FCC SAR Test Report

APPLICANT	:	Motorola Solutions, Inc.
EQUIPMENT	:	Enterprise Digital Assistant (EDA)
BRAND NAME	:	MOTOROLA
MODEL NAME	:	MC67ND
FCC ID	:	UZ7MC67ND
STANDARD	:	FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2003 FCC OET Bulletin 65 Supplement C (Edition 01-01)

The product was completely tested on Apr. 02, 2013. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai

Jones Tsai / Manager

Testing Laboratory 1190

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA320416	Rev. 01	Initial issue of report	Apr. 02, 2013

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Solutions, Inc. Enterprise Digital Assistant (EDA), MOTOROLA, MC67ND**, are as follows.

<Highest Reported standalone SAR Summary>

Exposure Position	Frequency Band	Reported 1g-SAR (W/kg)	Equipment Class	Highest Reported 1g-SAR (W/kg)
Head	GSM850	**1.20**	PCE	**1.40**
	GSM1900	**0.56**		
	WCDMA Band V	**1.30**		
	WCDMA Band II	**1.29**		
	CDMA 2000 BC0	**1.28**		
	CDMA 2000 BC1	**1.40**		
	WLAN 5.2GHz Band	**0.29**	NII	**0.29**
	WLAN 5.3GHz Band	**0.28**		
	WLAN 5.5GHz Band	**0.29**		
	WLAN 5.8GHz Band	**0.39**	DTS	**0.39**
	WLAN 2.4GHz Band	**0.17**		
Body-worn (1.5cm Gap)	GPRS850	**1.30**	PCE	**1.30**
	GPRS1900	**0.39**		
	WCDMA Band V	**0.39**		
	WCDMA Band II	**0.21**		
	CDMA 2000 BC0	**0.44**		
	CDMA 2000 BC1	**0.25**		
	WLAN 5.2GHz Band	**0.12**	NII	**0.13**
	WLAN 5.3GHz Band	**0.12**		
	WLAN 5.5GHz Band	**0.13**		
	WLAN 5.8GHz Band	**0.16**	DTS	**0.16**
	WLAN 2.4GHz Band	**0.09**		

<Highest Simultaneous transmission SAR>

Frequency Band	Equipment Class	Exposure Position	Highest Reported Simultaneous Transmission 1g-SAR (W/kg)
GSM850	PCE	Head	1.59
Bluetooth 2.4GHz	DSS		
WLAN 5.8GHz Band	DTS		

Frequency Band	Equipment Class	Exposure Position	Highest Reported Simultaneous Transmission 1g-SAR (W/kg)
WCDMA V	PCE	Head	1.59
Bluetooth 2.4GHz	DSS		
WLAN 5.2GHz Band	NII		

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2003 and FCC OET Bulletin 65 Supplement C (Edition 01-01).

2. Administration Data

2.1 Testing Laboratory

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978

2.2 Applicant

Company Name	Motorola Solutions, Inc.
Address	One Motorola Plaza, Holtsville, NY 11742-1300 USA

2.3 Manufacturer

Company Name	Motorola Solutions, Inc.
Address	One Motorola Plaza, Holtsville, NY 11742-1300 USA

2.4 Application Details

Date of Start during the Test	Feb. 05, 2013
Date of End during the Test	Apr. 02, 2013

3. General Information

3.1 Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT	Enterprise Digital Assistant (EDA)
Brand Name	MOTOROLA
Model Name	MC67ND
FCC ID	UZ7MC67ND
IMEI Code	004401680382864 for WWAN testing 004401680382609 for WLAN testing
TX Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz CDMA2000 BC0: 824.7 MHz ~ 848.31 MHz CDMA 2000 BC1: 1851.25 MHz ~ 1908.75 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2472 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Antenna Type	WWAN : Fixed Internal Antenna type (PIFA Antenna) WLAN : Fixed Internal Antenna type (PIFA Antenna) Bluetooth : Fixed Internal Antenna type (PIFA Antenna)
Antenna Gain	Bluetooth 2.4GHz (Freq 2402MHz ~ 2480MHz): 0.36dBi WLAN2.4GHz (Freq 2412MHz ~ 2472MHz): 1.91dBi WLAN5GHz (Freq 5180MHz ~ 5825MHz) : 3.34 dBi
HW Version	EV
SW Version	90.28.21 (RF Fusion Version : X_2.00.0.0.072R)
FW Version	2.47
Uplink Modulations	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA (Rel 99): QPSK HSDPA (Rel 6): QPSK HSUPA (Rel 6): QPSK CDMA2000: QPSK CDMA2000 1xEV-DO: QPSK/8PSK 802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth : GFSK Bluetooth EDR : π/4-DQPSK, 8-DPSK
Transfer Mode Category	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.

Remark:
1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. The DSD keypad PCB is the same as Numeric Keypad PCB, only difference is printed.
3. This device does not support WLAN hotspot function.
4. This device does not support WWAN VOIP function.
5. MC67ND HW/SW design is the same as FCC ID UZ7MC67NA granted on 2012/07/25, except the WWAN module replacement (PH8-P module in MC67NA, and PXS8 module in MC67ND). Due to the similarity, MC67NA SAR performance is representative and part of test data of MC67NA (Sporton SAR Report of FCC ID: UZ7MC67NA, Report No: FA221518-01 Rev.02, Date of available on FCC website: 2012/07/25) is referenced in this report. MC67NA test data is annotated as sample 1, and MC67ND is annotated as sample 2.

3.2 Maximum RF output power among production units

Mode	GSM 850	GSM 1900
	Burst Average power(dBm)	
GSM (GMSK, 1 Tx slot)	33.5	30.5
GPRS/EDGE (GMSK, 1 Tx slot)	33.5	30.5
GPRS/EDGE (GMSK, 2 Tx slots)	33.5	30.5
GPRS/EDGE (GMSK, 3 Tx slots)	33.5	30.5
GPRS/EDGE (GMSK, 4 Tx slots)	33.5	30.5
EDGE (8PSK, 1 Tx slot)	27.5	26.5
EDGE (8PSK, 2 Tx slots)	27.5	26.5
EDGE (8PSK, 3 Tx slots)	27.5	26.5
EDGE (8PSK, 4 Tx slots)	27.5	26.5

Mode	WCDMA Band V	WCDMA Band II
	Average power(dBm)	
RMC 12.2Kbps	24.5	24.5
HSDPA Subtest-1	24.5	24.5
HSUPA Subtest-5	24.5	24.5

Band	CDMA BC0	CDMA BC1
	Average power(dBm)	
1xRTT RC1 SO55	24.5	24.5
1xRTT RC3 SO55	24.5	24.5
1xRTT RC3 SO32	24.5	24.5
1xEV-DO Rev 0 (RTAP 153.6kbps)	24.5	24.5
1xEV-DO Rev A (RETAP 4096 bits)	24.5	24.5

WLAN2.4GHz Band	IEEE 802.11 Average power (dBm)		
Channel	11b	11g	11n-HT20
Ch1	15.21	14.69	14.86
Ch6	16.43	16.43	16.28
Ch11	16.31	14.12	13.0
Ch12	9.34	8.31	8.26
Ch13	6.99	1.90	1.59

Mode / Band	Bluetooth Average power (dBm)		
	1Mbps	2Mbps	3Mbps
	(GFSK)	(π/4-DQPSK)	(8-DPSK)
2.4GHz Bluetooth	2.46	1.74	1.75

WLAN5 GHz Band	IEEE 802.11 Average power (dBm)	
Channel	11a	11n-HT20
Ch36	12.08	11.22
Ch40	11.17	11.42
Ch44	11.91	11.72
Ch48	11.97	11.71
Ch52	13.41	13.58
Ch56	12.67	12.89
Ch60	13.32	12.81
Ch64	13.27	12.92
Ch100	13.00	12.92
Ch104	12.88	12.29
Ch108	12.69	12.21
Ch112	12.79	12.12
Ch116	12.64	13.15
Ch132	12.78	10.92
Ch136	12.90	10.48
Ch140	13.20	11.21
Ch149	14.59	15.29
Ch153	14.72	14.50
Ch157	14.64	15.31
Ch161	14.92	14.82
Ch165	14.68	15.44

3.3 Applied Standard

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2003
- FCC OET Bulletin 65 Supplement C (Edition 01-01)
- FCC KDB 447498 D01 v05
- FCC KDB 648474 D04 v01
- FCC KDB 248227 D01 v01r02
- FCC KDB 941225 D01 v02
- FCC KDB 941225 D03 v01

3.4 Device Category and SAR Limits

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user. Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

3.5 Test Conditions

3.5.1 Ambient Condition

Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

3.5.2 Test Configuration

For WWAN SAR testing, the device was controlled by using a base station emulator. Communication between the device and the emulator was established by air link. The distance between the EUT and the antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of EUT.

During WLAN SAR testing EUT is configured with the WLAN continuous TX tool, and the transmission duty factor was monitored on the spectrum analyzer with zero-span setting

Duty factor observed as below:

802.11b, 1Mbps: 100%

802.11a, 6Mbps: 100%

Bluetooth, DH5: 78.29%

For WLAN SAR testing, WLAN engineering testing software installed on the EUT can provide continuous transmitting RF signal.

4. Specific Absorption Rate (SAR)

4.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

4.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$\mathbf{SAR} = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\mathbf{dm}}\right) = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\boldsymbol{\rho}\mathbf{dv}}\right)$$

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be either related to the temperature elevation in tissue by

$$\mathbf{SAR} = \mathbf{C}\left(\frac{\boldsymbol{\delta}\mathbf{T}}{\boldsymbol{\delta}\mathbf{t}}\right)$$

Where: C is the specific heat capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

$$\mathbf{SAR} = \frac{\boldsymbol{\sigma}|\mathbf{E}|^2}{\boldsymbol{\rho}}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

5. SAR Measurement System

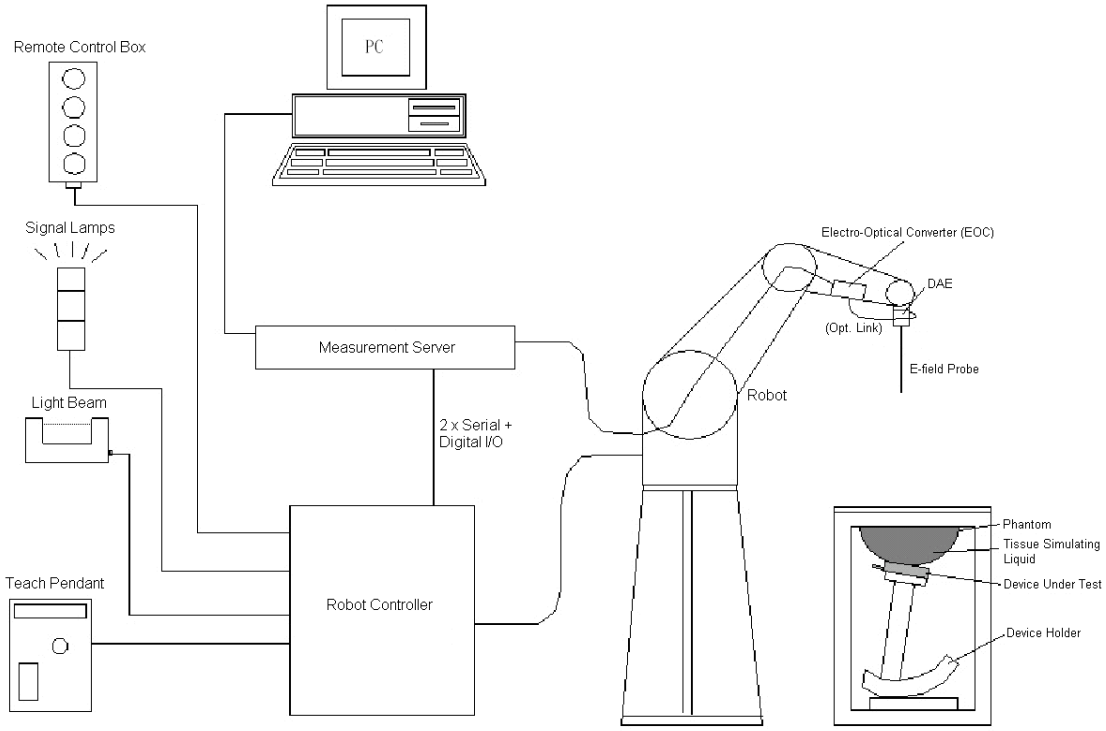


Fig 5.1 SPEAG DASY System Configurations

The DASY system for performance compliance tests is illustrated above graphically. This system consists of the following items:

- A standard high precision 6-axis robot with controller, a teach pendant and software
- A data acquisition electronic (DAE) attached to the robot arm extension
- A dosimetric probe equipped with an optical surface detector system
- The electro-optical converter (EOC) performs the conversion between optical and electrical signals
- A measurement server performs the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the accuracy of the probe positioning
- A computer operating Windows XP
- DASY software
- Remove control with teach pendant and additional circuitry for robot safety such as warming lamps, etc.
- The SAM twin phantom
- A device holder
- Tissue simulating liquid
- Dipole for evaluating the proper functioning of the system

Component details are described in in the following sub-sections.

5.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

5.1.1 E-Field Probe Specification

<ES3DV3 Probe >

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz to 3 GHz; Linearity: ± 0.2 dB
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.4 dB in HSL (rotation normal to probe axis)
Dynamic Range	10 µW/g to 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 10 mm) Tip diameter: 4 mm (Body: 10 mm) Distance from probe tip to dipole centers: 3 mm

Fig 5.2 Photo of ES3DV3

<EX3DV4 Probe>

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz to 6 GHz; Linearity: ± 0.2 dB
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

Fig 5.3 Photo of EX3DV4/ES3DV4

5.1.2 E-Field Probe Calibration

Each probe needs to be calibrated according to a dosimetric assessment procedure with accuracy better than ± 10%. The spherical isotropy shall be evaluated and within ± 0.25dB. The sensitivity parameters (NormX, NormY, and NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested. The calibration data can be referred to appendix C of this report.

5.2 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.4 Photo of DAE

5.3 Robot

The SPEAG DASY system uses the high precision robots (DASY4: RX90BL; DASY5: TX90XL) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY4: CS7MB; DASY5: CS8c) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ±0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

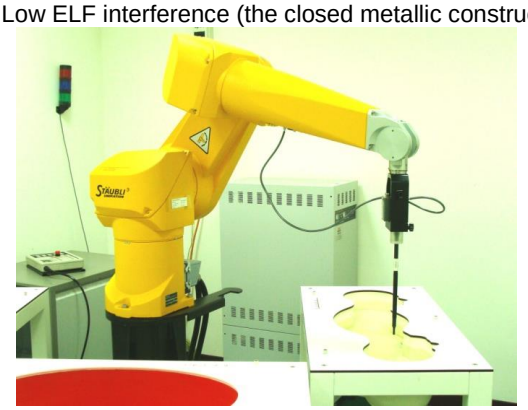


Fig 5.5 Photo of DASY4

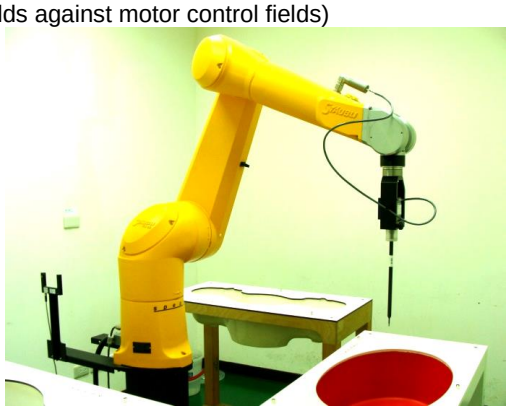


Fig 5.6 Photo of DASY5

5.4 Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY4: 166 MHz, Intel Pentium; DASY5: 400 MHz, Intel Celeron), chipdisk (DASY4: 32 MB; DASY5: 128 MB), RAM (DASY4: 64 MB, DASY5: 128 MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O board, which is directly connected to the PC/104 bus of the CPU board.

The measurement server performs all the real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operations.

Fig 5.7 Photo of Server for DASY4

Fig 5.8 Photo of Server for DASY5

5.5 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom

Fig 5.9 Photo of SAM Phantom

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI4 Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)
Filling Volume	Approx. 30 liters
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm

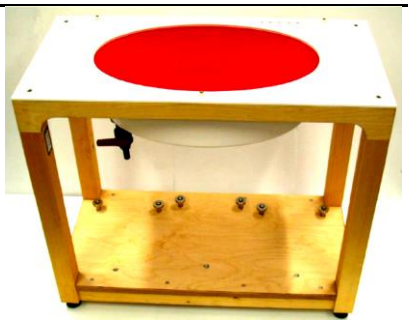


Fig 5.10 Photo of ELI4 Phantom

The ELI4 phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

5.6 Device Holder

<Device Holder for SAM Twin Phantom>

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5 mm distance, a positioning uncertainty of ± 0.5 mm would produce a SAR uncertainty of ± 20 %. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε = 3 and loss tangent δ = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

Fig 5.11 Device Holder

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

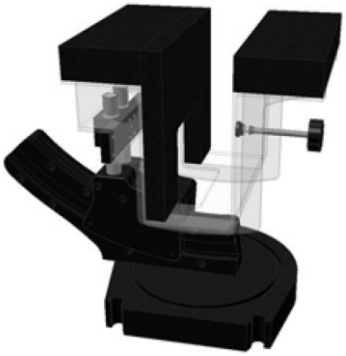


Fig 5.12 Laptop Extension Kit

5.7 Data Storage and Evaluation

5.7.1 Data Storage

The DASY software stores the assessed data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all the necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files. The post-processing software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of erroneous parameter settings. For example, if a measurement has been performed with an incorrect crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be reevaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type (e.g., [V/m], [A/m], [mW/g]). Some of these units are not available in certain situations or give meaningless results, e.g., a SAR-output in a non-lose media, will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

5.7.2 Data Evaluation

The DASY post-processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software：

Probe parameters：	- Sensitivity	$Norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion factor	$ConvF_i$
	- Diode compression point	dcp_i
Device parameters：	- Frequency	f
	- Crest factor	cf
Media parameters：	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multi-meter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power.

