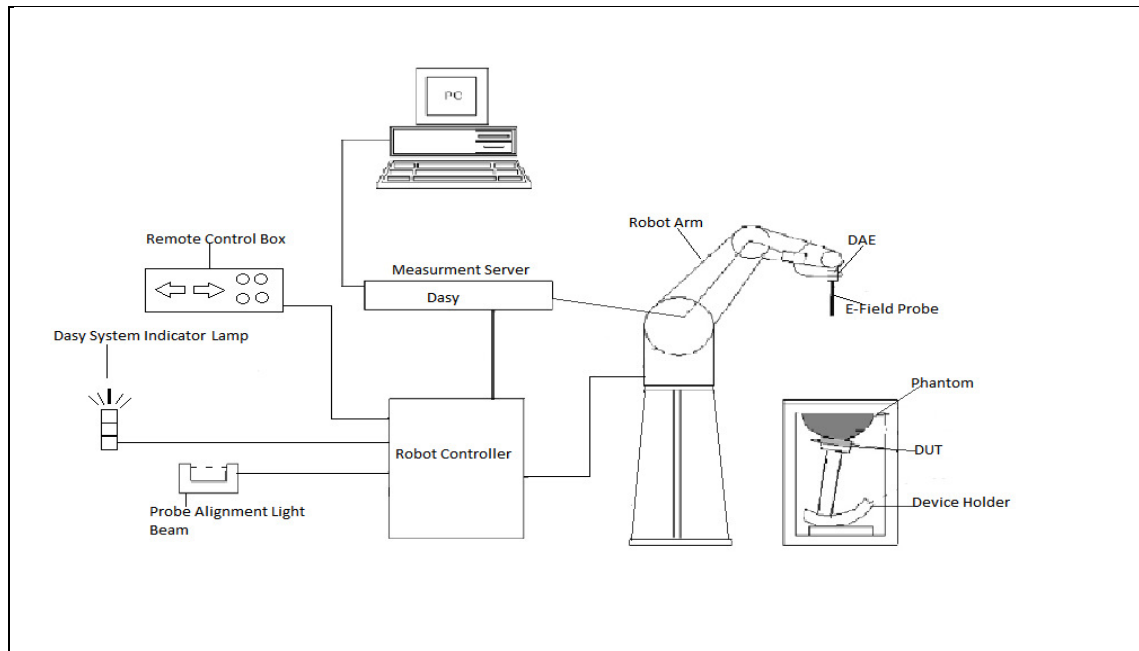
Dipole Validation Log											
per KDB 450824 Dipole SAR validation Verification v01r01											
Date	Tester	Object	Serial Number	Temp °C	RH	Tissue Type	Reported Return Loss	Reported Impedance	Return Loss dB	Impedance	Within tolerance
9/20/2012	DJS	D835V2	4d123	22.1	48%	Head	-31.5	52.0+j1.9	-29.2	51.3+j1.1	Yes
9/24/2012	DJS	D1900V2	5d144	22.0	47%	Head	-23.5	52.3+j6.1	-21.0	51.8+j3.9	Yes
5/6/2013	DJS	D2450V2	890	22.3	39%	Head	-28.6	53.8+j0.8	-25.8	53.0+j0.4	Yes

Attestation: I attest the above data is accurate.

Signed: 

Date: 8/29/2013

3.1 TEST SYSTEM BLOCK DIAGRAM



The Dasy5 SAR test system consists of:

- 1 Stäubli Robot and system controller cabinet
- 1 Electro Optical Converter mounted on robots arm
- Robot stand
- Robot remote controller
- Light beam for E-field probe alignment
- DASY5 measurement server
- SAM Twin Phantom
- Hand-Held/ Laptop device holder
- HP PC with DASY5 software
- Data Acquisition Electronics(DAE)
- System validation dipole kit
- Head/Body simulating liquid
- E-field probe
- Warning lamps

4 LIQUID PARAMETERS CHECK

The tissue dielectric parameters shall be measured at the beginning of the test or within 24 hours of the first SAR test. All dielectric parameters should be within the tolerance values shown in Table 3-1. For frequencies in 300 MHz to just under 6 GHz, the measured conductivity and relative permittivity should be within $\pm 5\%$ of the target values in table 1. The measured permittivity tolerances can be relaxed to no more than the $\pm 10\%$. All efforts should be made to obtain the target values as closely as possible.

The head tissue dielectric parameters recommended by the IEEE1528-2003 Standard have been incorporated in Table 3-1.

Table 3-1

Target dielectric properties of tissue equivalent material in the 300-2450 MHz frequency range

Frequency (MHz)	Head		Body	
	Relative permittivity (ϵ_r)	Conductivity(σ) (S/m)	Relative permittivity (ϵ_r)	Conductivity(σ) (S/m)
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	1.05
1450	40.5	1.20	54	1.3
1800-2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95

Table 3-2

Tissue Simulating Liquid Formulations

	835 MHz		1900 MHz		2450 MHz		5200-5800 MHz	
	Head	Body	Head	Body	Head	Body	Head	Body
Bactericide	0.10	0.10					See Note 2	See Note 3
DGBE								
HEC	1.00	1.00						
NaCL	1.45	0.94	1.03	0.70	0.00	0.30		
Sucrose	57.00	44.90						
Polysorbate (Tween) 20			46.10	28.00	45.25	28.00		
Water	40.45	53.06	52.87	71.30	55.75	71.70		

Note 1: Speag proprietary - Water 50-65%; Mineral Oil 10-30%; Emulsifiers 8-25%; NaCL 0-1.5%; Hexylene Glycol 1.0-2.8%

Note 2: Speag proprietary - Water 60-80%; Esters, Emulsifiers, Inhibitors 20-40%; NaCL 0-1.5%; Oleic acid 10-28%

