ANSI/IEEE Std. C95.1-1992

in accordance with the requirements of
FCC Report and Order: ET Docket 93-62, and OET Bulletin 65 Supplement C

FCC TEST REPORT

For

Mobile Phone

Trade Name: BAP

Model: Forge series

Issued to
BAP Precision Ltd.
1F., No. 5, Ln. 147, Chengzhang 1st St., Zhongli City,
Taoyuan County 320, Taiwan, R.O.C.
Issued by

Compliance Certification Services Inc.
No.11, Wu-Gong 6th Rd., Wugu Industrial Park,
New Taipei City 248, Taiwan (R.O.C.)
http://www.ccsrf.com.tw
service@ccsrf.com
Issued Date: August 14,2012

Testing Laboratory
1309

Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		2012/8/14		Initial Issue	ALL	Dabby

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1. CERTIFICATE OF COMPLIANCE (SAR EVALUATION)

Applicant: BAP Precision Ltd.
1F., No. 5, Ln. 147, Chengzhang 1st St.,
Zhongli City, Taoyuan County 320, Taiwan, R.O.C.

Equipment Under Test: Mobile Phone

Trade Name: BAP

Model Number: Forge series

Date of Test: August 1~August 8,2012

Device Category: PORTABLE DEVICES

Exposure Category: GENERAL POPULATION/UNCONTROLLED EXPOSURE

APPLICABLE STANDARDS	
STANDARD	
FCC	FCC OET 65 Supplement C IEEE 1528 KDB 648474 KDB 248227
Deviation from Applicable Standard	
None	
TEST RESULT	
No non-compliance noted	
The device was tested by Compliance Certification Services Inc. in accordance with the measurement methods and procedures specified in OET Bulletin 65 Supplement C (Edition 01-01). The test results in this report apply only to the tested sample of the stated device/equipment. Other similar device/equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.	

Approved by:

Alex Wu
Section Manager
Compliance Certification Services Inc.

Tested by:

Anson Lu
Test Engineer
Compliance Certification Services Inc.

2. EUT DESCRIPTION

<table>
<tr><td>Product</td><td colspan="2">Mobile Phone</td></tr>
<tr><td>Trade Name</td><td colspan="2">BAP</td></tr>
<tr><td>Model Number</td><td colspan="2">Forge series</td></tr>
<tr><td>Model Discrepancy</td><td colspan="2">All the above models are identical except the model designation.</td></tr>
<tr><td>Received Date</td><td colspan="2">Augus17,2012t</td></tr>
<tr><td>Frequency Range</td><td colspan="2">GPRS/EGPRS 850: 824 MHz to 849 MHz
GPRS/EGPRS1900: 1850 MHz to 1910 MHz
WCDMA Band II: 1852.4 MHz to 1907.6 MHz
WCDMA Band IV: 1712.4 MHz to 1752.6 MHz
WCDMA Band V: 826.4 MHz to846.6 MHz
802.11b: 2412 ~ 2462 MHz / 802.11g: 2412 ~ 2462 MHz</td></tr>
<tr><td rowspan="2">Max. Output Power(Avg)</td><td>GPRS 850: 23.8 dBm
EGPRS850: 17.5dBm
WCDMA band V: 23.11 dBm</td><td>GPRS1900: 19.8 dBm
EGPRS1900: 15.6 dBm
WCDMA band II: 22.65 dBm
WCDMA band IV: 22.78 dBm</td></tr>
<tr><td colspan="2">802.11b: 14.83 dBm
802.11g: 12.33 dBm
Bluetooth: 0.84 bBm</td></tr>
<tr><td>Max. SAR (1g)</td><td colspan="2">GPRS 850:
Body: 0.483 W/kg (Rear Side position)
GPRS1900:
Body: 0.519 W/kg (Right Edge position)
WCDMA band V:
Body: 0.587 W/kg (Rear Side position)
WCDMA band II:
Body: 1.25 W/kg (Right Edge position)
WCDMA band IV:
Body: 0.587 W/kg (Rear Side position
802.11b: 0.285 W/kg (Left Edge position)
802.11g: SAR test is not required, please refer to page 33 .
Bluetooth: SAR test is not required, please refer to page 33</td></tr>
<tr><td>Modulation Technique</td><td colspan="2">GSM / WCDMA: TDMA
802.11b: Direct Sequence Spread Spectrum(DSSS)
802.11g: Orthogonal Frequency Division Multiplexing (OFDM)
Bluetooth: FHSS (GFSK)</td></tr>
<tr><td>Antenna Specification</td><td colspan="2">Antenna. Type:
GSM/WCDMA: PIFA antenna
WLAN: PIFA antenna
Bluetooth: PIFA antenna</td></tr>
<tr><td>Battery</td><td colspan="2">Brand: BAP
Model: Series Batt
Rating: 3.7V 400mAh</td></tr>
</table>

The sample selected for test was production product and was provided by manufacturer.

