ANSI/IEEE Std. C95.1-1992

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

FCC TEST REPORT

For

PR30 series HSPA+ WLAN Pocket Router

Trade Name: BandLuxe

Model: PR30

Issued to

BandRich Inc.
7F., No.188, Baociao Rd., Sindian City, Taipei County 23145, Taiwan (R.O.C.)

Issued by

Compliance Certification Services Inc.
No. 11, Wugong 6th Rd., Wugu Industrial Park,
Taipei Hsien 248, Taiwan.
http://www.ccsrf.com
service@ccsrf.com.

Testing Laboratory
1309

TABLE OF CONTENTS

1. CERTIFICATE OF COMPLIANCE (SAR EVALUATION)

Applicant:	BandRich Inc. 7F.,No.188, Baociao Rd., Sindian City, Taipei Country 23145, Taiwan, R.O.C.
Equipment Under Test:	PR30 series HSPA+ WLAN Pocket Router
Trade Name:	BandLuxe
Model Number:	PR30
Date of Test:	March 16 ~ March 20, 2011
Device Category:	PORTABLE DEVICES
Exposure Category:	GENERAL POPULATION/UNCONTROLLED EXPOSURE

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC OET 65 Supplement C	No non-compliance noted
Deviation from Applicable Standard	
None	

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:

Rex Lai
Section Manager
Compliance Certification Services Inc.

Tested by:

Anson Lu
Test Engineer
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	PR30 series HSPA+ WLAN Pocket Router
Trade Name	BandLuxe
Model Number	PR30
Model Discrepancy	N/A
Frequency Range	GSM / GPRS / EGPRS: 850: 824.2 ~ 848.8 MHz GSM / GPRS / EGPRS: 1900: 1850.2 ~ 1909.8 MHz WCDMA / HSDPA band V: 826.4 ~ 846.6 MHz WCDMA / HSDPA band II: 1852.4 ~ 1907.6 MHz
Max. O/P Power: (Average)	850 Band: GPRS 850: 27.78 dBm EDGE850: 27.79 dBm WCDMA band V: 22.93 dBm HSDPA band V: 22.42 dBm HSUPA band V: 22.15 dBm 1900 Band: GPRS 1900: 26.89 dBm EDGE1900: 26.81 dBm WCDMA band II: 22.73 dBm HSDPA band II: 22.68 dBm HSUPA band II: 22.63 dBm
Max. SAR (1g):	GSM 850: GPRS: 0.391 W/kg (Body position) / EDGE: 0.209 W/kg (Body position) WCDMA band V: Body: 0.857 W/kg (Body position) HSDPA: 0.821 W/kg (Body position) / HSUPA: 0.637 W/kg (Body position) PCS1900: GPRS: 0.689 W/kg (Body position) / EDGE: 0.088 W/kg (Body position) WCDMA band II: Body: 1.180 W/kg (Body position) HSDPA: 1.160 W/kg (Body position) / HSUPA: 1.070 W/kg (Body position)
Modulation Technique	GSM / PCS: GMSK WCDMA: QPSK
Antenna Specification	Antenna. Type: GSM/WCDMA: PIFA antenna WLAN: CHIP antenna
Battery	Model: BA-21012300, Rating: 3.7VDC 2300mAh 8.51Wh

Remark: *The sample selected for test was prototype that approximated to production product and was provided by manufacturer.*

