FCC SAR Test Report

Product	:	Bikefinder Tracker
Trade mark	:	Bikefinder AS
Model/Type reference	:	BFG1S
Serial Number	:	N/A
Report Number	:	EED32L00192303
FCC ID	:	2ATRU-BFG1S
Date of Issue:	:	Aug. 02, 2019
Test Standards	:	Refer to Section 1.5
Test result	:	PASS

Prepared for:

Bikefinder AS

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Date:	Aug. 02, 2019		Check No.:3096360818

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Modified History

REV.	Modification Description	Issued Date	Remark
REV.1.0	Initial Test Report Release	Aug. 02, 2019	

1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in this test report.

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1.2 Application details

Date of receipt of test item:	2019-07-19
Start of test:	2019-07-19
End of test:	2019-07-29

1.3 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Bikefinder ASModel Name:BFG1S are as below:

Frequency Band	MAX Reported SAR (W/kg)			
	1-g SAR Head	1-g SAR Body (0mm)	1-g SAR Hotspot (10mm)	10-g SAR Product Specific (0mm)
GSM850	/	/	/	0.959
GSM1900	/	/	/	1.232
The highest simultaneous SAR is 3.442W/kg per KDB 690783 D01				

Note:

For body operation, this device has been tested and meets FCC/IC RF exposure guidelines when used with any accessory that contains no metal and that positions a minimum of 15mm from the body. Use of other accessories may not ensure compliance with FCC/IC RF exposure guidelines.

The device is in compliance with Specific Absorption Rate （ SAR ）for general population/uncontrolled exposure limits according to the FCC rule §2.1093, the ANSI/IEEE C95.1:1992, the NCRP Report Number 86 for uncontrolled environment, according to the Industry Canada Radio Standards Specification RSS-102 for General Population/Uncontrolled exposure, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013

1.4 EUT Information

Device Information：			
Product Name:	Bikefinder Tracker		
Model:	BFG1S		
FCC ID:	2ATRU-BFG1S		
Device Type:	Portable device		
Exposure Category:	uncontrolled environment / general population		
Firmware version:	2.0/2.0.45		
Hardware version:	1.3.1		
Antenna Type :	Monopole LDS Antenna		
Antenna Gain:	2.4G 1.47dBi		
Device Operating Configurations:			
Supporting Modes :	GPRS 850/1900; BT;		
Modulation:	GPRS(GMSK); BT(GFSK)		
Operating Frequency Range(s)	Band	TX(MHz)	RX(MHz)
	GSM850	824~849	869~894
	GSM1900	1850~1910	1930~1990
	BT	2402~2480	
GPRS class level:	GPRS class 12		
Test Channels (low-mid-high):	128-190-251 (GPRS850)		
	512-661-810 (GPRS1900)		
	0-19-39 (BT)		
Power Source:	Polymer Lithium Ion Batteries 3.8V, 960mAh		

Remark: The tested samples and the sample information are provided by the client.

1.5 Test standard/s

ANSI Std C95.1-1992	Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
IEEE Std 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
RSS-102	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands (Issue 5 of March 2015)
KDB 248227 D01	SAR guidance for IEEE 802.11(Wi-Fi) transmitters v02r02
KDB 447498 D01	General RF Exposure Guidance v06
KDB 648474 D04	Handsets SAR v01r03
KDB 690783 D01	SAR Listings on Grants v01r03
KDB 865664 D01	SAR Measurement 100 MHz to 6 GHz v01r04
KDB 865664 D02	RF Exposure Reporting v01r02
KDB 941225 D01	3G SAR Procedures v03r01
KDB 941225 D05	SAR for LTE Devices v02r05
KDB 941225 D06	Hotspot SAR v02r01

1.6 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain/Body/Arms/Legs)	**1.60 mW/g**	8.00 mW/g
Spatial Average SAR** (Whole Body)	0.08 mW/g	0.40 mW/g
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 mW/g	20.00 mW/g

The limit applied in this test report is shown in bold letters

Notes:

* The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

** The Spatial Average value of the SAR averaged over the whole body.

*** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

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

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

1.7 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dW) absorbed by(dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ).

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

SAR is expressed in units of watts per kilogram (W/kg). SAR can be related to the electric field at a point by

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

where:

σ = conductivity of the tissue (S/m)
ρ = mass density of the tissue (kg/m^3)
E = rms electric field strength (V/m)

1.8 Testing laboratory

Test Site	Centre Testing International Group Co., Ltd.
Test Location	Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China
Telephone	+86 (0) 755 3368 3668
Fax	+86 (0) 755 3368 3385

1.9 Test Environment

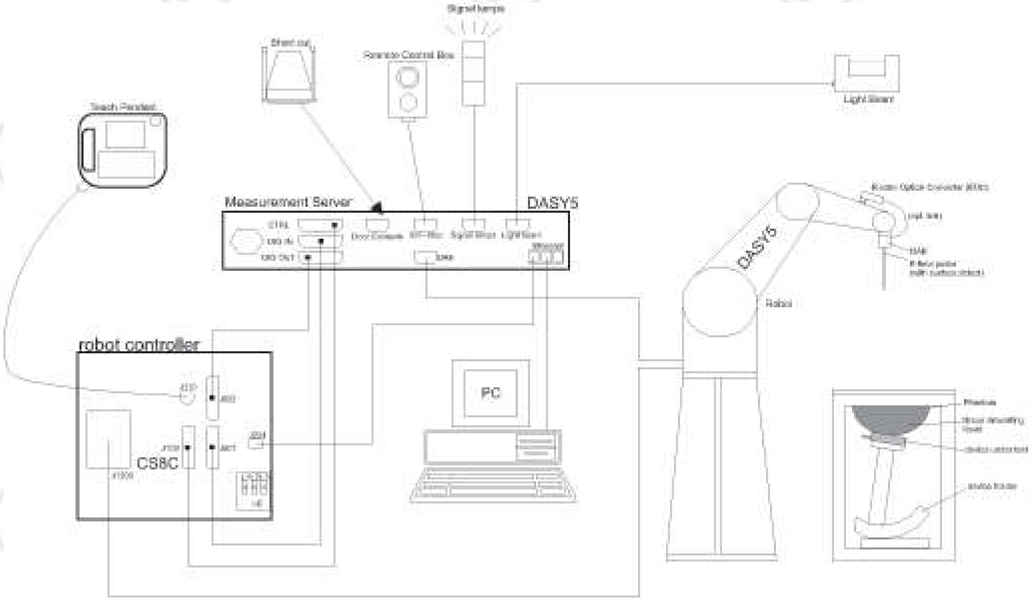
	Required	Actual
Ambient temperature:	18 – 25 °C	21.5 ± 2.0 °C
Tissue Simulating liquid:	18 – 25 °C	21.5 ± 2.0 °C
Relative humidity content:	30 – 70 %	30 – 70 %

1.10 Applicant and Manufacturer

Applicant/Client :	Bikefinder AS
Applicant Address:	Kvitsøygata 30, 4014 Stavanger
Manufacturer Name:	Bikefinder AS
Manufacturer Address:	Kvitsøygata 30, 4014 Stavanger
Factory:	High Quality PCB Co., Limited
Address of Factory:	1701 RM, Floor 17, Yunhua Shidai, Shajing Bao'an, Shenzhen

2 SAR Measurement System Description and Setup

2.1 The Measurement System Description



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

- A standard high precision 6-axis robot (Stäubli TX/RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- 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 from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted 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.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win7 profesional operating system and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

2.2 Probe description

Dosimetric Probes: These probes are specially designed and calibrated for use in liquids with high permittivities. They should not be used in air, since the spherical isotropy in air is poor(±2 dB). The dosimetric probes have special calibrations in various liquids at different frequencies.