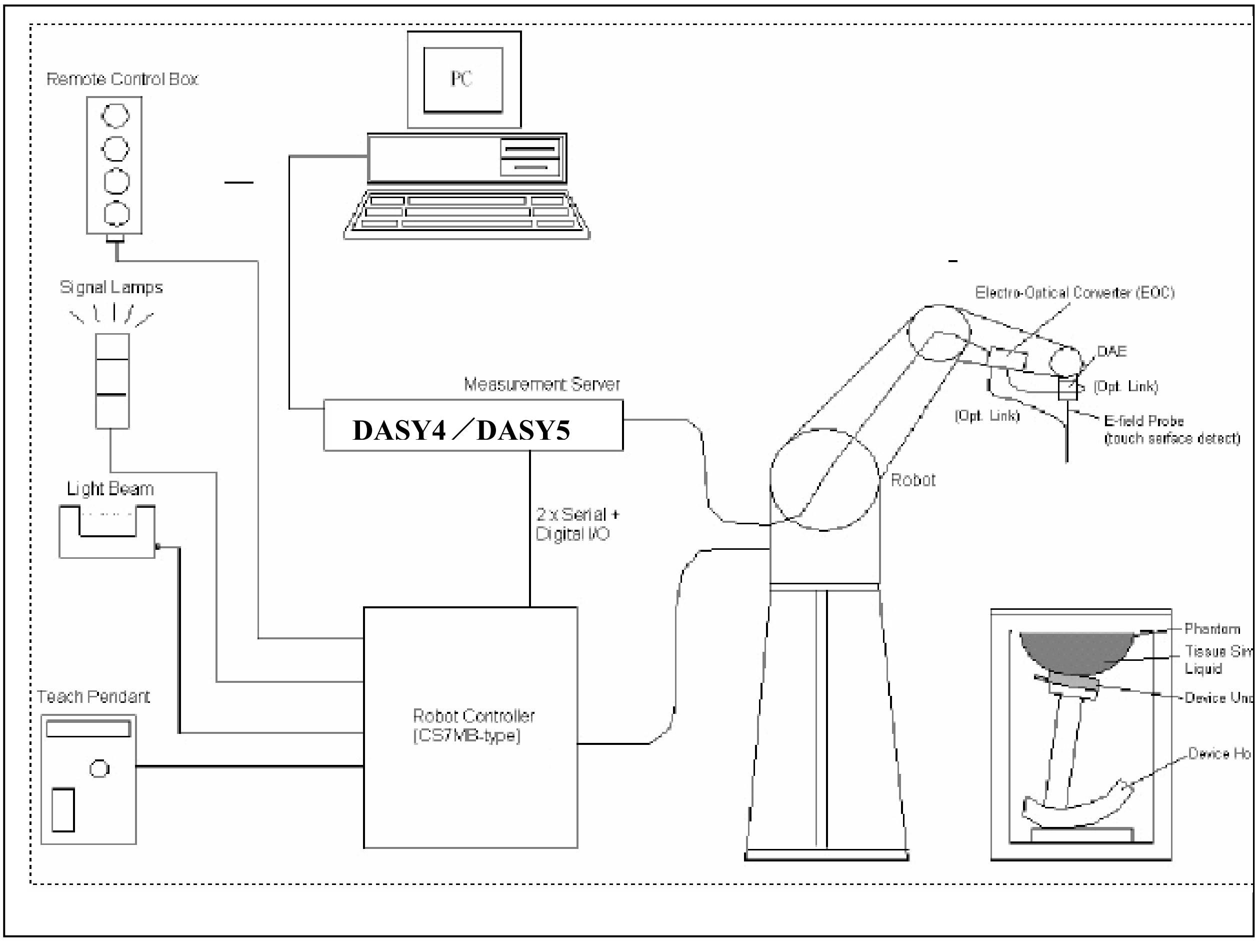
3. REQUIREMENTS FOR COMPLIANCE TESTING DEFINED BY THE FCC

The US Federal Communications Commission has released the report and order "Guidelines for Evaluating the Environmental Effects of RF Radiation", ET Docket No. 93-62 in August 1996. The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g for an uncontrolled environment and 8.0 mW/g for an occupational/controlled environment as recommended by the ANSI/IEEE standard C95.1-1992. According to the Supplement C of OET Bulletin 65 "Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under "worst-case" conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

4. DOSIMETRIC ASSESSMENT SETUP

These measurements were performed with the automated near-field scanning system DASY4/DASY5 from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9 m), which positions the probes with a positional repeatability of better than ± 0.02 mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines to the data acquisition unit. The SAR measurements were conducted with the dosimetric probe EX3DV4-SN:3665 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the procedure described in [7] with accuracy of better than ±10%. The spherical isotropy was evaluated with the procedure described in [8] and found to be better than ±0.25 dB. The phantom used was the SAM Twin Phantom as described in FCC supplement C, IEE P1528

4.1 MEASUREMENT SYSTEM DIAGRAM



The DASY4/DASY5 system for performing compliance tests consists of the following items:

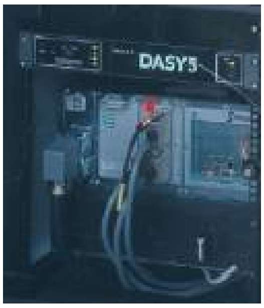
- A standard high precision 6-axis robot (St¨aubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- DASY4/DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing validating the proper functioning of the system.

4.2 SYSTEM COMPONENTS

DASY4/DASY5 Measurement Server

The DASY4/DASY5 measurement server is based on a PC/104 CPU board with a 166MHz low-power Pentium, 32MB chip disk and 64MB RAM. The necessary circuits for communication with either the DAE3 electronic box as well as the 16-bit AD-converter system for optical detection and digital I/O interface are contained on the DASY4/DASY5 I/O-board, which is directly connected to the PC/104 bus of the CPU board.

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



The PC-operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with two expansion slots which are reserved for future applications. Please note that the expansion slots do not have a standardized pinout and therefore only the expansion cards provided by SPEAG can be inserted. Expansion cards from any other supplier could seriously damage the measurement server. Calibration: No calibration required.

Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE3) 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 mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection. The input impedance of the DAE3 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

EX3DV4 Isotropic E-Field Probe for Dosimetric Measurements

Construction:	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration:	Basic Broad Band Calibration in air: 10-3000 MHz. Conversion Factors (CF) for HSL 900 and HSL 1800 CF-Calibration for other liquids and frequencies upon request.
Frequency:	10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Directivity:	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in HSL (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)
Distance from probe tip to dipole centers: 1 mm

Application: High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

Interior of probe

SAM Phantom (V4.0)

Construction: The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-200X, CENELEC 50361 and IEC 62209. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.

Shell Thickness: 2 ±0.2 mm

Filling Volume: Approx. 25 liters

Dimensions: Height: 810mm; Length: 1000mm; Width: 500mm

SAM Phantom (ELI4)
Description

Construction: Phantom 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 the latest draft of the standard IEC 62209 Part II and all known tissue simulating liquids. ELI4 has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is supported by software version DASY4/DASY5.5 and higher and is compatible with all SPEAG dosimetric probes and dipoles

Shell Thickness: 2.0 ± 0.2 mm (sagging: <1%)

Filling Volume: Approx. 25 liters
Dimensions: Major ellipse axis: 600 mm
Minor axis: 400 mm 500mm

Device Holder for SAM Twin Phantom

Construction: In combination with the Twin SAM Phantom V4.0 or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, and flat phantom).

System Validation Kits for SAM Phantom (V4.0)

Construction: Symmetrical dipole with l/4 balun Enables measurement of feedpoint impedance with NWA Matched for use near flat phantoms filled with brain simulating solutions Includes distance holder and tripod adaptor.

Frequency: 450, 900, 1800, 2450, 5800 MHz

Return loss: > 20 dB at specified validation position

Power capability: > 100 W (f < 1GHz); > 40 W (f > 1GHz)

Dimensions: D450V2: dipole length: 270 mm; overall height: 330 mm
D835V2: dipole length: 161 mm; overall height: 340 mm
D900V2: dipole length: 148.5 mm; overall height: 340 mm
D1800V2: dipole length: 72.5 mm; overall height: 300 mm
D1900V2: dipole length: 67.7 mm; overall height: 300 mm
D1900V3: dipole length: 67.0 mm; overall height: 300 mm
D2450V2: dipole length: 51.5 mm; overall height: 290 mm
D5GHzV2: dipole length: 20.6 mm; overall height: 300 mm

System Validation Kits for ELI4 phantom

Construction: Symmetrical dipole with l/4 balun Enables measurement of feedpoint impedance with NWA Matched for use near flat phantoms filled with brain simulating solutions Includes distance holder and tripod adaptor.