The formula for each channel can be given as：

$$\mathbf{V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}}$$

with V_i = compensated signal of channel i, (i = x, y, z)
U_i = input signal of channel i, (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcp_i = diode compression point (DASY parameter)

From the compensated input signals, the primary field data for each channel can be evaluated：

E-field Probes：$$\mathbf{E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}}$$

H-field Probes：$$\mathbf{H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}}$$

with V_i = compensated signal of channel i, (i = x, y, z)
$Norm_i$ = sensor sensitivity of channel i, (i = x, y, z), μV/(V/m)^2 for E-field Probes
ConvF = sensitivity enhancement in solution
a_{ij} = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
E_i = electric field strength of channel i in V/m
H_i = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude)：

$$\mathbf{E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}}$$

The primary field data are used to calculate the derived field units.

$$\mathbf{SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1000}}$$

with SAR = local specific absorption rate in mW/g
E_{tot} = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm^3

Note that the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

5.8 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 22, 2010	Mar. 21, 2013
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Mar. 23, 2010	Mar. 22, 2013
SPEAG	2450MHz System Validation Kit	D2450V2	736	Jul. 25, 2011	Jul. 24, 2013
SPEAG	5GHz System Validation Kit	D5GHzV2	1006	Dec. 11, 2012	Dec. 10, 2013
SPEAG	Data Acquisition Electronics	DAE4	778	Aug. 27, 2012	Aug. 26, 2013
SPEAG	Data Acquisition Electronics	DAE4	1279	Jan. 28, 2013	Jan. 27, 2014
SPEAG	Data Acquisition Electronics	DAE4	1338	Jun. 12, 2012	Jun. 11, 2013
SPEAG	Dosimetric E-Field Probe	EX3DV4	3697	Sep. 28, 2012	Sep. 27, 2013
SPEAG	Dosimetric E-Field Probe	EX3DV4	3578	Jun. 21, 2012	Jun. 20, 2013
SPEAG	Dosimetric E-Field Probe	EX3DV4	3792	Jun. 21, 2012	Jun. 20, 2013
SPEAG	Dosimetric E-Field Probe	ES3DV3	3270	Sep. 28, 2012	Sep. 27, 2013
Wisewind	Thermometer	ETP-101	TM560	Nov. 13, 2012	Nov. 12, 2013
Wisewind	Thermometer	ETP-101	TM685	Nov. 13, 2012	Nov. 12, 2013
Wisewind	Thermometer	HTC-1	TM281	Nov. 13, 2012	Nov. 12, 2013
SPEAG	SAM Phantom	QD 000 P40 CD	TP-1719	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1383	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1446	NCR	NCR
SPEAG	SAM Phantom	QD 000 P40 C	TP-1478	NCR	NCR
SPEAG	SAM Phantom	SM 000 T01 DA	TP-1542	NCR	NCR
Agilent	Network Analyzer	E5071C	MY46101588	May. 11, 2012	May. 10, 2013
Agilent	ESG Vector Series Signal Generator	E4438C	MY49070755	Oct. 02, 2012	Oct. 01, 2013
Anritsu	Power Meter	ML2495A	1132003	Aug. 14, 2012	Aug. 13, 2013
Agilent	Wireless Communication Test Set	E5515C	MY48360820	Jan. 05, 2012	Jan. 04, 2014
Agilent	Dual Directional Coupler	778D	50422	Note 4	
Woken	Attenuator 1	WK0602-XX	N/A	Note 4	
PE	Attenuator 2	PE7005-10	N/A	Note 4	
PE	Attenuator 3	PE7005- 3	N/A	Note 4	
Agilent	Dielectric Probe Kit	85070D	US01440205	Note 5	
AR	Power Amplifier	5S1G4M2	328767	Note 6	
R&S	Spectrum Analyzer	FSP	101131	Jul. 23, 2012	Jul. 22, 2013

Table 5.1 Test Equipment List

Note:

1. The calibration certificate of DASY can be referred to appendix C of this report.
2. Referring to KDB 865664 D01v01, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole D835V2, SN: 499, D1900V2, SN: 5d041, D2450V2, SN: 736, can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.
4. The Insertion Loss calibration of Dual Directional Coupler and Attenuator were characterized via the network analyzer and compensated during system check.
5. The dielectric probe kit was calibrated via the network analyzer, with the specified procedure (calibrated in pure water) and calibration kit (standard) short circuit, before the dielectric measurement. The specific procedure and calibration kit are provided by Agilent.
6. In system check we need to monitor the level on the power meter, and adjust the power amplifier level to have precise power level to the dipole; the measured SAR will be normalized to 1W input power according to the ratio of 1W to the input power to the dipole. For system check, the calibration of the power amplifier is deemed not critically required for correct measurement; the power meter is critical and we do have calibration for it
7. Attenuator 1 insertion loss is calibrated by the network Analyzer, which the calibration is valid, before system check.

6. Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 6.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 6.2.

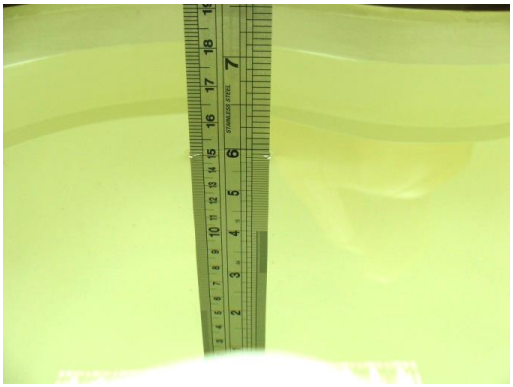


Fig 6.1 Photo of Liquid Height for Head SAR

Fig 6.2 Photo of Liquid Height for Body SAR

The following table gives the recipes for tissue simulating liquid.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ε_r)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
900	40.3	57.9	0.2	1.4	0.2	0	0.97	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
For Body								
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
900	50.8	48.2	0	0.9	0.1	0	1.05	55.0
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7

Table 6.1 Recipes of Tissue Simulating Liquid

Simulating Liquid for 5G, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an Agilent 85070D Dielectric Probe Kit and an Agilent Network Analyzer.

The following table shows the measuring results for simulating liquid.

Frequency (MHz)	Liquid Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (εr)	Conductivity Target (σ)	Permittivity Target (εr)	Delta (σ) (%)	Delta (εr) (%)	Limit (%)	Date
835	Head	21.4	0.873	41.054	0.9	41.5	-3.00	-1.07	±5	2013/2/6
835	Head	21.4	0.894	41.667	0.9	41.5	-0.67	0.40	±5	2013/2/8
835	Body	21.3	0.958	53.02	0.97	55.2	-1.24	-3.95	±5	2013/2/6
1900	Head	21.2	1.436	41.511	1.4	40	2.57	3.78	±5	2013/2/5
1900	Head	21.5	1.428	41.063	1.4	40	2.00	2.66	±5	2013/2/14
1900	Body	21.6	1.505	53.691	1.52	53.3	-0.99	0.73	±5	2013/2/7
2450	Head	21.6	1.853	38.053	1.8	39.2	2.94	-2.93	±5	2013/2/7
2450	Head	21.3	1.836	39.308	1.8	39.2	2.00	0.28	±5	2013/2/28
2450	Head	21.4	1.84	38.651	1.8	39.2	2.22	-1.40	±5	2013/3/4
2450	Body	21.6	2.018	52.307	1.95	52.7	3.49	-0.75	±5	2013/2/7
5200	Head	21.3	4.79	35.478	4.66	36	2.79	-1.45	±5	2013/2/8
5200	Head	21.2	4.793	35.493	4.66	36	2.85	-1.41	±5	2013/2/20
5200	Body	21.4	5.257	47.536	5.3	49	-0.81	-2.99	±5	2013/2/8
5300	Head	21.3	4.896	35.349	4.76	35.9	2.86	-1.53	±5	2013/2/8
5300	Head	21.2	4.899	35.364	4.76	35.9	2.92	-1.49	±5	2013/2/20
5300	Body	21.4	5.393	47.275	5.42	48.9	-0.50	-3.32	±5	2013/2/8
5600	Head	21.4	5.2	34.77	5.1	35.5	1.96	-2.06	±5	2013/2/8
5600	Head	21.5	5.205	34.778	5.1	35.5	2.06	-2.03	±5	2013/2/20
5600	Body	21.4	5.79	46.784	5.8	48.5	-0.17	-3.54	±5	2013/2/8
5800	Head	21.4	5.39	34.414	5.27	35.3	2.28	-2.51	±5	2013/2/8
5800	Head	21.5	5.395	34.416	5.27	35.3	2.37	-2.50	±5	2013/2/20
5800	Head	21.6	5.42	34.321	5.27	35.3	2.85	-2.77	±5	2013/4/2
5800	Body	21.4	6.144	46.492	6	48.2	2.40	-3.54	±5	2013/2/8
5800	Body	21.6	6.127	46.464	6	48.2	2.12	-3.60	±5	2013/4/2

Table 6.2 Measuring Results for Simulating Liquid

7. SAR System Verification

Each DASY system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system performance check and system validation. System validation kit includes a dipole, tripod holder to fix it underneath the flat phantom and a corresponding distance holder.

7.1 Purpose of System Performance check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

7.2 System Setup

In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:

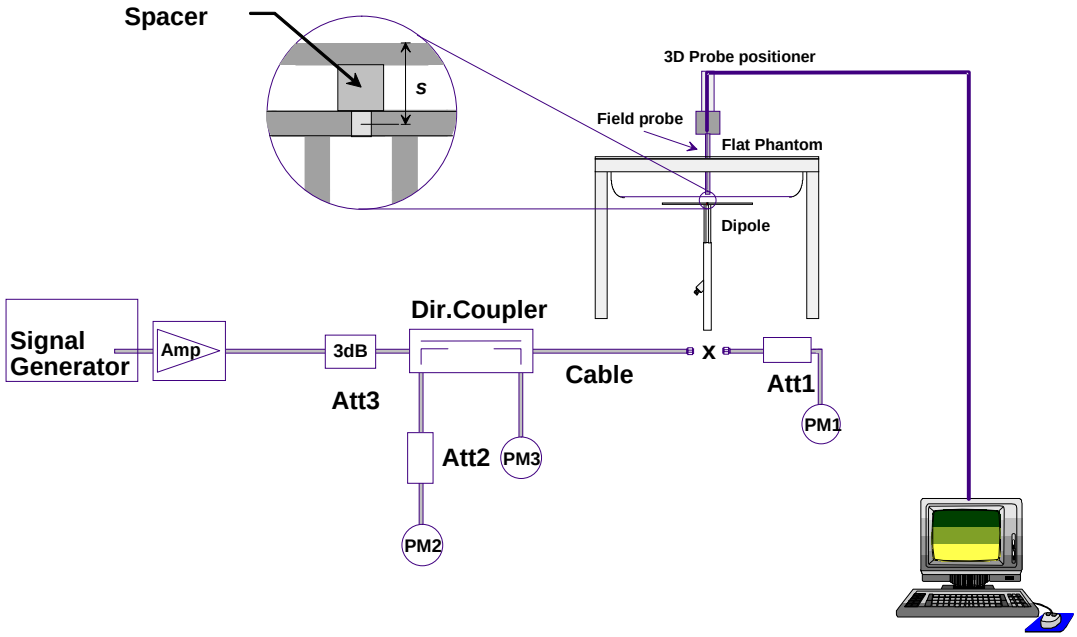


Fig 7.1 System Setup for System Evaluation

1. Signal Generator
2. Amplifier
3. Directional Coupler
4. Power Meter
5. Calibrated Dipole

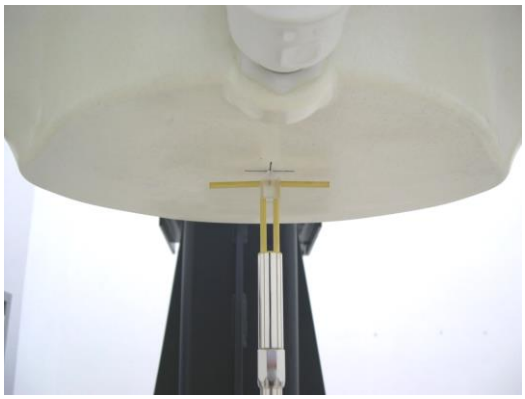


Fig 7.2 Photo of Dipole Setup

7.3 SAR System Verification Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Table 7.1 shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Date	Frequency (MHz)	Liquid Type	Power fed onto reference dipole (mW)	Targeted SAR (W/kg)	Measured SAR (W/kg)	Normalized SAR (W/kg)	Deviation (%)
2013/2/6	835	Head	250	9.71	2.28	9.12	-6.08
2013/2/8	835	Head	250	9.71	2.35	9.4	-3.19
2013/2/6	835	Body	250	9.82	2.37	9.48	-3.46
2013/2/5	1900	Head	250	39.8	9.83	39.32	-1.21
2013/2/14	1900	Head	250	39.8	9.41	37.64	-5.43
2013/2/7	1900	Body	250	40	9.59	38.36	-4.10
2013/2/7	2450	Head	250	54.8	14.1	56.4	2.92
2013/2/28	2450	Head	250	54.8	14	56	2.19
2013/3/4	2450	Head	250	54.8	13.7	54.8	0.00
2013/2/7	2450	Body	250	52.3	12.3	49.2	-5.93
2013/2/8	5200	Head	100	79.8	8.01	80.1	0.38
2013/2/20	5200	Head	100	79.8	7.76	77.6	-2.76
2013/2/8	5200	Body	100	71.4	7.37	73.7	3.22
2013/2/8	5300	Head	100	82.6	8.41	84.1	1.82
2013/2/20	5300	Head	100	82.6	8.23	82.3	-0.36
2013/2/8	5300	Body	100	73.5	7.35	73.5	0.00
2013/2/8	5600	Head	100	83.6	7.98	79.8	-4.55
2013/2/20	5600	Head	100	83.6	7.76	77.6	-7.18
2013/2/8	5600	Body	100	76.8	7.52	75.2	-2.08
2013/2/8	5800	Head	100	78.9	8.38	83.8	6.21
2013/2/20	5800	Head	100	78.9	8.04	80.4	1.90
2013/4/2	5800	Head	100	78.9	8.5	85	7.73
2013/2/8	5800	Body	100	71.7	7.22	72.2	0.70
2013/4/2	5800	Body	100	71.7	7.13	71.3	-0.56

Table 7.1 Target and Measurement SAR after Normalized

8. EUT Testing Position

This EUT was tested in seven different positions. They are right cheek, right tilted, left cheek, left tilted, Front of the EUT with phantom 1.5 cm gap, Back of the EUT with phantom 1.5 cm gap and Front with Holster of the EUT with phantom 0cm gap. Please refer to Appendix D for the test setup photos

8.1 Define two imaginary lines on the handset

(a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.

(b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.

(c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

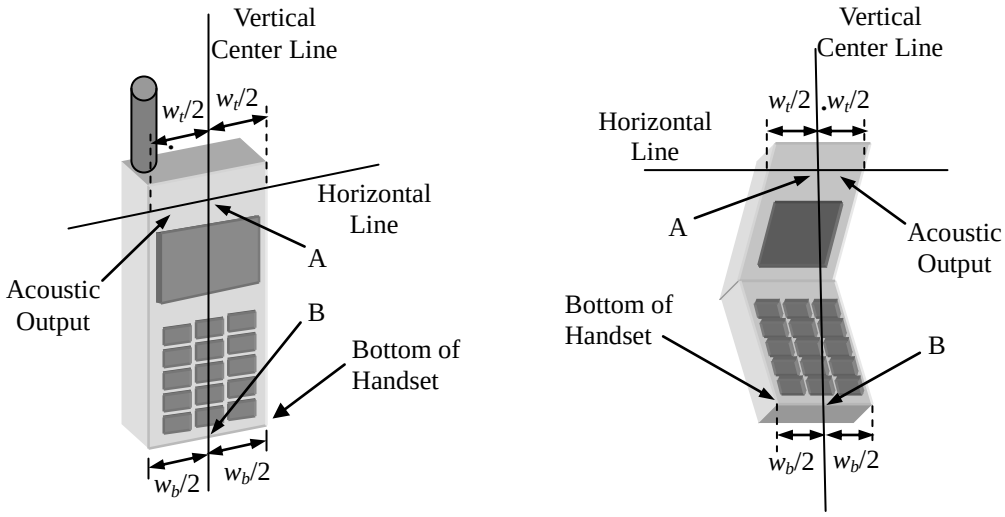


Fig 8.1 Illustration for Handset Vertical and Horizontal Reference Lines

8.2 Cheek Position

(a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

(b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig. 8.2).

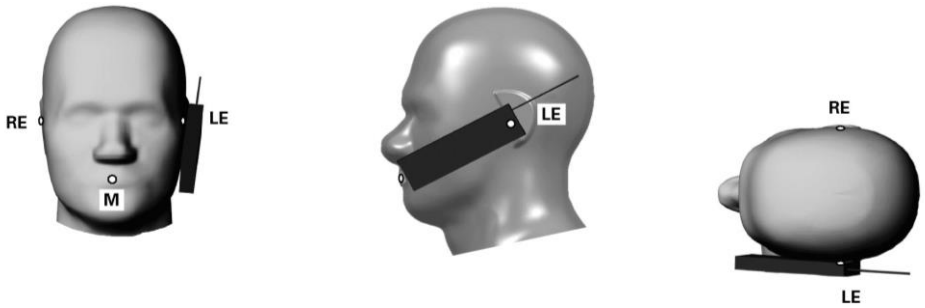


Fig 8.2 Illustration for Cheek Position

8.3 Tilted Position

(a) To position the device in the "cheek" position described above.

(b) While maintaining the device the reference plane described above and pivoting against the ear moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see Fig. 8.3).

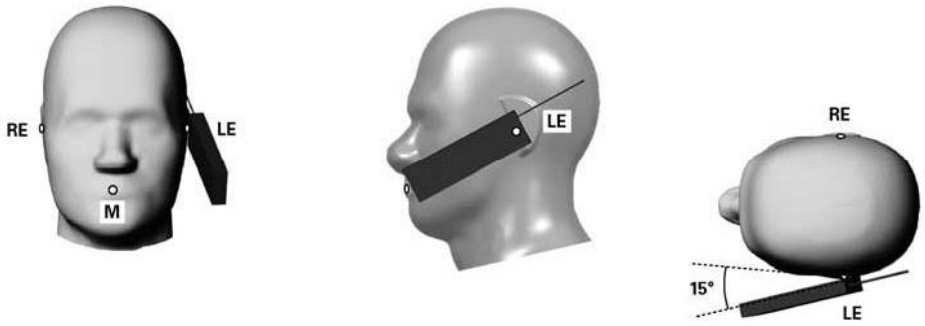


Fig 8.3 Illustration for Tilted Position

8.4 Body Worn Position

(a) To position the device parallel to the phantom surface with either keypad up or down.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device surface and the flat phantom to 1.5 cm.

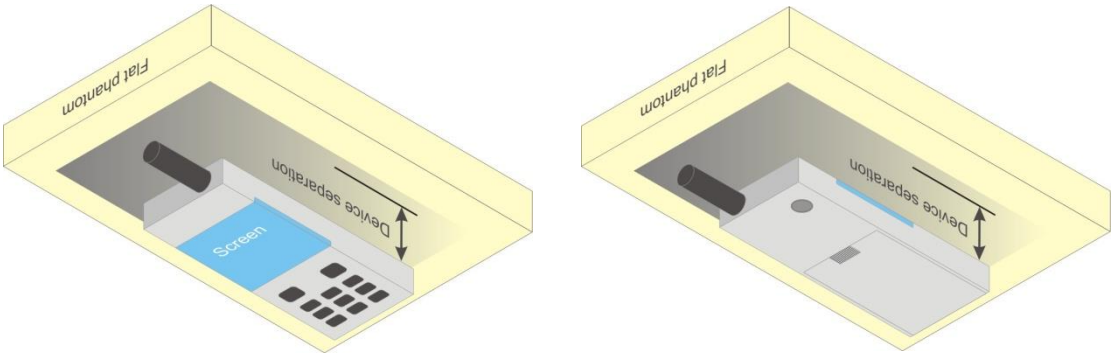


Fig 8.4 Illustration for Body Worn Position

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>
(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>
(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

9.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

9.2 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. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

9.3 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01v01 quoted below.