4.1 TABLE 3-2 TISSUE VERIFICATION MEASURED

Tissue Verification TARGET & MEASURED								
Date	Tissue Type	Measured Frequency (MHz)	Measured Dielectric Constant, ϵ	Measured Conductivity, σ S/m	Target Dielectric Constant, ϵ	Target Conductivity, σ S/m	% deviation, σ	% deviation, ϵ
6/17/2013	835B	824	54.6	0.93	55.2	1.0	-1.1%	-4.1%
6/17/2013	835B	836	54.5	0.94	55.2	1.0	-1.3%	-3.1%
6/17/2013	835B	848	54.4	0.95	55.2	1.0	-1.4%	-2.1%
6/17/2013	1900B	1880	53.0	1.56	53.3	1.5	-0.6%	2.8%
6/17/2013	1900B	1851	53.1	1.53	53.3	1.5	-0.4%	2.3%
6/17/2013	1900B	1908	52.9	1.59	53.3	1.5	-0.8%	4.6%
6/18/2013	2450B	2462	52.0	2.09	52.7	1.95	-1.4%	7.2%
6/18/2013	2450B	2412	52.1	2.03	52.7	1.95	-1.1%	4.1%
6/18/2013	2450B	2437	52.0	2.06	52.7	1.95	-1.3%	5.6%
6/19/2013	2450B	2450	52.0	2.08	52.7	1.95	-1.3%	6.8%
6/20/2013	2450B	2450	51.7	2.08	52.7	1.95	-1.8%	6.6%
6/21/2013	835B	824	54.8	0.93	55.2	0.97	-0.8%	-4.4%
6/21/2013	835B	836	54.7	0.94	55.2	0.97	-1.0%	-3.1%
6/21/2013	835B	848	54.5	0.95	55.2	0.97	-1.2%	-1.9%
6/22/2013	835B	824	54.6	0.93	55.2	0.97	-1.0%	-3.8%
6/22/2013	835B	836	54.5	0.94	55.2	0.97	-1.3%	-2.7%
6/22/2013	835B	848	54.4	0.96	55.2	0.97	-1.5%	-1.4%
6/24/2013	835B	824	54.5	0.93	55.2	0.97	-1.2%	-4.2%
6/24/2013	835B	836	54.4	0.94	55.2	0.97	-1.4%	-3.0%
6/24/2013	835B	848	54.3	0.95	55.2	0.97	-1.6%	-1.8%
6/25/2013	835B	824	54.4	0.93	55.2	0.97	-1.4%	-4.2%
6/25/2013	835B	836	54.3	0.94	55.2	0.97	-1.6%	-2.9%
6/25/2013	835B	848	54.2	0.95	55.2	0.97	-1.8%	-1.7%
6/26/2013	835B	824	54.3	0.93	55.2	0.97	-1.6%	-3.7%
6/26/2013	835B	836	54.2	0.95	55.2	0.97	-1.9%	-2.5%
6/26/2013	835B	848	54.0	0.96	55.2	0.97	-2.1%	-1.2%
6/27/2013	1900B	1880	53.1	1.56	53.3	1.5	-0.4%	2.5%
6/27/2013	1900B	1850	53.2	1.53	53.3	1.5	-0.2%	0.5%
6/27/2013	1900B	1910	53.0	1.59	53.3	1.5	-0.5%	4.4%
7/1/2013	1900B	1880	53.0	1.57	53.3	1.5	-0.6%	3.0%
7/1/2013	1900B	1850	53.1	1.54	53.3	1.5	-0.4%	1.0%
7/1/2013	1900B	1910	52.9	1.60	53.3	1.5	-0.7%	4.9%
7/2/2013	1900B	1880	52.9	1.56	53.3	1.5	-0.7%	2.4%
7/2/2013	1900B	1850	53.0	1.53	53.3	1.5	-0.5%	0.5%
7/2/2013	1900B	1910	52.8	1.59	53.3	1.5	-0.9%	4.3%
7/3/2013	1900B	1880	52.8	1.56	53.3	1.5	-1.0%	2.4%
7/3/2013	1900B	1850	52.9	1.53	53.3	1.5	-0.8%	0.4%
7/3/2013	1900B	1910	52.7	1.59	53.3	1.5	-1.1%	4.3%
7/5/2013	1900B	1880	52.7	1.57	53.3	1.5	-1.1%	3.0%
7/5/2013	1900B	1850	52.8	1.54	53.3	1.5	-0.9%	1.0%
7/5/2013	1900B	1910	52.6	1.60	53.3	1.5	-1.3%	4.9%
7/8/2013	1900B	1880	52.7	1.56	53.3	1.5	-1.2%	2.5%
7/8/2013	1900B	1850	52.8	1.53	53.3	1.5	-1.0%	0.5%
7/8/2013	1900B	1910	52.6	1.59	53.3	1.5	-1.4%	4.4%
7/9/2013	835B	824	54.3	0.93	55.2	0.97	-1.7%	-3.9%
7/9/2013	835B	836	54.2	0.94	55.2	0.97	-1.9%	-2.6%
7/9/2013	835B	848	54.0	0.96	55.2	0.97	-2.1%	-1.4%
7/10/2013	835H	824	40.2	0.87	41.5	0.90	-3.0%	-3.2%
7/10/2013	835H	836	40.1	0.88	41.5	0.90	-3.4%	-2.0%
7/10/2013	835H	848	40.0	0.89	41.5	0.90	-3.7%	-0.8%
7/11/2013	835H	824	39.9	0.87	41.5	0.90	-3.8%	-3.7%
7/11/2013	835H	836	39.8	0.88	41.5	0.90	-4.1%	-2.5%
7/11/2013	835H	848	39.6	0.89	41.5	0.90	-4.5%	-1.3%

7/12/2013	1900H	1880	38.9	1.43	40.0	1.4	-2.8%	2.3%
7/12/2013	1900H	1850	39.0	1.40	40.0	1.4	-2.5%	0.2%
7/12/2013	1900H	1910	38.8	1.46	40.0	1.4	-3.1%	4.3%
7/13/2013	1900H	1880	38.7	1.44	40.0	1.4	-3.2%	2.8%
7/13/2013	1900H	1850	38.9	1.41	40.0	1.4	-2.9%	0.7%
7/13/2013	1900H	1910	38.6	1.47	40.0	1.4	-3.5%	4.7%
7/15/2013	1900H	1880	38.8	1.44	40.0	1.4	-3.0%	2.7%
7/15/2013	1900H	1850	38.9	1.41	40.0	1.4	-2.7%	0.6%
7/15/2013	1900H	1910	38.7	1.47	40.0	1.4	-3.3%	4.8%
7/16/2013	1900H	1880	38.6	1.43	40.0	1.4	-3.5%	2.3%
7/16/2013	1900H	1850	38.7	1.40	40.0	1.4	-3.2%	0.2%
7/16/2013	1900H	1910	38.5	1.46	40.0	1.4	-3.8%	4.3%
7/17/2013	1900H	1880	38.3	1.44	40.0	1.4	-4.3%	2.9%
7/17/2013	1900H	1850	38.4	1.41	40.0	1.4	-4.0%	0.7%
7/17/2013	1900H	1910	38.2	1.47	40.0	1.4	-4.6%	4.9%
7/17/2013	2450H	2462	38.7	1.85	39.2	1.8	-1.4%	2.5%
7/17/2013	2450H	2412	38.9	1.79	39.2	1.8	-0.9%	-0.6%
7/17/2013	2450H	2437	38.8	1.82	39.2	1.8	-1.1%	0.9%
7/18/2013	2450H	2462	38.3	1.88	39.2	1.8	-2.3%	4.4%
7/18/2013	2450H	2412	38.5	1.82	39.2	1.8	-1.9%	1.1%

5 SAR MEASUREMENT SYSTEM VERIFICATION

The system performance verification verifies the system operates within the $\pm 10\%$ limit. Each performance check is performed prior to any SAR testing to measure accuracy.