Frequency: 450, 900, 1800, 2450, 5800 MHz

Return loss: > 20 dB at specified validation position

Power capability: > 100 W (f < 1GHz); > 40 W (f > 1GHz)

Dimensions: D450V2: dipole length: 270 mm; overall height: 330 mm
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D1900V3: dipole length: 67.0 mm; overall height: 300 mm
D2450V2: dipole length: 51.5 mm; overall height: 290 mm
D5GHzV2: dipole length: 20.6 mm; overall height: 300 mm

5. EVALUATION PROCEDURES

DATA EVALUATION

The DASY4 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 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:

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

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: $$E_i = \sqrt{\frac{V_i}{Norm_i \bullet ConvF}}$$

H-field probes: $$H_i = \sqrt{Vi} \cdot \frac{a_{i10} + a_{i11} f + a_{i12} f^2}{f}$$

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 E0field Probes
$ConvF$ = Sensitivity enhancement in solution
aij = Sensor sensitivity factors for H-field probes
f = Carrier frequency (GHz)
Ei = Electric field strength of channel i in V/m
Hi = Magnetic field strength of channel i in A/m

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

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

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

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

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 normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid.

The power flow density is calculated assuming the excitation field as a free space field.

$$P_{pwe} = \frac{E_{tot}^{2}}{3770} \quad \text{or} \quad P_{pwe} = H_{tot}^{2} \cdot 37.7$$

with P_{pwe} = Equivalent power density of a plane wave in mW/cm^2
E_{tot} = total electric field strength in V/m
H_{tot} = total magnetic field strength in A/m

SAR EVALUATION PROCEDURES

The procedure for assessing the peak spatial-average SAR value consists of the following steps:

- **Power Reference Measurement**

  The reference and drift jobs are useful jobs for monitoring the power drift of the device under test in the batch process. Both jobs measure the field at a specified reference position, at a selectable distance from the phantom surface. The reference position can be either the selected section's grid reference point or a user point in this section. The reference job projects the selected point onto the phantom surface, orients the probe perpendicularly to the surface, and approaches the surface using the selected detection method.

- **Area Scan**

  The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a finer measurement around the hot spot. The sophisticated interpolation routines implemented in DASY4 software can find the maximum locations even in relatively coarse grids. The scan area is defined by an editable grid. This grid is anchored at the grid reference point of the selected section in the phantom. When the area scan's property sheet is brought-up, grid was at to 15 mm by 15 mm and can be edited by a user.

- **Zoom Scan**

  Zoom scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default zoom scan measures 7 x 7 x 9 points within a cube whose base faces are centered around the maximum found in a preceding area scan job within the same procedure. If the preceding Area Scan job indicates more then one maximum, the number of Zoom Scans has to be enlarged accordingly (The default number inserted is 1).

- **Power Drift measurement**

  The drift job measures the field at the same location as the most recent reference job within the same procedure, and with the same settings. The drift measurement gives the field difference in dB from the reading conducted within the last reference measurement. Several drift measurements are possible for one reference measurement. This allows a user to monitor the power drift of the device under test within a batch process. In the properties of the Drift job, the user can specify a limit for the drift and have DASY4 software stop the measurements if this limit is exceeded.

SPATIAL PEAK SAR EVALUATION

The procedure for spatial peak SAR evaluation has been implemented according to the IEEE1529 standard. It can be conducted for 1 g and 10 g.

The DASY4 system allows evaluations that combine measured data and robot positions, such as:

- maximum search
- extrapolation
- boundary correction
- peak search for averaged SAR

During a maximum search, global and local maximum searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard's method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation

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. Several measurements at different distances are necessary for the extrapolation.

Extrapolation routines require at least 10 measurement points in 3-D space. They are used in the Cube Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation. For a grid using 7x7x9 measurement points with 5mm resolution amounting to 441 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1 g and 10 g cubes.

Boundary effect

For measurements in the immediate vicinity of a phantom surface, the field coupling effects between the probe and the boundary influence the probe characteristics. Boundary effect errors of different dosimetric probe types have been analyzed by measurements and using a numerical probe model. As expected, both methods showed an enhanced sensitivity in the immediate vicinity of the boundary. The effect strongly depends on the probe dimensions and disappears with increasing distance from the boundary. The sensitivity can be approximately given as:

$$S \approx S_o + S_b exp(-\frac{z}{a})cos(\pi\frac{z}{\lambda})$$

Since the decay of the boundary effect dominates for small probes ($a<<\lambda$), the cos-term can be omitted. Factors *Sb* (parameter Alpha in the DASY4 software) and *a* (parameter Delta in the DASY4 software) are assessed during probe calibration and used for numerical compensation of the boundary effect. Several simulations and measurements have confirmed that the compensation is valid for different field and boundary configurations.

This simple compensation procedure can largely reduce the probe uncertainty near boundaries. It works well as long as:

- the boundary curvature is small
- the probe axis is angled less than 30_ to the boundary normal
- the distance between probe and boundary is larger than 25% of the probe diameter
- the probe is symmetric (all sensors have the same offset from the probe tip)

Since all of these requirements are fulfilled in a DASY4 system, the correction of the probe boundary effect in the vicinity of the phantom surface is performed in a fully automated manner via the measurement data extraction during postprocessing.

6. MEASUREMENT UNCERTAINTY

UNCERTAINTY BUDGE ACCORDING TO IEEE P1528						
Error Description	**Uncertainty Value ±%**	**Probability distribution**	**Divisor**	**C_1 1g**	**Standard unc.(1g/10g) ±%**	**V_1 or V_{eff}**
Measurement System						
Probe calibration	±4.8	normal	1	1	±4.8	∞
Axial isotropy of probe	±4.6	rectangular	√3	$(1\text{-Cp})^{1/2}$	±1.9	∞
Sph. Isotropy of probe	±9.7	rectangular	√3	$(\text{Cp})^{1/2}$	±3.9	∞
Probe linearity	±4.5	rectangular	√3	1	±2.7	∞
Detection Limit	±0.9	rectangular	√3	1	±0.6	∞
Boundary effects	±8.5	rectangular	√3	1	±4.8	∞
Readoutelectronics	±1.0	normal	1	1	±1.0	∞
Response time	±0.9	rectangular	√3	1	±0.5	∞
Integration time	±1.2	rectangular	√3	1	±0.8	∞
Mech Constrains of robot	±0.5	rectangular	√3	1	±0.2	∞
Probe positioning	±2.7	rectangular	√3	1	±1.7	∞
Extrap. And integration	±4.0	rectangular	√3	1	±2.3	∞
RF ambient conditiona	±0.54	rectangular	√3	1	±0.43	∞
Test Sample Related						
Device positioning	±2.2	normal	1	1	±2.23	11
Device holder uncertainty	±5	normal	1	1	±5.0	7
Power drift	±5	rectangular	√3	1	±2.9	∞
Phantom and Set up						
Phantom uncertainty	±4	rectangular	√3	1	±2.3	∞
Liquid conductivity	±5	rectangular	√3	0.6	±1.7	∞
Liquid conductivity	±5	rectangular	√3	0.6	±3.5/1.7	∞
Liquid permittivity	±5	rectangular	√3	0.6	±1.7	∞
Liquid permittivity	±5	rectangular	√3	0.6	±1.7	∞
Combined Standard Uncertainty					±12.14/11.76	
Coverage Factor for 95%		kp=2				
Expanded Standard Uncertainty					±24.29/23.51	

Table: Worst-case uncertainty for DASY4 assessed according to IEEE P1528.
The budge is valid for the frequency range 300 MHz to 6G Hz and represents a worst-case analysis.