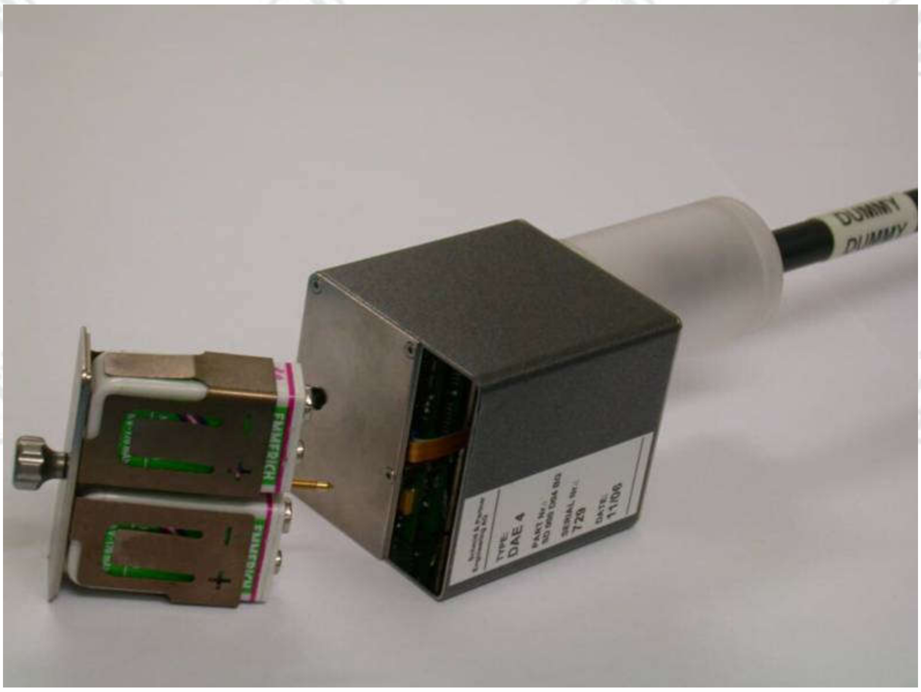
Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to 6 GHz; Linearity: ± 0.2 dB
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	9mm
Tip Diameter	2.5mm
Dynamic range	5 μW/g to 100 mW/g; Linearity: ± 0.2 dB

2.3 Data Acquisition Electronics description

The data acquisition electronics (DAE4) consist 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 with a 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 DAE4 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

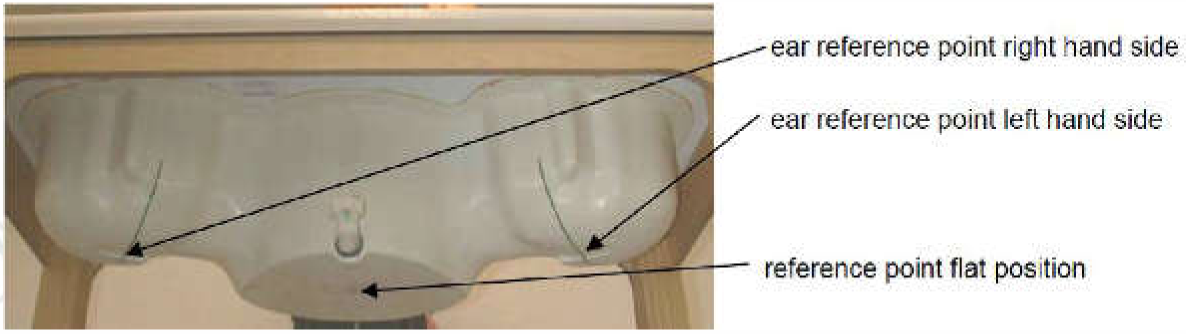
Batteries: The DAE works with either two standard 9V batteries or two 9V (actually 8.4V or 9.6 V) rechargeable batteries. Because the electronics automatically power-down unused components during braking or between measurements, the battery lifetime depends on system usage. Typical lifetimes are >20 hours for batteries and >10 hours for accus. Remove the batteries if you do not plan to use the DAE for a long period of time.



2.4 SAM Twin Phantom description

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6 mm). The phantom has three measurement areas:

- ♦ Left hand
- ♦ Right hand
- ♦ Flat phantom



The phantom table for the DASY systems have the size of 100 x 50 x 85 cm (L xWx H). these tables are reinforced for mounting of the robot onto the table. For easy dislocation these tables have fork lift cut outs at the bottom.

The bottom plate contains three pairs of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.

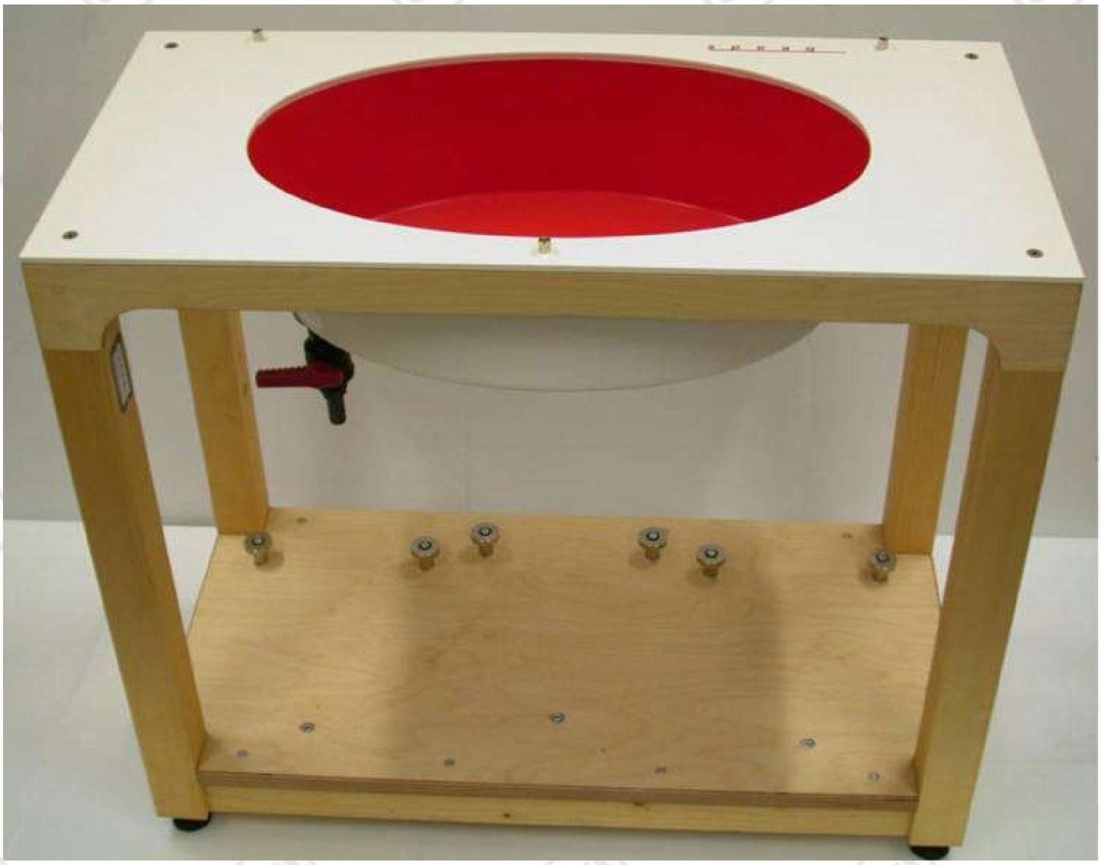
A white cover is provided to cover the phantom during off-periods to prevent water evaporation and changes in the liquid parameters.