5.1 PERFORMANCE CHECK MEASUREMENT CONDITIONS

- Measurements are performed in the flat section of the SAM phantom
- Phantom is filled with Head or Body simulating liquids
- DASV5 system parameters are tested using a Isotropic E-field probe
- The dipole is mounted on an extendable tripod that is positioned below the flat phantom center. The dipole is oriented parallel with the body's axis. The standard measuring distance is 10 mm above 1 GHz or 15 mm below 1 GHz from the dipole to the simulating liquids surface.
- A grid spacing of 15 mm is aligned with the dipole
- 7x7x7 cube is selected for a zoom scan
- A 4 mm distance is set between the probe and phantom surface
- Dipole input power(forward power) is set to 100 mW
- Results are normalized to 1 W input power

5.2 SAR REFERENCE VALUES FOR HEAD AND BODY CALIBRATION

**Numerical reference SAR values (W/kg) for dipole and flat phantom
(IEEE1528-2003 Table 7)**

Frequency (MHz)	1g SAR	10g SAR
300	3.0	2.0
450	4.9	3.3
835	9.5	6.2
900	10.8	6.9
1450	29.0	16.0
1800	38.1	19.8
1900	39.7	20.5
2000	41.1	21.1
2450	52.4	24.0

5.2.1 SYSTEM VERIFICATION

System Verification TARGET & MEASURED										
Date	Ambient Temp (°C)	Liquid Temp (°C)	Input Power (W)	Tissue Frequency (MHz)	Dipole SN	Tissue Type	Measured SAR _{1g} (W/kg)	1W Target SAR _{1g} (W/kg)	1W Normalized SAR ₁₀ (W/kg)	Deviation (%)
6/19/2013	22	22.2	0.100	2450	890	Body	5.28	50.60	52.80	4.3%
6/21/2013	22	22	0.100	835	4d123	Body	0.957	9.42	9.57	1.6%
6/24/2013	22	21.4	0.100	835	4d123	Body	0.93	9.42	9.30	-1.3%
6/26/2013	22.2	21.3	0.100	835	4d123	Body	0.929	9.42	9.29	-1.4%
6/27/2013	22.6	21.5	0.100	1900	5d144	Body	3.96	40.60	39.60	-2.5%
7/1/2013	22.6	21.6	0.100	1900	5d144	Body	4.04	40.60	40.40	-0.5%
7/5/2013	22	21.7	0.100	1900	5d144	Body	4.02	40.60	40.20	-1.0%
7/8/2013	22.2	21.7	0.100	1900	5d144	Body	3.99	40.60	39.90	-1.7%
7/10/2013	23	24.5	0.100	835	4d123	Head	0.932	9.42	9.32	-1.1%
7/13/2013	21.9	21.7	0.100	1900	5d144	Head	3.72	40.60	37.20	-8.4%
7/15/2013	22.9	21.5	0.100	1900	5d144	Head	3.72	40.60	37.20	-8.4%
7/17/2013	23	21.2	0.100	1900	5d144	Head	3.67	40.60	36.70	-9.6%

6 SAR MEASUREMENT PROCEDURE

- Area Scan is used for a fast scan in two dimension to find the area of high field values before any finer measurement around the hotspot. The routines implemented in the DASY5 software can find the maximum locations.
- Zoom Scan is used to assess the peak spatial values within a cubic averaging volume containing 1g and 10g of simulated tissue. The scan measures a 7x7x7 area within the cube. Once measurement is done the values are displayed within the job's label.
- Power Drift will measure the field at the same location as the most recent power reference measurement within the same procedure and settings. The Power Drift Measurement gives the field difference in dB.
- Z- Scan measure points along a straight vertical line. The lines run along the z-axis of a one dimensional grid. To get a reasonable extrapolation the extrapolated distance should not be larger than the step size in z direction.

6.1 HEAD SAR CONFIGURATION

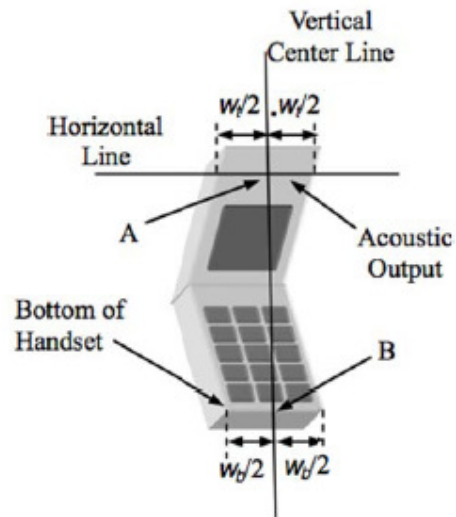
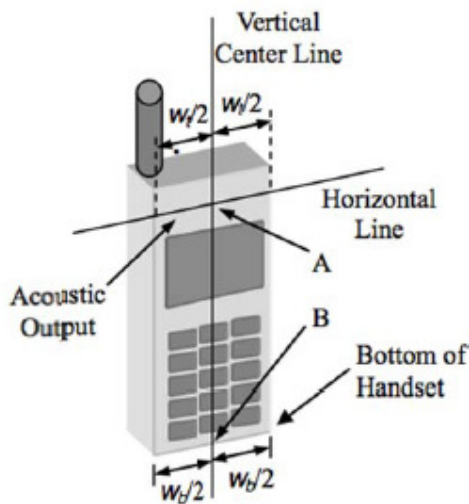
6.1.1 SAM SPECIFICATIONS

The Specific Anthropomorphic Mannequin (SAM) phantom corresponds to specifications defined in IEEE 1528 and IEC 62209-1. It allows dosimetric evaluation of the left, right, hand phone usage as well as body mounted usage at the flat region of the phantom

6.1.2 HANDSET REFERENCE POINTS

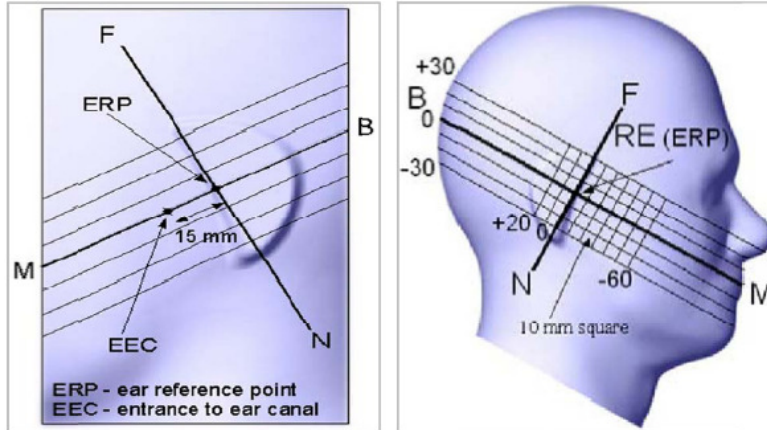
In order to identify reference points on the handset, define two imaginary lines on the handset

- The vertical centreline passes through two points on the front side of the handset. The midpoint of the width at the acoustic output and the midpoint of the width of the bottom of handset.
- The horizontal line is perpendicular to the vertical centreline and passes through the center of the acoustic output.
- The two lines intersect at point A.