7. EXPOSURE LIMIT

(A).Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	2.0

(B).Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

NOTE: ***Whole-Body SAR*** is averaged over the entire body, ***partial-body SAR*** is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. ***SAR for hands, wrists, feet and ankles*** is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

Population/Uncontrolled Environments:

are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Occupational/Controlled Environments:

are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

NOTE
GENERAL POPULATION/UNCONTROLLED EXPOSURE
PARTIAL BODY LIMIT
1.6 W/kg

8. TYPICAL COMPOSITION OF INGREDIENTS FOR LIQUID TISSUE PHANTOMS

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

Ingredients (% by weight)	*Frequency (MHz)*				
	450	*835*	*915*	*1900*	*2450*
Tissue Type	*Body*	*Body*	*Body*	*Body*	*Body*
Water	***51.16***	***52.4***	***56.0***	***40.4***	***73.2***
Salt (NaCl)	***1.49***	***1.4***	***0.76***	***0.5***	***0.04***
Sugar	***46.78***	***45.0***	***41.76***	***58.0***	***0.0***
HEC	***0.52***	***1.0***	***1.21***	***1.0***	***0.0***
Bactericide	***0.05***	***0.1***	***0.27***	***0.1***	***0.0***
Triton X-100	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
DGBE	***0.0***	***0.0***	***0.0***	***0.0***	***26.7***
Dielectric Constant	***58.0***	***56.1***	***56.8***	***54.0***	***52.5***
Conductivity (S/m)	***0.83***	***0.95***	***1.07***	***1.45***	***1.78***

Salt: 99^{+}% Pure Sodium Chloride   Sugar: 98^{+}% Pure Sucrose
Water: De-ionized, 16 $M\Omega^{+}$ resistivity   HEC: Hydroxyethyl Cellulose
DGBE: 99^{+}% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1, 1, 3, 3-tetramethylbutyl)phenyl]ether

Simulating Liquids for 5 GHz, Manufactured by SPEAG:

Ingredients	(% by weight)
Water	60-80
Esters,Emulsifiers,Inhibitors	20-40
Sodium and Salt	0-1.5

9. MEASUREMENT RESULTS

9.1 TEST LIQUIDS CONFIRMATION

SIMULATING LIQUIDS PARAMETER CHECK

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectric parameters are within the tolerances of the specified target values

The relative permittivity and conductivity of the tissue material should be within ± 5% of the values given in the table below. 5% may not be easily achieved at certain frequencies. Under such circumstances, 10% tolerance may be used until more precise tissue recipes are available

IEEE SCC-34/SC-2 P1528 RECOMMENDED TISSUE DIELECTRIC PARAMETERS

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

Target Frequency (MHz)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800-2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	45.3	5.27	48.2	6.00

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

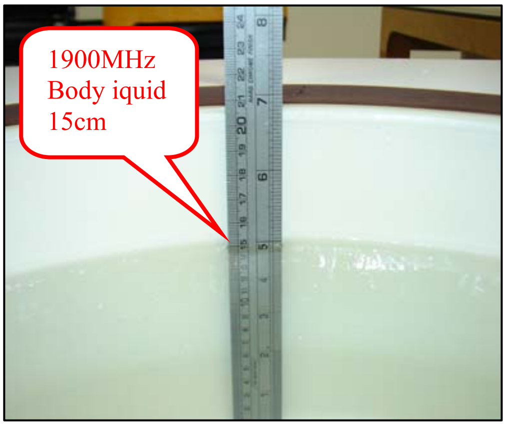
LIQUID MEASUREMENT RESULTS

Date: July 28, 2012 **Ambient condition:** Temperature 24.2 °C; Relative humidity: 55 %

Head Simulatinf Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]	Depth [cm]					
824.2 MHz	23.20	15.00	Permitivity:	55.24	54.47	-1.39	±5
			Conductivity:	0.97	0.940	-3.09	± 5
835 MHz	23.20	15.00	Permitivity:	55.2	54.03	-2.12	±5
			Conductivity:	0.97	0.940	-3.09	± 5
836.6 MHz	23.20	15.00	Permitivity:	55.2	54.05	-2.08	±5
			Conductivity:	0.97	0.940	-3.09	± 5
848.8 MHz	23.20	15.00	Permitivity:	55.16	53.89	-2.30	±5
			Conductivity:	0.99	0.950	-4.04	± 5

Date: July 28, 2012 **Ambient condition:** Temperature 24.2 °C; Relative humidity: 55 %

Head Simulating Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]	Depth (cm)					
1850.2 MHz	23.20	15.00	Permitivity:	53.30	53.31	0.02	± 5
			Conductivity:	1.52	1.52	0.00	± 5
1880 MHz	23.20	15.00	Permitivity:	53.30	53.25	-0.09	± 5
			Conductivity:	1.52	1.55	1.97	± 5
1900 MHz	23.20	15.00	Permitivity:	53.30	53.19	-0.21	± 5
			Conductivity:	1.52	1.56	2.63	± 5
1909.8 MHz	23.20	15.00	Permitivity:	53.30	53.17	-0.24	± 5
			Conductivity:	1.52	1.57	3.29	± 5