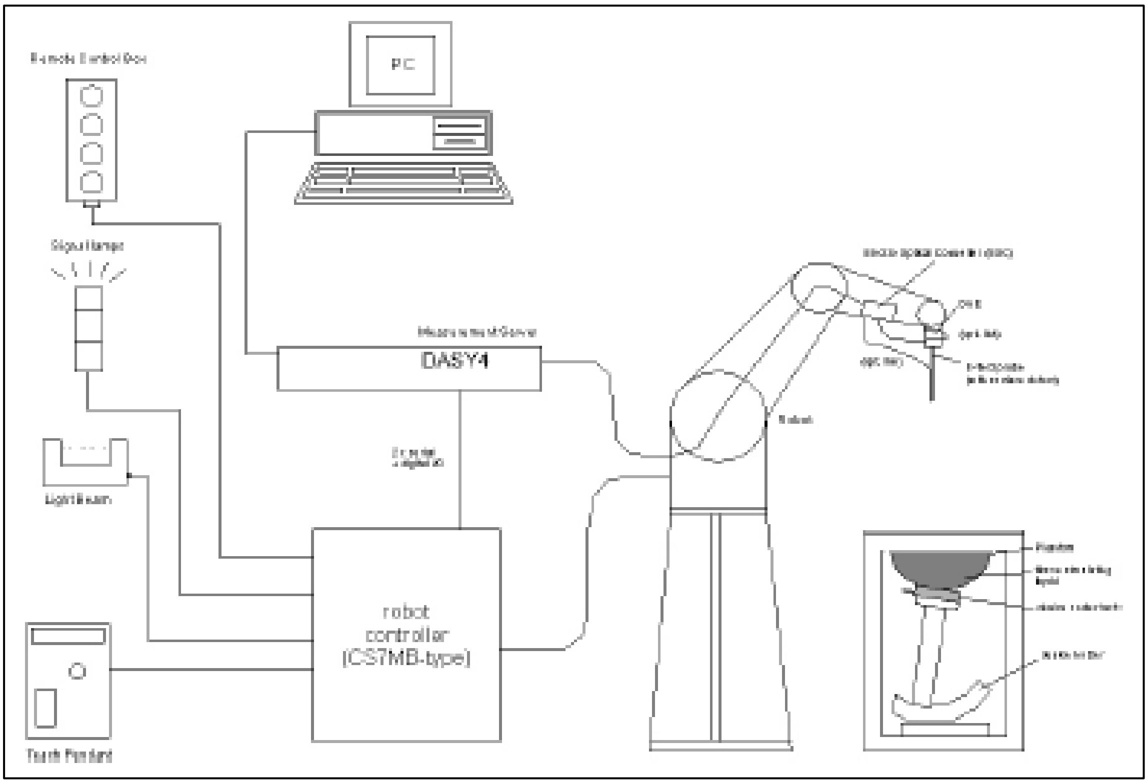
3. REQUIREMENTS FOR COMPLIANCE TESTING DEFINED BY THE FCC

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 [1]. 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 [6]. 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 SYSTEM

These measurements were performed with the automated near-field scanning system DASY4/DAST5 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: 3554 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the procedure with accuracy of better than ±10%. The spherical isotropy was evaluated with the procedure and found to be better than ±0.25 dB. The phantom used was the SAM Twin Phantom as described in FCC supplement C, IEEE P1528 and EN50361.

4.1 MEASUREMENT SYSTEM DIAGRAM



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

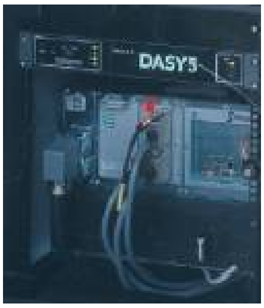
- A standard high precision 6-axis robot (St¨aubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. 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/DAST5 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.

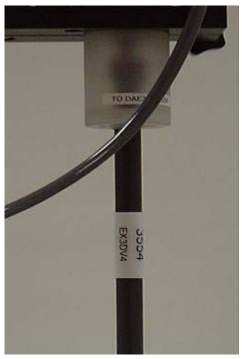


The PC-operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement 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.

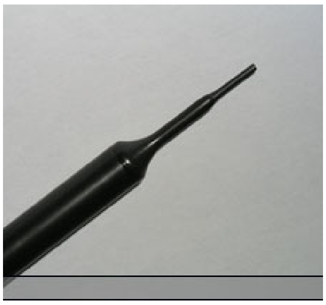
EX3DV4 Isotropic E-Field Probe for Dosimetric Measurements



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

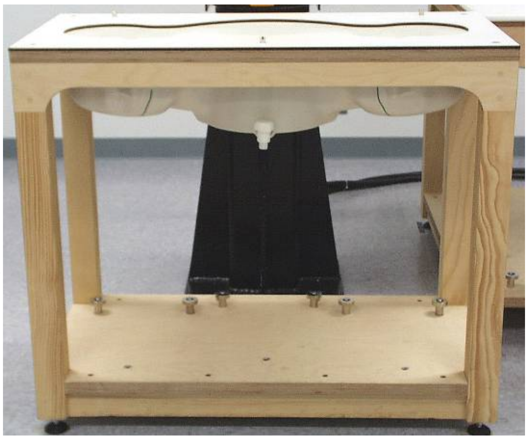
Application: High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.



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.

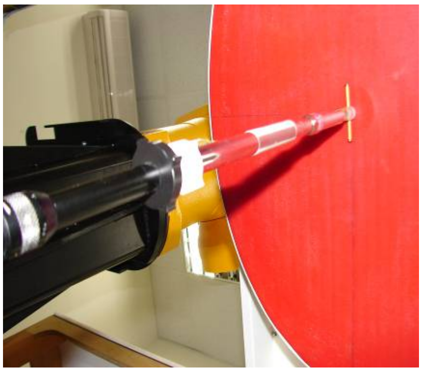
Frequency: 450, 900, 1800, 2450, 5800 MHz

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



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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/DAST5 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 μV/(V/m)^2 for E0field Probes	(i = x, y, z)
$ConvF$	= 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 MEASUREMENT 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/DAST5 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 7x7x9 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/DAST5 software stop the measurements if this limit is exceeded.

- **Z-Scan**

  The Z Scan job measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. A user can anchor the grid to the current probe location. As with any other grids, the local Z-axis of the anchor location establishes the Z-axis of the grid.