For any secondary peaks found in the area scan which are within 2 dB of the maximum peak and are not within this zoom scan, the zoom scan should be repeated

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the area scan based *1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

9.4 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

9.5 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

9.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

10. Conducted RF Output Power (Unit: dBm)

<GSM RMS Conducted Power>

Band: GSM850	Burst Average Power (dBm)			Frame-Average Power (dBm)		
Channel	128	189	251	128	189	251
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8
GSM (GMSK, 1 Tx slot)	32.98	32.89	33.01	23.98	23.89	24.01
GPRS (GMSK, 1 Tx slot) – CS1	32.93	32.83	32.95	23.93	23.83	23.95
GPRS (GMSK, 2 Tx slots) – CS1	32.83	32.74	32.86	26.83	26.74	26.86
GPRS (GMSK, 3 Tx slots) – CS1	32.74	32.62	32.73	28.48	28.36	28.47
GPRS (GMSK, 4 Tx slots) – CS1	32.59	32.49	32.63	29.59	29.49	29.63
EDGE (GMSK, 1 Tx slot) – MCS1	32.97	32.87	32.98	23.97	23.87	23.98
EDGE (GMSK, 2 Tx slots) – MCS1	32.84	32.75	32.87	26.84	26.75	26.87
EDGE (GMSK, 3 Tx slots) – MCS1	32.75	32.63	32.73	28.49	28.37	28.47
EDGE (GMSK, 4 Tx slots) – MCS1	32.60	32.50	32.61	29.60	29.50	29.61
EDGE (8PSK, 1 Tx slot) – MCS5	26.56	26.51	26.52	17.56	17.51	17.52
EDGE (8PSK, 2 Tx slots) – MCS5	26.48	26.43	26.44	20.48	20.43	20.44
EDGE (8PSK, 3 Tx slots) – MCS5	26.39	26.34	26.34	22.13	22.08	22.08
EDGE (8PSK, 4 Tx slots) – MCS5	26.27	26.23	26.27	23.27	23.23	23.27

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method are shown as below:
Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB
Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB
Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

Note:

1. Per KDB 447498 D01v05, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. For Head SAR testing, EUT was set in GSM Voice for GSM850 SAR testing
3. For Body worn SAR testing, GSM, GPRS and EDGE should be evaluated, therefore the EUT was set in GPRS 4 Tx slots for GSM850 due to its highest frame-average power.

Band: GSM1900	Burst Average Power (dBm)			Frame-Average Power (dBm)		
Channel	512	661	810	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8	1850.2	1880.0	1909.8
GSM (GMSK, 1 Tx slot)	30.07	29.87	30.08	21.07	20.87	21.08
GPRS (GMSK, 1 Tx slot) – CS1	30.09	29.89	30.09	21.09	20.89	21.09
GPRS (GMSK, 2 Tx slots) – CS1	29.88	29.68	29.91	23.88	23.68	23.91
GPRS (GMSK, 3 Tx slots) – CS1	29.71	29.47	29.64	25.45	25.21	25.38
GPRS (GMSK, 4 Tx slots) – CS1	29.43	29.22	29.44	26.43	26.22	26.44
EDGE (GMSK, 1 Tx slot) – MCS1	29.84	29.65	29.89	20.84	20.65	20.89
EDGE (GMSK, 2 Tx slots) – MCS1	29.71	29.50	29.74	23.71	23.50	23.74
EDGE (GMSK, 3 Tx slots) – MCS1	29.57	29.33	29.53	25.31	25.07	25.27
EDGE (GMSK, 4 Tx slots) – MCS1	29.31	29.10	29.33	26.31	26.10	26.33
EDGE (8PSK, 1 Tx slot) – MCS5	25.53	25.53	25.70	16.53	16.53	16.70
EDGE (8PSK, 2 Tx slots) – MCS5	25.35	25.44	25.57	19.35	19.44	19.57
EDGE (8PSK, 3 Tx slots) – MCS5	25.24	25.31	25.42	20.98	21.05	21.16
EDGE (8PSK, 4 Tx slots) – MCS5	25.06	25.14	25.29	22.06	22.14	22.29

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method are shown as below:
Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB
Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB
Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

Note:

1. Per KDB 447498 D01v05, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. For Head SAR testing, EUT was set in GSM Voice for GSM1900 for SAR testing.
3. For Body worn SAR testing, GSM, GPRS and EDGE should be evaluated, therefore the EUT was set in GPRS 4 Tx slots for GSM1900 due to its highest frame-average power.

<WCDMA Conducted Power>

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

<WCDMA RMS Conducted Power>

Note:
1. Applying the subtest setup in Table C.11.1.3 of 3GPP TS 34.121-1 V9.1.0 to Rel. 6 HSPA.
2. Per KDB 941225 D01, RMC 12.2kbps setting is used to evaluate SAR. If AMR 12.2kbps power is < 0.25dB higher than RMC 12.2kbps, SAR tests with AMR 12.2kbps can be excluded.
3. By design, AMR, HSDPA/HSUPA RF power will not be larger than RMC 12.2kbps.

Band		WCDMA V			WCDMA II		
TX Channel		4132	4182	4233	9262	9400	9538
Rx Channel		4357	4407	4458	9662	9800	9938
Frequency (MHz)		826.4	836.4	846.6	1852.4	1880	1907.6
3GPP Rel 99	AMR 12.2Kbps	23.68	23.82	23.53	23.47	23.29	23.54
3GPP Rel 99	RMC 12.2Kbps	23.7	23.84	23.56	23.5	23.3	23.56
3GPP Rel 6	HSDPA Subtest-1	23.63	23.75	23.67	23.31	23.23	23.35
3GPP Rel 6	HSDPA Subtest-2	23.67	23.76	23.69	23.35	23.25	23.23
3GPP Rel 6	HSDPA Subtest-3	23.13	23.32	23.07	22.83	22.68	22.77
3GPP Rel 6	HSDPA Subtest-4	23.19	23.25	23.14	22.90	22.73	22.77
3GPP Rel 6	HSUPA Subtest-1	23.72	23.82	23.60	23.09	22.96	23.05
3GPP Rel 6	HSUPA Subtest-2	21.96	22.03	21.78	22.13	22.10	22.12
3GPP Rel 6	HSUPA Subtest-3	22.77	22.66	22.40	22.53	22.03	22.66
3GPP Rel 6	HSUPA Subtest-4	22.73	22.44	22.39	22.40	22.37	22.49
3GPP Rel 6	HSUPA Subtest-5	23.68	23.77	23.58	23.55	23.42	23.42
3GPP MPR specification	MPR result	WCDMA V			WCDMA II		
0	HSDPA Subtest-1	0.00	0.00	0.00	0.00	0.00	0.00
0	HSDPA Subtest-2	-0.04	-0.01	-0.02	-0.04	-0.02	0.12
≦0.5	HSDPA Subtest-3	0.50	0.43	0.60	0.48	0.55	0.58
≦0.5	HSDPA Subtest-4	0.44	0.50	0.53	0.41	0.50	0.58
≦0	HSUPA Subtest-1	-0.04	-0.05	-0.02	0.46	0.46	0.37
≦2	HSUPA Subtest-2	1.72	1.74	1.80	1.42	1.32	1.30
≦1	HSUPA Subtest-3	0.91	1.11	1.18	1.02	1.39	0.76
≦2	HSUPA Subtest-4	0.95	1.33	1.19	1.15	1.05	0.93
≦0	HSUPA Subtest-5	0.00	0.00	0.00	0.00	0.00	0.00

<CDMA2000 RMS Conducted Power>

Note:
1. According to KDB 941225 D01, Head SAR for RC1+SO55 is not required because the maximum average output power of RC1 is less than 1/4 dB higher than RC3+SO55.
2. Referring to KDB 941225 D01, the CDMA Handset Body-worn SAR tests based on RC3+SO32. RC1, Ev-Do Rev 0 (RTAP 153.6kbps) Ev-Do Rev A(RETAP 4096 bits) power are all less than 1/4 dB higher than RC3, thus SAR testing in these modes are not required.

Band	CDMA2000 BC0			CDMA2000 BC1		
Channel	1013	384	777	25	600	1175
Frequency (MHz)	824.70	836.52	848.31	1851.25	1880.00	1908.75
1xRTT RC1+SO55	23.77	23.97	23.68	23.73	23.60	23.69
1xRTT RC3+SO55	23.75	23.96	23.6	23.67	23.5	23.61
1xRTT RC3+SO32 (+ F-SCH)	23.73	23.93	23.57	23.67	23.49	23.60
1xRTT RC3 SO32(+SCH)	23.72	23.91	23.52	23.66	23.46	23.57
1xEVDO RTAP 153.6 kbps	23.80	23.98	23.76	23.74	23.63	23.75
1xEVDO RETAP 4096 bits	23.76	23.96	23.74	23.73	23.62	23.70

<WLAN 2.4GHz Conducted Power>

Mode	Channel	Frequency (MHz)	Burst Average power (dBm)			
			Data Rate			
			1Mbps	2 Mbps	5.5 Mbps	11 Mbps
802.11b	CH 01	2412 MHz	15.21	15.15	15.18	15.20
	CH 06	2437 MHz	**16.43**	16.34	16.18	16.25
	CH 11	2462 MHz	16.31	16.29	16.27	16.27
	CH 12	2467 MHz	9.34	9.31	9.17	9.26
	CH 13	2472 MHz	6.99	6.87	6.90	6.80

Mode	Channel	Frequency (MHz)	Burst Average power (dBm)							
			Data Rate							
			6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
802.11g	CH 01	2412 MHz	14.69	14.67	14.64	14.66	14.15	14.24	14.09	14.06
	CH 06	2437 MHz	**16.43**	16.36	16.09	16.34	14.80	14.50	13.58	13.66
	CH 11	2462 MHz	14.12	14.02	13.99	14.02	13.96	13.94	14.04	13.86
	CH 12	2467 MHz	8.31	8.22	8.20	8.18	8.08	8.04	8.16	8.10
	CH 13	2472 MHz	1.90	1.86	1.83	1.88	1.79	1.82	1.87	1.86

Mode	Channel	Frequency (MHz)	Burst Average power (dBm)							
			MCS Index							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n HT20	CH 01	2412 MHz	14.86	14.69	14.67	14.31	14.23	13.73	13.73	13.00
	CH 06	2437 MHz	**16.28**	16.15	16.22	14.86	15.00	13.76	13.68	13.86
	CH 11	2462 MHz	13.00	12.94	12.99	12.78	12.90	12.93	12.91	12.82
	CH 12	2467 MHz	8.26	8.23	8.21	7.97	8.10	8.01	8.20	8.19
	CH 13	2472 MHz	1.59	1.58	1.56	1.56	1.52	1.58	1.41	1.39

Note:

1. Per KDB 248227 D01 v01r02, choose the highest output power channel to test SAR and determine further SAR exclusion
2. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4dB higher than those measured at the lowest data rate
3. Per KDB 248227 D01 v01r02, 11g and 11n-HT20 output power is less than 1/4dB higher than 11b mode, thus the SAR can be excluded.

<Bluetooth Conducted Power>

Mode	Channel	Frequency (MHz)	Burst average power (dBm)								
			GFSK / 1Mbps			π/4-DQPSK / 2Mbps			8-DPSK / 3Mbps		
			DH1	DH3	DH5	2DH1	2DH3	2DH5	3DH1	3DH3	3DH5
Bluetooth	CH 0	2402	2.14	2.13	2.14	1.19	1.49	1.52	1.17	1.47	1.50
	CH 39	2441	2.42	2.40	2.42	1.38	1.69	1.73	1.40	1.67	1.73
	CH 78	2480	2.33	2.41	**2.46**	1.42	1.72	**1.74**	1.41	1.70	**1.75**

Mode	Channel	Frequency (MHz)	Source-based time-average power (dBm)								
			GFSK / 1Mbps			π/4-DQPSK / 2Mbps			8-DPSK / 3Mbps		
			DH1	DH3	DH5	2DH1	2DH3	2DH5	3DH1	3DH3	3DH5
Bluetooth	CH 0	2402	-2.77	0.41	1.08	-3.34	-0.19	0.50	-3.36	-0.19	0.49
	CH 39	2441	-2.49	0.68	1.36	-3.15	0.01	0.71	-3.13	0.01	0.72
	CH 78	2480	-2.58	0.69	**1.40**	-3.11	0.04	**0.72**	-3.12	0.04	**0.74**

Note:

1. The data above is the average power level during the "ON" burst of Bluetooth transmitter
2. The duty factor of DH1/DH3/DH5 is applied to determine source-based time-average power, and time-average power = burst average power / duty factor
3. Duty factor of DH1/DH3/DH5 is 32.28% / 67.33% / 78.29% individually

<WLAN 5GHz Conducted Power>

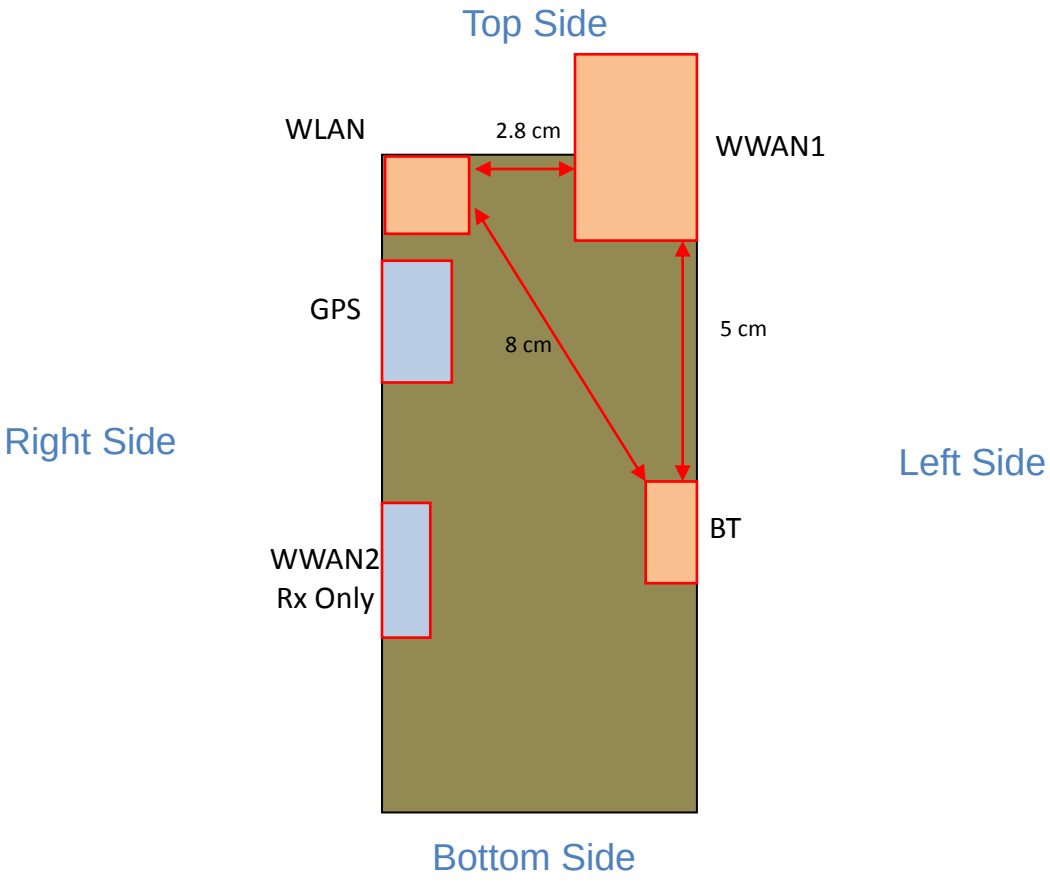
Mode	Channel	Frequency (MHz)	Burst Average Power (dBm)							
			Data Rate							
			6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
802.11a	CH 36	5180	**12.08**	11.99	12.06	12.03	11.93	11.96	11.97	11.91
	CH 40	5200	11.17	11.14	11.08	11.12	11.06	11.04	11.05	11.04
	CH 44	5220	11.91	11.90	11.89	11.90	11.89	11.88	11.84	11.88
	CH 48	5240	11.97	11.92	11.94	11.92	11.87	11.96	11.96	11.90
	CH 52	5260	**13.41**	13.38	13.36	13.34	13.38	13.33	13.01	13.08
	CH 56	5280	12.67	12.62	12.65	12.64	12.60	12.58	12.56	12.54
	CH 60	5300	13.32	13.21	13.22	13.16	13.08	13.15	12.78	12.60
	CH 64	5320	13.27	13.18	13.24	13.10	13.14	13.13	12.63	12.58
	CH 100	5500	13.00	12.97	12.97	12.87	12.95	12.90	12.43	12.27
	CH 104	5520	12.88	12.84	12.85	12.81	12.76	12.74	12.75	12.72
	CH 108	5540	12.69	12.66	12.64	12.63	12.65	12.61	12.58	12.54
	CH 112	5560	12.79	12.76	12.74	12.73	12.71	12.72	12.68	12.65
	CH 116	5580	12.64	12.51	12.51	12.44	12.57	12.50	12.10	11.97
	CH 132	5660	12.78	12.75	12.73	12.71	12.68	12.70	12.64	12.63
	CH 136	5680	12.90	12.88	12.85	12.84	12.82	12.81	12.79	12.74
	CH 140	5700	**13.20**	13.09	13.06	12.98	13.00	13.05	11.69	11.64
	CH 149	5745	14.59	14.58	14.58	14.46	13.94	13.95	11.74	11.71
	CH 153	5765	14.72	12.71	12.67	12.64	12.62	12.63	12.62	12.61
	CH 157	5785	14.64	14.63	14.63	14.57	13.59	13.62	12.35	12.29
	CH 161	5805	**14.92**	14.87	12.89	12.85	12.84	12.82	12.77	12.75
	CH 165	5825	14.68	14.66	14.67	14.67	13.92	13.95	12.15	12.08

Mode	Channel	Frequency (MHz)	Burst Average Power (dBm)							
			MCS Index							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11an HT20	CH 36	5180	11.22	11.18	11.16	11.21	11.15	11.17	11.21	11.21
	CH 40	5200	11.42	11.41	12.38	12.35	12.37	12.34	12.31	12.28
	CH 44	5220	**11.72**	11.70	11.67	11.68	11.70	11.69	11.70	10.94
	CH 48	5240	11.71	11.69	11.65	11.65	11.64	11.70	11.65	10.96
	CH 52	5260	**13.58**	13.57	13.56	13.54	13.57	13.04	13.08	11.81
	CH 56	5280	12.89	12.84	12.82	12.86	12.83	12.81	12.76	12.77
	CH 60	5300	12.81	12.76	12.78	12.77	12.77	12.18	12.14	11.96
	CH 64	5320	12.92	12.81	12.63	12.65	12.79	12.52	12.50	11.73
	CH 100	5500	12.92	12.70	12.67	12.78	12.68	12.51	12.51	11.75
	CH 104	5520	12.29	12.22	12.26	12.25	12.24	12.21	12.19	12.20
	CH 108	5540	12.21	12.19	12.20	12.17	12.15	12.15	12.14	12.12
	CH 112	5560	12.12	12.10	12.08	12.11	12.09	12.06	12.05	12.07
	CH 116	5580	**13.15**	13.04	13.01	13.09	13.13	12.06	12.15	10.39
	CH 132	5660	10.92	10.89	10.90	10.86	10.84	10.85	10.83	10.82
	CH 136	5680	10.48	10.46	10.45	10.44	10.43	10.45	10.41	10.39
	CH 140	5700	11.21	11.16	11.08	11.19	11.20	11.01	10.91	10.16
	CH 149	5745	15.29	15.22	15.16	15.21	15.24	15.21	15.20	15.30
	CH 153	5765	14.5	14.46	14.43	14.42	14.41	14.39	14.40	14.41
	CH 157	5785	15.31	15.27	15.24	15.26	15.27	15.30	15.24	15.27
	CH 161	5805	14.82	14.81	14.79	14.77	14.75	14.76	14.75	14.74
	CH 165	5825	**15.44**	15.34	15.14	15.33	15.29	15.21	15.21	15.33

Note:

1. Per KDB 248227 D01 v01r02, choose the highest output power channel to test SAR and determine further SAR exclusion
2. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4dB higher than those measured at the lowest data rate.
3. Per KDB 248227 D01 v01r02, 11n-HT20 (Freq: 5180MHz ~ 5700MHz) output power is less than 1/4dB higher than 802.11a mode, thus the SAR can be excluded.
4. Per KDB 248227 D01 v01r02, 11n-HT20 (Freq: 5745MHz ~ 5825MHz) average output power is higher than 1/4dB higher than 11a mode, these modes SAR will be verified at the highest RF exposure position found in 802.11a SAR testing.

