D-PL-12139-01-00

The Testcenter facility 'Dosimetric Test Lab' within IMST GmbH is accredited by the German National 'Deutsche Akkreditierungsstelle GmbH (DAkkS)' for testing according to the scope as listed in the accreditation certificate: D-PL-12139-01-00.

SAR Test Report

Dosimetric Assessment of the Emergency Locator Buddi Click System - Clip from buddi Limited

(FCC ID: ZDL353A)

According to the FCC Requirements

November 26, 2014

IMST GmbH

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Executive Summary

The Buddi Click System - Clip is a new pocket worn emergency locator (Portable Device) from buddi Limited operating in the 850 MHz and 1900 MHz frequency range. The device has an integrated antenna and works in the GSM 850, GPRS 850 (Class 10), PCS 1900, GPRS 1900 (Class 10) and 900 MHz SRD standards.

The objective of the measurements done by IMST was the dosimetric assessment of one device in a worst case setup according to FCC inquiry 867474. Based on the KDB 648474 [KDB 648474] measurements for SRD are not required since the output power is below the threshold. The examinations have been carried out with the dosimetric assessment system „DASY4“.

The measurements were made according to the 47 CFR § 2.1093 [47CFR] for evaluating compliance of mobile and portable devices with FCC limits for human exposure (general population) to radiofrequency emissions and IEEE 1528-2013 [IEEE1528-2013].

Additional information and guidelines given by the following FCC documents were used:

- SAR Measurement Requirements for 100 MHz to 6 GHz [KDB 865664 D01 v01r03]
- Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies [KDB 447498 D01 v05r02]
- SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas [KDB 648474 D04 v01r02]

All measurements have been performed in accordance to the recommendations given by SPEAG.

Compliance Statement

The assessed SAR values for Buddi Click System - Clip device from buddi Limited (FCC ID: ZDL353A) are in compliance with the following standards for uncontrolled exposure:

- 47 CFR § 2.1093 [47CFR]
- ANSI / IEEE C95.1-1999 [IEEE C95.1-1999]

All measured SAR results are shown in Table 8, the highest reported results of SAR for the Buddi Click System - Clip are as follows:

Worst Case SAR Results								
Mode	**Frequency [MHz]**	**CH**	**Device Configuration**		**Figure No.**	**Reported SAR_{1g} [W/kg]**	**SAR Limit [W/kg]**	
GSM 850	824.2	128	Body Worn	Top Side	13	0.898	1.6	PASS
PCS 1900	1850.2	512			15	1.410		
GPRS 850	824.2	128			17	0.124		
GPRS 1900	1880.0	661			17	0.313		

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1 Subject of Investigation

The Buddi Click System - Clip is a new pocket worn emergency locator (Portable Device) from buddi Limited operating in the 850 MHz and 1900 MHz frequency range. The device has an integrated antenna and works in the GSM 850, GPRS 850 (Class 10), PCS 1900, GPRS 1900 (Class 10) and 900 MHz SRD standards.