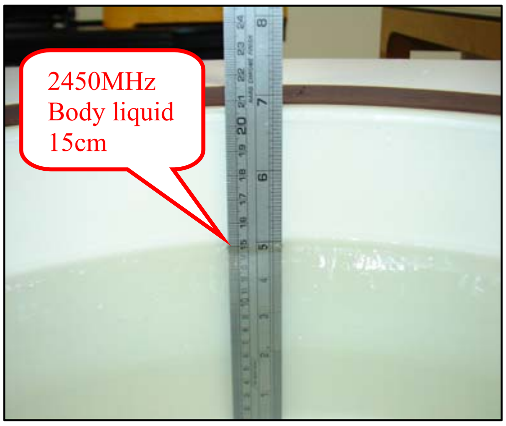


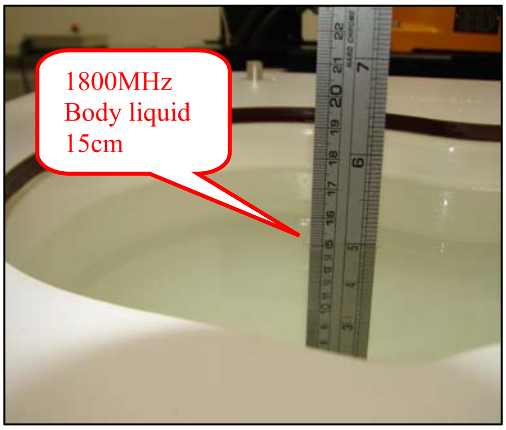
Date: August 13, 2012 **Ambient condition:** Temperature 24.2 °C; Relative humidity: 55 %

Head Simulating Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
f (MHz)	Temp. [°C]	Depth (cm)					
2412 MHz	23.20	15.00	Permitivity:	52.75	51.93	-1.55	± 5
			Conductivity:	1.94	1.92	-1.03	± 5
2437 MHz	23.20	15.00	Permitivity:	52.72	51.86	-1.63	± 5
			Conductivity:	1.94	1.95	0.52	± 5
2450 MHz	23.20	15.00	Permitivity:	52.70	51.83	-1.65	± 5
			Conductivity:	1.95	1.96	0.51	± 5
2462 MHz	23.20	15.00	Permitivity:	52.68	51.77	-1.73	± 5
			Conductivity:	1.97	1.97	0.00	± 5

Date: August 11, 2012 **Ambient condition:** Temperature 24.2 °C; Relative humidity: 55 %

Body Simulating Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
f (MHz)	Temp. [°C]	Depth (cm)					
1710 MHz	23.20	15.00	Permitivity:	53.53	53.31	-0.41	± 5
			Conductivity:	1.46	1.52	4.11	± 5
1750 MHz	23.20	15.00	Permitivity:	52.90	53.45	1.04	± 5
			Conductivity:	1.46	1.50	2.74	± 5
1784 MHz	23.20	15.00	Permitivity:	53.34	53.19	-0.28	± 5
			Conductivity:	1.51	1.56	3.31	± 5
2462 MHz	23.20	15.00	Permitivity:	53.30	53.17	-0.24	± 5
			Conductivity:	1.52	1.57	3.29	± 5





9.2 SYSTEM PERFORMANCE CHECK

The system performance check is performed prior to any usage of the system in order to guarantee reproducible results. The system performance check verifies that the system operates within its specifications of ±10%. The system performance check results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

IEEE P1528 Recommended Reference Value

Frequency (MHz)	1 g SAR	10 g SAR	Local SAR at surface (Above feed point)	Local SAR at surface (y=2cm offset from feed point)
300	3.0	2.0	4.4	2.1
450	4.9	3.3	7.2	3.2
835	9.5	6.2	14.1	4.9
900	10.8	6.9	16.4	5.4
1450	29.0	16.0	50.2	6.5
1800	38.1	19.8	69.5	6.8
1900	38.8	20.4	67.6	6.6
2000	41.1	21.1	74.6	6.5
2450	52.4	24.0	104.2	7.7
3000	63.8	25.7	140.2	9.5

SYSTEM PERFORMANCE CHECK MEASUREMENT CONDITIONS

- The measurements were performed in the flat section of the SAM twin phantom filled with Bodysimulating liquid of the following parameters.
- The DASY4 system with EX3DV4-SN3665 was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15 mm (below 1 GHz) and 10 mm (above 1 GHz) from dipole center to the simulating liquid surface.
- The dipole input power (forward power) was 250 mW.
- The 1g and 10 g spatial average SAR values normalized to 1 W dipole input power give reference data for comparisons and it’s equal to 4x(dipole forward power).

SYSTEM PERFORMANCE CHECK RESULTS

Dipole: D835V2-SN4d015

Date: July 28, 2012 **Ambient condition:** Temperature 24.2°C; Relative humidity: 55%

Head Simulatinf Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]	Depth [cm]					
835 MHz	23.20	15.00	Permitivity:	55.20	54.03	-2.12	±5
			Conductivity:	0.97	0.94	-3.09	± 5
			1g SAR:	9.53	9.72	1.99	± 5

ps. 1g SAR is equal 4x2.43 (250mW forward power SAR value)

Dipole: D1900V2 SN: 5d056

Date: July 28, 2012 **Ambient condition:** Temperature 24.2°C; Relative humidity: 55%

Head Simulatinf Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]	Depth [cm]					
1900.00	23.20	15.00	Permitivity:	53.30	53.19	-0.21	±5
			Conductivity:	1.52	1.56	2.63	± 5
			1g SAR:	38.30	37.60	-1.83	± 5

ps. 1g SAR is equal 4x 9.4 (250mW forward power SAR value)

Dipole: D2450V2 SN: 728

Date: August 13, 2012 **Ambient condition:** Temperature 24.2°C; Relative humidity: 55%

Head Simulating Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
f(MHz)	Temp. [°C]	Depth [cm]					
2450.00	23.20	15.00	Permitivity:	52.70	51.83	-1.65	± 5
			Conductivity:	1.95	1.96	0.51	± 5
			1g SAR:	51.20	53.20	3.91	± 5

ps. 1g SAR is equal 4x13.3(250mW forward power SAR value)

Dipole: D1750 SN:1008

Date: August 11, 2012 **Ambient condition:** Temperature 24.2°C; Relative humidity: 55%

Body Simulating Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
f(MHz)	Temp. [°C]	Depth [cm]					
1750.00	23.20	15.00	Permitivity:	52.90	53.45	1.04	± 5
			Conductivity:	1.46	1.50	2.74	± 5
			1g SAR:	36.50	38.12	4.44	± 5

ps. 1g SAR is equal 4x9.53(250mW forward power SAR value)

9.3 EUT TUNE-UP PROCEDURES

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

- The client supplied a special driver to program the EUT, allowing it to continually transmit the specified maximum power and change the channel frequency.
- The output power(dBm) we measured before SAR test in different channel
- Performing the highest output power channel first.
- If the SAR measured on the highest output channel is < 50% of the SAR limit, SAR evaluation for the other required channels is unnecessary.

- To setup the desire channel frequency and the maximum output power. A Radio Communication Tester "Agilent 8960 series 10" and "ROHDE SCHWARZ CMU-200" was used to program the EUT.