11. Exposure Positions Consideration



Back View

Antennas	Technology
WWAN1 (Tx/Rx)	GSM/GPRS/EDGE, Band 850/1900 WCDMA/HSPA, Band 850/1900 CDMA 2000, Band 850/1900
WWAN2 (Rx only)	GSM/GPRS/EDGE, Band 850/1900 WCDMA/HSPA, Band 850/1900 CDMA 2000, Band 850/1900
WLAN (Tx/Rx)	WLAN 2.4GHz/5GHz
BT (Tx/Rx)	Bluetooth
GPS (Rx only)	GPS receiving only

Note:

1. If the test separation distance (antenna-user) is < 5mm, 5mm is used for excluded SAR calculation.
2. For minimum test separation distance ≤50mm, Bluetooth standalone SAR test exclusion power threshold is determined by:[(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR. The formula sets the maximum RF power threshold, and the transmitter with RF power equal or less than the power threshold, SAR testing is not required

Exposure Position	Wireless Interface	**Bluetooth**
	Source-based time-average power (dBm)	1.4
	Maximum rated power (mW)	1.38
Head	Antenna to user (mm)	5
	SAR exclusion threshold (mW)	10
	SAR testing required?	NO
Body 0 cm(Body Worn) with Holster	Antenna to user (mm)	5
	SAR exclusion threshold (mW)	10
	SAR testing required?	NO
Body 1.5 cm(Body Worn)	Antenna to user (mm)	15
	SAR exclusion threshold (mW)	29
	SAR testing required?	NO

12. SAR Test Results

Note:

1. Per KDB 447498 D01v05, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   Scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   Reported SAR(W/kg)= Measured SAR(W/kg) Scaling Factor*
2. Per KDB 447498 D01v05, for each exposure position, if the highest output channel reported SAR ≤0.8W/kg, other channels SAR testing is not necessary.
3. Additional Bluetooth SAR testing was performed for simultaneous transmission analysis.
4. MC67ND HW/SW design is the same as FCC ID UZ7MC67NA granted on 2012/07/25, except the WWAN module replacement (PH8-P module in MC67NA, and PXS8 module in MC67ND). Due to the similarity, MC67NA SAR performance is representative and part of test data of MC67NA (Sporton SAR Report of FCC ID: UZ7MC67NA, Report No: FA221518-01 Rev.02, Date of available on FCC website: 2012/07/25) is referenced in this report. MC67NA test data is annotated as sample 1, and MC67ND is annotated as sample 2.
5. Per KDB 447498 D01v05, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

Definition of each configuration code.

Keypad	Camera	Holster
(1) Qwerty (2) Numeric (3) PIM	(1) With camera (2) Without camera	(2) Soft (3) Rigid

Note:

1. This device supports the option and combination of accessory listed as above.
2. The Rigid holster supports display-inward only, therefore only position Front available.

12.1 Test Records for Head SAR Test

<GSM SAR>

Plot No.	Band	Mode	Test Position	Keypad	Camera	Sample	Ch.	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)
1	GSM850	GSM Voice	Right Cheek	Keypad1	Camera1	Sample1	251	33.23	33.5	1.064	0.116	1.08	1.149
2	GSM850	GSM Voice	Right Tilted	Keypad1	Camera1	Sample1	251	33.23	33.5	1.064	-0.019	1.07	1.139
3	GSM850	GSM Voice	Left Cheek	Keypad1	Camera1	Sample1	251	33.23	33.5	1.064	-0.044	0.943	1.003
4	GSM850	GSM Voice	Left Tilted	Keypad1	Camera1	Sample1	251	33.23	33.5	1.064	0.117	0.978	1.041
27	GSM850	GSM Voice	Right Tilted	Keypad2	Camera1	Sample1	251	33.23	33.5	1.064	0.124	0.905	0.963
28	GSM850	GSM Voice	Right Tilted	Keypad3	Camera1	Sample1	251	33.23	33.5	1.064	0.021	0.905	0.963
600	**GSM850**	**GSM Voice**	**Right Tilted**	**Keypad1**	**Camera2**	**Sample2**	**251**	**33.01**	**33.5**	**1.119**	**-0.159**	**1.07**	**1.198**
601	GSM850	GSM Voice	Right Tilted	Keypad1	Camera2	Sample2	128	32.98	33.5	1.127	0.03	0.955	1.076
602	GSM850	GSM Voice	Right Tilted	Keypad1	Camera2	Sample2	189	32.89	33.5	1.151	0.04	0.981	1.129
9	GSM1900	GSM Voice	Right Cheek	Keypad1	Camera1	Sample1	512	29.6	30.5	1.230	-0.022	0.343	0.422
10	GSM1900	GSM Voice	Right Tilted	Keypad1	Camera1	Sample1	512	29.6	30.5	1.230	0.006	0.413	0.508
11	GSM1900	GSM Voice	Left Cheek	Keypad1	Camera1	Sample1	512	29.6	30.5	1.230	-0.013	0.211	0.260
12	GSM1900	GSM Voice	Left Tilted	Keypad1	Camera1	Sample1	512	29.6	30.5	1.230	-0.026	0.244	0.300
25	GSM1900	GSM Voice	Right Tilted	Keypad2	Camera1	Sample1	512	29.6	30.5	1.230	-0.193	0.423	0.520
26	GSM1900	GSM Voice	Right Tilted	Keypad3	Camera1	Sample1	512	29.6	30.5	1.230	0.044	0.431	0.530
604	**GSM1900**	**GSM Voice**	**Right Tilted**	**Keypad1**	**Camera2**	**Sample2**	**512**	**30.07**	**30.5**	**1.104**	**-0.122**	**0.511**	**0.564**
79	GSM1900	GSM Voice	Right Tilted	Keypad1	Camera2	Sample1	661	29.57	30.5	1.239	0.169	0.393	0.487
80	GSM1900	GSM Voice	Right Tilted	Keypad1	Camera2	Sample1	810	29.6	30.5	1.230	0.019	0.429	0.528

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Keypad	Camera	Sample	Ch.	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)
5	WCDMA V	RMC 12.2Kbps	Right Cheek	Keypad1	Camera1	Sample1	4182	23.86	24.5	1.159	-0.101	1.04	1.205
6	WCDMA V	RMC 12.2Kbps	Right Tilted	Keypad1	Camera1	Sample1	4182	23.86	24.5	1.159	0.009	1.12	1.298
7	WCDMA V	RMC 12.2Kbps	Left Cheek	Keypad1	Camera1	Sample1	4182	23.86	24.5	1.159	-0.023	0.946	1.096
8	WCDMA V	RMC 12.2Kbps	Left Tilted	Keypad1	Camera1	Sample1	4182	23.86	24.5	1.159	-0.069	0.85	0.985
29	WCDMA V	RMC 12.2Kbps	Right Tilted	Keypad2	Camera1	Sample1	4182	23.86	24.5	1.159	-0.122	0.982	1.138
30	WCDMA V	RMC 12.2Kbps	Right Tilted	Keypad3	Camera1	Sample1	4182	23.86	24.5	1.159	-0.081	0.963	1.116
605	**WCDMA V**	**RMC 12.2Kbps**	**Right Tilted**	**Keypad1**	**Camera2**	**Sample2**	**4233**	**23.56**	**24.5**	**1.242**	**-0.15**	**1.05**	**1.304**
606	WCDMA V	RMC 12.2Kbps	Right Tilted	Keypad1	Camera2	Sample2	4182	23.84	24.5	1.164	-0.04	1.05	1.222
607	WCDMA V	RMC 12.2Kbps	Right Tilted	Keypad1	Camera2	Sample2	4132	23.7	24.5	1.202	-0.02	1.04	1.250
19	WCDMA II	RMC 12.2Kbps	Right Cheek	Keypad1	Camera1	Sample1	9400	24.46	24.5	1.009	-0.002	0.93	0.939
20	WCDMA II	RMC 12.2Kbps	Right Tilted	Keypad1	Camera1	Sample1	9400	24.46	24.5	1.009	-0.011	1.19	1.201
21	WCDMA II	RMC 12.2Kbps	Left Cheek	Keypad1	Camera1	Sample1	9400	24.46	24.5	1.009	-0.061	0.642	0.648
22	WCDMA II	RMC 12.2Kbps	Left Tilted	Keypad1	Camera1	Sample1	9400	24.46	24.5	1.009	-0.015	0.718	0.725
23	WCDMA II	RMC 12.2Kbps	Right Tilted	Keypad2	Camera1	Sample1	9400	24.46	24.5	1.009	0.087	1.18	1.191
24	WCDMA II	RMC 12.2Kbps	Right Tilted	Keypad3	Camera1	Sample1	9400	24.46	24.5	1.009	-0.021	1.14	1.151
609	**WCDMA II**	**RMC 12.2Kbps**	**Right Tilted**	**Keypad1**	**Camera2**	**Sample2**	**9538**	**23.56**	**24.5**	**1.242**	**-0.11**	**1.04**	**1.291**
610	WCDMA II	RMC 12.2Kbps	Right Tilted	Keypad1	Camera2	Sample2	9262	23.5	24.5	1.259	-0.03	0.944	1.188
611	WCDMA II	RMC 12.2Kbps	Right Tilted	Keypad1	Camera2	Sample2	9400	23.3	24.5	1.318	-0.04	0.948	1.250

<CDMA SAR>

Plot No.	Band	Mode	Test Position	Keypad	Camera	Sample	Ch.	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)
613	CDMA BC0	1xRTT RC3 SO55	Right Cheek	Keypad1	Camera2	Sample2	384	23.96	24.5	1.132	-0.01	1.11	1.257
615	CDMA BC0	1xRTT RC3 SO55	Right Cheek	Keypad1	Camera2	Sample2	1013	23.75	24.5	1.189	-0.03	1.07	1.272
616	CDMA BC0	1xRTT RC3 SO55	Right Cheek	Keypad1	Camera2	Sample2	777	23.6	24.5	1.230	-0.03	1.02	1.255
617	CDMA BC0	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	Sample2	384	23.96	24.5	1.132	-0.06	1.03	1.166
618	**CDMA BC0**	**1xRTT RC3 SO55**	**Right Tilted**	**Keypad1**	**Camera2**	**Sample2**	**1013**	**23.75**	**24.5**	**1.189**	**-0.05**	**1.08**	**1.284**
619	CDMA BC0	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	Sample2	777	23.6	24.5	1.230	-0.02	0.976	1.201
620	CDMA BC0	1xRTT RC3 SO55	Left Cheek	Keypad1	Camera2	Sample2	384	23.96	24.5	1.132	0.01	1.01	1.144
621	CDMA BC0	1xRTT RC3 SO55	Left Cheek	Keypad1	Camera2	Sample2	1013	23.75	24.5	1.189	0.04	0.966	1.148
622	CDMA BC0	1xRTT RC3 SO55	Left Cheek	Keypad1	Camera2	Sample2	777	23.6	24.5	1.230	0	0.899	1.106
623	CDMA BC0	1xRTT RC3 SO55	Left Tilted	Keypad1	Camera2	Sample2	384	23.96	24.5	1.132	-0.02	0.91	1.030
624	CDMA BC0	1xRTT RC3 SO55	Left Tilted	Keypad1	Camera2	Sample2	1013	23.75	24.5	1.189	0.01	0.889	1.057
625	CDMA BC0	1xRTT RC3 SO55	Left Tilted	Keypad1	Camera2	Sample2	777	23.6	24.5	1.230	0	0.825	1.015
626	CDMA BC1	1xRTT RC3 SO55	Right Cheek	Keypad1	Camera2	Sample2	1175	23.61	24.5	1.227	0.05	0.841	1.032
627	CDMA BC1	1xRTT RC3 SO55	Right Cheek	Keypad1	Camera2	Sample2	25	23.67	24.5	1.211	-0.12	0.81	0.981
628	CDMA BC1	1xRTT RC3 SO55	Right Cheek	Keypad1	Camera2	Sample2	600	23.5	24.5	1.259	-0.05	0.875	1.102
629	CDMA BC1	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	Sample2	1175	23.61	24.5	1.227	-0.02	1.11	1.362
630	CDMA BC1	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	Sample2	25	23.67	24.5	1.211	0.04	1.07	1.295
631	**CDMA BC1**	**1xRTT RC3 SO55**	**Right Tilted**	**Keypad1**	**Camera2**	**Sample2**	**600**	**23.5**	**24.5**	**1.259**	**-0.14**	**1.11**	**1.397**
633	CDMA BC1	1xRTT RC3 SO55	Left Cheek	Keypad1	Camera2	Sample2	1175	23.61	24.5	1.227	-0.03	0.62	0.761
634	CDMA BC1	1xRTT RC3 SO55	Left Tilted	Keypad1	Camera2	Sample2	1175	23.61	24.5	1.227	0.15	0.738	0.906
635	CDMA BC1	1xRTT RC3 SO55	Left Tilted	Keypad1	Camera2	Sample2	25	23.67	24.5	1.211	-0.01	0.647	0.783
636	CDMA BC1	1xRTT RC3 SO55	Left Tilted	Keypad1	Camera2	Sample2	600	23.5	24.5	1.259	0.05	0.705	0.888

<WLAN SAR DTS>

Plot No.	Band	Mode	Test Position	Keypad	Camera	Sample	Ch.	Data Rate (bps)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)
637	WLAN2.4GHz	802.11b	Right Cheek	Keypad1	Camera2	Sample2	1	1Mbps	15.21	15.21	1.000	-0.05	0.117	0.117
638	WLAN2.4GHz	802.11b	Right Tilted	Keypad1	Camera2	Sample2	1	1Mbps	15.21	15.21	1.000	-0.04	0.133	0.133
639	WLAN2.4GHz	802.11b	Left Check	Keypad1	Camera2	Sample2	1	1Mbps	15.21	15.21	1.000	0.02	0.152	0.152
640	**WLAN2.4GHz**	**802.11b**	**Left Tilted**	**Keypad1**	**Camera2**	**Sample2**	**1**	**1Mbps**	**15.21**	**15.21**	**1.000**	**0.03**	**0.167**	**0.167**
653	WLAN5GHz	802.11a	Right Check	Keypad1	Camera2	Sample2	161	6Mbps	14.92	14.92	1.000	-0.03	0.254	0.254
654	**WLAN5GHz**	**802.11a**	**Right Tilted**	**Keypad1**	**Camera2**	**Sample2**	**161**	**6Mbps**	**14.92**	**14.92**	**1.000**	**-0.04**	**0.394**	**0.394**
800	WLAN5GHz	802.11n-HT20	Right Tilted	Keypad1	Camera2	Sample2	165	6Mbps	15.44	15.44	1.000	0.11	0.387	0.387
655	WLAN5GHz	802.11a	Left Check	Keypad1	Camera2	Sample2	161	6Mbps	14.92	14.92	1.000	-0.01	0.204	0.204
656	WLAN5GHz	802.11a	Left Tilted	Keypad1	Camera2	Sample2	161	6Mbps	14.92	14.92	1.000	-0.07	0.219	0.219

<Bluetooth SAR - DSS>

Plot No.	Band	Mode	Test Position	Keypad	Camera	Sample	Ch.	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)
657	**Bluetooth**	**DH5**	**Right Cheek**	**Keypad1**	**Camera2**	**Sample2**	**78**	**2.46**	**2.46**	**1.000**	**0.163**	**0.00289**	**0.003**
658	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	Sample2	78	2.46	2.46	1.000	0.148	0.0000658	0.00007
659	Bluetooth	DH5	Left Cheek	Keypad1	Camera2	Sample2	78	2.46	2.46	1.000	-0.108	0.002	0.002
660	Bluetooth	DH5	Left Tilted	Keypad1	Camera2	Sample2	78	2.46	2.46	1.000	0.19	0.000659	0.001

<WLAN SAR NII>

Plot No.	Band	Mode	Test Position	Keypad	Camera	Sample	Ch.	Data Rate	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)
641	WLAN5GHz	802.11a	Right Cheek	Keypad1	Camera2	Sample2	44	6Mbps	11.91	11.91	1.000	-0.09	0.171	0.171
642	**WLAN5GHz**	**802.11a**	**Right Tilted**	**Keypad1**	**Camera2**	**Sample2**	**44**	**6Mbp**	**11.91**	**11.91**	**1.000**	**-0.04**	**0.29**	**0.29**
643	WLAN5GHz	802.11a	Left Check	Keypad1	Camera2	Sample2	44	6Mbp	11.91	11.91	1.000	0.05	0.134	0.134
644	WLAN5GHz	802.11a	Left Tilted	Keypad1	Camera2	Sample2	44	6Mbp	11.91	11.91	1.000	-0.03	0.193	0.193
645	WLAN5GHz	802.11a	Right Check	Keypad1	Camera2	Sample2	52	6Mbp	13.41	13.41	1.000	0.07	0.184	0.184
646	**WLAN5GHz**	**802.11a**	**Right Tilted**	**Keypad1**	**Camera2**	**Sample2**	**52**	**6Mbp**	**13.41**	**13.41**	**1.000**	**0.02**	**0.276**	**0.276**
647	WLAN5GHz	802.11a	Left Check	Keypad1	Camera2	Sample2	52	6Mbp	13.41	13.41	1.000	-0.02	0.162	0.162
648	WLAN5GHz	802.11a	Left Tilted	Keypad1	Camera2	Sample2	52	6Mbp	13.41	13.41	1.000	-0.03	0.22	0.220
649	WLAN5GHz	802.11a	Right Check	Keypad1	Camera2	Sample2	116	6Mbp	12.64	12.64	1.000	0.04	0.283	0.283
650	**WLAN5GHz**	**802.11a**	**Right Tilted**	**Keypad1**	**Camera2**	**Sample2**	**116**	**6Mbp**	**12.64**	**12.64**	**1.000**	**0.03**	**0.289**	**0.289**
651	WLAN5GHz	802.11a	Left Check	Keypad1	Camera2	Sample2	116	6Mbp	12.64	12.64	1.000	0.06	0.154	0.154
652	WLAN5GHz	802.11a	Left Tilted	Keypad1	Camera2	Sample2	116	6Mbp	12.64	12.64	1.000	-0.01	0.175	0.175