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/DAST5 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 ($a \ll \lambda$), the cos-term can be omitted. Factors *Sb* (parameter Alpha in the DASY4/DAST5 software) and *a* (parameter Delta in the DASY4/DAST5 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/DAST5 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

DASY4:

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	$(Cp)^{1/2}$	±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.

Dasy5:

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	±5.9	normal	1	1	±5.9	∞
Axial isotropy of probe	±4.7	rectangular	√3	$(1\text{-}Cp)^{1/2}$	±1.9	∞
Sph. Isotropy of probe	±9.6	rectangular	√3	$(Cp)^{1/2}$	±3.9	∞
Probe linearity	±4.7	rectangular	√3	1	±2.7	∞
Detection Limit	±1.0	rectangular	√3	1	±0.6	∞
Boundary effects	±1.0	rectangular	√3	1	±0.6	∞
Readoutelectronics	±0.3	normal	1	1	±0.3	∞
Response time	±0.8	rectangular	√3	1	±0.5	∞
Integration time	±2.6	rectangular	√3	1	±1.5	∞
Probe positioning	±0.4	rectangular	√3	1	±0.2	∞
Extrap. And integration	±4.0	rectangular	√3	1	±2.3	∞
RF ambient conditiona	±3.0	rectangular	√3	1	±1.7	∞
RF ambient conditiona	±3.0	rectangular	√3	1	±1.7	∞
Test Sample Related						
Device positioning	±2.9	normal	1	1	±2.9	145
Device holder uncertainty	±3.6	normal	1	1	±3.6	5
Power drift	±5.0	rectangular	√3	1	±2.9	∞
Phantom and Set up						
Phantom uncertainty	±4.0	rectangular	√3	1	±2.3	∞
Liquid conductivity	±5.0	rectangular	√3	0.6	±1.8/1.2	∞
Liquid conductivity	±1.5	rectangular	√3	0.6	±0.6	∞
Liquid permittivity	±5.0	rectangular	√3	0.6	±1.7/1.4	∞
Liquid permittivity	±1.0	rectangular	√3	0.6	±0.4	∞
Combined Standard Uncertainty					±10.375	
Coverage Factor for 95%		kp=2				
Expanded Standard Uncertainty					±20.75	

Table: Worst-case uncertainty for DASY5 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	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Salt: 99^{+}% Pure Sodium Chloride Sugar: 98^{+}% Pure Sucrose
Water: De-ionized, 16 $M\Omega^{+}$ 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

9. MEASUREMENT RESULTS

9.1 TEST LIQUID 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

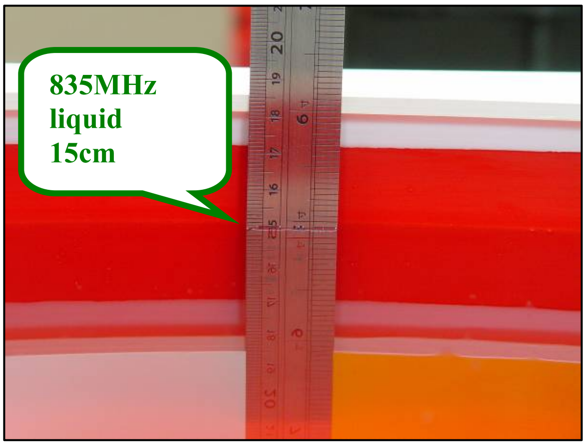
SIMULATING LIQUIDS PARAMETER CHECK RESULTS

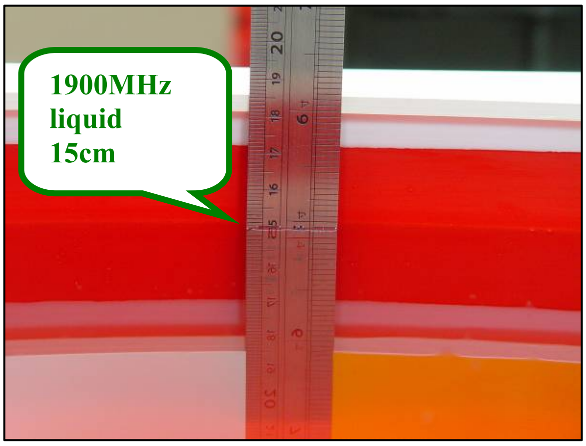
Date: March 19, 2011 **Ambient condition:** Temperature 24.6°C; Relative humidity: 52%

Body Simulatinf Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]	Depth [cm]					
835 MHz	23.60	15.00	Permitivity:	55.20	55.00	-0.36	±5
			Conductivity:	0.97	0.950	-2.06	± 5

Date: March 20, 2011 **Ambient condition:** Temperature 24.6°C; Relative humidity: 52%

Body Simulatinf Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]	Depth [cm]					
835 MHz	23.60	15.00	Permitivity:	55.20	54.30	-1.63	±5
			Conductivity:	0.97	0.960	-1.03	± 5





Date: March 16, 2011 **Ambient condition:** Temperature 24.6°C; Relative humidity: 52%