6.1.3 EAR REFERENCE

This category includes most wireless handsets. The handset should have its earpieces located within the upper part of the device or along the centerline. The handset should be positioned with the earpiece region pressed against the ear spacer of the phantom.



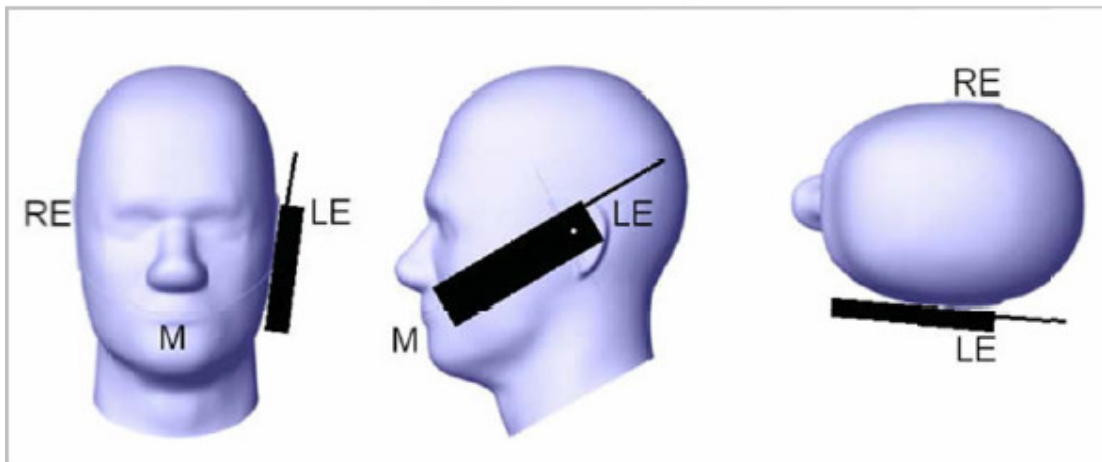
6.1.4 CHEEK POSITIONS

The device is attached toward the mouth part of the phantom by pivoting against the ear reference point

The test position is established when:

- Any point on the display, keypad or mouthpiece portion of the EUT is in contact with the phantom

Check / Touch Position

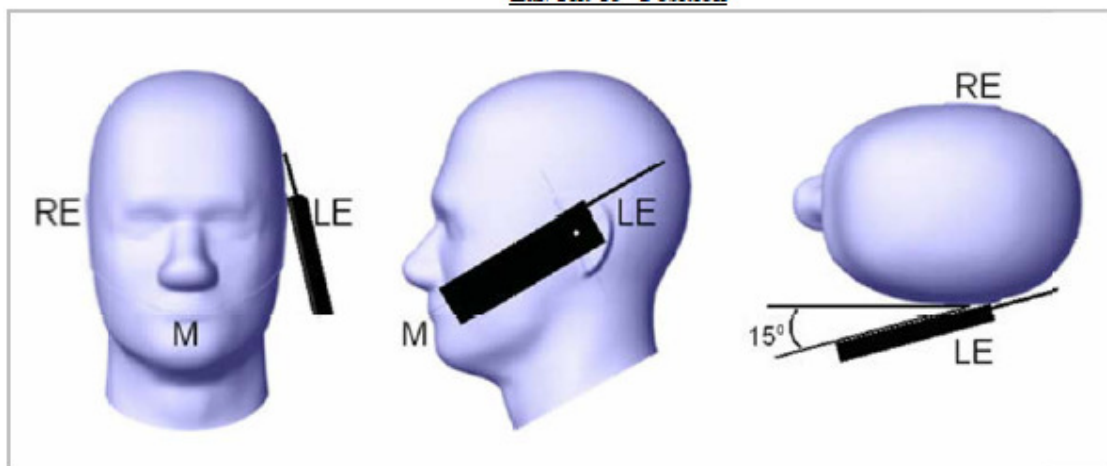


6.1.5 TILT POSITION

The test position is established when:

- Repeat the cheek touch position setup
- While maintaining the orientation of the handset move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
- Rotate the handset around the horizontal line by 15°
- While maintain the orientation of the handset move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear.
- The tilt position is obtained when the contact point is on the pinna and the antenna is at the back of the phantoms head.

Ear/Tilt 15° Position



7 CONDUCTED OUTPUT POWER VERIFICATION

			Average Power, dBm					
Mode	Type	Test mode	Cellular Band, BC0			PCS Band, BC1		
			1013	384	777	25	600	1175
			824.7MHz	836.52MHz	848.71MHz	1850.25MHz	1880MHz	1909.75MHz
CDMA	Voice	SO55 / RC1	24.51	24.66	24.10	24.66	24.54	24.47
		SO55 / RC3	24.60	24.59	24.18	24.62	24.46	24.52
		SO75 / RC8	24.51	24.66	24.14	24.52	24.54	24.48
EVDO	Data	SO32 / FCH+SCH	24.57	24.53	24.18	24.53	24.37	24.50
		SO32 / FCH	24.65	24.58	24.26	24.68	24.41	24.54
		1x EVDO Rev 0	24.65	24.68	24.27	24.71	24.50	24.70
		1x EVDO Rev A	24.67	24.66	24.22	24.68	24.55	24.61

			Burst Average Power, dBm					
Mode	Type	Test mode	Cellular Band, GSM850			PCS Band, GSM1900		
			128	190	251	512	661	810
			824.2MHz	836.6MHz	848.8MHz	1850.2MHz	1880MHz	1909.8MHz
GSM	Voice		33.00	32.92	32.91	29.47	29.80	29.73
GPRS	Data	1 slot	32.92	32.86	32.88	29.48	29.88	29.80
		2 slot	32.82	32.76	32.77	29.26	29.58	29.55
EDGE	Data	1 slot	32.88	32.85	33.08	29.47	29.80	29.71
		2 slot	32.79	32.76	32.99	29.28	29.56	29.48