12.2 Test Records for Body-worn SAR Test

<GSM SAR>

Plot No.	Band	Mode	Test Position	Keypad	Camera	Holster	Sample	Ch.	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)
13	GSM850	GPRS (4 Tx slots)	Front	Keypad1	Camera1		Sample1	251	32.82	33.5	1.169	0.108	1.03	1.205
14	GSM850	GPRS (4 Tx slots)	Back	Keypad1	Camera1		Sample1	251	32.82	33.5	1.169	-0.024	0.721	0.843
33	GSM850	GPRS (4 Tx slots)	Front	Keypad2	Camera1		Sample1	251	32.82	33.5	1.169	0.098	1.02	1.193
34	GSM850	GPRS (4 Tx slots)	Front	Keypad3	Camera1		Sample1	251	32.82	33.5	1.169	-0.125	0.98	1.146
661	GSM850	GPRS (4 Tx slots)	Front	Keypad1	Camera2		Sample2	189	32.49	33.5	1.262	-0.05	0.912	1.151
662	GSM850	GPRS (4 Tx slots)	Front	Keypad1	Camera2		Sample2	128	32.59	33.5	1.233	-0.03	0.878	1.083
663	**GSM850**	**GPRS (4 Tx slots)**	**Front**	**Keypad1**	**Camera2**		**Sample2**	**251**	**32.63**	**33.5**	**1.222**	**0.182**	**1.06**	**1.295**
64	GSM850	GPRS (4 Tx slots)	Front	Keypad1	Camera2	Holster2	Sample1	251	32.82	33.5	1.169	0.049	1.03	1.205
65	GSM850	GPRS (4 Tx slots)	Front	Keypad1	Camera2	Holster2	Sample1	128	32.74	33.5	1.191	-0.016	0.888	1.058
66	GSM850	GPRS (4 Tx slots)	Front	Keypad1	Camera2	Holster2	Sample1	189	32.71	33.5	1.199	0.142	0.874	1.048
67	GSM850	GPRS (4 Tx slots)	Front	Keypad1	Camera2	Holster3	Sample1	251	32.82	33.5	1.169	-0.061	0.706	0.826
68	GSM850	GPRS (4 Tx slots)	Front	Keypad1	Camera2	Holster3	Sample1	128	32.74	33.5	1.191	0.044	0.637	0.759
69	GSM850	GPRS (4 Tx slots)	Front	Keypad1	Camera2	Holster3	Sample1	189	32.71	33.5	1.199	-0.03	0.702	0.842
17	GSM1900	GPRS (4 Tx slots)	Front	Keypad1	Camera1		Sample1	512	29.11	30.5	1.377	0.199	0.279	0.384
18	GSM1900	GPRS (4 Tx slots)	Back	Keypad1	Camera1		Sample1	512	29.11	30.5	1.377	-0.113	0.268	0.369
35	GSM1900	GPRS (4 Tx slots)	Front	Keypad2	Camera1		Sample1	512	29.11	30.5	1.377	0.184	0.28	0.386
36	**GSM1900**	**GPRS (4 Tx slots)**	**Front**	**Keypad3**	**Camera1**		**Sample1**	**512**	**29.11**	**30.5**	**1.377**	**0.11**	**0.283**	**0.390**
665	GSM1900	GPRS (4 Tx slots)	Front	Keypad1	Camera2		Sample2	512	29.43	30.5	1.279	0	0.175	0.224
38	GSM1900	GPRS (4 Tx slots)	Front	Keypad1	Camera2		Sample1	661	29.03	30.5	1.403	-0.143	0.265	0.372
39	GSM1900	GPRS (4 Tx slots)	Front	Keypad1	Camera2		Sample1	810	29.05	30.5	1.396	-0.099	0.214	0.299
40	GSM1900	GPRS (4 Tx slots)	Front	Keypad1	Camera2	Holster2	Sample1	512	29.11	30.5	1.377	-0.174	0.218	0.300
41	GSM1900	GPRS (4 Tx slots)	Front	Keypad1	Camera2	Holster2	Sample1	661	29.03	30.5	1.403	-0.074	0.228	0.320
42	GSM1900	GPRS (4 Tx slots)	Front	Keypad1	Camera2	Holster2	Sample1	810	29.05	30.5	1.396	-0.052	0.185	0.258
43	GSM1900	GPRS (4 Tx slots)	Front	Keypad1	Camera2	Holster3	Sample1	512	29.11	30.5	1.377	-0.147	0.225	0.310
44	GSM1900	GPRS (4 Tx slots)	Front	Keypad1	Camera2	Holster3	Sample1	661	29.03	30.5	1.403	-0.023	0.211	0.296
45	GSM1900	GPRS (4 Tx slots)	Front	Keypad1	Camera2	Holster3	Sample1	810	29.05	30.5	1.396	0.006	0.178	0.249

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Keypad	Camera	Holster	Sample	Ch.	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)
15	WCDMA V	RMC 12.2Kbps	Front	Keypad1	Camera1		Sample1	4182	23.86	24.5	1.159	-0.141	0.309	0.358
16	WCDMA V	RMC 12.2Kbps	Back	Keypad1	Camera1		Sample1	4182	23.86	24.5	1.159	-0.005	0.268	0.311
31	WCDMA V	RMC 12.2Kbps	Front	Keypad2	Camera1		Sample1	4182	23.86	24.5	1.159	-0.072	0.326	0.378
32	WCDMA V	RMC 12.2Kbps	Front	Keypad3	Camera1		Sample1	4182	23.86	24.5	1.159	-0.172	0.318	0.368
52	WCDMA V	RMC 12.2Kbps	Front	Keypad1	Camera2		Sample1	4182	23.86	24.5	1.159	-0.075	0.335	0.388
53	WCDMA V	RMC 12.2Kbps	Front	Keypad1	Camera2		Sample1	4132	23.81	24.5	1.172	0.071	0.308	0.361
666	**WCDMA V**	**RMC 12.2Kbps**	**Front**	**Keypad1**	**Camera2**		**Sample2**	**4233**	**23.56**	**24.5**	**1.242**	**-0.01**	**0.314**	**0.390**
55	WCDMA V	RMC 12.2Kbps	Front	Keypad1	Camera2	Holster2	Sample1	4182	23.86	24.5	1.159	-0.078	0.296	0.343
56	WCDMA V	RMC 12.2Kbps	Front	Keypad1	Camera2	Holster2	Sample1	4132	23.81	24.5	1.172	-0.137	0.258	0.302
57	WCDMA V	RMC 12.2Kbps	Front	Keypad1	Camera2	Holster2	Sample1	4233	23.58	24.5	1.236	-0.05	0.278	0.344
58	WCDMA V	RMC 12.2Kbps	Front	Keypad1	Camera2	Holster3	Sample1	4182	23.86	24.5	1.159	-0.074	0.239	0.277
59	WCDMA V	RMC 12.2Kbps	Front	Keypad1	Camera2	Holster3	Sample1	4132	23.81	24.5	1.172	0.034	0.218	0.256
60	WCDMA V	RMC 12.2Kbps	Front	Keypad1	Camera2	Holster3	Sample1	4233	23.58	24.5	1.236	-0.024	0.226	0.279
70	WCDMA II	RMC 12.2Kbps	Front	Keypad1	Camera1		Sample1	9400	24.46	24.5	1.009	-0.069	0.195	0.197
71	WCDMA II	RMC 12.2Kbps	Back	Keypad1	Camera1		Sample1	9400	24.46	24.5	1.009	0.043	0.194	0.196
72	WCDMA II	RMC 12.2Kbps	Front	Keypad2	Camera1		Sample1	9400	24.46	24.5	1.009	-0.06	0.191	0.193
73	WCDMA II	RMC 12.2Kbps	Front	Keypad3	Camera1		Sample1	9400	24.46	24.5	1.009	-0.084	0.195	0.197
74	WCDMA II	RMC 12.2Kbps	Front	Keypad1	Camera2		Sample1	9400	24.46	24.5	1.009	0.125	0.205	0.207
83	WCDMA II	RMC 12.2Kbps	Front	Keypad1	Camera2		Sample1	9262	24.43	24.5	1.016	0.077	0.189	0.192
667	**WCDMA II**	**RMC 12.2Kbps**	**Front**	**Keypad1**	**Camera2**		**Sample2**	**9538**	**23.56**	**24.5**	**1.242**	**0.13**	**0.169**	**0.210**
75	WCDMA II	RMC 12.2Kbps	Front	Keypad1	Camera2	Holster2	Sample1	9400	24.46	24.5	1.009	-0.175	0.183	0.185
85	WCDMA II	RMC 12.2Kbps	Front	Keypad1	Camera2	Holster2	Sample1	9262	24.43	24.5	1.016	-0.082	0.145	0.147
86	WCDMA II	RMC 12.2Kbps	Front	Keypad1	Camera2	Holster2	Sample1	9538	24.44	24.5	1.014	-0.014	0.173	0.175
76	WCDMA II	RMC 12.2Kbps	Front	Keypad1	Camera2	Holster3	Sample1	9400	24.46	24.5	1.009	0.103	0.184	0.186
87	WCDMA II	RMC 12.2Kbps	Front	Keypad1	Camera2	Holster3	Sample1	9262	24.43	24.5	1.016	0.112	0.195	0.198
88	WCDMA II	RMC 12.2Kbps	Front	Keypad1	Camera2	Holster3	Sample1	9538	24.44	24.5	1.014	-0.011	0.186	0.189

<CDMA SAR>

Plot No.	Band	Mode	Test Position	Keypad	Camera	Holster	Sample	Ch.	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)
668	**CDMA BC0**	**1xRTT RC3 SO32**	**Front**	**Keypad1**	**Camera2**		**Sample2**	**384**	**23.93**	**24.5**	**1.140**	**-0.02**	**0.387**	**0.441**
669	CDMA BC0	1xRTT RC3 SO32	Back	Keypad1	Camera2		Sample2	384	23.93	24.5	1.140	0.03	0.291	0.332
670	CDMA BC0	1xRTT RC3 SO32	Front	Keypad1	Camera2	Holster2	Sample2	384	23.93	24.5	1.140	0.08	0.373	0.425
671	CDMA BC0	1xRTT RC3 SO32	Front	Keypad1	Camera2	Holster3	Sample2	384	23.93	24.5	1.140	0.07	0.25	0.285
672	CDMA BC1	1xRTT RC3 SO32	Front	Keypad1	Camera2		Sample2	1175	23.6	24.5	1.230	0.02	0.176	0.217
673	**CDMA BC1**	**1xRTT RC3 SO32**	**Back**	**Keypad1**	**Camera2**		**Sample2**	**1175**	**23.6**	**24.5**	**1.230**	**-0.12**	**0.204**	**0.251**
674	CDMA BC1	1xRTT RC3 SO32	Front	Keypad1	Camera2	Holster2	Sample2	1175	23.6	24.5	1.230	0.03	0.106	0.130
675	CDMA BC1	1xRTT RC3 SO32	Front	Keypad1	Camera2	Holster3	Sample2	1175	23.6	24.5	1.230	-0.01	0.158	0.194

<WLAN SAR - DTS>

Plot No.	Band	Mode	Test Position	Keypad	Camera	Holster	Sample	Ch.	Data Rate (bps)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)
144	WLAN2.4GHz	802.11b	Front	Keypad1	Camera1		Sample1	11	1Mbps	16.03	16.03	1.000	0.111	0.062	0.062
145	WLAN2.4GHz	802.11b	Back	Keypad1	Camera1		Sample1	11	1Mbps	16.03	16.03	1.000	0.119	0.044	0.044
146	WLAN2.4GHz	802.11b	Front	Keypad2	Camera1		Sample1	11	1Mbps	16.03	16.03	1.000	-0.175	0.059	0.059
147	WLAN2.4GHz	802.11b	Front	Keypad3	Camera1		Sample1	11	1Mbps	16.03	16.03	1.000	-0.098	0.058	0.058
148	WLAN2.4GHz	802.11b	Front	Keypad1	Camera2		Sample1	11	1Mbps	16.03	16.03	1.000	-0.114	0.066	0.066
676	WLAN2.4GHz	802.11b	Front	Keypad1	Camera2		Sample2	1	1Mbps	15.21	15.21	1.000	-0.01	0.033	0.033
150	WLAN2.4GHz	802.11b	Front	Keypad1	Camera2		Sample1	6	1Mbps	16.01	16.01	1.000	-0.113	0.067	0.067
154	WLAN2.4GHz	802.11b	Front	Keypad1	Camera2	Holster2	Sample1	6	1Mbps	16.01	16.01	1.000	0.072	0.068	0.068
155	WLAN2.4GHz	802.11b	Front	Keypad1	Camera2	Holster2	Sample1	1	1Mbps	15.22	15.22	1.000	0.185	0.072	0.072
156	**WLAN2.4GHz**	**802.11b**	**Front**	**Keypad1**	**Camera2**	**Holster2**	**Sample1**	**11**	**1Mbps**	**16.03**	**16.03**	**1.000**	**0.117**	**0.086**	**0.086**
157	WLAN2.4GHz	802.11b	Front	Keypad1	Camera2	Holster3	Sample1	6	1Mbps	16.01	16.01	1.000	-0.122	0.081	0.081
677	WLAN2.4GHz	802.11b	Front	Keypad1	Camera2	Holster3	Sample2	1	1Mbps	15.21	15.21	1.000	0.16	0.025	0.025
189	WLAN2.4GHz	802.11b	Front	Keypad1	Camera2	Holster3	Sample1	11	1Mbps	16.03	16.03	1.000	0.127	0.081	0.081
117	WLAN5GHz	802.11a	Front	Keypad1	Camera1		Sample1	161	6Mbps	15	15	1.000	0	0.154	0.154
118	WLAN5GHz	802.11a	Back	Keypad1	Camera1		Sample1	161	6Mbps	15	15	1.000	-0.01	0.151	0.151
124	WLAN5GHz	802.11a	Front	Keypad2	Camera1		Sample1	161	6Mbps	15	15	1.000	0.114	0.125	0.125
121	WLAN5GHz	802.11a	Front	Keypad3	Camera1		Sample1	161	6Mbps	15	15	1.000	0.126	0.135	0.135
163	**WLAN5GHz**	**802.11a**	**Front**	**Keypad1**	**Camera2**		**Sample1**	**161**	**6Mbps**	**15**	**15**	**1.000**	**0.025**	**0.158**	**0.158**
681	WLAN5GHz	802.11a	Front	Keypad1	Camera2		Sample2	149	6Mbps	14.59	14.59	1.000	0.15	0.139	0.139
801	WLAN5GHz	802.11n-HT20	Front	Keypad1	Camera2		Sample2	165	MCS0	15.44	15.44	1.000	-0.09	0.127	0.127
185	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster2	Sample1	161	6Mbps	15	15	1.000	0.148	0.053	0.053
186	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster2	Sample1	149	6Mbps	14.72	14.72	1.000	0.179	0.05	0.050
187	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster3	Sample1	161	6Mbps	15	15	1.000	0.156	0.062	0.062
188	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster3	Sample1	149	6Mbps	14.72	14.72	1.000	-0.133	0.063	0.063

<WLAN SAR - NII>

Plot No.	Band	Mode	Test Position	Keypad	Camera	Holster	Sample	Ch.	Data Rate (bps)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured SAR 1g (W/kg)	Scaled SAR 1g (W/kg)
113	WLAN5GHz	802.11a	Front	Keypad1	Camera1		Sample1	44	6Mbps	11.85	11.85	1.000	0.137	0.048	0.048
114	WLAN5GHz	802.11a	Back	Keypad1	Camera1		Sample1	44	6Mbps	11.85	11.85	1.000	0.01	0.028	0.028
122	WLAN5GHz	802.11a	Front	Keypad2	Camera1		Sample1	44	6Mbps	11.85	11.85	1.000	-0.04	0.03	0.030
119	WLAN5GHz	802.11a	Front	Keypad3	Camera1		Sample1	44	6Mbps	11.85	11.85	1.000	0	0.039	0.039
162	WLAN5GHz	802.11a	Front	Keypad1	Camera2		Sample1	44	6Mbps	11.85	11.85	1.000	0.001	0.062	0.062
678	**WLAN5GHz**	**802.11a**	**Front**	**Keypad1**	**Camera2**		**Sample2**	**36**	**6Mbps**	**12.08**	**12.08**	**1.000**	**-0.16**	**0.116**	**0.116**
171	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster2	Sample1	44	6Mbps	11.85	11.85	1.000	0.156	0.039	0.039
172	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster2	Sample1	36	6Mbps	11.81	11.81	1.000	0.13	0.03	0.030
173	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster3	Sample1	44	6Mbps	11.85	11.85	1.000	0.01	0.027	0.027
174	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster3	Sample1	36	6Mbps	11.81	11.81	1.000	0.01	0.031	0.031
115	WLAN5GHz	802.11a	Front	Keypad1	Camera1		Sample1	52	6Mbps	13.29	13.29	1.000	0.001	0.086	0.086
116	WLAN5GHz	802.11a	Back	Keypad1	Camera1		Sample1	52	6Mbps	13.29	13.29	1.000	0.108	0.068	0.068
123	WLAN5GHz	802.11a	Front	Keypad2	Camera1		Sample1	52	6Mbps	13.29	13.29	1.000	0.125	0.077	0.077
120	WLAN5GHz	802.11a	Front	Keypad3	Camera1		Sample1	52	6Mbps	13.29	13.29	1.000	0.125	0.072	0.072
679	**WLAN5GHz**	**802.11a**	**Front**	**Keypad1**	**Camera2**		**Sample2**	**52**	**6Mbps**	**13.41**	**13.41**	**1.000**	**0.11**	**0.119**	**0.119**
167	WLAN5GHz	802.11a	Front	Keypad1	Camera2		Sample1	64	6Mbps	13.14	13.14	1.000	0	0.095	0.095
175	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster2	Sample1	52	6Mbps	13.29	13.29	1.000	0.129	0.061	0.061
176	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster2	Sample1	64	6Mbps	13.14	13.14	1.000	0.144	0.059	0.059
177	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster3	Sample1	52	6Mbps	13.29	13.29	1.000	0.108	0.052	0.052
178	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster3	Sample1	64	6Mbps	13.14	13.14	1.000	0.101	0.054	0.054
125	WLAN5GHz	802.11a	Front	Keypad1	Camera1		Sample1	140	6Mbps	13.78	13.78	1.000	0.146	0.105	0.105
126	WLAN5GHz	802.11a	Back	Keypad1	Camera1		Sample1	140	6Mbps	13.78	13.78	1.000	-0.165	0.095	0.095
127	WLAN5GHz	802.11a	Front	Keypad2	Camera1		Sample1	140	6Mbps	13.78	13.78	1.000	0.177	0.102	0.102
128	WLAN5GHz	802.11a	Front	Keypad3	Camera1		Sample1	140	6Mbps	13.78	13.78	1.000	0.112	0.095	0.095
168	WLAN5GHz	802.11a	Front	Keypad1	Camera2		Sample1	140	6Mbps	13.78	13.78	1.000	0.187	0.109	0.109
169	**WLAN5GHz**	**802.11a**	**Front**	**Keypad1**	**Camera2**		**Sample1**	**104**	**6Mbps**	**13.02**	**13.02**	**1.000**	**0.172**	**0.127**	**0.127**
680	WLAN5GHz	802.11a	Front	Keypad1	Camera2		Sample2	116	6Mbps	12.64	12.64	1.000	0.01	0.116	0.116
179	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster2	Sample1	140	6Mbps	13.78	13.78	1.000	0.145	0.049	0.049
180	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster2	Sample1	104	6Mbps	13.02	13.02	1.000	0.136	0.051	0.051
181	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster2	Sample1	116	6Mbps	12.59	12.59	1.000	0.143	0.073	0.073
182	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster3	Sample1	140	6Mbps	13.78	13.78	1.000	0.112	0.05	0.050
183	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster3	Sample1	104	6Mbps	13.02	13.02	1.000	0.182	0.066	0.066
184	WLAN5GHz	802.11a	Front	Keypad1	Camera2	Holster3	Sample1	116	6Mbps	12.59	12.59	1.000	0.163	0.074	0.074