Body Simulatinf Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]	Depth [cm]					
1900 MHz	23.60	15.00	Permitivity:	53.30	52.00	-2.44	±5
			Conductivity:	1.52	1.520	0.00	± 5

Date: March 18, 2011 **Ambient condition:** Temperature 24.6°C; Relative humidity: 52%

Body Simulatinf Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]	Depth [cm]					
1900 MHz	23.60	15.00	Permitivity:	53.30	51.70	-3.00	±5
			Conductivity:	1.52	1.500	-1.32	± 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. The system performance check results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

SYSTEM PERFORMANCE CHECK MEASUREMENT CONDITIONS

- The measurements were performed in the flat section of the SAM twin phantom filled with Body simulating liquid of the following parameters.
- The DASY4/DAST5 system with an E-field probe EX3DV4 SN:3554 was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 15 mm (below 1 GHz) and 10 mm (above 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 10mm was aligned with the dipole.
- Special 7x7x7 fine cube was chosen for cube integration (dx= 5 mm, dy= 5 mm, dz= 5 mm).
- Distance between probe sensors and phantom surface was set to 2.5 mm.
- The dipole input power (forward power) was 250 mW±3%.
- The results are normalized to 1 W input power.

Reference SAR values

The reference SAR values were using measurement results indicated in the dipole calibration document (see table below)

Frequency (MHz)	1g SAR	10g SAR	Local SAR at Surface (Above Feed Point)	Local SAR at Surface (y = 2cm offset from feed point)
900	10.3	6.57	16.4	5.4
1800	38.2	20.3	69.5	6.8

SYSTEM PERFORMANCE CHECK RESULTS

Dipole: D835V2-SN4d015

Date: March 19, 2011 **Ambient condition:** Temperature 24.6°C; Relative humidity: 52%

Body Simulatinf Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]	Depth [cm]					
835.00	23.60	15.00	Permitivity:	55.20	55.00	-0.36	±5
			Conductivity:	0.97	0.950	-2.06	± 5
			10g SAR:	9.96	9.85	-1.10	± 5

ps. 10g SAR is equal 4x2.49(250mW forward power SAR value)

Dipole: D835V2-SN4d015

Date: March 20, 2011 **Ambient condition:** Temperature 24.6°C; Relative humidity: 52%

Body Simulatinf Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]	Depth [cm]					
835.00	23.60	15.00	Permitivity:	55.20	54.30	-1.63	±5
			Conductivity:	0.97	0.960	-1.03	± 5
			10g SAR:	9.96	9.72	-2.41	± 5

ps. 10g SAR is equal 4x2.43(250mW forward power SAR value)

Dipole: D1900V2 SN: 5d056

Date: March 16, 2011 **Ambient condition:** Temperature 24.6°C; Relative humidity: 52%

Body Simulatinf Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]	Depth [cm]					
1900.00	23.60	15.00	Permitivity:	53.30	52.00	-2.44	±5
			Conductivity:	1.52	1.520	0.00	± 5
			10g SAR:	39.80	40.40	1.51	± 5

ps. 10g SAR is equal 4x10.1(250mW forward power SAR value)

Dipole: D1900V2 SN: 5d056

Date: March 18, 2011 **Ambient condition:** Temperature 24.6°C; Relative humidity: 52%

Body Simulatinf Liquid			Parameters	Target	Measured	Deviation[%]	Limited[%]
Frequency	Temp. [°C]	Depth [cm]					
1900.00	23.60	15.00	Permitivity:	53.30	51.70	-3.00	±5
			Conductivity:	1.52	1.510	-0.66	± 5
			10g SAR:	39.80	39.52	-0.70	± 5

ps. 10g SAR is equal 4x9.88(250mW forward power SAR value)

9.3 EUT TUNE-UP PROCEDURES

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

- To setup the desire channel frequency and the maximum output power. A Radio Communication Tester “Agilent E5515c 8960 ” was used to program the EUT.
- If the SAR measured on the highest output channel is < 50% of the SAR limit, SAR evaluation for the other required channels is unnecessary.
- There are six modes during SAR testing(Front, Back, Top, Bottom, Left, Right)

GPRS 850 / EGPRS 850
Network Support: *GPRS / EGPRS*
Main Service: *Circuit Switched / Package Switched*
Power Setting: *33dBm / 33dBm class 12(4Up1Dn)*
GPRS support class B

GPRS 1900 / EGPRS 1900
Network Support: *GPRS / EGPRS*
Main Service: *Circuit Switched / Package Switched*
Power Setting: *30dBm / 30dBm class 12(4Up1Dn)*
GPRS support class B

Conducted output power (Average)(dBm)

802.11b / 802.11g Conducted Power (Avg)(dBm):

Mode / Frequency	**802.11b 1M** before SAR test	**802.11b 1M** after SAR test	**802.11g 6M** before SAR test	**802.11g 6M** after SAR test
1(2412 MHz)	10.13	unnecessary	8.35	unnecessary
6(2437 MHz)	9.88	unnecessary	8.27	unnecessary
11(2462 MHz)	9.61	unnecessary	8.39	unnecessary

Ps.(1) 802.11b maximum output power 10.13dBm(10.304mW) is less than 24.876mW((60/f)mW), So 802.11b stand-alone SAR test is not required.
(2) 802.11g maximum output power 8.39dBm(6.902mW) is less than 24.370mW((60/f)mW), So 802.11g stand-alone SAR test is not required.