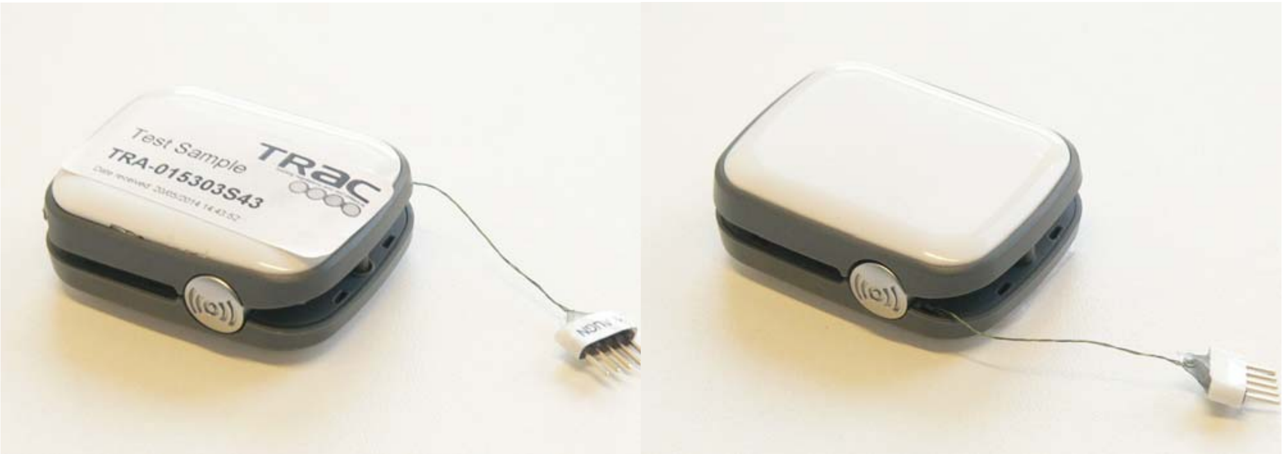


Fig. 1: Picture of the device under test.

The objective of the measurements done by IMST was the dosimetric assessment of one device in a worst case setup according to FCC inquiry 867474. Based on the KDB 648474 [KDB 648474] measurements for SRD are not required since the output power is below the threshold. The examinations have been carried out with the dosimetric assessment system „DASY4“.

2 FCC Exposure Criteria

In the USA the FCC exposure criteria [KDB 865664] are based on the withdrawn IEEE Standard C95.1-1999 [IEEE C95.1-1999].

In this report the comparison between the FCC exposure limits and the measured data is made using the spatial peak SAR; the power level of the device under test guarantees that the whole body averaged SAR is not exceeded.

Having in mind a worst case consideration, the SAR limit is valid for uncontrolled environment and mobile respectively portable transmitters. According to Table 1 the SAR values have to be averaged over a mass of 1 g (SAR_{1g}) with the shape of a cube.

Rule	SAR Limit [W/kg]
47 CFR § 2.1093 (d)(2)	1.6

Table 1: Relevant spatial peak SAR limit averaged over a mass of 1 g.

2.1 Distinction Between Exposed Population, Duration of Exposure and Frequencies

The American Standard [IEEE C95.1-1999] distinguishes between controlled and uncontrolled environment. Controlled environments are locations where there is exposure that may be incurred by persons who are aware of the potential for exposure as a concomitant of employment or by other cognizant persons. Uncontrolled environments are locations where there is the exposure of individuals who have no knowledge or control of their exposure. The exposures may occur in living quarters or workplaces. For exposure in controlled environments higher field strengths are admissible. In addition the duration of exposure is considered.

Due to the influence of frequency on important parameters, as the penetration depth of the electromagnetic fields into the human body and the absorption capability of different tissues, the limits in general vary with frequency.

2.2 Distinction between Maximum Permissible Exposure and SAR Limits

The biological relevant parameter describing the effects of electromagnetic fields in the frequency range of interest is the specific absorption rate SAR (dimension: power/mass). It is a measure of the power absorbed per unit mass. The SAR may be spatially averaged over the total mass of an exposed body or its parts. The SAR is calculated from the r.m.s. electric field strength *E* inside the human body, the conductivity σ and the mass density ρ of the biological tissue:

$$SAR = \sigma \frac{E^2}{\rho} = c \left. \frac{\partial T}{\partial t} \right|_{t \to 0+} . \quad (1)$$

The specific absorption rate describes the initial rate of temperature rise $\partial T / \partial t$ as a function of the specific heat capacity *c* of the tissue. A limitation of the specific absorption rate prevents an excessive heating of the human body by electromagnetic energy.

As it is sometimes difficult to determine the SAR directly by measurement (e.g. whole body averaged SAR), the standard specifies more readily measurable maximum permissible exposures in terms of external electric *E* and magnetic field strength *H* and power density *S*, derived from the SAR limits. The limits for *E*, *H* and *S* have been fixed so that even under worst case conditions, the limits for the specific absorption rate SAR are not exceeded.

For the relevant frequency range the maximum permissible exposure may be exceeded if the exposure can be shown by appropriate techniques to produce SAR values below the corresponding limits.

3 The FCC Measurement Procedure

3.1 General Requirements

The test shall be performed in a laboratory with an environment which avoids influence on SAR measurements by ambient EM sources and any reflection from the environment itself. The ambient temperature shall be in the range of 20°C to 26°C and 30-70% humidity. All tests have been conducted according the latest version of all relevant KDBs.

3.2 Phantom Requirements

For body-worn and other configurations a flat phantom shall be used which is comprised of material with electrical properties similar to the corresponding tissues.