12.3 Repeated SAR Measurement

Plot No.	Band	Mode	Test Position	Gap (cm)	Keypad	Camera	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured SAR 1g (W/kg)	Ratio	Scaled SAR 1g (W/kg)
600	GSM850	GSM Voice	Right Tilted	-	Keypad1	Camera2	251	848.8	33.01	33.5	1.119	-0.159	1.07	1	1.198
603	GSM850	GSM Voice	Right Tilted	-	Keypad1	Camera2	251	848.8	33.01	33.5	1.119	0.133	1.01	1.06	1.131
606	WCDMA V	RMC 12.2Kbps	Right Tilted	-	Keypad1	Camera2	4182	836.4	23.84	24.5	1.164	-0.04	1.05	1	1.222
608	WCDMA V	RMC 12.2Kbps	Right Tilted		Keypad1	Camera2	4182	836.4	23.84	24.5	1.164	-0.19	1.01	1.04	1.176
609	WCDMA II	RMC 12.2Kbps	Right Tilted	-	Keypad1	Camera2	9538	1907.6	23.56	24.5	1.242	-0.11	1.04	1	1.291
612	WCDMA II	RMC 12.2Kbps	Right Tilted	-	Keypad1	Camera2	9538	1907.6	23.56	24.5	1.242	-0.02	1.03	1.01	1.279
613	CDMA BC0	1xRTT RC3 SO55	Right Cheek	-	Keypad1	Camera2	384	836.52	23.96	24.5	1.132	-0.01	1.11	1	1.257
614	CDMA BC0	1xRTT RC3 SO55	Right Cheek	-	Keypad1	Camera2	384	836.52	23.96	24.5	1.132	-0.04	1.1	1.01	1.246
631	CDMA BC1	1xRTT RC3 SO55	Right Tilted	-	Keypad1	Camera2	600	1880	23.5	24.5	1.259	-0.14	1.11	1	1.397
632	CDMA BC1	1xRTT RC3 SO55	Right Tilted	-	Keypad1	Camera2	600	1880	23.5	24.5	1.259	0.08	1.08	1.03	1.360
663	GSM850	GPRS (4 Tx slots)	Front	1.5cm	Keypad1	Camera2	251	848.8	32.63	33.5	1.222	0.182	1.06	1	1.295
664	GSM850	GPRS (4 Tx slots)	Front	1.5cm	Keypad1	Camera2	251	848.8	32.63	33.5	1.222	0.17	1.03	1.03	1.258

Note:

1. Per KDB 865664 D01v01, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg
2. Per KDB 865664 D01v01, if the ratio among the original and repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The deviation is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

12.4 Highest SAR Plot

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013/2/6

#600_GSM850_GSM Voice_Right Tilted_Ch251;Keypad1_Camera2

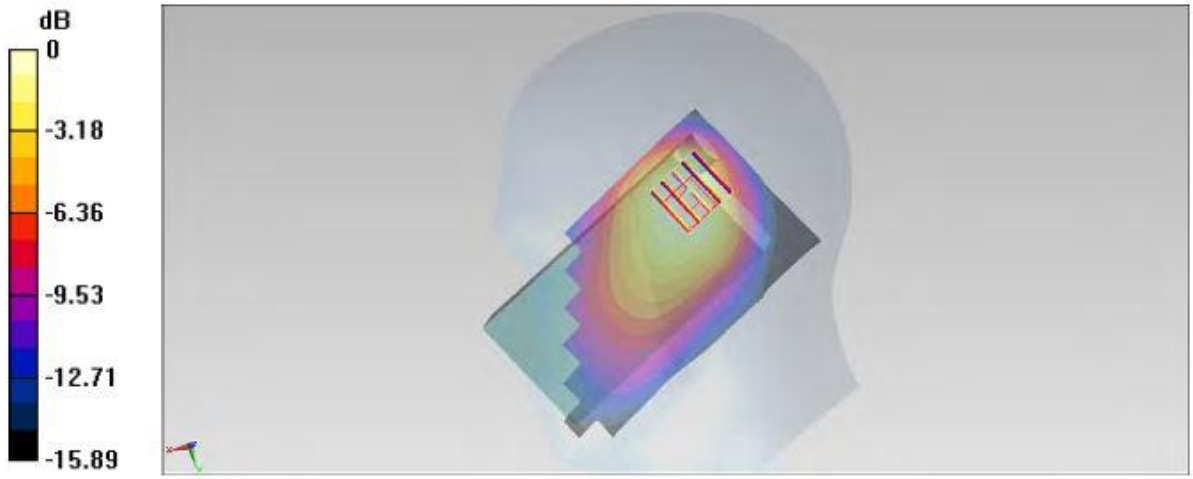
DUT: 320416

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: HSL_850_130206 Medium parameters used: f = 849 MHz; σ = 0.883 mho/m; ε_r = 40.899; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1478
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch251/Area Scan (71x131x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.42 mW/g

Configuration/Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 41.464 V/m; Power Drift = -0.159 dB
Peak SAR (extrapolated) = 1.819 mW/g
SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.665 mW/g
Maximum value of SAR (measured) = 1.25 mW/g



0 dB = 1.25 mW/g = 1.94 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013/2/5

#604_GSM1900_GSM Voice_Right Tilted_Ch512;Keypad1_Camera2

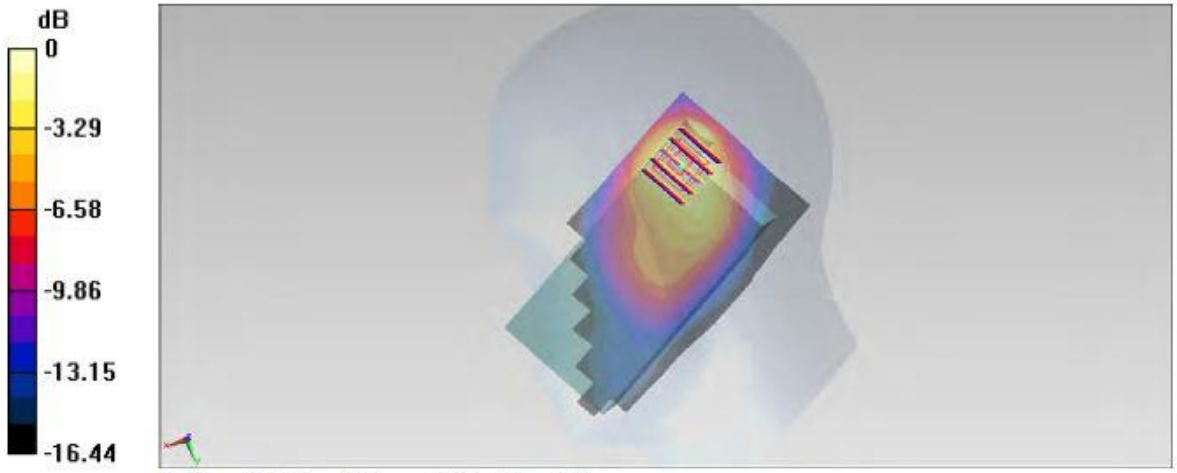
DUT: 320416

Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: HSL_1900_130205 Medium parameters used: f = 1850.2 MHz; σ = 1.389 mho/m; ε_r = 41.577; ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(5.05, 5.05, 5.05); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1446
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch512/Area Scan (71x131x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.653 mW/g

Configuration/Ch512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.279 V/m; Power Drift = -0.122 dB
Peak SAR (extrapolated) = 0.879 mW/g
SAR(1 g) = 0.511 mW/g; SAR(10 g) = 0.282 mW/g
Maximum value of SAR (measured) = 0.602 mW/g



0 dB = 0.602 mW/g = -4.41 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013/2/6

#605_WCDMA V_RMC 12.2Kbps_Right Tilted_Ch4233;Keypad1_Camera2

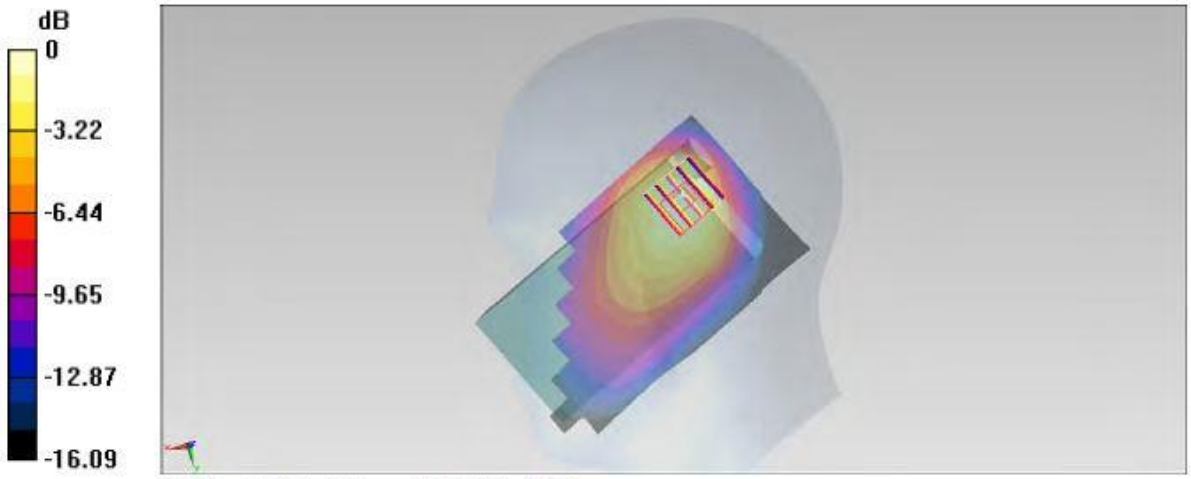
DUT: 320416

Communication System: WCDMA; Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: HSL_850_130206 Medium parameters used: f = 847 MHz; σ = 0.881 mho/m; ε_r = 40.923; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1478
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch4233/Area Scan (71x131x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.26 mW/g

Configuration/Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 39.131 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 1.856 mW/g
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.635 mW/g
Maximum value of SAR (measured) = 1.26 mW/g



0 dB = 1.26 mW/g = 2.01 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013/2/5

#609_WCDMA II_RMC 12.2Kbps_Right Tilted_Ch9538;Keypad1_Camera2

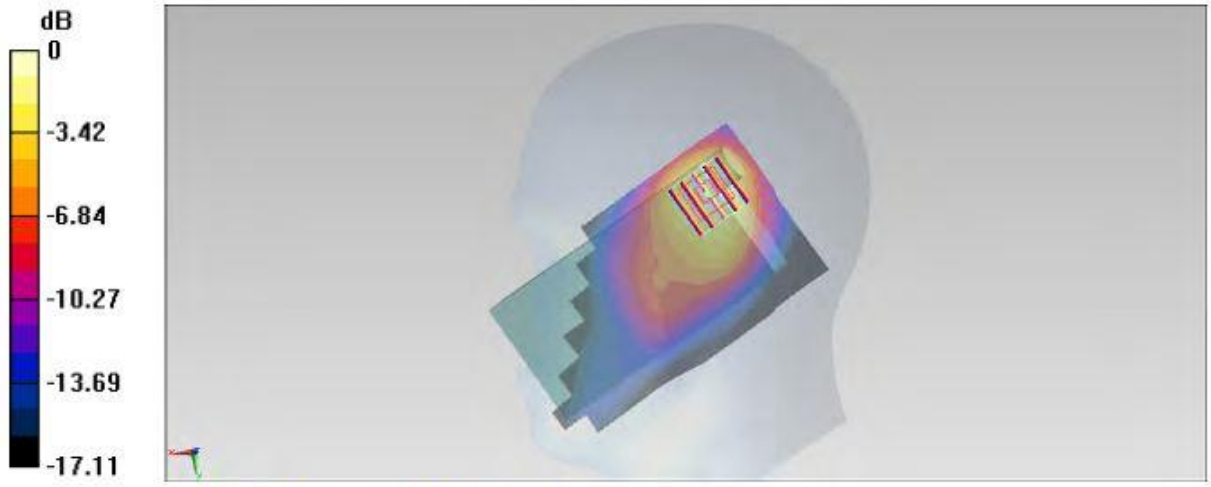
DUT: 320416

Communication System: WCDMA; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: HSL_1900_130205 Medium parameters used: f = 1908 MHz; σ = 1.445 mho/m; ε_r = 41.494; ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(5.05, 5.05, 5.05); Calibrated: 2012/9/28;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1446
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch9538/Area Scan (71x131x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.16 mW/g

Configuration/Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.591 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.865 mW/g
SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.566 mW/g
Maximum value of SAR (measured) = 1.13 mW/g



0 dB = 1.13 mW/g = 1.06 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013/2/6

#618_CDMA BC0_1xRTT RC3 SO55_Right Tilted_Ch1013;Keypad1_Camera2

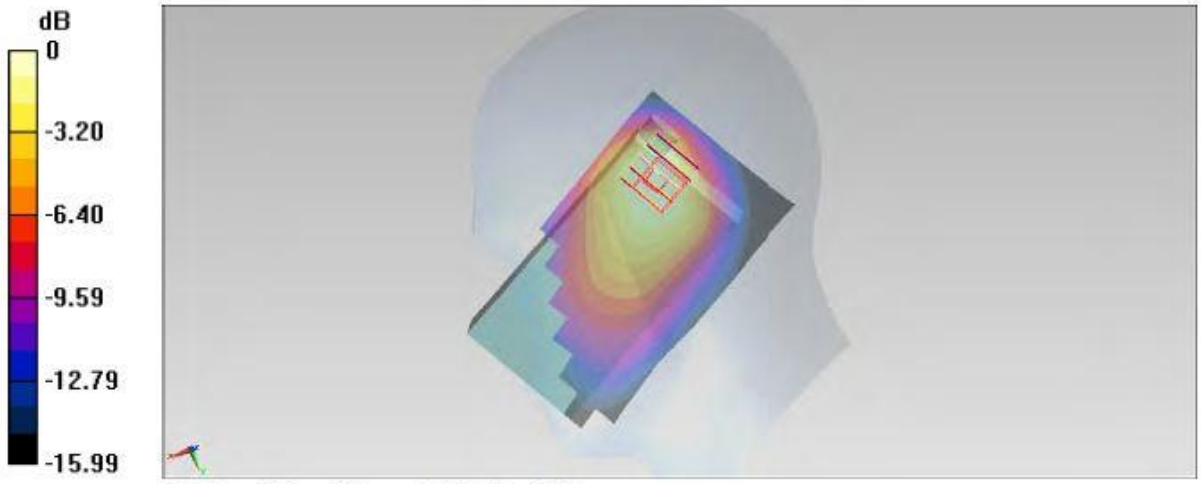
DUT: 320416

Communication System: CDMA ; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: HSL_850_130206 Medium parameters used: f = 825 MHz; σ = 0.865 mho/m; ε_r = 41.154; ρ = 1000 kg/m^3
Ambient Temperature : 22.4 ℃; Liquid Temperature : 21.4 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(6.2, 6.2, 6.2); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1478
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch1013/Area Scan (71x131x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.31 mW/g

Configuration/Ch1013/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.427 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.889 mW/g
SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.671 mW/g
Maximum value of SAR (measured) = 1.29 mW/g



0 dB = 1.29 mW/g = 2.21 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013/2/5

#631_CDMA BC1_1xRTT RC3 SO55_Right Tilted_Ch600;Keypad1_Camera2

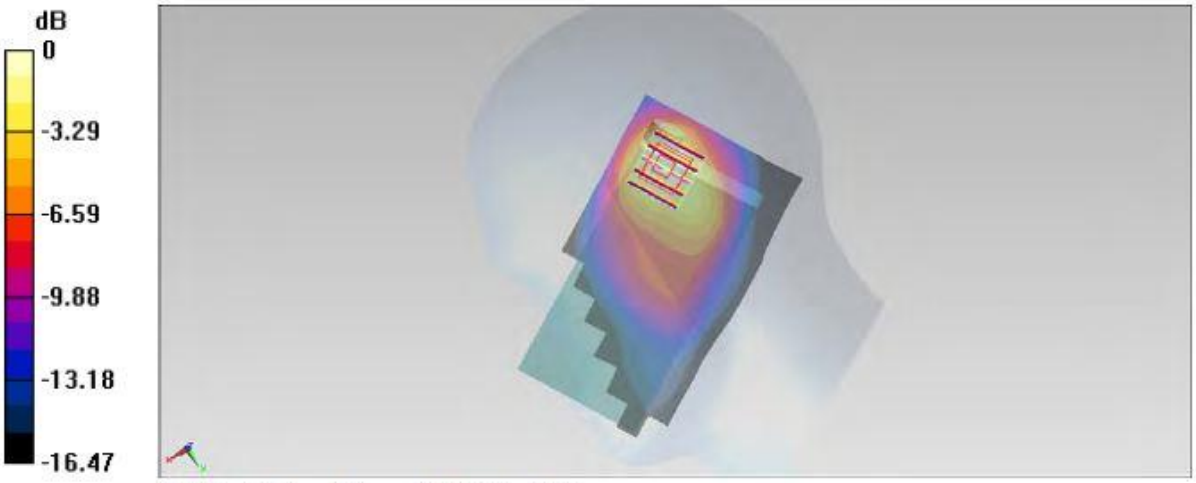
DUT: 320416

Communication System: CDMA ; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: HSL_1900_130205 Medium parameters used: f = 1880 MHz; σ = 1.418 mho/m; ε_r = 41.52; ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(5.05, 5.05, 5.05); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1446
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch600/Area Scan (71x131x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.38 mW/g

Configuration/Ch600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.922 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 1.895 mW/g
SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.625 mW/g
Maximum value of SAR (measured) = 1.28 mW/g



0 dB = 1.28 mW/g = 2.14 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013/2/7