Three reference marks are provided on the phantom counter. These reference marks are used to teach the absolute phantom position relative to the robot.

2.5 ELI4 Phantom description

The ELI4 phantom is intended for compliance testing of handheld and body mounted wireless devices in the frequency range of 30MHz to 6 GHz. ELI4 is fully compatible with the latest draft of the standard IEC 62209-2 and all known tissue simulating liquids.

ELI4 has been optimized regarding its performance and can be integrated into a SPEAG standard phantom table. 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



2.6 Device Holder description

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

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

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

3 SAR Test Equipment List

To simplify the identification of the test equipment and/or ancillaries which were used, the reporting of the relevant test cases only refer to the test item number as specified in the table below.

	Manufacturer	Device Type	Type(Model)	Serial number	Date of last calibration	Valid period
☒	SPEAG	E-Field Probe	EX3DV4	7328	2019-03-01	One year
☒	SPEAG	Data acquisition electronics	DAE4	1458	2019-02-26	One year
☒	SPEAG	835 MHz Dipole	D835V2	4d193	2018-02-19	Three years
☒	SPEAG	1750 MHz Dipole	D1750V2	1134	2018-02-22	Three years
☒	SPEAG	1900 MHz Dipole	D1900V2	5d198	2018-02-22	Three years
☐	SPEAG	2000 MHz Dipole	D2000V2	1078	2018-02-22	Three years
☐	SPEAG	2300 MHz Dipole	D2300V2	1082	2017-01-25	Three years
☐	SPEAG	2450 MHz Dipole	D2450V2	959	2018-02-16	Three years
☐	SPEAG	2600 MHz Dipole	D2600V2	1101	2018-02-16	Three years
☐	SPEAG	5 GHz Dipole	D5GHzV2	1208	2018-02-21	Three years
☒	SPEAG	Software	DASY 5	NA	NCR	NCR
☐	SPEAG	Twin Phantom	SAM V5.0	1875	NCR	NCR
☒	SPEAG	Flat Phantom	ELI V6.0	2024	NCR	NCR
☒	SPEAG	DAKS probe	DAKS-3.5	1052	2018-02-20	Three years
☒	SPEAG	Planar R140 Vector Reflectometer	DAKS-VNA R140	0200514	2018-02-20	Three years
☒	R & S	Universal Radio Communication Tester	CMU200	101553	2019-03-01	One year
☐	R & S	Universal Radio Communication Tester	CMW500	102898	2019-01-18	One year
☒	Agilent	Signal Generator	N5181A	MY50142334	2019-03-01	One year
☒	BONN	Power Amplifier and directional coupler	SU319W	BL-SZ1550140	2019-01-18	One year
☒	KEITHLEY	RF Power Meter	3500	1128079	2018-08-01	One year
☒	KEITHLEY	RF Power Meter	3500	1128081	2018-08-01	One year

Note:

a) There is no physical damage on the dipole;

b) System check with specific dipole is within 10% of calibrated value;

c) The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement.

d) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5Ω from the previous measurement.

4 SAR Measurement Procedures

4.1 Spatial Peak SAR Evaluation

The DASY5 software includes all numerical procedures necessary to evaluate the spatial peak SAR values.The base for the evaluation is a "cube" measurement in a volume of 30mm^3 (7x7x7 points). The measured volume must include the 1 g and 10 g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan. If the 10g cube or both cubes are not entirely inside the measured volumes,the system issues a warning regarding the evaluated spatial peak values within the Postprocessing engine (SEMCAD X). This means that if the measured volume is shifted, higher values might be possible. To get the correct values you can use a finer measurement grid for the area scan. In complicated field distributions, a large grid spacing for the area scan might miss some details and give an incorrectly interpolated peak location. The entire evaluation of the spatial peak values is performed within the Postprocessing engine (SEMCAD X). The system always gives the maximum values for the 1 g and 10 g cubes.

The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. extraction of the measured data (grid and values) from the Zoom Scan
2. calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. generation of a high-resolution mesh within the measured volume
4. interpolation of all measured values from the measurement grid to the high-resolution grid
5. extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. calculation of the averaged SAR within masses of 1 g and 10 g

4.2 Data Storage and Evaluation

Data Storage

The DASY5 software stores the measured voltage acquired by the Data Acquisition Electronics (DAE) as raw data together with all the necessary software parameters for the data evaluation (probe calibration data, liquid parameters and communication system parameters) in measurement files with the extension .da5x. The postprocessing software evaluates the data every time the data is visualized or exported. This allows the verification and modification of the setup after completion of the measurement. For example, if a measurement has been performed with an incorrect crest factor, the parameter can be corrected afterwards and the data can be reevaluated.

To avoid unintentional parameter changes or data manipulations, the parameters in measured files are locked. In the administrator access mode of the software, the parameters can be unlocked. After changing the parameters, the measured scans can be reevaluated in the postprocessing engine.

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

Data Evaluation

The fields and SAR are calculated from the measured voltage (probe voltage acquired by the DAE) and the following parameters:

Probe parameters:	- Sensitivity	$norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion Factor	$convF_i$
	- Diode Compression Point	dcp_i
	- Probe Modulation Response Factors	a_i, b_i,c_i, d
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Relative Permittivity	ρ

This parameters are stored in the DASY5 V52 measurement file.

These parameters must be correctly set in the DASY5 V52 software setup. They are available as configuration file and can be imported into the measurement file. The values displayed in the multimeter window are assessed using the parameters of the actual system setup. In the scan visualization and export modes, the parameters stored in the measurement file are used.

The measured voltage is not proportional to the exciting. It must be first linearized.

Approximated Probe Response Linearization using Crest Factor.

This linearization method is enabled when a custom defined communication system is measured. The compensation applied is a function of the measured voltage, the detector diode compression point and the crest factor of the measured signal.