			Frame Average Power, dBm					
Mode	Type	Test mode	Cellular Band, GSM850			PCS Band, GSM1900		
			128	190	251	512	661	810
			824.2MHz	836.6MHz	848.8MHz	1850.2MHz	1880MHz	1909.8MHz
GSM	Voice		24.18	24.11	23.95	20.88	21.06	21.27
GPRS	Data	1 slot	24.89	24.83	24.85	20.72	20.97	21.28
		2 slot	26.79	26.73	26.74	23.23	23.55	23.52
EDGE	Data	1 slot	24.85	24.82	25.05	22.81	22.89	23.20
		2 slot	26.76	26.73	26.96	23.25	23.53	23.45

			Average Power, dBm					
Mode	Release Version	Subtest mode	Cellular Band, FDD5			PCS Band, FDD2		
			4132	4183	4233	9262	9400	9538
			826.4MHz	836.6MHz	846.6MHz	1852.4MHz	1880MHz	1907.7MHz
WCDMA	99	12.2 kbps RMC	24.79	25.05	24.85	24.83	24.85	24.83
HSDPA	6	Subtest 1	24.55	24.98	24.95	24.79	24.76	24.49
		Subtest 2	24.47	25.02	24.93	24.80	24.77	24.52
		Subtest 3	24.44	24.96	24.69	24.59	24.80	24.48
		Subtest 4	24.13	24.55	24.54	24.75	24.62	24.57
HSUPA	6	Subtest 1	23.20	23.59	23.35	23.39	23.57	23.41
		Subtest 2	23.19	23.63	23.35	23.44	23.54	23.35
		Subtest 3	24.15	24.55	24.37	24.39	24.42	24.30
		Subtest 4	24.60	25.11	24.69	24.80	24.93	24.73
		Subtest 5	24.55	25.03	25.02	24.82	24.85	24.58

802.11 - Average RF Power

Protocol	Channel	Data Rate	Channel Power Average dBm
802.11b	1	1	17.6
802.11b	1	5.5	
802.11b	1	11	17.2
802.11b	6	1	17.1
802.11b	6	5.5	
802.11b	6	11	16.8
802.11b	11	1	17.9
802.11b	11	5.5	
802.11b	11	11	17.7
802.11g	1	6	12.5
802.11g	1	36	11.8
802.11g	1	54	11.7
802.11g	6	6	12.9
802.11g	6	36	12.2
802.11g	6	54	12.1
802.11g	11	6	12.7
802.11g	11	36	12.5
802.11g	11	54	12.4
802.11n	1	MCS0	12.5
802.11n	1	MCS7	11.2
802.11n	6	MCS0	12.8
802.11n	6	MCS7	11.7
802.11n	11	MCS0	12.7
802.11n	11	MCS7	12.5

8 2G-3G HEAD SAR MEASUREMENT RESULTS

REGULATION	TEST CONFIG.	FREQ. BAND	MODE			FREQ. (MHz)	CHAN.	CH. NO.	TEST POSITION		NO. of TESTS	Test Results W/kg (1g)
FCC, IC	HEAD	850	GSM	Voice	GMSK	836.6	Mid	190	Left	Touch	1	0.156
									Left	Tilt	1	0.097
									Right	Touch	1	0.218
									Right	Tilt	1	0.174
									Right	Touch	Note 1	0.233
									Right	Touch	Note 1	0.151
									Freq. Range: 824.2 - 848.8 MHz			
FCC, IC	HEAD	850	GPRS	VoIP	No. of slots: 2	836.6	Mid	190	Left	Touch	1	0.300
									Left	Tilt	1	0.209
									Right	Touch	1	0.449
									Right	Tilt	1	0.352
									Right	Touch	Note 1	0.518
									Right	Touch	Note 1	0.322
									Freq. Range: 824.2 - 848.8 MHz			
FCC, IC	HEAD	850	WCDMA Band V	UMTS	RMC 12.2K	836.6	Mid	4183	Left	Touch	1	0.228
									Left	Tilt	1	0.128
									Right	Touch	1	0.276
									Right	Tilt	1	0.213
									Right	Touch	Note 1	0.334
									Right	Touch	Note 1	0.266
									Freq. Range: 826.4 - 846.6 MHz			
FCC, IC	HEAD	850	CDMA 1xRTT	RC3	SO55	836.52	Mid	384	Left	Touch	1	0.228
									Left	Tilt	1	0.136
									Right	Touch	1	0.274
									Right	Tilt	1	0.223
									Right	Touch	Note 1	0.325
									Right	Touch	Note 1	0.185
									Freq. Range: 824.70 - 848.31 MHz			
FCC, IC	HEAD	850	GPRS	with 3900 mAh Battery		824.2	Low	128	Right	Touch	1	0.536
FCC, IC	HEAD	1900	GSM	Voice	GMSK	1880.0	Mid	661	Left	Touch	1	0.050
									Left	Tilt	1	0.065
									Right	Touch	1	0.067
									Right	Tilt	1	0.066
									Right	Touch	Note 1	0.104
									Right	Touch	Note 1	0.034
									Freq. Range: 1850.2 - 1909.8 MHz			
FCC, IC	HEAD	1900	GPRS	VoIP	No. of slots: tba	1880.0	Mid	661	Left	Touch	1	0.068
									Left	Tilt	1	0.078
									Right	Touch	1	0.089
									Right	Tilt	1	0.119
									Right	Touch	Note 1	0.138
									Right	Touch	Note 1	0.062
									Freq. Range: 1850.2 - 1909.8 MHz			
FCC, IC	HEAD	1900	WCDMA Band II	UMTS	RMC 12.2K	1880.0	Mid	9400	Left	Touch	1	0.077
									Left	Tilt	1	0.074
									Right	Touch	1	0.119
									Right	Tilt	1	0.093
									Right	Touch	Note 1	0.200
									Right	Touch	Note 1	0.118
									Freq. Range: 1852.4 - 1907.6 MHz			
FCC, IC	HEAD	1900	CDMA 1xRTT	RC3	SO55	1880.0	Mid	600	Left	Touch	1	0.084
									Left	Tilt	1	0.082
									Right	Touch	1	0.122
									Right	Tilt	1	0.089
									Right	Touch	Note 1	0.130
									Right	Touch	Note 1	0.115
									Freq. Range: 1851.25 - 1908.75 MHz			
FCC, IC	HEAD	1900	WCDMA Band II	with 3900 mAh Battery		1852.4	Low	9262	Right	Touch	1	0.204