GPRS850
Network Support: *GPRS/EDGE*
Main Service: Packet data
Power Setting: *33dBm/27dBm*
Class: 10 (2 Up / 1 Down)

GPRS1900
Network Support: *GPRS/EDGE*
Main Service: Packet data
Power Setting: *30dBm/26dBm*
Class: 10 (2 Up / 1 Down)

Antenna transmit mode:

operation mode	Chain 0	operation mode	Chain 0
802.11b	O	802.11g	O

GPRS835/1900 Conducted Output Power(Time average, dBm):

mode / power / channel		GPRS mode	GPRS mode
		1 Slot	2 Slot
GPRS 850	Ch 128	23.8	23.6
	Ch 190	23.6	23.7
	Ch 251	23.5	23.6
mode / power / channel		GPRS mode	GPRS mode
		1 Slot	2 Slot
GPRS 1900	Ch 512	19.8	19.7
	Ch 661	19.2	19.2
	Ch 810	19.7	19.8

mode / power / channel		EGPRS mode	EGPRS mode
		1 Slot	2 Slot
EGPRS 850	Ch 128	17.5	17.5
	Ch 190	17.5	17.3
	Ch 251	17.5	17.3
mode / power / channel		EGPRS mode	EGPRS mode
		1 Slot	2 Slot
EGPRS 1900	Ch 512	15.6	15.5
	Ch 661	15.4	15.2
	Ch 810	15.4	15.2

RF POWER OUTPUT FOR UMTS REL99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.5.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7) 12.2kps RMC is used for this testing. Power control set to All bits up. A summary of these settings are illustrated below:

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

REL 99

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
				Average
UMTS850 (Band V)	4132	4357	826.4	22.94
	4182	4407	836.4	23.11
	4233	4458	846.6	22.91
UMTS1900 (Band II)	9262	9662	1852.4	22.65
	9400	9800	1880.0	22.28
	9538	9938	1907.6	22.48
UMTS1800 (Band IV)	1312	1517	1712.4	22.78
	1413	1638	1732.6	22.65
	1513	1738	1752.6	22.52

RF POWER OUTPUT FOR UMTS Rel 5 HSDPA

The following Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.5.0 specification. All TX RMS and Peak power requirements for Power Class 3 were met according to table 5.2AA.5 and achieved through the outlined test procedure in section 5.2AA.4.2. A summary of these settings are illustrated below:

	Mode	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	HSUPA Test	Not Applicable			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βec	-	-	-	-
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	βed	Not Applicable			
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs = βhs/βc	30/15			

Result

REL 5 HSDPA only

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm) Average
UMTS850 (Band V)	1	2712	8762	882.4	22.60
		2788	8838	897.6	21.89
		2863	8912	912.6	22.84
	2	2712	8762	882.4	22.54
		2788	8838	897.6	22.84
		2863	8912	912.6	22.71
	3	2712	8762	882.4	22.41
		2788	8838	897.6	22.62
		2863	8912	912.6	22.58
	4	2712	8762	882.4	22.53
		2788	8838	897.6	22.12
		2863	8912	912.6	22.56
UMTS1900 (Band II)	1	9262	9662	1852.4	22.58
		9400	9800	1880.0	21.89
		9538	9938	1907.6	22.56
	2	9262	9662	1852.4	22.54
		9400	9800	1880.0	22.84
		9538	9938	1907.6	21.95
	3	9262	9662	1852.4	22.01
		9400	9800	1880.0	22.62
		9538	9938	1907.6	22.58
	4	9262	9662	1852.4	22.53
		9400	9800	1880.0	22.12
		9538	9938	1907.6	22.56

UMTS1800 (Band IV)	1	1312	1517	1712.4	22.59
		1413	1638	1732.6	21.88
		1513	1738	1752.6	22.83
	2	1312	1517	1712.4	22.53
		1413	1638	1732.6	22.83
		1513	1738	1752.6	22.72
	3	1312	1517	1712.4	22.40
		1413	1638	1732.6	22.61
		1513	1738	1752.6	22.57
	4	1312	1517	1712.4	22.53
		1413	1638	1732.6	22.13
		1513	1738	1752.6	22.55

RF POWER OUTPUT UMTS REL 6 HSPA (HSDPA & HSUPA)

The following 5 Sub-Tests were completed according to the test requirements outlined in section 5.2B of the 3GPP TS34.121-1 V8.7.0 specification. All TX RMS and Peak power requirements were met according to table 5.2B.5 and achieved through the outlined test procedure in section 5.2B.4.2. A summary of these settings are illustrated below:

	Mode	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	15/15
	β_{ec}	209/225	12/15	30/15	2/15	24/15
	β_c/β_d	11/15	6/15	15/9	2/15	15/15
	β_{hs}	22/15	12/15	30/15	4/15	30/15
	β_{ed}	1309/225	94/75	47/15 47/15	56/75	134/15
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	$Ahs = \beta_{hs}/\beta_c$	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

Result

REL 6 HSPA (HSDPA & HSUPA)

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
					Average
UMTS850 (Band V)	1	2712	8762	882.4	22.70
		2788	8838	897.6	22.59
		2863	8912	912.6	22.54
	2	2712	8762	882.4	20.45
		2788	8838	897.6	20.85
		2863	8912	912.6	20.56
	3	2712	8762	882.4	21.41
		2788	8838	897.6	21.78
		2863	8912	912.6	21.46
	4	2712	8762	882.4	20.59
		2788	8838	897.6	20.11
		2863	8912	912.6	20.16
	5	2712	8762	882.4	22.59
		2788	8838	897.6	22.54
		2863	8912	912.6	22.68
UMTS1900 (Band II)	1	9262	9662	1852.4	23.37
		9400	9800	1880.0	23.42
		9538	9938	1907.6	23.40
	2	9262	9662	1852.4	21.35
		9400	9800	1880.0	21.43
		9538	9938	1907.6	21.51
	3	9262	9662	1852.4	22.21
		9400	9800	1880.0	22.78
		9538	9938	1907.6	22.46
	4	9262	9662	1852.4	21.52
		9400	9800	1880.0	21.11
		9538	9938	1907.6	21.16
	5	9262	9662	1852.4	23.59
		9400	9800	1880.0	23.54
		9538	9938	1907.6	23.68

UMTS1800 (Band IV)	1	1312	1517	1712.4	22.69
		1413	1638	1732.6	22.57
		1513	1738	1752.6	22.53
	2	1312	1517	1712.4	20.46
		1413	1638	1732.6	20.86
		1513	1738	1752.6	20.55
	3	1312	1517	1712.4	21.40
		1413	1638	1732.6	21.76
		1513	1738	1752.6	21.45
	4	1312	1517	1712.4	20.57
		1413	1638	1732.6	20.10
		1513	1738	1752.6	20.16
	5	1312	1517	1712.4	22.60
		1413	1638	1732.6	22.55
		1513	1738	1752.6	22.67

HSPA+ Conducted Output Power(average, dBm):)