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

with	V_i	=	linearized voltage of channel i (uV)	(i = x,y,z)
	U_i	=	measured voltage of channel i (uV)	(i = x,y,z)
	cf	=	crest factor of exciting field	(DASY parameter)

dcp_i = diode compression point of channel i (uV) (Probe parameter, i = x,y,z)

Field and SAR Calculation

The primary field data for each channel are calculated using the linearized voltage:

E - fieldprobes : $$E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

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

with V_i = linearized voltage of channel i (i = x,y,z)

$Norm_i$ = sensor sensitivity of channel i (i = x,y,z)

$uV/(V/m)^2$ for E-field Probes

ConvF = sensitivity enhancement in solution

a_{ij} = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

E_i = electric field strength of channel i in V/m

H_i = magnetic field strength of channel i in A/m

The RMS 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.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

with SAR = local specific absorption rate in mW/g

E_{tot} = total field strength in V/m

σ = conductivity in [mho/m] or [Siemens/m]

ρ = equivalent tissue density in g/cm^3

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

Spatial Peak SAR for 1 g and 10 g

The DASY5 software includes all numerical procedures necessary to evaluate the spatial peak SAR values.The base for the evaluation is a "cube" measurement at the points of the fine cube grid consisting of 5 x 5 x 7 points(with 8mm horizontal resolution) or 7 x 7 x 7 points(with 5mm horizontal resolution) or 8 x 8 x 7 points(with 4mm horizontal resolution)..The entire evaluation of the spatial peak values is performed within the Postprocessing engine (SEMCAD X).The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. extraction of the measured data (grid and values) from the Zoom Scan.
2. calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters).
3. generation of a high-resolution mesh within the measured volume.
4. interpolation of all measured values from the measurement grid to the high-resolution grid
5. extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface.
6. calculation of the averaged SAR within masses of 1 g and 10 g.

4.3 Data Storage and Evaluation

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

Step 1: Power reference measurement

The Power Reference Measurement and Power Drift Measurement are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. By default, the Minimum distance of probe sensors to surface is 4 mm. This distance can be modified by the user, but cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties. The SAR measurement was taken at a selected spatial reference point to monitor power variations during testing. This fixed location point was measured and used as a reference value.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a finer measurement around the hotspot. The sophisticated interpolation routines implemented in DASY5 software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE 1528-2003 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Step 3: Zoom Scan

The Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The default Zoom Scan is defined in the following table. DASY5 is also able to perform repeated zoom scans if more than 1 peak is found during area scan. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Area scan and Zoom scan resolutions per FCC KDB Publication 865664 D01:

Frequency	Maximun Area Scan resolution (Δx_{Area},Δy_{Area})	Maximun Zoom Scan spatial resolution (Δx_{Zoom},Δy_{Zoom})	Maximun Zoom Scan spatial resolution			Minimum zoom scan volume (x,y,z)
			Uniform Grid	Graded Grad		
			$\Delta z_{Zoom}(n)$	$\Delta z_{Zoom}(1)$*	$\Delta z_{Zoom}(n>1)$*	
≤ 2GHz	≤ 15mm	≤ 8mm	≤ 5mm	≤ 4mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 30mm
2-3GHz	≤ 12mm	≤ 5mm	≤ 5mm	≤ 4mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 30mm
3-4GHz	≤ 12mm	≤ 5mm	≤ 4mm	≤ 3mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 28mm
4-5GHz	≤ 10mm	≤ 4mm	≤ 3mm	≤ 2.5mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 25mm
5-6GHz	≤ 10mm	≤ 4mm	≤ 2mm	≤ 2mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 22mm

Step 4: Power Drift Monitoring

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. If the value changed by more than 5%, the evaluation should be retested.

5 SAR Verification Procedure

5.1 Tissue Verification

The following materials are used for producing the tissue-equivalent materials.
(Liquids used for tests are marked with☒):

Ingredients (% of weight)	Frequency (MHz)						
Tissue Type	Head Tissue						
frequency band	835	1800	2000	2300	2450	2600	5200-5800
Water	41.45	52.64	54.9	62.82	62.7	55.242	65.52
Salt (NaCl)	1.45	0.36	0.18	0.51	0.5	0.306	0.0
Sugar	56.0	0.0	0.0	0.0	0.0	0.0	0.0
HEC	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Bactericide	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	36.8	0.0	17.24
DGBE	0.0	47.0	44.92	36.67	0.0	44.452	0.0
Diethylenglycol monohexylether	0.0	0.0	0.0	0.0	0.0	0.0	17.24

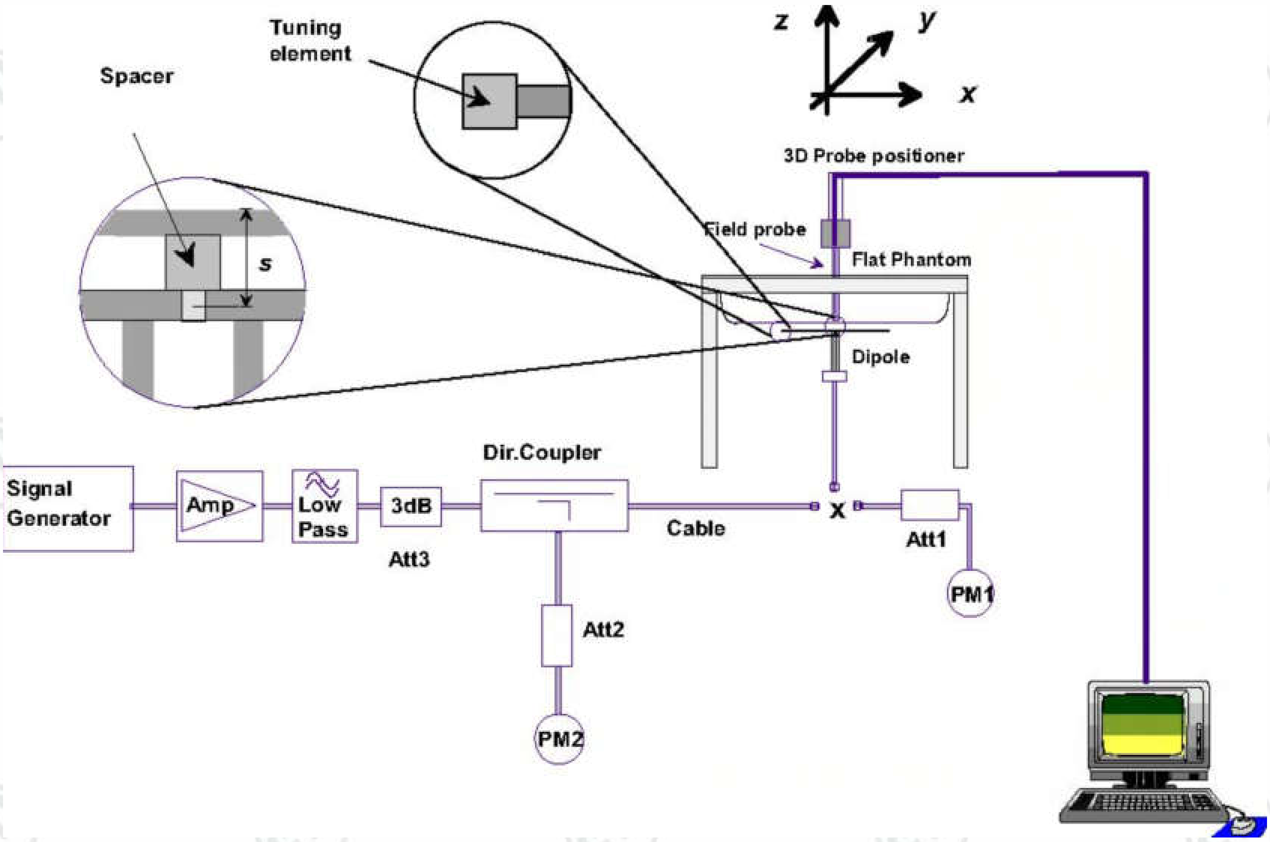
Ingredients (% of weight)	Body Tissue					
frequency band	835	1750	1900	2450	2600	5200-5800
Water	52.5	69.91	69.91	73.20	64.50	76.3
Salt (NaCl)	1.40	0.13	0.13	0.04	0.02	0.0
Sugar	45.0	0.0	0.0	0.0	0.0	0.0
HEC	1.0	0.0	0.0	0.0	0.0	0.0
Bactericide	0.1	0.0	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	10.2
DGBE	0.0	29.96	29.96	26.76	35.48	0.0
Diethylenglycol monohexylether	0.0	0.0	0.0	0.0	0.0	13.5