9 WI-FI HEAD SAR MEASUREMENT RESULTS

REGULATION	TEST CONFIG.		BAND	BATTERY	TEST MODE	DATA RATE	FREQ. (MHz)	CHAN.	CH. NO.	TEST POSITION		NO. of TESTS	Test Results W/kg (1g)
FCC, IC	HEAD	ISM	2.4 GHz	3900 mAh	802.11b	DSSS 1 Mbps		2462 HOPC (High)	11	Left	Touch	1	0.022
				Left						Tilt	1	0.011	
				Right						Touch	1	0.022	
				Right						Tilt	1	0.009	
				Right						Touch	1	0.029	
IC			3850 mAh						Right	Touch	1	0.030	
IC			3900 mAh				2412 Low		1	Right	Touch	1	0.030
IC			3900 mAh				2437 Mid		6	Right	Touch	1	0.023

10 2G-3G BODY SAR MEASUREMENT RESULTS

REGULATION	CONFIG.	BAND	MODE			FREQ. (MHz)	CHAN.	CH. NO.	ACC. #	TEST POSITION	NO. of TESTS	Test Results W/kg (1g)	
FCC, IC	BODY	850	GSM	Voice	GMSK	836.6	Mid	190	B1	P1 screen away from body	1	0.091	
										B1	P2 screen towards body	1	0.062
										B2	P1	1	0.122
						824.2	Low	128	B3	P1 screen away from body	1	0.342	
										B3	P2 screen towards body	1	0.207
										B3	P1 screen away from body	<i>Note 1</i>	0.392
848.8	High	251	B3	P1 screen away from body	<i>Note 1</i>	0.228							
				MINIMUM NO. OF TESTS									
Freq. Range: 824.2 - 848.8 MHz													
FCC, IC	BODY	850	GPRS	VoIP	2	836.6	Mid	190	B1	P1 screen away from body	1	0.160	
										B1	P2 screen towards body	1	0.104
										B2	P1	1	0.283
						824.2	Low	128	B3	P1 screen away from body	1	0.787	
										B3	P2 screen towards body	1	0.321
										B3	P1 screen away from body	<i>Note 1</i>	0.925
848.8	High	251	B3	P1 screen away from body	<i>Note 1</i>	0.457							
				MINIMUM NO. OF TESTS									
Freq. Range: 824.2 - 848.8 MHz													
FCC, IC	BODY	850	WCDMA Band V	UMTS with HSPA Inactive (<i>Note 2,3</i>)	RMC 12.2K	836.6	Mid	4183	B1	P1 screen away from body	1	0.115	
										B1	P2 screen towards body	1	0.070
										B2	P1	1	0.136
						826.4	Low	4132	B3	P1 screen away from body	1	0.429	
										B3	P2 screen towards body	1	0.163
										B3	P1 screen away from body	<i>Note 1</i>	0.508
846.6	High	4233	B3	P1 screen away from body	<i>Note 1</i>	0.372							
				MINIMUM NO. OF TESTS									
Freq. Range: 826.4 - 846.6 MHz													
FCC, IC	BODY	850	CDMA 1xRTT (<i>Note 4</i>)	RC3	SO32 FCH (<i>Note 5</i>)	836.52	Mid	384	B1	P1 screen away from body	1	0.111	
										B1	P2 screen towards body	1	0.064
										B2	P1	1	0.105
						824.70	Low	1013	B3	P1 screen away from body	1	0.391	
										B3	P2 screen towards body	1	0.164
										B3	P1 screen away from body	<i>Note 1</i>	0.516
848.31	High	777	B3	P1 screen away from body	<i>Note 1</i>	0.324							
				MINIMUM NO. OF TESTS									
Freq. Range: 824.70 - 848.31 MHz													
FCC, IC	BODY	850	(wc 850)	with 3900 mAh Battery		tba	tba	tba		Case SAR 3900mAh)	1	0.518	
FCC, IC	BODY	1900	GSM	Voice	GMSK	1880.0	Mid	661	B1	P1 screen away from body	1	0.202	
										B1	P2 screen towards body	1	0.009
										B2	P1	1	0.075
						1850.2	Low	512	B3	P1 screen away from body	1	0.545	
										B3	P2 screen towards body	1	0.016
										B3	P1 screen away from body	<i>Note 1</i>	0.512
1909.8	High	810	B3	P1 screen away from body	<i>Note 1</i>	0.463							
				MINIMUM NO. OF TESTS									
Freq. Range: 1850.2 - 1909.8 MHz													
FCC, IC	BODY	1900	GPRS	VoIP	2	1880.0	Mid	661	B1	P1 screen away from body	1	0.503	
										B1	P2 screen towards body	1	0.021
										B2	P1	1	0.178
						1850.2	Low	512	B3	P1 screen away from body	1	1.040	
										B3	P2 screen towards body	1	0.039
										B3	P1 screen away from body	<i>Note 1</i>	1.110
1909.8	High	810	B3	P1 screen away from body	<i>Note 1</i>	1.020							
				MINIMUM NO. OF TESTS									
Freq. Range: 1850.2 - 1909.8 MHz													
FCC, IC	BODY	1900	WCDMA Band II	UMTS with HSPA Inactive (<i>Note 2,3</i>)	RMC 12.2K	1880.0	Mid	9400	B1	P1 screen away from body	1	0.587	
										B1	P2 screen towards body	1	0.020
										B2	P1	1	0.150
						1852.4	Low	9262	B3	P1 screen away from body	1	0.992	
										B3	P2 screen towards body	1	0.033
										B3	P1 screen away from body	<i>Note 1</i>	1.010
1907.6	High	9538	B3	P1 screen away from body	<i>Note 1</i>	1.260							
				MINIMUM NO. OF TESTS									
Freq. Range: 1852.4 - 1907.6 MHz													
FCC, IC	BODY	1900	CDMA 1xRTT	RC3	SO32 FCH (<i>Note 5</i>)	1880.0	Mid	600	B1	P1 screen away from body	1	0.587	
										B1	P2 screen towards body	1	0.012
										B2	P1	1	0.123
						1851.25	Low	25	B3	P1 screen away from body	1	0.922	
										B3	P2 screen towards body	1	0.037
										B3	P1 screen away from body	<i>Note 1</i>	0.994
1908.75	High	1175	B3	P1 screen away from body	<i>Note 1</i>	1.110							
				MINIMUM NO. OF TESTS									
Freq. Range: 1851.25 - 1908.75 MHz													
FCC, IC	BODY	1900	WCDMA Band II	with 3900 mAh Battery		1907.6	High	9538	B3	P1 screen away from body	1	1.300	