#640_WLAN2.4G_802.11b_Left Tilted_Ch1;Keypad1_Camera2

DUT: 320416

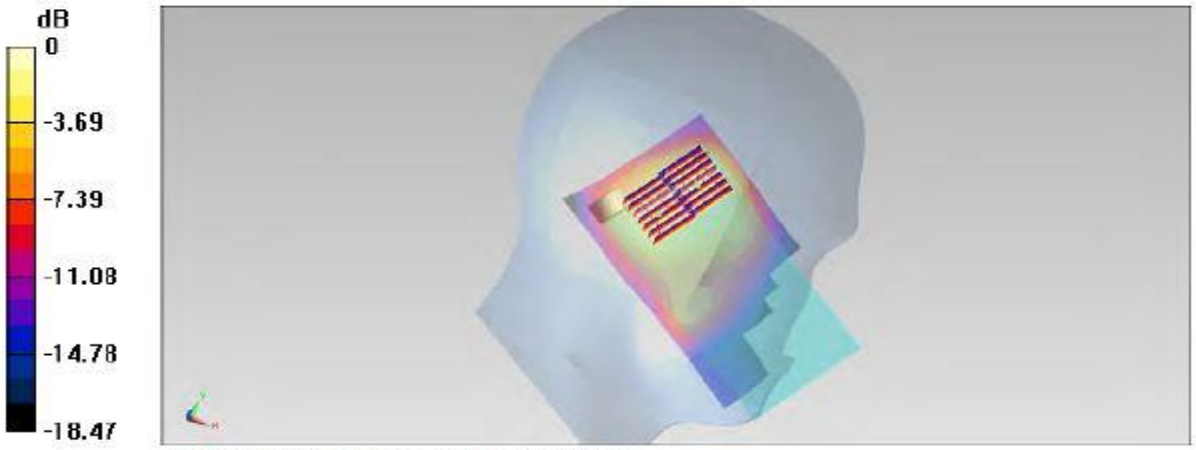
Communication System: 802.11b; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: HSL_2450_130207 Medium parameters used: f = 2412 MHz; σ = 1.809 mho/m; ε_r = 38.256; ρ = 1000 kg/m^3
Ambient Temperature : 22.6 ℃; Liquid Temperature : 21.6 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3270; ConvF(4.45, 4.45, 4.45); Calibrated: 2012/9/28;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2012/8/27
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1446
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6477)

Configuration/Ch1/Area Scan (81x151x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.213 mW/g

Configuration/Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.333 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.338 mW/g
SAR(1 g) = 0.167 mW/g; SAR(10 g) = 0.083 mW/g
Maximum value of SAR (measured) = 0.215 mW/g

Configuration/Ch1/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.333 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.240 mW/g
SAR(1 g) = 0.121 mW/g; SAR(10 g) = 0.068 mW/g
Maximum value of SAR (measured) = 0.162 mW/g



0 dB = 0.162 mW/g = -15.81 dB mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2013/2/8

#654_WLAN5G_802.11a_Right Tilted_Ch161;Keypad1_Camera2

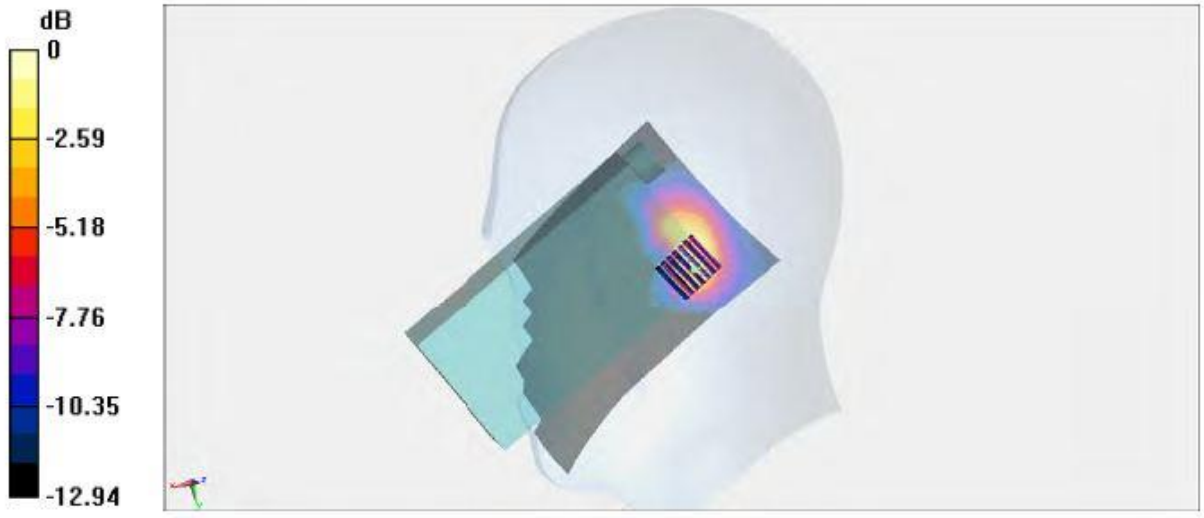
DUT: 320416

Communication System: 802.11a; Frequency: 5805 MHz;Duty Cycle: 1:1
Medium: HSL_5G_130208 Medium parameters used: f = 5805 MHz; σ = 5.396 mho/m; ε_r = 34.39; ρ = 1000 kg/m^3
Ambient Temperature : 22.4 ℃; Liquid Temperature : 21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3578; ConvF(3.72, 3.72, 3.72); Calibrated: 2012/6/21;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2013/1/28
- Phantom: SAM RIGHT; Type: SAM; Serial: 1719
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.5 (6469)

Configuration/Ch161/Area Scan (101x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.919 mW/g

Configuration/Ch161/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 14.346 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.222 mW/g
SAR(1 g) = 0.394 mW/g; SAR(10 g) = 0.160 mW/g
Maximum value of SAR (measured) = 0.840 mW/g



0 dB = 0.840 mW/g = -1.51 dB mW/g

12.5 Simultaneous Multi-band Transmission Analysis

No.	Applicable Simultaneous Transmission Combination
1.	WWAN + WLAN
2.	WWAN + Bluetooth
3.	WWAN + WLAN + Bluetooth
4.	WLAN + Bluetooth

Simultaneous Transmitters Configuration	Head		Body-Worn	
	WLAN802.11abgn	Bluetooth	WLAN802.11abgn	Bluetooth
GSM	Yes	Yes	Yes	Yes
GPRS	No	No	Yes	Yes
EGPRS	No	No	Yes	Yes
CDMA	Yes	Yes	Yes	Yes
WCDMA	Yes	Yes	Yes	Yes

Note:

1. WLAN2.4GHz and WLAN5GHz share the same antenna and cannot transmit simultaneously.
2. GSM/WCDMA/CDMA share the same antenna, and cannot transmit simultaneously
3. The Scaled SAR summation is calculated based on the same configuration and test position.
4. Per KDB 447498 D01v05, simultaneous transmission SAR is compliant. if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) *SPLSR* = (SAR1 + SAR2)1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan
   If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary
   iii) *Simultaneously* transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg
5. For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v05 based on the formula below.
   i) (*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)]·[√f(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.
   ii) 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.

Bluetooth Max Power (source-based time-average)	Exposure Position	Body-worn 0cm with Holster	Body-worn 1.5cm
Packet Type : DH5	Test separation	5 mm	15mm
1.4 dBm	Estimated SAR (W/kg)	0.058 W/kg	0.019 W/kg

12.6 Head SAR Co-location Simultaneous Transmission Analysis

< WWAN + WLAN2.4GHz Band + Bluetooth>

	WWAN			WLAN		Bluetooth			
Position	WWAN Band	Plot No	SAR (W/kg)	Plot No	Reported SAR (W/kg)	Reported SAR (W/kg)	**WWAN + WLAN + Bluetooth**	Case No	Multi-Band Combined SAR (W/kg)
Right Cheek	GSM850	1	1.149	637	0.117	0.003	**1.27**		
	GSM1900	9	0.422	637	0.117	0.003	**0.54**		
	WCDMA V	5	1.205	637	0.117	0.003	**1.33**		
	WCDMA II	19	0.939	637	0.117	0.003	**1.06**		
	CDMA BC0	615	1.272	637	0.117	0.003	**1.39**		
	CDMA BC1	628	1.102	637	0.117	0.003	**1.22**		
Right Tilted	GSM850	600	1.198	638	0.133	0.00007	**1.33**		
	GSM1900	604	0.564	638	0.133	0.00007	**0.70**		
	WCDMA V	605	1.304	638	0.133	0.00007	**1.44**		
	WCDMA V	606	1.222	638	0.133	0.00007	**1.36**		
	WCDMA V	607	1.25	638	0.133	0.00007	**1.38**		
	WCDMA II	609	1.291	638	0.133	0.00007	**1.42**		
	WCDMA II	610	1.188	638	0.133	0.00007	**1.32**		
	WCDMA II	611	1.25	638	0.133	0.00007	**1.38**		
	CDMA BC0	617	1.166	638	0.133	0.00007	**1.30**		
	CDMA BC0	618	1.284	638	0.133	0.00007	**1.42**		
	CDMA BC0	619	1.201	638	0.133	0.00007	**1.33**		
	CDMA BC1	629	1.362	638	0.133	0.00007	**1.50**		
	CDMA BC1	630	1.295	638	0.133	0.00007	**1.43**		
	CDMA BC1	631	1.397	638	0.133	0.00007	**1.53**		
Left Cheek	GSM850	3	1.003	639	0.152	0.002	**1.16**		
	GSM1900	11	0.26	639	0.152	0.002	**0.41**		
	WCDMA V	7	1.096	639	0.152	0.002	**1.25**		
	WCDMA II	21	0.648	639	0.152	0.002	**0.80**		
	CDMA BC0	621	1.148	639	0.152	0.002	**1.30**		
	CDMA BC1	633	0.761	639	0.152	0.002	**0.92**		
Left Tilted	GSM850	4	1.041	640	0.167	0.001	**1.21**		
	GSM1900	12	0.3	640	0.167	0.001	**0.47**		
	WCDMA V	8	0.985	640	0.167	0.001	**1.15**		
	WCDMA II	22	0.725	640	0.167	0.001	**0.89**		
	CDMA BC0	624	1.057	640	0.167	0.001	**1.23**		
	CDMA BC1	634	0.906	640	0.167	0.001	**1.07**		

<WWAN + WLAN5.2GHz Band + Bluetooth>

	WWAN			WLAN		Bluetooth	WWAN + WLAN + Bluetooth	Case No	Multi-Band Combined SAR (W/kg)
Position	WWAN Band	Plot No	SAR (W/kg)	Plot No	Reported SAR (W/kg)	Reported SAR (W/kg)			
Right Cheek	GSM850	1	1.149	641	0.171	0.003	**1.32**		
	GSM1900	9	0.422	641	0.171	0.003	**0.60**		
	WCDMA V	5	1.205	641	0.171	0.003	**1.38**		
	WCDMA II	19	0.939	641	0.171	0.003	**1.11**		
	CDMA BC0	615	1.272	641	0.171	0.003	**1.45**		
	CDMA BC1	628	1.102	641	0.171	0.003	**1.28**		
Right Tilted	GSM850	600	1.198	642	0.29	0.00007	**1.49**		
	GSM1900	604	0.564	642	0.29	0.00007	**0.85**		
	WCDMA V	605	1.304	642	0.29	0.00007	**1.59**		
	WCDMA V	606	1.222	642	0.29	0.00007	**1.51**		
	WCDMA V	607	1.25	642	0.29	0.00007	**1.54**		
	WCDMA II	609	1.291	642	0.29	0.00007	**1.58**		
	WCDMA II	610	1.188	642	0.29	0.00007	**1.48**		
	WCDMA II	611	1.25	642	0.29	0.00007	**1.54**		
	CDMA BC0	617	1.166	642	0.29	0.00007	**1.46**		
	CDMA BC0	618	1.284	642	0.29	0.00007	**1.57**		
	CDMA BC0	619	1.201	642	0.29	0.00007	**1.49**		
	CDMA BC1	629	1.362	642	0.29	0.00007	**1.65**	Case 2	1.38
	CDMA BC1	630	1.295	642	0.29	0.00007	**1.59**		
	CDMA BC1	631	1.397	642	0.29	0.00007	**1.69**	Case 1	1.42
Left Cheek	GSM850	3	1.003	643	0.134	0.002	**1.14**		
	GSM1900	11	0.26	643	0.134	0.002	**0.40**		
	WCDMA V	7	1.096	643	0.134	0.002	**1.23**		
	WCDMA II	21	0.648	643	0.134	0.002	**0.78**		
	CDMA BC0	621	1.148	643	0.134	0.002	**1.28**		
	CDMA BC1	633	0.761	643	0.134	0.002	**0.90**		
Left Tilted	GSM850	4	1.041	644	0.193	0.001	**1.24**		
	GSM1900	12	0.3	644	0.193	0.001	**0.49**		
	WCDMA V	8	0.985	644	0.193	0.001	**1.18**		
	WCDMA II	22	0.725	644	0.193	0.001	**0.92**		
	CDMA BC0	624	1.057	644	0.193	0.001	**1.25**		
	CDMA BC1	634	0.906	644	0.193	0.001	**1.10**		

<WWAN + WLAN5.3GHz Band + Bluetooth>

	WWAN			WLAN		Bluetooth	WWAN + WLAN + Bluetooth	Case No	Multi-Band Combined SAR (W/kg)
Position	WWAN Band	Plot No	SAR (W/kg)	Plot No	Reported SAR (W/kg)	Reported SAR (W/kg)			
Right Cheek	GSM850	1	1.149	645	0.184	0.003	**1.34**		
	GSM1900	9	0.422	645	0.184	0.003	**0.61**		
	WCDMA V	5	1.205	645	0.184	0.003	**1.39**		
	WCDMA II	19	0.939	645	0.184	0.003	**1.13**		
	CDMA BC0	615	1.272	645	0.184	0.003	**1.46**		
	CDMA BC1	628	1.102	645	0.184	0.003	**1.29**		
Right Tilted	GSM850	600	1.198	646	0.276	0.00007	**1.47**		
	GSM1900	604	0.564	646	0.276	0.00007	**0.84**		
	WCDMA V	605	1.304	646	0.276	0.00007	**1.58**		
	WCDMA V	606	1.222	646	0.276	0.00007	**1.50**		
	WCDMA V	607	1.25	646	0.276	0.00007	**1.53**		
	WCDMA II	609	1.291	646	0.276	0.00007	**1.57**		
	WCDMA II	610	1.188	646	0.276	0.00007	**1.46**		
	WCDMA II	611	1.25	646	0.276	0.00007	**1.53**		
	CDMA BC0	617	1.166	646	0.276	0.00007	**1.44**		
	CDMA BC0	618	1.284	646	0.276	0.00007	**1.56**		
	CDMA BC0	619	1.201	646	0.276	0.00007	**1.48**		
	CDMA BC1	629	1.362	646	0.276	0.00007	**1.64**	Case 4	1.42
	CDMA BC1	630	1.295	646	0.276	0.00007	**1.57**		
	CDMA BC1	631	1.397	646	0.276	0.00007	**1.67**	Case 3	1.45
Left Cheek	GSM850	3	1.003	647	0.162	0.002	**1.17**		
	GSM1900	11	0.26	647	0.162	0.002	**0.42**		
	WCDMA V	7	1.096	647	0.162	0.002	**1.26**		
	WCDMA II	21	0.648	647	0.162	0.002	**0.81**		
	CDMA BC0	621	1.148	647	0.162	0.002	**1.31**		
	CDMA BC1	633	0.761	647	0.162	0.002	**0.93**		
Left Tilted	GSM850	4	1.041	648	0.22	0.001	**1.26**		
	GSM1900	12	0.3	648	0.22	0.001	**0.52**		
	WCDMA V	8	0.985	648	0.22	0.001	**1.21**		
	WCDMA II	22	0.725	648	0.22	0.001	**0.95**		
	CDMA BC0	624	1.057	648	0.22	0.001	**1.28**		
	CDMA BC1	634	0.906	648	0.22	0.001	**1.13**		

<WWAN + WLAN5.5GHz Band + Bluetooth>

	WWAN			WLAN		Bluetooth	WWAN + WLAN + Bluetooth	Case No	Multi-Band Combined SAR (W/kg)
Position	WWAN Band	Plot No	SAR (W/kg)	Plot No	Reported SAR (W/kg)	Reported SAR (W/kg)			
Right Cheek	GSM850	1	1.149	649	0.283	0.003	**1.44**		
	GSM1900	9	0.422	649	0.283	0.003	**0.71**		
	WCDMA V	5	1.205	649	0.283	0.003	**1.49**		
	WCDMA II	19	0.939	649	0.283	0.003	**1.23**		
	CDMA BC0	615	1.272	649	0.283	0.003	**1.56**		
	CDMA BC1	628	1.102	649	0.283	0.003	**1.39**		
Right Tilted	GSM850	600	1.198	650	0.289	0.00007	**1.49**		
	GSM1900	604	0.564	650	0.289	0.00007	**0.85**		
	WCDMA V	605	1.304	650	0.289	0.00007	**1.59**		
	WCDMA V	606	1.222	650	0.289	0.00007	**1.51**		
	WCDMA V	607	1.25	650	0.289	0.00007	**1.54**		
	WCDMA II	609	1.291	650	0.289	0.00007	**1.58**		
	WCDMA II	610	1.188	650	0.289	0.00007	**1.48**		
	WCDMA II	611	1.25	650	0.289	0.00007	**1.54**		
	CDMA BC0	617	1.166	650	0.289	0.00007	**1.46**		
	CDMA BC0	618	1.284	650	0.289	0.00007	**1.57**		
	CDMA BC0	619	1.201	650	0.289	0.00007	**1.49**		
	CDMA BC1	629	1.362	650	0.289	0.00007	**1.65**	Case 6	1.37
	CDMA BC1	630	1.295	650	0.289	0.00007	**1.58**		
	CDMA BC1	631	1.397	650	0.289	0.00007	**1.69**	Case 5	1.40
Left Cheek	GSM850	3	1.003	651	0.154	0.002	**1.16**		
	GSM1900	11	0.26	651	0.154	0.002	**0.42**		
	WCDMA V	7	1.096	651	0.154	0.002	**1.25**		
	WCDMA II	21	0.648	651	0.154	0.002	**0.80**		
	CDMA BC0	621	1.148	651	0.154	0.002	**1.30**		
	CDMA BC1	633	0.761	651	0.154	0.002	**0.92**		
Left Tilted	GSM850	4	1.041	652	0.175	0.001	**1.22**		
	GSM1900	12	0.3	652	0.175	0.001	**0.48**		
	WCDMA V	8	0.985	652	0.175	0.001	**1.16**		
	WCDMA II	22	0.725	652	0.175	0.001	**0.90**		
	CDMA BC0	624	1.057	652	0.175	0.001	**1.23**		
	CDMA BC1	634	0.906	652	0.175	0.001	**1.08**		