Salt: 99+% Pure Sodium Chloride Sugar: 98+% Pure Sucrose
Water: De-ionized, 16MΩ+ 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
Tissue simulating liquids: parameters:

Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		εr (+/-5%)	σ (S/m) (+/-5%)	εr	σ (S/m)		
835 Head	**825**	41.60 (39.52~43.68)	0.90 (0.86~0.95)	40.360	0.914	21.15°C	7/23/2019
	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	40.340	0.919		
	850	41.50 (39.43~43.58)	0.92 (0.87~0.96)	40.200	0.930		
835 Head	**825**	41.60 (39.52~43.68)	0.90 (0.86~0.95)	39.950	0.901	20.88°C	7/24/2019
	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	39.960	0.910		
	850	41.50 (39.43~43.58)	0.92 (0.87~0.96)	39.890	0.918		
1900 Head	**1850**	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.720	1.348	21.06°C	7/25/2019
	1880	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.600	1.376		
	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.520	1.401		
	1910	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.560	1.414		
1900 Head	**1850**	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.740	1.334	20.86°C	7/26/2019
	1880	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.610	1.363		
	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.580	1.381		
	1910	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.530	1.391		
ε_r= Relative permittivity, σ= Conductivity							

5.2 System check procedure

The System check is performed by using a System check dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 250mW. To adjust this power a power meter is used. The power sensor is connected to the cable before the System check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the validation to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).
System check results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system.



5.3 System check results

The system Check is performed for verifying the accuracy of the complete measurement system and performance of the software. The following table shows System check results for all frequency bands and tissue liquids used during the tests (plot(s) see annex A).

System Check							
Tissue Type	Target SAR 1W (+/-10%)		Measured SAR		Liquid Temp.	Test Date	Test Engineer
	1g(mW/g)	10g(mW/g)	1g(mW/g)	10g(mW/g)			
D835V2 Head	9.51 (8.559~10.461)	6.19 (5.571~6.809)	8.840	5.80	21.15°C	2019-7-23	Bill.Lu
D835V2 Head	9.51 (8.559~10.461)	6.19 (5.571~6.809)	9.240	6.08	20.88°C	2019-7-24	Bill.Lu
D1900V2 Head	40.60 (36.54~44.66)	21.40 (19.26~23.54)	40.400	21.36	21.06°C	2019-7-25	Bill.Lu
D1900V2 Head	40.60 (36.54~44.66)	21.40 (19.26~23.54)	40.800	21.36	20.86°C	2019-7-26	Bill.Lu

6 SAR Measurement variability and uncertainty

6.1 SAR measurement variability

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.The same procedures should be adapted for measurements according to extremity exposure limits by applying a factor of 2.5 for extremity exposure.

1) Repeated measurement is not required when the original highest measured SAR is < 2.0 W/kg; steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 2.0 W/kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 3.0 or when the original or repeated measurement is ≥ 3.6 W/kg (~ 10% from the 10-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥3.75 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

6.2 SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04,when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

7 SAR Test Configuration

7.1 GSM Test Configurations

SAR tests for GSM850 and GSM1900, a communication link is set up with a base station by air link. Using CMU200 the power lever is set to “5”and “0” in SAR of GSM850 and GSM1900. The tests in the band of GSM850 and GSM1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS/EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. When SAR tests for EGPRS mode is necessary, GMSK modulation should be used to minimize SAR measurement error due to higher peak-to-average power (PAR) ratios inherent in 8-PSK.

8 SAR Test Results

8.1 Conducted Power Measurements

1.For the measurements a Rohde & Schwarz Radio Communication Tester CMU200 was used.

2.Establish communication link between emulator and EUT and set EUT to operate at maximum output power all the time.

3.Source-based Time Averaged Burst Power Calculation:

For TDMA,the following duty cycle factor was used to calculate the Source-based Time Averaged power.

Number of Time slot	1	2	3	4
Duty cycle	1:8.3	1:4.1	1:2.77	1:2.08
Duty cycle factor	-9.19	-6.13	-4.42	-3.18

8.1.1 Conducted Power of GSM850

GSM850		Burst-Averaged output Power (dBm)			Division Factors	Source Based time Average Power(dBm)		
		128CH	190CH	251CH		128CH	190CH	251CH
GPRS/ EDGE (GMSK)	1 Tx Slot	33.72	33.14	32.29	-9.19	24.53	23.95	23.10
	2 Tx Slots	31.65	31.18	30.54	-6.13	**25.52**	25.05	24.41
	3 Tx Slots	29.32	28.94	28.55	-4.42	24.90	24.52	24.13
	4 Tx Slots	27.90	27.61	27.30	-3.18	24.72	24.43	24.12

Note: 1) The conducted power of GSM850 is measured with RMS detector.

2) Source Based time Average Power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timeslots.

3) The bolded GPRS 4Tx slots mode was selected for SAR testing according the highest Source Based time Average Power table.

4) channel/Frequency: 128/824.2,190/836.6,251/848.8

8.1.2 Conducted Power of GSM1900

GSM1900		Burst-Averaged output Power (dBm)			Division Factors	Source Based time Average Power(dBm)		
		512CH	661CH	810CH		512CH	661CH	810CH
GPRS/ EDGE (GMSK)	1 Tx Slot	30.91	30.15	30.79	-9.19	21.72	20.96	21.60
	2 Tx Slots	30.48	28.88	29.40	-6.13	24.35	22.75	23.27
	3 Tx Slots	29.31	27.98	28.58	-4.42	24.89	23.56	24.16
	4 Tx Slots	28.27	26.97	27.88	-3.18	**25.09**	23.79	24.70

Note: 1) The conducted power of GSM1900 is measured with RMS detector.

2) Source Based time Average Power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timeslots.

3) The bolded GPRS 4Tx slots mode was selected for SAR testing according the highest Source Based time Average Power table.

4) channel/Frequency: 512/1850.2,661/1880,810/1909.8

8.1.3 Conducted Power of BT

The output power of BT antenna is as following:

For BT 4.0:

Average Conducted Power(dBm)			
Channel	0CH	19CH	39CH
BT	-0.15	-0.18	-0.68

Note: channel /Frequency: 0/2402, 19/2440, 39/2480.

8.2 SAR test results

Notes:

1) Per KDB447498 D01v06, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is: ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.