802.11n HT20 Conducted Power (Avg)(dBm):

Mode / Frequency	**802.11g 6.5M** before SAR test	**802.11g 6.5M** after SAR test
1(2412 MHz)	7.82	unnecessary
6(2437 MHz)	7.78	unnecessary
11(2462 MHz)	7.58	unnecessary

Ps. 802.11n HT20 maximum output power 7.82dBm(6.053mW) is less than 24.876mW((60/f)mW), So 802.11n HT20 stand-alone SAR test is not required.

GSM		GPRS mode		EDGE mode	
		Before SAR test	After SAR test	Before SAR test	After SAR test
GSM 850	Ch 128	27.75	27.68	27.74	27.68
	Ch 190	27.78	27.70	27.77	27.71
	Ch 251	27.73	27.66	27.79	27.72
GSM		GPRS mode		EDGE mode	
		Before SAR test	After SAR test	Before SAR test	After SAR test
GSM 1900	Ch 512	26.72	26.65	26.72	26.66
	Ch 661	26.82	26.75	26.78	26.71
	Ch 810	26.89	26.83	26.81	26.75

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

Result

REL 99

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
				Average
UMTS850 (Band V)	4132	4357	826.4	22.39
	4182	4407	836.4	22.93
	4233	4458	846.6	22.79
UMTS1900 (Band II)	9262	9662	1852.4	22.33
	9400	9800	1880.0	22.73
	9538	9938	1907.6	22.52

RF POWER OUTPUT FOR UMTS REL 6 HSDPA

The following Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.7.0 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

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
					Average
UMTS850 (Band V)	1	4132	4357	826.4	22.30
		4182	4407	836.4	22.42
		4233	4458	846.6	22.33
	2	4132	4357	826.4	22.20
		4182	4407	836.4	22.33
		4233	4458	846.6	22.25
	3	4132	4357	826.4	21.93
		4182	4407	836.4	21.95
		4233	4458	846.6	21.88
	4	4132	4357	826.4	21.82
		4182	4407	836.4	21.85
		4233	4458	846.6	21.72
UMTS1900 (Band II)	1	9262	9662	1852.4	22.25
		9400	9800	1880.0	22.68
		9538	9938	1907.6	22.33
	2	9262	9662	1852.4	22.11
		9400	9800	1880.0	22.66
		9538	9938	1907.6	22.18
	3	9262	9662	1852.4	21.81
		9400	9800	1880.0	22.13
		9538	9938	1907.6	21.85
	4	9262	9662	1852.4	21.66
		9400	9800	1880.0	22.05
		9538	9938	1907.6	21.55

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				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	15/15
	βec	209/225	12/15	30/15	2/15	24/15
	βc/βd	11/15	6/15	15/9	2/15	15/15
	βhs	22/15	12/15	30/15	4/15	30/15
	βed	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 = βhs/βc	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	4132	4357	826.4	22.10
		4182	4407	836.4	22.15
		4233	4458	846.6	21.78
	2	4132	4357	826.4	20.33
		4182	4407	836.4	20.45
		4233	4458	846.6	19.71
	3	4132	4357	826.4	21.22
		4182	4407	836.4	21.35
		4233	4458	846.6	20.85
	4	4132	4357	826.4	20.28
		4182	4407	836.4	20.35
		4233	4458	846.6	19.70
	5	4132	4357	826.4	22.05
		4182	4407	836.4	22.08
		4233	4458	846.6	21.65
UMTS1900 (Band II)	1	9262	9662	1852.4	22.30
		9400	9800	1880.0	22.63
		9538	9938	1907.6	21.99
	2	9262	9662	1852.4	20.43
		9400	9800	1880.0	20.81
		9538	9938	1907.6	20.01
	3	9262	9662	1852.4	21.33
		9400	9800	1880.0	21.55
		9538	9938	1907.6	20.93
	4	9262	9662	1852.4	20.37
		9400	9800	1880.0	20.75
		9538	9938	1907.6	19.95
	5	9262	9662	1852.4	22.21
		9400	9800	1880.0	22.45
		9538	9938	1907.6	21.89

9.4 SAR MEASUREMENTS RESULTS

Front position

Back position

Test mode: **GPRS 850**, Duty Cycle: 25%, Crest Factor: 4 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Front	Fixed	190	836.6	23.6	0.091	1.6
Back	Fixed	190	836.6	23.6	0.391	