<WWAN + WLAN5.8GHz Band + Bluetooth>

	WWAN			WLAN		Bluetooth	WWAN + WLAN + Bluetooth	Case No	Multi-Band Combined SAR (W/kg)
Position	WWAN Band	Plot No	SAR (W/kg)	Plot No	Reported SAR (W/kg)	Reported SAR (W/kg)			
Right Cheek	GSM850	1	1.149	653	0.254	0.003	**1.41**		
	GSM1900	9	0.422	653	0.254	0.003	**0.68**		
	WCDMA V	5	1.205	653	0.254	0.003	**1.46**		
	WCDMA II	19	0.939	653	0.254	0.003	**1.20**		
	CDMA BC0	615	1.272	653	0.254	0.003	**1.53**		
	CDMA BC1	628	1.102	653	0.254	0.003	**1.36**		
Right Tilted	GSM850	600	1.198	654	0.394	0.00007	**1.59**		
	GSM1900	604	0.564	654	0.394	0.00007	**0.96**		
	WCDMA V	605	1.304	654	0.394	0.00007	**1.70**	Case 7	1.33
	WCDMA V	606	1.222	654	0.394	0.00007	**1.62**	Case 8	1.34
	WCDMA V	607	1.25	654	0.394	0.00007	**1.64**	Case 9	1.37
	WCDMA II	609	1.291	654	0.394	0.00007	**1.69**	Case 10	1.32
	WCDMA II	610	1.188	654	0.394	0.00007	**1.58**		
	WCDMA II	611	1.25	654	0.394	0.00007	**1.64**	Case 11	1.28
	CDMA BC0	617	1.166	654	0.394	0.00007	**1.56**		
	CDMA BC0	618	1.284	654	0.394	0.00007	**1.68**	Case 12	1.24
	CDMA BC0	619	1.201	654	0.394	0.00007	**1.60**	Case 13	1.40
	CDMA BC1	629	1.362	654	0.394	0.00007	**1.76**	Case 15	1.39
	CDMA BC1	630	1.295	654	0.394	0.00007	**1.69**	Case 16	1.27
	CDMA BC1	631	1.397	654	0.394	0.00007	**1.79**	Case 14	1.42
Left Cheek	GSM850	3	1.003	655	0.204	0.002	**1.21**		
	GSM1900	11	0.26	655	0.204	0.002	**0.47**		
	WCDMA V	7	1.096	655	0.204	0.002	**1.30**		
	WCDMA II	21	0.648	655	0.204	0.002	**0.85**		
	CDMA BC0	621	1.148	655	0.204	0.002	**1.35**		
	CDMA BC1	633	0.761	655	0.204	0.002	**0.97**		
Left Tilted	GSM850	4	1.041	656	0.219	0.001	**1.26**		
	GSM1900	12	0.3	656	0.219	0.001	**0.52**		
	WCDMA V	8	0.985	656	0.219	0.001	**1.21**		
	WCDMA II	22	0.725	656	0.219	0.001	**0.95**		
	CDMA BC0	624	1.057	656	0.219	0.001	**1.28**		
	CDMA BC1	634	0.906	656	0.219	0.001	**1.13**		

12.7 Body-Worn SAR Co-location Simultaneous Transmission Analysis

<WWAN + WLAN2.4GHz Band + Bluetooth>

	WWAN			WLAN		Bluetooth			
Position	WWAN Band	Plot No	SAR (W/kg)	Plot No	Reported SAR (W/kg)	Estimated SAR (W/kg)	**WWAN + WLAN + Bluetooth**	Case No	Multi-Band Combined SAR (W/kg)
Front (1.5cm Gap)	GSM850	663	1.295	148	0.066	0.019	**1.38**		
	GSM1900	36	0.39	148	0.066	0.019	**0.48**		
	WCDMA V	666	0.39	148	0.066	0.019	**0.48**		
	WCDMA II	667	0.21	148	0.066	0.019	**0.30**		
	CDMA BC0	668	0.441	148	0.066	0.019	**0.53**		
	CDMA BC1	672	0.217	148	0.066	0.019	**0.30**		
Back (1.5cm Gap)	GSM850	14	0.843	145	0.044	0.019	**0.91**		
	GSM1900	18	0.369	145	0.044	0.019	**0.43**		
	WCDMA V	16	0.311	145	0.044	0.019	**0.37**		
	WCDMA II	71	0.196	145	0.044	0.019	**0.26**		
	CDMA BC0	669	0.332	145	0.044	0.019	**0.40**		
	CDMA BC1	673	0.251	145	0.044	0.019	**0.31**		
Front with Holster2 (0cm Gap)	GSM850	64	1.205	156	0.086	0.058	**1.35**		
	GSM1900	41	0.32	156	0.086	0.058	**0.46**		
	WCDMA V	57	0.344	156	0.086	0.058	**0.49**		
	WCDMA II	75	0.185	156	0.086	0.058	**0.33**		
	CDMA BC0	670	0.425	156	0.086	0.058	**0.57**		
	CDMA BC1	674	0.13	156	0.086	0.058	**0.27**		
Front with Holster3 (0cm Gap)	GSM850	69	0.842	189	0.081	0.058	**0.98**		
	GSM1900	43	0.31	189	0.081	0.058	**0.45**		
	WCDMA V	60	0.279	189	0.081	0.058	**0.42**		
	WCDMA II	87	0.198	189	0.081	0.058	**0.34**		
	CDMA BC0	671	0.285	189	0.081	0.058	**0.42**		
	CDMA BC1	675	0.194	189	0.081	0.058	**0.33**		

<WWAN + WLAN5.2GHz Band + Bluetooth>

	WWAN			WLAN		Bluetooth	**WWAN + WLAN + Bluetooth**	Case No	Multi-Band Combined SAR (W/kg)
Position	WWAN Band	Plot No	SAR (W/kg)	Plot No	Reported SAR (W/kg)	Estimated SAR (W/kg)			
Front	GSM850	663	1.295	678	0.116	0.019	**1.43**		
	GSM1900	36	0.39	678	0.116	0.019	**0.53**		
	WCDMA V	666	0.39	678	0.116	0.019	**0.53**		
	WCDMA II	667	0.21	678	0.116	0.019	**0.35**		
	CDMA BC0	668	0.441	678	0.116	0.019	**0.58**		
	CDMA BC1	672	0.217	678	0.116	0.019	**0.35**		
Back	GSM850	14	0.843	114	0.028	0.019	**0.89**		
	GSM1900	18	0.369	114	0.028	0.019	**0.42**		
	WCDMA V	16	0.311	114	0.028	0.019	**0.36**		
	WCDMA II	71	0.196	114	0.028	0.019	**0.24**		
	CDMA BC0	669	0.332	114	0.028	0.019	**0.38**		
	CDMA BC1	673	0.251	114	0.028	0.019	**0.30**		
Front with Holster2 (0cm Gap)	GSM850	64	1.205	171	0.039	0.058	**1.30**		
	GSM1900	41	0.32	171	0.039	0.058	**0.42**		
	WCDMA V	57	0.344	171	0.039	0.058	**0.44**		
	WCDMA II	75	0.185	171	0.039	0.058	**0.28**		
	CDMA BC0	670	0.425	171	0.039	0.058	**0.52**		
	CDMA BC1	674	0.13	171	0.039	0.058	**0.23**		
Front with Holster3 (0cm Gap)	GSM850	69	0.842	174	0.031	0.058	**0.93**		
	GSM1900	43	0.31	174	0.031	0.058	**0.40**		
	WCDMA V	60	0.279	174	0.031	0.058	**0.37**		
	WCDMA II	87	0.198	174	0.031	0.058	**0.29**		
	CDMA BC0	671	0.285	174	0.031	0.058	**0.37**		
	CDMA BC1	675	0.194	174	0.031	0.058	**0.28**		

<WWAN + WLAN5.3GHz Band + Bluetooth>

	WWAN			WLAN		Bluetooth	WWAN + WLAN + Bluetooth	Case No	Multi-Band Combined SAR (W/kg)
Position	WWAN Band	Plot No	SAR (W/kg)	Plot No	Reported SAR (W/kg)	Estimated SAR (W/kg)			
Front	GSM850	663	1.295	679	0.119	0.019	**1.43**		
	GSM1900	36	0.39	679	0.119	0.019	**0.53**		
	WCDMA V	666	0.39	679	0.119	0.019	**0.53**		
	WCDMA II	667	0.21	679	0.119	0.019	**0.35**		
	CDMA BC0	668	0.441	679	0.119	0.019	**0.58**		
	CDMA BC1	672	0.217	679	0.119	0.019	**0.36**		
Back	GSM850	14	0.843	116	0.068	0.019	**0.93**		
	GSM1900	18	0.369	116	0.068	0.019	**0.46**		
	WCDMA V	16	0.311	116	0.068	0.019	**0.40**		
	WCDMA II	71	0.196	116	0.068	0.019	**0.28**		
	CDMA BC0	669	0.332	116	0.068	0.019	**0.42**		
	CDMA BC1	673	0.251	116	0.068	0.019	**0.34**		
Front with Holster2 (0cm Gap)	GSM850	64	1.205	175	0.061	0.058	**1.32**		
	GSM1900	41	0.32	175	0.061	0.058	**0.44**		
	WCDMA V	57	0.344	175	0.061	0.058	**0.46**		
	WCDMA II	75	0.185	175	0.061	0.058	**0.30**		
	CDMA BC0	670	0.425	175	0.061	0.058	**0.54**		
	CDMA BC1	674	0.13	175	0.061	0.058	**0.25**		
Front with Holster3 (0cm Gap)	GSM850	69	0.842	178	0.054	0.058	**0.95**		
	GSM1900	43	0.31	178	0.054	0.058	**0.42**		
	WCDMA V	60	0.279	178	0.054	0.058	**0.39**		
	WCDMA II	87	0.198	178	0.054	0.058	**0.31**		
	CDMA BC0	671	0.285	178	0.054	0.058	**0.40**		
	CDMA BC1	675	0.194	178	0.054	0.058	**0.31**		

<WWAN + WLAN5.5GHz Band + Bluetooth>

	WWAN			WLAN		Bluetooth	**WWAN + WLAN + Bluetooth**	Case No	Multi-Band Combined SAR (W/kg)
Position	WWAN Band	Plot No	SAR (W/kg)	Plot No	Reported SAR (W/kg)	Estimated SAR (W/kg)			
Front	GSM850	663	1.295	169	0.127	0.019	**1.44**		
	GSM1900	36	0.39	169	0.127	0.019	**0.54**		
	WCDMA V	666	0.39	169	0.127	0.019	**0.54**		
	WCDMA II	667	0.21	169	0.127	0.019	**0.36**		
	CDMA BC0	668	0.441	169	0.127	0.019	**0.59**		
	CDMA BC1	672	0.217	169	0.127	0.019	**0.36**		
Back	GSM850	14	0.843	126	0.095	0.019	**0.96**		
	GSM1900	18	0.369	126	0.095	0.019	**0.48**		
	WCDMA V	16	0.311	126	0.095	0.019	**0.43**		
	WCDMA II	71	0.196	126	0.095	0.019	**0.31**		
	CDMA BC0	669	0.332	126	0.095	0.019	**0.45**		
	CDMA BC1	673	0.251	126	0.095	0.019	**0.37**		
Front with Holster2 (0cm Gap)	GSM850	64	1.205	181	0.073	0.058	**1.34**		
	GSM1900	41	0.32	181	0.073	0.058	**0.45**		
	WCDMA V	57	0.344	181	0.073	0.058	**0.48**		
	WCDMA II	75	0.185	181	0.073	0.058	**0.32**		
	CDMA BC0	670	0.425	181	0.073	0.058	**0.56**		
	CDMA BC1	674	0.13	181	0.073	0.058	**0.26**		
Front with Holster3 (0cm Gap)	GSM850	69	0.842	184	0.074	0.058	**0.97**		
	GSM1900	43	0.31	184	0.074	0.058	**0.44**		
	WCDMA V	60	0.279	184	0.074	0.058	**0.41**		
	WCDMA II	87	0.198	184	0.074	0.058	**0.33**		
	CDMA BC0	671	0.285	184	0.074	0.058	**0.42**		
	CDMA BC1	675	0.194	184	0.074	0.058	**0.33**		

<WWAN + WLAN5.8GHz Band + Bluetooth>

	WWAN			WLAN		Bluetooth	WWAN + WLAN + Bluetooth	Case No	Multi-Band Combined SAR (W/kg)
Position	WWAN Band	Plot No	SAR (W/kg)	Plot No	Reported SAR (W/kg)	Estimated SAR (W/kg)			
Front	GSM850	663	1.295	163	0.158	0.019	**1.47**		
	GSM1900	36	0.39	163	0.158	0.019	**0.57**		
	WCDMA V	666	0.39	163	0.158	0.019	**0.57**		
	WCDMA II	667	0.21	163	0.158	0.019	**0.39**		
	CDMA BC0	668	0.441	163	0.158	0.019	**0.62**		
	CDMA BC1	672	0.217	163	0.158	0.019	**0.39**		
Back	GSM850	14	0.843	118	0.151	0.019	**1.01**		
	GSM1900	18	0.369	118	0.151	0.019	**0.54**		
	WCDMA V	16	0.311	118	0.151	0.019	**0.48**		
	WCDMA II	71	0.196	118	0.151	0.019	**0.37**		
	CDMA BC0	669	0.332	118	0.151	0.019	**0.50**		
	CDMA BC1	673	0.251	118	0.151	0.019	**0.42**		
Front with Holster2 (0cm Gap)	GSM850	64	1.205	185	0.053	0.058	**1.32**		
	GSM1900	41	0.32	185	0.053	0.058	**0.43**		
	WCDMA V	57	0.344	185	0.053	0.058	**0.46**		
	WCDMA II	75	0.185	185	0.053	0.058	**0.30**		
	CDMA BC0	670	0.425	185	0.053	0.058	**0.54**		
	CDMA BC1	674	0.13	185	0.053	0.058	**0.24**		
Front with Holster3 (0cm Gap)	GSM850	69	0.842	188	0.063	0.058	**0.96**		
	GSM1900	43	0.31	188	0.063	0.058	**0.43**		
	WCDMA V	60	0.279	188	0.063	0.058	**0.40**		
	WCDMA II	87	0.198	188	0.063	0.058	**0.32**		
	CDMA BC0	671	0.285	188	0.063	0.058	**0.41**		
	CDMA BC1	675	0.194	188	0.063	0.058	**0.32**		

12.8 Volume Scan Result

Case NO.	Plot No.	Band	Mode	Test Position	Keypad	Camera	Ch.	Data Rate	Average Power (dBm)	Tune-Up Limit (dBm)	Power Drift (dB)	Measured SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Tune-up Scaling Factor	Multi Band Reported SAR 1g (W/kg)
Case 1	694	CDMA BC1	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	600	-	23.5	24.5	-0.05	1.08	1.360	1.259	**1.42**
	697	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	44	6Mbps	11.91	11.91	-0.17	0.251	0.251	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 2	695	CDMA BC1	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	1175	-	23.61	24.5	0.13	1.08	1.326	1.227	**1.38**
	697	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	44	6Mbps	11.91	11.91	-0.17	0.251	0.251	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 3	694	CDMA BC1	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	600	-	23.5	24.5	-0.05	1.08	1.360	1.259	**1.45**
	698	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	52	6Mbps	13.41	13.41	-0.02	0.323	0.323	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 4	695	CDMA BC1	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	1175	-	23.61	24.5	0.13	1.08	1.326	1.227	**1.42**
	698	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	52	6Mbps	13.41	13.41	-0.02	0.323	0.323	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 5	694	CDMA BC1	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	600	-	23.5	24.5	-0.05	1.08	1.360	1.259	**1.4**
	699	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	116	6Mbps	12.64	12.64	0.09	0.275	0.275	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 6	695	CDMA BC1	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	1175	-	23.61	24.5	0.13	1.08	1.326	1.227	**1.37**
	699	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	116	6Mbps	12.64	12.64	0.09	0.275	0.275	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 7	685	WCDMA V	RMC 12.2Kbps	Right Tilted	Keypad1	Camera2	4233	-	23.56	24.5	-0.12	0.953	1.183	1.242	**1.33**
	700	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	161	6Mbps	14.92	14.92	-0.02	0.351	0.351	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 8	686	WCDMA V	RMC 12.2Kbps	Right Tilted	Keypad1	Camera2	4182	-	23.84	24.5	0.13	1.01	1.176	1.164	**1.34**
	700	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	161	6Mbps	14.92	14.92	-0.02	0.351	0.351	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 9	687	WCDMA V	RMC 12.2Kbps	Right Tilted	Keypad1	Camera2	4132	-	23.7	24.5	-0.08	1	1.202	1.202	**1.37**
	700	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	161	6Mbps	14.92	14.92	-0.02	0.351	0.351	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 10	688	WCDMA II	RMC 12.2Kbps	Right Tilted	Keypad1	Camera2	9538	-	23.56	24.5	0.06	1.01	1.254	1.242	**1.32**
	700	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	161	6Mbps	14.92	14.92	-0.02	0.351	0.351	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 11	690	WCDMA II	RMC 12.2Kbps	Right Tilted	Keypad1	Camera2	9400	-	23.3	24.5	-0.01	0.924	1.218	1.318	**1.28**
	700	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	161	6Mbps	14.92	14.92	-0.02	0.351	0.351	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 12	691	CDMA BC0	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	1013	-	23.75	24.5	-0.12	0.922	1.096	1.189	**1.24**
	700	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	161	6Mbps	14.92	14.92	-0.02	0.351	0.351	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 13	692	CDMA BC0	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	777	-	23.6	24.5	0.04	1.03	1.267	1.230	**1.4**
	700	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	161	6Mbps	14.92	14.92	-0.02	0.351	0.351	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	

Case NO.	Plot No.	Band	Mode	Test Position	Keypad	Camera	Ch.	Data Rate	Average Power (dBm)	Tune-Up Limit (dBm)	Power Drift (dB)	Measured SAR 1g (W/kg)	Reported SAR 1g (W/kg)	Tune-up Scaling Factor	Multi Band Reported SAR 1g (W/kg)
Case 14	694	CDMA BC1	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	600	-	23.5	24.5	-0.05	1.08	1.360	1.259	**1.42**
	700	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	161	6Mbps	14.92	14.92	-0.02	0.351	0.351	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 15	695	CDMA BC1	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	1175	-	23.61	24.5	0.13	1.08	1.326	1.227	**1.39**
	700	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	161	6Mbps	14.92	14.92	-0.02	0.351	0.351	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	
Case 16	696	CDMA BC1	1xRTT RC3 SO55	Right Tilted	Keypad1	Camera2	25	-	23.67	24.5	0.07	0.998	1.208	1.211	**1.27**
	700	WLAN5GHz	802.11a	Right Tilted	Keypad1	Camera2	161	6Mbps	14.92	14.92	-0.02	0.351	0.351	1.000	
	701	Bluetooth	DH5	Right Tilted	Keypad1	Camera2	78	-	2.46	2.46	0.16	0.00364	0.004	1.000	

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13. Uncertainty Assessment

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in Table 13.1

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[(a)]	1/k[(b)]	1/√3	1/√6	1/√2

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Table 13.1 Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.0	Normal	1	1	1	± 6.0 %	± 6.0 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.4	Rectangular	√3	1	1	± 0.2 %	± 0.2 %
Probe Positioning	2.9	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Max. SAR Eval.	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 11.0 %	± 10.8 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						**± 22.0 %**	**± 21.5 %**

Table 13.2 Uncertainty Budget for frequency range 300 MHz to 3 GHz according to IEEE 1528-2003

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.55	Normal	1	1	1	± 6.55 %	± 6.55 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	2.0	Rectangular	√3	1	1	± 1.2 %	± 1.2 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Probe Positioning	9.9	Rectangular	√3	1	1	± 5.7 %	± 5.7 %
Max. SAR Eval.	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 12.8 %	± 12.6 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						**± 25.6 %**	**± 25.2 %**

Table 13.3 Uncertainty Budget for frequency range 3 GHz to 6 GHz according to Dasy5 user manual

14. References

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[3] IEEE Std. 1528-2003, “Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, December 2003

[4] FCC OET Bulletin 65 (Edition 97-01) Supplement C (Edition 01-01), “Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields”, June 2001

[5] SPEAG DASY System Handbook

[6] FCC KDB 248227 D01 v01r02, “SAR Measurement Procedures for 802.11 a/b/g Transmitters”, May 2007

[7] FCC KDB 447498 D01 v05, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, October 2012

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[10] FCC KDB 941225 D03 v01, “Recommended SAR Test Reduction Procedures for GSM / GPRS / EDGE”, December 2008