2) Per KDB447498 D01v06, All measurement SAR result is scaled-up to account for tune-up tolerance is compliant.

3) Per KDB865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/Kg; if the deviation among the repeated measurement is ≤ 20%, and the measured SAR <1.45W/Kg, only one repeated measurement is required.

4) Per KDB865664 D02v01r02, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is > 1.5 W/kg, or > 7.0 W/kg for occupational exposure. The same procedures should be adapted for measurements according to extremity exposure limits by applying a factor of 2.5 for extremity exposure.The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing (Refer to appendix B for details).

5) Per KDB941225 D06, the DUT Dimension is bigger than 9 cm x 5 cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

6) Per KDB648474 D04, SAR is evaluated without a headset connected to the device. When the standalone reported body-worn SAR is ≤1.2 W/kg, no additional SAR evaluations using a headset are required.

8.2.1 Results overview of GSM850

Test position of Body	channel/ Frequency	Test Mode	SAR Value (W/Kg)		Power Drift(dB)	Conducted Power(dBm)	Tune up Power(dBm)	Scaled SAR10-g(W/kg)	Limit (W/Kg)	Liquid Temp.	Test Date
			1-g	10-g							
Position 1	128/824.2	GPRS 2TS	2.540	0.844	-0.150	31.65	32.00	0.915	4.0	20.88°C	2019-7-24
Position 1	190/836.6	GPRS 2TS	2.450	0.732	0.180	31.18	32.00	0.884	4.0	21.15°C	2019-7-23
Position 1	251/848.8	GPRS 2TS	2.200	0.662	-0.080	30.54	32.00	0.927	4.0	21.15°C	2019-7-23
Position 1 Repeated	128/824.2	GPRS 2TS	2.550	0.808	0.070	31.65	32.00	0.876	4.0	20.88°C	2019-7-24
Position 1 Repeated	190/836.6	GPRS 2TS	2.050	0.690	-0.190	31.18	32.00	0.833	4.0	20.88°C	2019-7-24
Position 1 Repeated	251/848.8	GPRS 2TS	2.030	0.685	0.050	30.54	32.00	**0.959**	4.0	20.88°C	2019-7-24

Note:
1) The maximum SAR value of each test band is shown in **bold** letters.

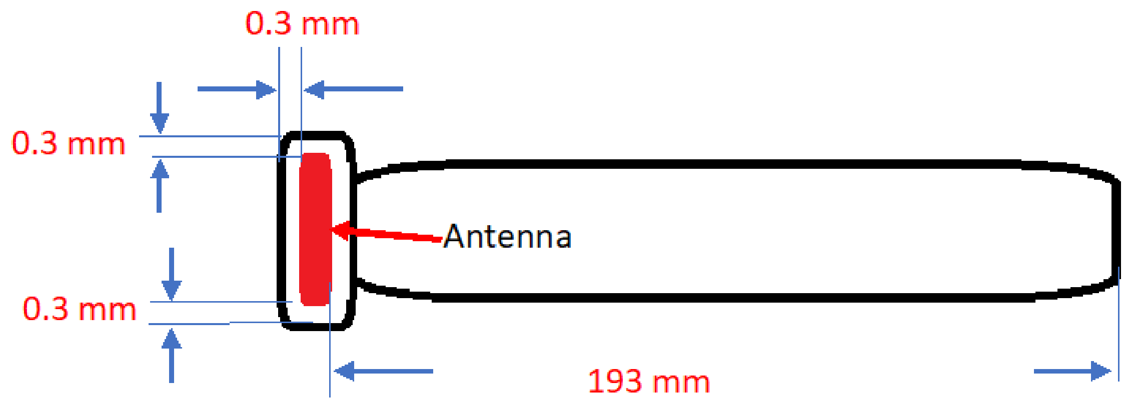
8.2.2 Results overview of GSM1900

Test position of Body	channel/ Frequency	Test Mode	SAR Value (W/Kg)		Power Drift(dB)	Conducted Power(dBm)	Tune up Power(dBm)	Scaled SAR10-g(W/kg)	Limit (W/Kg)	Liquid Temp.	Test Date
			1-g	10-g							
Position 1	512/1850.2	GPRS 4TS	1.740	0.931	-0.070	28.27	28.50	0.982	4.0	21.06°C	2019-7-25
Position 1	661/1880	GPRS 4TS	2.040	0.767	-0.180	26.97	28.50	1.091	4.0	21.06°C	2019-7-25
Position 1	810/1909.8	GPRS 4TS	2.130	0.863	-0.090	27.88	28.50	0.995	4.0	20.86°C	2019-7-26
Position 1 Repeated	661/1880	GPRS 4TS	2.420	0.866	-0.160	26.97	28.50	**1.232**	4.0	20.86°C	2019-7-26
Position 1 Repeated	810/1909.8	GPRS 4TS	2.220	0.908	0.190	27.88	28.50	1.047	4.0	20.86°C	2019-7-26

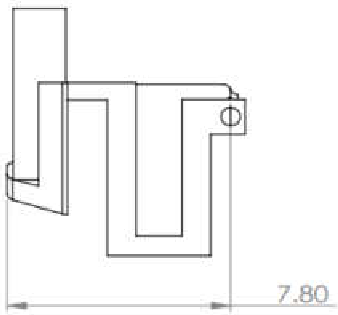
Note:
1) The maximum SAR value of each test band is shown in **bold** letters.

8.3 Multiple Transmitter Information

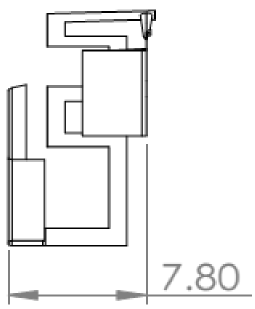
The location of the antennas inside BFG1S s shown as below picture:



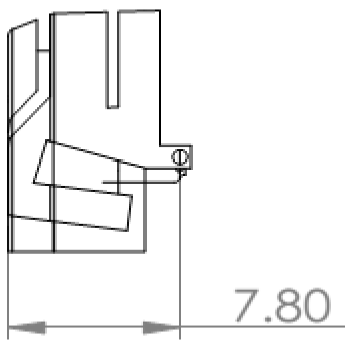
BT(mm)



GPS(mm)



GSM(mm)



8.4 Stand-alone SAR

Per FCC KDB 447498D01:

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

• f(GHz) is the RF channel transmit frequency in GHz

• Power and distance are rounded to the nearest mW and mm before calculation

• The result is rounded to one decimal place for comparison

When the minimum test separation distance is < 5 mm, a distance of 5mm is applied to determine SAR test exclusion.

Mode	Position	P_{max} (dBm)	P_{max} (mW)	Distance (mm)	F (GHz)	Calculation Result	SAR test exclusion Threshold	SAR test exclusion
BT	Body	0.00	1.00	5.00	2.450	0.31	3.00	Yes

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

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm, where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Mode	Position	P_{max} (dBm)	P_{max} (mW)	Distance(mm)	f(GHz)	X	Estimated SAR(W/Kg)
BT	Body	0.00	1.00	5.00	2.45	7.50	0.023

Note: 1) maximum possible output power (including tune-up tolerance) declared by manufacturer

2) Held to ear configurations are not applicable to Bluetooth for this device

8.5 Simultaneous Transmission Possibilities

The Simultaneous Transmission Possibilities of this device are as below:

Simultaneous Tx Combination	Configuration	Head	Body-worn	Hotspot	product specific 10-g SAR
1	GSM + BT	N/A	N/A	N/A	Yes

8.6 SAR Summation Scenario

Test Position		2G Antenna SARmax		BT Antenna SARmax	Σ10-g SAR10-g	SPLSP
		GSM850	GSM1900	BT		
Body-worn 0mm	Position 1	0.959	1.232	0.023	1.255	No

Note: Simultaneous Tx Combination of 2G antenna and BT.