Test mode: **EGPRS 850**, Duty Cycle: 25%, Crest Factor: 4 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Front	Fixed	251	848.8	23.6	0.033	1.6
Back	Fixed	251	848.8	23.6	0.209	

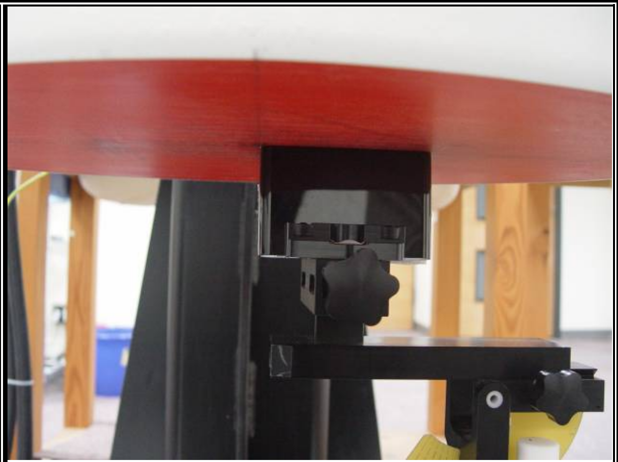
Test mode: **GPRS 1900**, Duty Cycle: 25%, Crest Factor: 4 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Front	Fixed	661	1880.0	23.6	0.430	1.6
Back	Fixed	661	1880.0	23.6	0.569	

Test mode: **EGPRS 1900**, Duty Cycle: 25%, Crest Factor: 4 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Front	Fixed	661	1880.0	23.6	0.084	1.6
Back	Fixed	661	1880.0	23.6	0.088	

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

	
Top position	**Bottom position**

Test mode: **GPRS 850**, Duty Cycle: 25%, Crest Factor: 4 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Top	Fixed	190	836.6	23.6	0.237	1.6
Bottom	Fixed	190	836.6	23.6	0.199	

Test mode: **EGPRS 850**, Duty Cycle: 25%, Crest Factor: 4 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Top	Fixed	251	848.8	23.6	0.097	1.6
Bottom	Fixed	251	848.8	23.6	0.184	

Test mode: **GPRS 1900**, Duty Cycle: 25%, Crest Factor: 4 Depth of liquid: 15.0 cm

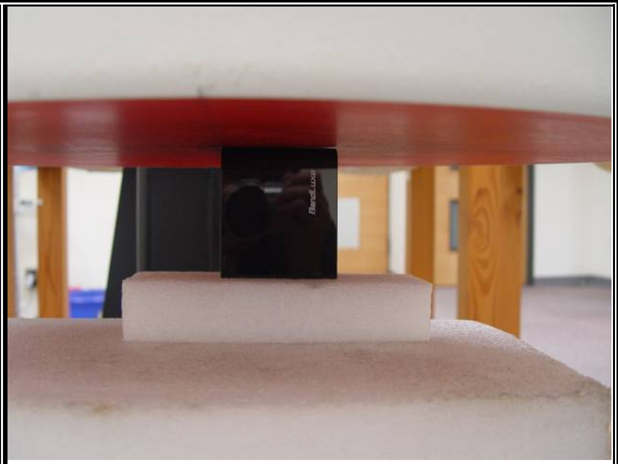
EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Top	Fixed	661	1880.0	23.6	0.200	1.6
Bottom	Fixed	661	1880.0	23.6	0.597	

Test mode: **EGPRS 1900**, Duty Cycle: 25%, Crest Factor: 4 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Top	Fixed	661	1880.0	23.6	0.017	1.6
Bottom	Fixed	661	1880.0	23.6	0.076	

Notes: 1) Top side/ Bottom side in parallel with flat phantom
2) Please refer to attachment for the result presentation in plot format.

Left position



Right position

Test mode: **GPRS 850**, Duty Cycle: 25%, Crest Factor: 4 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Left	Fixed	190	836.6	23.6	0.158	1.6
Right	Fixed	190	836.6	23.6	0.014	

Test mode: **EGPRS 850**, Duty Cycle: 25%, Crest Factor: 4 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Left	Fixed	251	848.8	23.6	0.058	1.6
Right	Fixed	251	848.8	23.6	0.00408	

Test mode: **GPRS 1900**, Duty Cycle: 25%, Crest Factor: 4 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Left	Fixed	661	1880.0	23.6	0.689	1.6
Right	Fixed	661	1880.0	23.6	0.094	

Test mode: **EGPRS 1900**, Duty Cycle: 25%, Crest Factor: 4 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Left	Fixed	661	1880.0	23.6	0.076	1.6
Right	Fixed	661	1880.0	23.6	0.015	

Notes: 1) Left side/ Right side in parallel with flat phantom
2) Please refer to attachment for the result presentation in plot format.