11 WI-FI BODY SAR MEASUREMENT RESULTS

REGULATION	TEST CONFIG.	BAND	BATTERY	TEST MODE	DATA RATE	FREQ. (MHz)	CHAN.	CH. NO.	ACC. #	TEST POSITION	NO. of TESTS	Test Results W/kg (1g)	
FCC, IC	BODY ISM	2.4 GHz	3900 mAh	802.11b	DSSS	1 Mbps	2462	HOPC (High)	11	B1	P1	1	0.063
										B1	P2	1	<.01
										B2	P1	1	<.01
										B3	P1	1	0.125
										B3	P2	1	<.01
										B3	P1	1	0.111
IC			3850 mAh			2412	Low	1	B3	P1	1	0.110	
IC			3900 mAh			2437	Mid	6	B3	P1	1	0.105	
Freq. Range: 2412 - 2462 MHz											TOTAL MINIMUM NO. OF TESTS	8	

12 SIMULTANEOUS TRANSMISSIONS

<u>Head and Body SAR conditions</u>
GSM 850 Voice + WiFi
GSM 850 Voice + Bluetooth
GSM 1900 Voice + WiFi
GSM 1900 Voice + Bluetooth
WCDMA 850 Voice + WiFi
WCDMA 850 Voice + Bluetooth
WCDMA 1900 Voice + WiFi
WCDMA 1900 Voice + Bluetooth
1xRTT 850 Voice + WiFi
1xRTT 850 Voice + Bluetooth
1xRTT 1900 Voice + WiFi
1xRTT 1900 Voice + Bluetooth
GPRS 850 VOIP + WiFi
GPRS 850 VOIP + Bluetooth
GPRS 1900 VOIP + WiFi
GPRS 1900 VOIP + Bluetooth

FCC / IC	HEAD SAR - Maximum <i>Reported</i> SAR Levels			BODY SAR - Maximum <i>Reported</i> SAR Levels		
MODE	GSM 850 Voice	Wi-Fi	Σ SUM 1g ²	GSM 850 Voice	Wi-Fi	Σ SUM 1g ²
SAR W/kg	0.233	0.030	0.263	0.392	0.125	0.517
Test Ch./Config.	CH 128, Right Touch			CH 128, B3, P1		
MODE	GSM 1900 Voice	Wi-Fi	Σ SUM 1g ²	GSM 1900 Voice	Wi-Fi	Σ SUM 1g ²
SAR W/kg	0.104	0.030	0.134	0.545	0.125	0.670
Test Ch./Config.	CH 512, Right Touch			CH 661, B3, P1		
MODE	WCDMA 850 Voice	Wi-Fi	Σ SUM 1g ²	WCDMA 850 Voice	Wi-Fi	Σ SUM 1g ²
SAR W/kg	0.334	0.030	0.364	0.518	0.125	0.643
Test Ch./Config.	CH 4132 Right Touch			CH 4183, B3, P1		
MODE	WCDMA 1900 Voic	Wi-Fi	Σ SUM 1g ²	WCDMA 1900 Voic	Wi-Fi	Σ SUM 1g ²
SAR W/kg	0.200	0.030	0.230	1.300	0.125	1.425
Test Ch./Config.	CH 9262 Right Touch			CH 9262, B3, P1		
MODE	1xRTT 850 Voice	Wi-Fi	Σ SUM 1g ²	1xRTT 850 Voice	Wi-Fi	Σ SUM 1g ²
SAR W/kg	0.325	0.030	0.355	0.516	0.125	0.641
Test Ch./Config.	CH 1013 Right Touch			CH 1013, B3, P1		
MODE	1xRTT 1900 Voice	Wi-Fi	Σ SUM 1g ²	1xRTT 1900 Voice	Wi-Fi	Σ SUM 1g ²
SAR W/kg	0.130	0.030	0.160	1.110	0.125	1.235
Test Ch./Config.	CH 25 Right Touch			CH 1175, B3, P1		
MODE	GPRS 850 VoIP	Wi-Fi	Σ SUM 1g ²	GPRS 850 VoIP	Wi-Fi	Σ SUM 1g ²
SAR W/kg	0.536	0.030	0.566	0.925	0.125	1.050
Test Ch./Config.	CH 128, Right Touch			CH 251, B3, P1		
MODE	GPRS 1900 VoIP	Wi-Fi	Σ SUM 1g ²	GPRS 1900 VoIP	Wi-Fi	Σ SUM 1g ²
SAR W/kg	0.138	0.030	0.168	1.110	0.125	1.235
Test Ch./Config.	CH 512, Right Touch			CH 512, B3, P1		

Note 1

Bluetooth Simultaneous Transmission Procedure for Estimating SAR Level per FCC KDB 447498 D01 v05r01, Section 4.3.2., 2):

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

* (max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[vf(GHz)/x] W/kg for test separation distances ≤ 50 mm;

where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.

* 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm. This SAR estimation formula has been considered, in conjunction with the SAR Test Exclusion Thresholds, to result in substantially conservative SAR values of ≤ 0.4 W/kg. When SAR is estimated, the peak SAR location is assumed to be at the feed-point or geometric center of the antenna, whichever

provides a smaller antenna separation distance, and must be clearly identified in test reports. The estimated SAR is used only to determine simultaneous transmission SAR test exclusion; it should not be reported as the standalone SAR. When SAR is estimated, it must be applied to determine the sum of 1-g SAR test exclusion. When SAR to peak location separation ratio test exclusion is applied, the highest reported SAR for simultaneous transmission can be an estimated standalone SAR if the estimated SAR is the highest among the simultaneously transmitting antennas (see KDB 690783). For conditions where the estimated SAR is overly conservative for certain conditions, the test lab may choose to perform standalone SAR measurements and use the measured SAR to determine simultaneous transmission SAR test exclusion.

Note 2**Simultaneous Transmission SAR Test Exclusion Considerations per FCC KDB 447498 D01 v05r01, Section 4.3.2.**

When the sum of the 1-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration.

When the sum is greater than the SAR limit, the SAR to peak location separation ratio procedures described in Section 4.3.2. 3) and 4) may be applied to determine if simultaneous transmission SAR test exclusion applies.

When simultaneous transmission SAR test exclusion does not apply to an antenna pair, SAR measurements are required according to the enlarged zoom scan and volume scan post-processing procedures specified in FCC KDB 865664 D01 v01r01.