8.7 Simultaneous Transmission Conlcusion

The above numeral summed SAR results is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore simultaneous transmission SAR with Volume Scans is not required per KDB 447498 D01v06

Annex A: SAR System performance Check Plots

(Please See Appendix A)

Test Laboratory: CTI SAR Lab

Systemcheck-835-Head

DUT: D835V2 - SN4d193; Type: D835V2; Serial: SN4d193

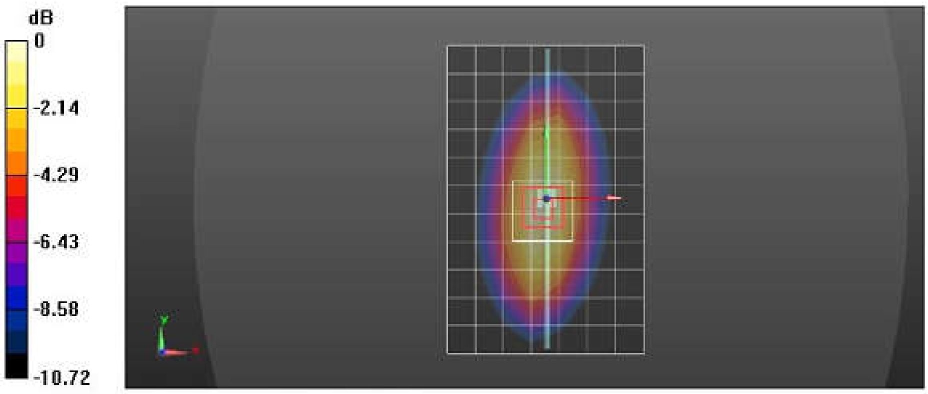
Communication System: UID 0, CW (0); Communication System Band: D835(835.0 MHz); Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.919 S/m; ε_r = 40.343; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN7328; ConvF(10.2, 10.2, 10.2); Calibrated: 3/1/2019;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1458; Calibrated: 2/26/2019
- Phantom: ELI v6.0; Type: QDOVA003AA; Serial: 2024
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/d=15mm,Pin=250mW/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.52 W/kg

Configuration/d=15mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 51.16 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.24 W/kg
SAR(1 g) = 2.21 W/kg; SAR(10 g) = 1.45 W/kg
Maximum value of SAR (measured) = 2.80 W/kg



0 dB = 2.80 W/kg = 4.47 dBW/kg

Test Laboratory: CTI SAR Lab

Systemcheck-835-Head

DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:4d193

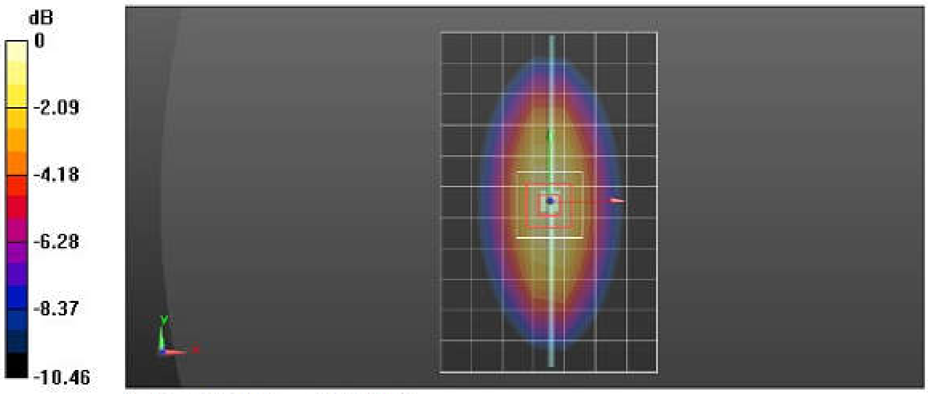
Communication System: UID 0, CW (0); Communication System Band: D835(835.0 MHz); Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; $\sigma = 0.91$ S/m; $\varepsilon_r = 39.964$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN7328; ConvF(10.2, 10.2, 10.2); Calibrated: 3/1/2019;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1458; Calibrated: 2/26/2019
- Phantom: ELI v6.0; Type: QDOVA003AA; Serial: 2024
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/d=15mm,Pin=250mW/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.48 W/kg

Configuration/d=15mm,Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 52.43 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 3.36 W/kg
SAR(1 g) = 2.31 W/kg; SAR(10 g) = 1.52 W/kg
Maximum value of SAR (measured) = 2.91 W/kg



0 dB = 2.91 W/kg = 4.64 dBW/kg

Test Laboratory: CTI SAR Lab

Systemcheck 1900-Head

DUT: D1900V2 - SN5d198; Type: D1900V2; Serial: SN5d198

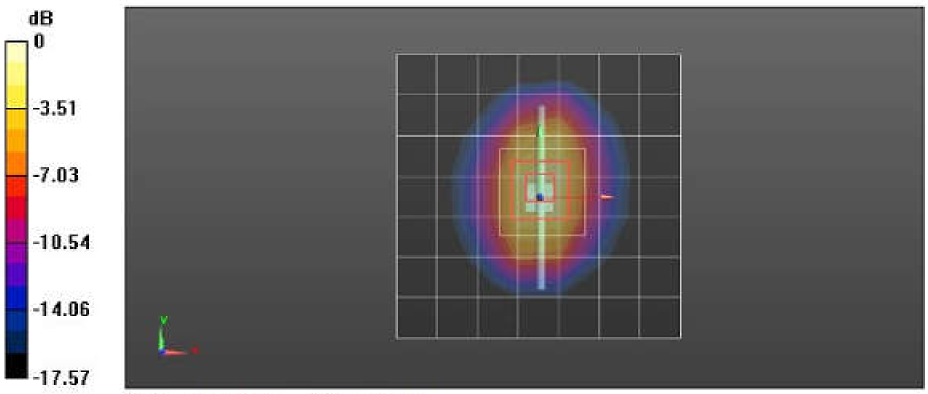
Communication System: UID 0, CW (0); Communication System Band: D1900 (1900.0 MHz); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.401 S/m; ε_r = 39.518; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN7328; ConvF(8.32, 8.32, 8.32); Calibrated: 3/1/2019;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1458; Calibrated: 2/26/2019
- Phantom: ELI v6.0; Type: QDOVA003AA; Serial: 2024
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/d=10mm, Pin=250 mW/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 10.7 W/kg

Configuration/d=10mm, Pin=250 mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 101.0 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 18.4 W/kg
SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.34 W/kg
Maximum value of SAR (measured) = 14.4 W/kg