	
Front position	**Back position**

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	Fixed	4182	836.4	23.6	0.173	1.6
Back	Fixed	4132	826.4	23.6	0.704	
Back	Fixed	4182	836.4	23.6	0.857	
Back	Fixed	4233	846.6	23.6	0.768	

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

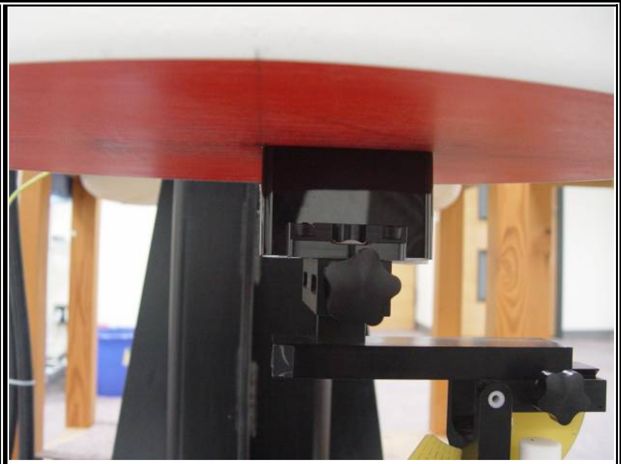
EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Front	Fixed	4182	836.4	23.6	0.125	1.6
Back	Fixed	4132	826.4	23.6	0.646	
Back	Fixed	4182	836.4	23.6	0.821	
Back	Fixed	4233	846.6	23.6	0.712	

Test mode: **HSUPA 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	Fixed	4182	836.4	23.6	0.109	1.6
Back	Fixed	4182	836.4	23.6	0.637	

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

Top position



Bottom position

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			
Top	Fixed	4182	836.4	23.6	0.503	1.6
Bottom	Fixed	4182	836.4	23.6	0.407	

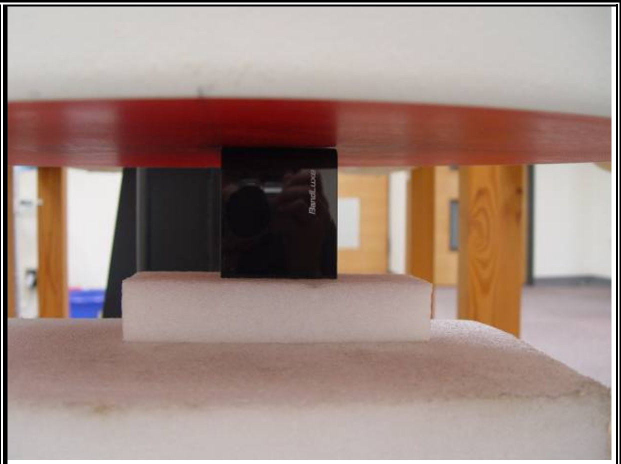
Test mode: **HSDPA Band V**, Duty Cycle: 100%, Crest Factor: 1 Depth of liquid: 15.0 cm

EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Top	Fixed	4182	836.4	23.6	0.396	1.6
Bottom	Fixed	4182	836.4	23.6	0.391	

Test mode: **HSUPA 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			
Top	Fixed	4182	836.4	23.6	0.369	1.6
Bottom	Fixed	4182	836.4	23.6	0.356	

Notes: 1) Top side/ Bottom side in parallel with flat phantom
2) Please refer to attachment for the result presentation in plot format.

	
Left position	**Right position**

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			
Left	Fixed	4182	836.4	23.6	0.229	1.6
Right	Fixed	4182	836.4	23.6	0.021	

Test mode: **HSDPA 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			
Left	Fixed	4182	836.4	23.6	0.181	1.6
Right	Fixed	4182	836.4	23.6	0.017	

Test mode: **HSUPA 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			
Left	Fixed	4182	836.4	23.6	0.190	1.6
Right	Fixed	4182	836.4	23.6	0.020	

Notes: 1) Left side/ Right side in parallel with flat phantom
2) Please refer to attachment for the result presentation in plot format.

Front position

Back 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	Fixed	9400	1880.0	23.6	0.785	1.6
Back	Fixed	9262	1852.4	23.6	0.980	
Back	Fixed	9400	1880.0	23.6	1.170	
Back	Fixed	9538	1907.6	23.6	0.876	

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

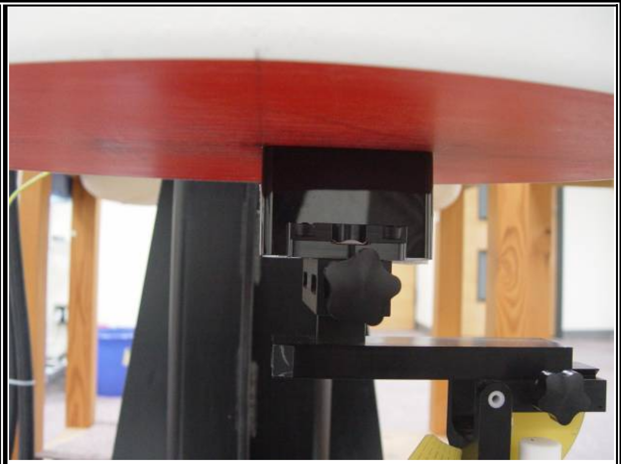
EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Front	Fixed	9400	1880.0	23.6	0.646	1.6
Back	Fixed	9262	1852.4	23.6	0.777	
Back	Fixed	9400	1880.0	23.6	1.100	
Back	Fixed	9538	1907.6	23.6	0.741	