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
					Average
UMTS850 (Band V)	1	2712	8762	882.4	22.39
		2788	8838	897.6	22.37
		2863	8912	912.6	22.38
	2	2712	8762	882.4	20.57
		2788	8838	897.6	20.49
		2863	8912	912.6	20.52
	3	2712	8762	882.4	21.51
		2788	8838	897.6	21.51
		2863	8912	912.6	21.50
	4	2712	8762	882.4	20.50
		2788	8838	897.6	20.51
		2863	8912	912.6	20.50
	5	2712	8762	882.4	22.33
		2788	8838	897.6	22.31
		2863	8912	912.6	22.32
UMTS1900 (Band II)	1	9262	9662	1852.4	22.28
		9400	9800	1880.0	22.03
		9538	9938	1907.6	22.28
	2	9262	9662	1852.4	20.40
		9400	9800	1880.0	20.17
		9538	9938	1907.6	20.40
	3	9262	9662	1852.4	21.40
		9400	9800	1880.0	21.14
		9538	9938	1907.6	21.43
	4	9262	9662	1852.4	20.38
		9400	9800	1880.0	20.16
		9538	9938	1907.6	20.32
	5	9262	9662	1852.4	22.26
		9400	9800	1880.0	22.01
		9538	9938	1907.6	22.23

UMTS1800 (Band IV)	1	1312	1517	1712.4	22.52
		1413	1638	1732.6	22.48
		1513	1738	1752.6	22.45
	2	1312	1517	1712.4	22.52
		1413	1638	1732.6	22.48
		1513	1738	1752.6	22.45
	3	1312	1517	1712.4	20.54
		1413	1638	1732.6	20.49
		1513	1738	1752.6	20.50
	4	1312	1517	1712.4	21.63
		1413	1638	1732.6	21.63
		1513	1738	1752.6	21.57
	5	1312	1517	1712.4	20.53
		1413	1638	1732.6	20.55
		1513	1738	1752.6	20.51

802.11b Conducted Output Power(average, dBm):

Mode / Frequency (MHz)	802.11b 1M chain 0
2412	14.69
2437	14.83
2462	14.7

802.11g Conducted Output Power(average, dBm):

Mode / Frequency (MHz)	802.11g 6M chain 0
2412	11.62
2437	11.87
2462	12.33

:

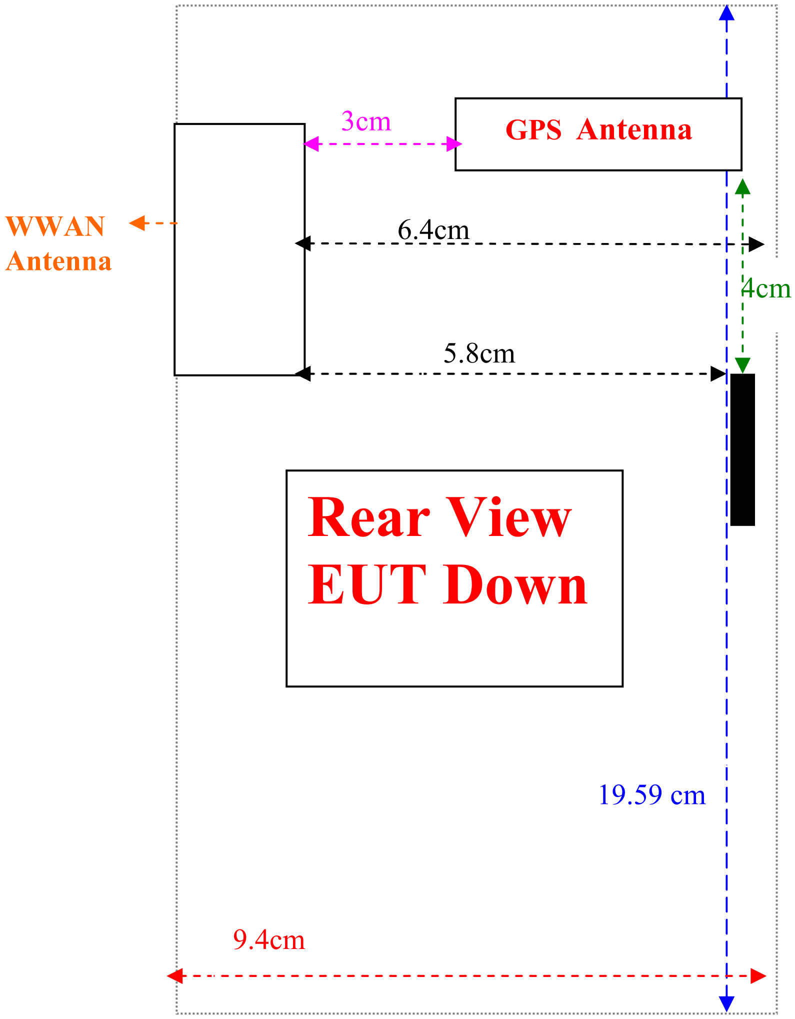
Ps. KDB 248227 - SAR is not required for 802.11g channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.

Bluetooth Conducted Output Power(average, dBm):

Mode / Frequency (MHz)	DH5	3DH5
2402	0.36	-4.09
2441	0.84	-3.24
2408	0.53	-3.55

Ps. *(1) Bluetooth maximum output power 0.84dBm(1.213mW) is less than 24.580mW(60/f), so Bluetooth SAR testing is not required.*

Antenna Location



KDB 648474 simultaneous SAR evaluation:

	GPRS 850 body
GPRS SAR(worst)	0.483
802.11b SAR(worst)	0.285
Σ1g-SAR(worst)	*0.768*
remark	Less than 1.6W/kg(limit)

	GPRS 1900 body
GPRS 1900 SAR(worst)	0.519
802.11b SAR(worst)	0.285
Σ1g-SAR(worst)	*0.804*
remark	Less than 1.6W/kg(limit)

	WCDMA band V body	***WCDMA band II body***	***WCDMA band IV body***
WCDMA SAR(worst)	0.587	1.25	1.06
802.11b SAR(worst)	0.285	0.285	0.285
Σ1g-SAR(worst)	*0.872*	*1.535*	*1.345*
remark	Less than 1.6W/kg(limit)	Less than 1.6W/kg(limit)	Less than 1.6W/kg(limit)

Antenna Location

antenna1	***antenna2***	***distance(mm)***	***distance(cm)***	***remark***
GSM/WCDMA	WLAN	58	5.8	*Please refer to pag 34*
GSM/WCDMA	GPS	30	3	*Please refer to page 34*
GPS	WLAN	40	4	*Please refer to page 34*

device, mode, f	***P, dBm***	***P, mW***	***stand-alone SAR(W/kg)***
T1, GPRS/WCDMA, 850/1900	*Please refer to page 24~32*		***Yes**, Please refer to page 36~37*
T2, WLAN, 802.11b	14.83	30.41	***Yes**, Please refer to page 38*
T2, WLAN, 802.11g	12.33	*17.10*	***No**, Please refer to page 33*
T2, Bluetooth, 2441	0.84	*1.21*	***No**, Please refer to page 33*