0 dB = 14.4 W/kg = 11.58 dBW/kg

Test Laboratory: CTI SAR Lab

Systemcheck 1900-Head

DUT: D1900V2 - SN5d198; Type: D1900V2; Serial: SN5d198

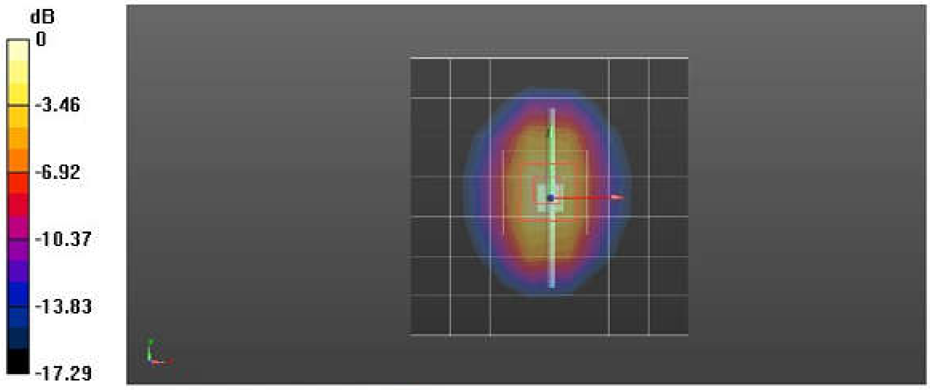
Communication System: UID 0, CW (0); Communication System Band: D1900 (1900.0 MHz); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.381 S/m; ε_r = 39.576; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN7328; ConvF(8.32, 8.32, 8.32); Calibrated: 3/1/2019;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1458; Calibrated: 2/26/2019
- Phantom: ELI v6.0; Type: QDOVA003AA; Serial: 2024
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/d=10mm, Pin=250 mW/Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 10.1 W/kg

Configuration/d=10mm, Pin=250 mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 102.7 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 18.5 W/kg
SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.34 W/kg
Maximum value of SAR (measured) = 14.6 W/kg



0 dB = 14.6 W/kg = 11.64 dBW/kg

Annex B: SAR Measurement results Plots

(Please See Appendix B)

Test Laboratory: CTI SAR Lab

Bikefinder Tracker GSM850 GPRS 2TS 251CH Position 1 0mm - Repeated

DUT: Bikefinder Tracker; Type: BFG1S; Serial: NA

Communication System: UID 0, GPRS 2TS (0); Communication System Band: GSM850 GPRS 2TS; Frequency: 848.8 MHz;Duty Cycle: 1:4.10015
Medium parameters used: f = 849 MHz; σ = 0.92 S/m; ε_r = 39.864; ρ = 1000 kg/m^3
Phantom section: Flat Section

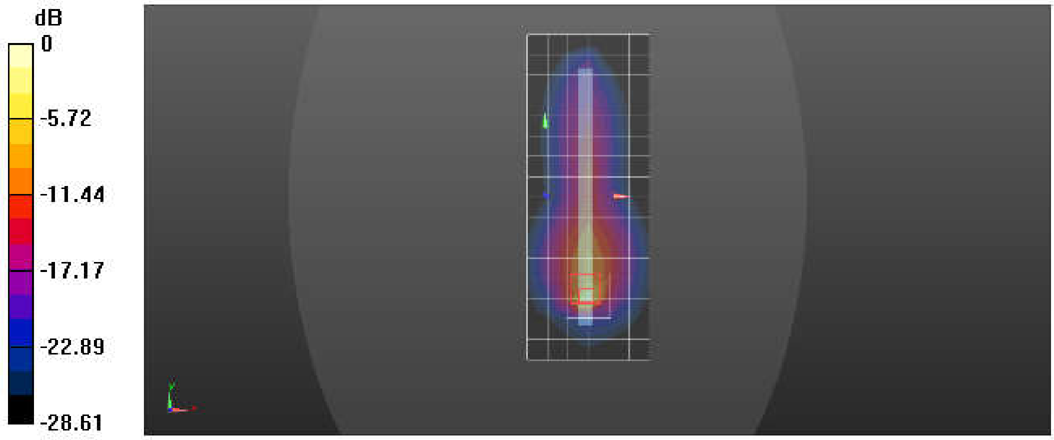
DASY Configuration:

- Probe: EX3DV4 - SN7328; ConvF(10.2, 10.2, 10.2); Calibrated: 3/1/2019;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1458; Calibrated: 2/26/2019
- Phantom: ELI v6.0; Type: QDOVA003AA; Serial: 2024
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Head/Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 6.72 W/kg

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.612 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 11.4 W/kg
SAR(1 g) = 2.03 W/kg; SAR(10 g) = 0.685 W/kg

Maximum value of SAR (measured) = 7.63 W/kg



0 dB = 7.63 W/kg = 8.83 dBW/kg

Test Laboratory: CTI SAR Lab

Bikefinder Tracker GSM1900 GPRS 4TS 661CH Position 1 0mm-Repeated

DUT: Bikefinder Tracker; Type: BFG1S; Serial: NA

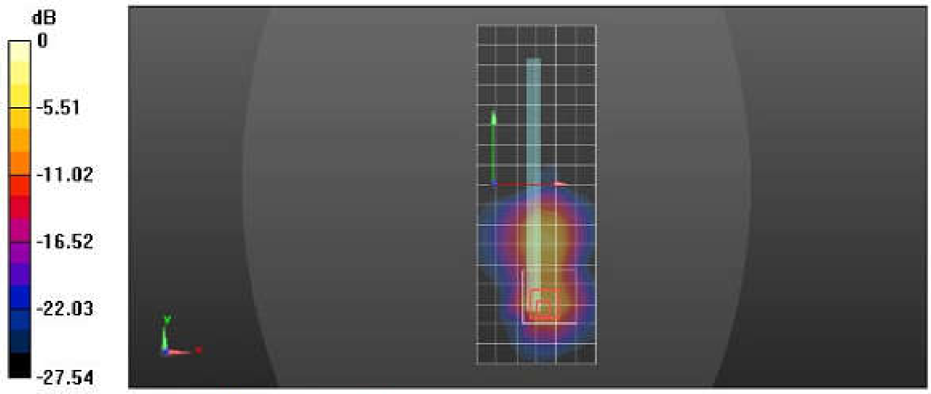
Communication System: UID 0, GPRS 4TS (0); Communication System Band: GSM1900 GPRS 4TS; Frequency: 1880 MHz;Duty Cycle: 1:2.0797
Medium parameters used: f = 1880 MHz; σ = 1.363 S/m; ε_r = 39.614; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:

- Probe: EX3DV4 - SN7328; ConvF(8.32, 8.32, 8.32); Calibrated: 3/1/2019;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1458; Calibrated: 2/26/2019
- Phantom: ELI v6.0; Type: QDOVA003AA; Serial: 2024
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Head/Area Scan (7x18x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.51 W/kg

Configuration/Head/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.488 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 12.8 W/kg
SAR(1 g) = 2.42 W/kg; SAR(10 g) = 0.866 W/kg
Maximum value of SAR (measured) = 6.25 W/kg



0 dB = 6.25 W/kg = 7.96 dBW/kg

Annex C: Calibration reports

(Please See Appendix C)

Annex D: Photo documentation

(Please See Appendix D)

——END OF REPORT——