Test mode: **HSUPA 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	Fixed	9400	1880.0	23.6	0.340	1.6
Back	Fixed	9262	1852.4	23.6	0.459	
Back	Fixed	9400	1880.0	23.6	0.823	
Back	Fixed	9538	1907.6	23.6	0.480	

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

Top position



Bottom 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			
Top	Fixed	9400	1880.0	23.6	0.280	1.6
Bottom	Fixed	9262	1852.4	23.6	0.696	
Bottom	Fixed	9400	1880.0	23.6	0.817	
Bottom	Fixed	9538	1907.6	23.6	0.720	

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

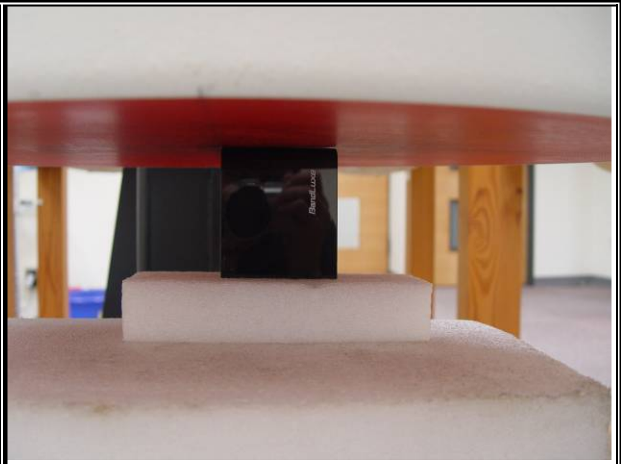
EUT Position	Antenna	Frequency		Liquid Temp_°C	**SAR** (1g) (W/kg)	Limit (W/kg)
		Channel	MHz			
Top	Fixed	9400	1880.0	23.6	0.287	1.6
Bottom	Fixed	9400	1880.0	23.6	0.776	

Test mode: **HSUPA 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			
Top	Fixed	9400	1880.0	23.6	0.159	1.6
Bottom	Fixed	9400	1880.0	23.6	0.460	

Notes: 1) Top side/ Bottom side in parallel with flat phantom
2) Please refer to attachment for the result presentation in plot format.

Left position



Right 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			
Left	Fixed	9262	1852.4	23.6	1.010	1.6
Left	Fixed	9400	1880.0	23.6	1.180	
Left	Fixed	9538	1907.6	23.6	0.839	
Right	Fixed	9400	1880.0	23.6	0.196	

Test mode: **HSDPA 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			
Left	Fixed	9400	1880.0	23.6	1.030	1.6
Left	Fixed	9400	1880.0	23.6	1.060	
Left	Fixed	9538	1907.6	23.6	0.744	
Right	Fixed	9400	1880.0	23.6	0.120	

Test mode: **HSUPA 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			
Left	Fixed	9400	1880.0	23.6	0.960	1.6
Left	Fixed	9400	1880.0	23.6	1.070	
Left	Fixed	9538	1907.6	23.6	0.673	
Right	Fixed	9400	1880.0	23.6	0.0989	

Notes: 1) Left side/ Right side 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	07/05/2011
Electronic Probe kit	Hewlett Packard	85070D	N/A	N/A	N/A
Spectrum Analyzer	Agilent	E4446A	US42510252	365	11/04/2011
Wireless Communication Test Set	Agilent	E5515C 8960	MY48363204	365	10/06/2011
Data Acquisition Electronics (DAE)	SPEAG	DAE4	877	365	02/16/2011
Data Acquisition Electronics (DAE)	SPEAG	DAE4	558	365	07/13/2011
Dosimetric E-Field Probe	SPEAG	EX3DV4	3665	365	03/24/2011
Dosimetric E-Field Probe	SPEAG	EX3DV4	3554	365	09/21/2011
835 MHz System Validation Dipole	SPEAG	D835V2	4d015	730	11/18/2012
1900 MHz System Validation Dipole	SPEAG	D1900V2	5d018	730	06/14/2012
2450 MHz System Validation Dipole	SPEAG	D2450V2	728	730	05/26/2012
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

11. FACILITIES

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

☐ No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang, Taoyuan Hsien, Taiwan, R.O.C.

☒ No. 11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan.

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

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13. ATTACHMENTS

Exhibit	Content
1	System Performance Check Plots
2	SAR Test Plots
3	Probe EX3DV4 sn3554
4	
5	

END OF REPORT