13 UNCERTAINTY BUDGET 0.3 – 3 GHZ RANGE

Test Name:	SAR IEEE 1528/ 62209-1 (0.3 to 3 GHz range)
Instrument(s) Used:	SAR Measurement Sytem
Standard(s) Reference:	IEEE 1528:2010 and IEC 62209-1:2010

Symbol	Source of Uncertainty	Value	Probability Distribution	Divisor	ci (1g)	ci (10g)	Std. Unc. (1g)	Std. Unc. (10g)	vi or veff
MEASUREMENT DESCRIPTION									
	Probe Calibration	5.5%	N1	1	1	1	5.5%	5.5%	inf
	Axial Isotropy	4.7%	R	1.732	0.7	0.7	1.9%	1.9%	inf
	Hemispherical Isotropy	9.6%	R	1.732	0.7	0.7	3.9%	3.9%	inf
	Boundary Effects	1.0%	R	1.732	1	1	0.6%	0.6%	inf
	Linearity	4.7%	R	1.732	1	1	2.7%	2.7%	inf
	System Detection Limits	1.0%	R	1.732	1	1	0.6%	0.6%	inf
	Modulation Response	2.4%	R	1.732	1	1	1.4%	1.4%	inf
	Readout Electronics	0.3%	N1	1	1	1	0.3%	0.3%	inf
	Response Time	0.8%	R	1.732	1	1	0.5%	0.5%	inf
	Integration Time	2.6%	R	1.732	1	1	1.5%	1.5%	inf
	RF Ambient Noise	3.0%	R	1.732	1	1	1.7%	1.7%	inf
	RF Ambient Reflections	3.0%	R	1.732	1	1	1.7%	1.7%	inf
	Probe Positioner	0.4%	R	1.732	1	1	0.2%	0.2%	inf
	Probe Positioning	2.9%	R	1.732	1	1	1.7%	1.7%	inf
	Max. SAR Eval.	1.0%	R	1.732	1	1	0.6%	0.6%	inf
TEST SAMPLE RELATED									
	Device Positioning	2.9%	N1	1	1	1	2.9%	2.9%	inf
	Device Holder	3.6%	N1	1	1	1	3.6%	3.6%	inf
	Power Drift	5.0%	R	1.732	1	1	2.9%	2.9%	inf
	Power Scaling	0.0%	R	1.732	1	1	0.0%	0.0%	inf
PHANTOM AND SETUP									
	Phantom Uncertainty	4.0%	R	1.732	1	1	2.3%	2.3%	inf
	SAR correction	1.9%	R	1.732	1	0.84	1.1%	0.9%	inf
	Liquid Conductivity(meas.)	2.5%	N1	1	0.78	0.71	2.0%	1.8%	inf
	Liquid Permittivity(meas.)	2.5%	N1	1	0.26	0.26	0.7%	0.7%	inf
	Temp. unc. - Conductivity	1.7%	R	1.732	0.78	0.71	0.8%	0.7%	inf
	Temp. unc. - Permittivity	0.3%	R	1.732	0.23	0.26	0.0%	0.0%	inf
			n1	1	1	1	0.0%	0.0%	inf

uc(Fs)	Combined Standard Uncertainty	N1	1	10.6%	10.5%
U(Fs)	Expanded Uncertainty	Normal k=	2	21.2%	21.1%

The Expanded Uncertainty is 21.2% for a Normal k factor equal to 2

Test Name:	SAR 62209-2 (0.3 to 3 GHz range)
Instrument(s) Used:	SAR Measurement Sytem
Standard(s) Reference:	IEC 62209-2:2010

Symbol	Source of Uncertainty	Value	Probability Distribution	Divisor	ci (1g)	ci (10g)	Std. Unc. (1g)	Std. Unc. (10g)	vi or veff
	MEASUREMENT DESCRIPTION								
	Probe Calibration	6.55%	N1	1	1	1	6.6%	6.6%	inf
	Axial Isotropy	4.70%	R	1.732	0.7	0.7	1.9%	1.9%	inf
	Hemispherical Isotropy	9.60%	R	1.732	0.7	0.7	3.9%	3.9%	inf
	Linearity	4.70%	R	1.732	1	1	2.7%	2.7%	inf
	System Detection Limits	1.00%	R	1.732	1	1	0.6%	0.6%	inf
	Modulation Response	2.40%	R	1.732	1	1	1.4%	1.4%	inf
	Boundary Effects	2.00%	R	1.732	1	1	1.2%	1.2%	inf
	Readout Electronics	0.30%	N1	1	1	1	0.3%	0.3%	inf
	Response Time	0.80%	R	1.732	1	1	0.5%	0.5%	inf
	Integration Time	2.60%	R	1.732	1	1	1.5%	1.5%	inf
	RF Ambient Noise	3.00%	R	1.732	1	1	1.7%	1.7%	inf
	RF Ambient Reflections	3.00%	R	1.732	1	1	1.7%	1.7%	inf
	Probe Positioner	0.80%	R	1.732	1	1	0.5%	0.5%	inf
	Probe Positioning	6.70%	R	1.732	1	1	3.9%	3.9%	inf
	Post Processing	4.00%	R	1.732	1	1	2.3%	2.3%	inf
	TEST SAMPLE RELATED								
	Device Positioning	2.90%	N1	1	1	1	2.9%	2.9%	inf
	Device Holder	3.60%	N1	1	1	1	3.6%	3.6%	inf
	Power Drift	5.00%	R	1.732	1	1	2.9%	2.9%	inf
	Power Scaling	0.00%	R	1.732	1	1	0.0%	0.0%	inf
	PHANTOM AND SETUP								
	Phantom Uncertainty	4.00%	R	1.732	1	1	2.3%	2.3%	inf
	SAR correction	1.90%	R	1.732	1	0.84	1.1%	0.9%	inf
	Liquid Conductivity(meas.)	2.50%	N1	1	0.78	0.71	2.0%	1.8%	inf
	Liquid Permittivity(meas.)	2.50%	N1	1	0.26	0.26	0.7%	0.7%	inf
	Temp. unc. - Conductivity	1.70%	R	1.732	0.78	0.71	0.8%	0.7%	inf
	Temp. unc. - Permittivity	0.30%	R	1.732	0.23	0.26	0.0%	0.0%	inf
			n1	1	1	1	0.0%	0.0%	inf

uc(Fs)	Combined Standard Uncertainty	N1	1	11.9%	11.9%
U(Fs)	Expanded Uncertainty	Normal k=	2	23.9%	23.8%

The Expanded Uncertainty is 23.9% for a Normal k factor equal to 2

14 REVISION HISTORY

Revision Level	Description of changes	Revision Date
0	Initial release	30 July 2013
1	Updated per TCB comments	28 August 2013
2	Headings updated and renumbered. Added dipole validation data. Added 802.11 conducted power measurements.	29 August 2013
3	Updated SAR reference values for System Validation	30 August 2013
4	Updated dipole validation values (page 16) and applied proper SAR measurement values from SEMCAD reports (pages 23-26). Corrected summary table on cover page.	6 September 2013