(x,y)	***d_{xy}, cm***	***simultaneous Tx SAR***	***remarks***
(1,2)	*5.8*	***NO***	*$d_{xy} > 5cm$ the Sum of all 1-g SAR < 1.6 W/kg, please refer to page 36~38*

9.4 SAR MEASUREMENT RESULTS

Body position

Test mode: **GPRS 850**, Duty Cycle: 12.5%, Crest Factor: 8 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Front Side	Fixed	190	836.6	23.2	0.102	
Rear Side	Fixed	190	836.6	23.2	0.483	
Left Edge	Fixed	190	836.6	23.2	0.036	1.6
Right Edge	Fixed	190	836.6	23.2	0.127	
Tip Edge	Fixed	190	836.6	23.2	0.183	

Test mode: **GPRS 1900**, Duty Cycle: 12.5%, Crest Factor: 8 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Front Side	Fixed	661	1880	23.2	0.29	
Rear Side	Fixed	661	1880	23.2	0.403	
Left Edge	Fixed	661	1880	23.2	103	1.6
Right Edge	Fixed	661	1880	23.2	0.519	
Tip Edge	Fixed	661	1880	23.2	0.462	

Test mode: **WCDMA Band V**, Duty Cycle: 100%, Crest Factor: 1 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Front Side	Fixed	4183	826.4	23.2	0.132	
Rear Side	Fixed	4183	826.4	23.2	0.587	
Left Edge	Fixed	4183	826.4	23.2	0.042	1.6
Right Edge	Fixed	4183	826.4	23.2	0.139	
Tip Edge	Fixed	4183	826.4	23.2	0.173	

Notes: 1. Front panel / Bottom face in parallel with flat phantom
2. Please refer to attachment for the result presentation in plot format.

Body position

Test mode: **WCDMA Band II**, Duty Cycle: 100%, Crest Factor: 1						Depth of liquid: 15.0 cm
EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Front Side	Fixed	9400	1880	23.2	0.76	1.6
Rear Side	Fixed	9400	1880	23.2	1.08	
Rear Side	Fixed	9262	1852.4	23.2	1.06	
Rear Side	Fixed	9538	1907.6	23.2	1.1	
Left Edge	Fixed	9400	1880	23.2	0.315	
Right Edge	Fixed	9400	1880	23.2	1.27	
Right Edge	Fixed	9262	1852.4	23.2	1.25	
Right Edge	Fixed	9538	1907.6	23.2	1.2	
Tip Edge	Fixed	9400	1880	23.2	1.14	
Tip Edge	Fixed	9262	1852.4	23.2	1.2	
Tip Edge	Fixed	9538	1907.6	23.2	1.18	
Test mode: **WCDMA Band IV** Duty Cycle: 100%, Crest Factor: 1						Depth of liquid: 15.0 cm
EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Front Side	Fixed	1413	1732.6	23.2	0.435	1.6
Rear Side	Fixed	1413	1732.6	23.2	1.05	
Left Edge	Fixed	1413	1732.6	23.2	0.062	
Tip Edge	Fixed	1413	1732.6	23.2	0.226	
Rear Side	Fixed	1312	1732.6	23.2	0.78	
Rear Side	Fixed	1513	1732.6	23.2	1.06	

Notes: 1. Front panel / Bottom face in parallel with flat phantom
2. Please refer to attachment for the result presentation in plot format.

Body position

Test mode: **802.11b**, Duty Cycle: 100%, Crest Factor: 1						Depth of liquid: 15.0 cm
EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Front Side	Fixed	6	2437	23.2	0.124	1.6
Rear Side	Fixed	6	2437	23.2	0.016	
Left Edge	Fixed	6	2437	23.2	0.285	
Right Edge	Fixed	6	2437	23.2	0.0011	
Tip Edge	Fixed	6	2437	23.2	0.034	

Notes: 1. Front panel / Bottom face in parallel with flat phantom
2. Please refer to attachment for the result presentation in plot format.

10. EQUIPMENT LIST & CALIBRATION STATUS

Name of Equipment	Manufacturer	Type/Model	Serial Number	Calibration Cycle(days)	Calibration Due
S-Parameter Network Analyzer	Agilent	E8358A	US40260243	365	07/14/2012
Electronic Probe kit	Hewlett Packard	85070D	N/A	N/A	N/A
Spectrum Analyzer	Agilent	E4446A	MY43360131	365	11/04/2012
Power Meter	Anritsu	ML2495A	1012009	365	03/27/2013
Power Sensor	Anritsu	MA2411B	0917072	365	03/08/2013
Data Acquisition Electronics (DAE)	SPEAG	DAE4	877	365	03/15/2013
Dosimetric E-Field Probe	SPEAG	EX3DV4	3554	365	09/28/2012
Dosimetric E-Field Probe	SPEAG	EX3DV4	3665	365	04/26/2013
835 MHz System Validation Dipole	SPEAG	D835V2	4d015	730	03/13/2013
1900 MHz System Validation Dipole	SPEAG	D1900V2	5d056	730	02/21/2013
2450 MHz System Validation Dipole	SPEAG	D2450V2	728	730	11/11/2012
D5GHz System Validation Dipole	SPEAG	D5GHzV2	1004	730	11/15/2012
Probe Alignment Unit	SPEAG	LB (V2)	348	N/A	N/A
Robot	Staubli	RX90B L	F02/5T69A1/A/01	N/A	N/A
SAM Twin Phantom V4.0	SPEAG	N/A	N/A	N/A	N/A
Devices Holder	SPEAG	N/A	N/A	N/A	N/A
Head/ Muscle 835 MHz	CCS	H/M 835A	N/A	N/A	N/A
Head/ Muscle 1900 MHz	CCS	H/M 1900A	N/A	N/A	N/A
Head/ Muscle 2450 MHz	CCS	H/M 2450A	N/A	N/A	N/A
Head/ Muscle 5800 MHz	CCS	H/M 5800A	N/A	N/A	N/A

11. FACILITIES

All measurement facilities used to collect the measurement data are located at

☐ No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.

☒ No.11, Wu-Gong 6th Rd., Wugu Industrial Park, New Taipei City 248, Taiwan (R.O.C.)

☐ No. 199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

12. REFERENCES

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13. ATTACHMENTS

Exhibit	Content
1	System Performance Check Plots
2	SAR Test Plots
3	Probe_EX3DV4_sn3554_20110929c
4	Dipole_D835V2_sn4d015_20120314c
5	Dipole_D1900v2_sn5d056_20120222c
6	Dipole_D1750v2_1008_20120529c
7	Dipole_D2450v2_sn728_20111122c
8	T120723D04-SF PHOTOs
9	Thermometer

END OF REPOR