3.3 Test to be Performed

For devices with retractable antenna the SAR test shall be performed with the antenna fully extended and fully retracted. Other factors that may affect the exposure shall also be tested. For example, optional antennas or optional battery packs which may significantly change the volume, lengths, flip open/closed, etc. of the device, or any other accessories which might have the potential to considerably increase the peak spatial-average SAR value. For phablet computers additionally the configurations according applicable KDBs needs to be considered.

The SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the SAR measured at the middle channel resp. that channel with the highest output power for each test configuration is < 0.4 W/kg, testing at the high and low channels is optional.

3.3.1 Measurement Variability

According KDB 865664 repeated measurements are required only when the measured SAR is ≥ 0.80 W/kg. If the measured SAR value of the initial repeated measurement is < 1.45 W/kg with ≤ 20% variation, only one repeated measurement is required to reaffirm that the results are not expected to have substantial variations, which may introduce significant compliance concerns. A second repeated measurement is required only if the measured result for the initial repeated measurement is within 10% of the SAR limit and vary by more than 20%, which are often related to device and measurement setup difficulties. The following procedures are applied to determine if repeated measurements are required.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 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 > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

4 The Measurement System

DASY is an abbreviation of „Dosimetric Assessment System“ and describes a system that is able to determine the SAR distribution inside a phantom of a human being according to different standards. The DASY4 system consists of the following items as shown in Fig: 2. Additional Fig: 3 show the equipment, similar to the installations in other laboratories.

- Fully compliant with all current measurement standards as stated in Fig. 8
- High precision robot with controller
- Measurement server (for surveillance of the robot operation and signal filtering)
- Data acquisition electronics DAE (for signal amplification and filtering)
- Field probes calibrated for use in liquids
- Electro-optical converter EOC (conversion from the optical into a digital signal)
- Light beam (improving of the absolute probe positioning accuracy)
- Two SAM phantoms filled with tissue simulating liquid
- DASY4 software
- SEMCAD

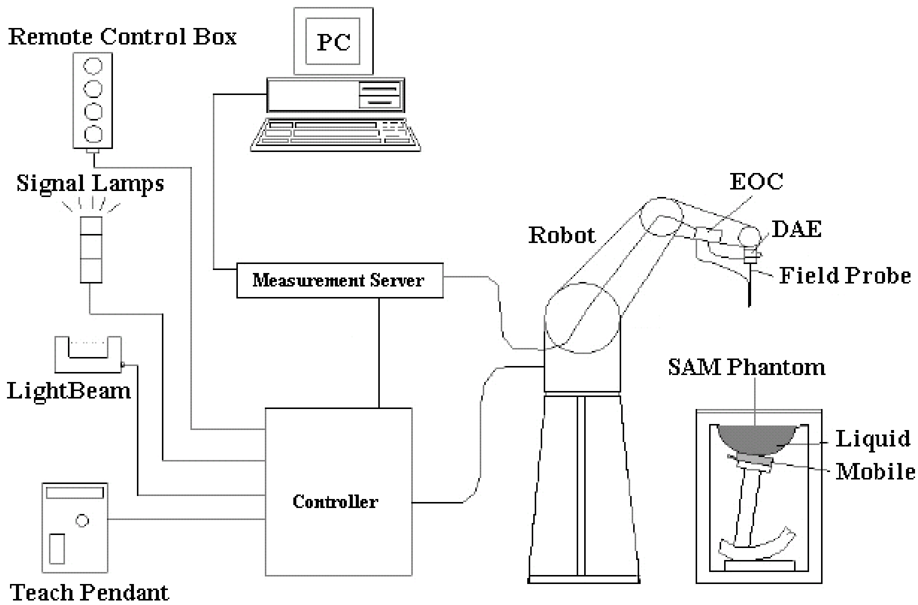


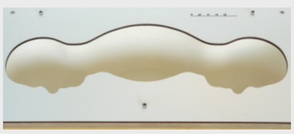
Fig. 2: The DASY4 measurement system.

Fig. 3: The measurement set-up with two SAM phantoms containing tissue simulating liquid.

The mobile phone operating at the maximum power level is placed by a non metallic device holder (delivered from Schmid & Partner) in the above described positions at a shell phantom of a human being. The distribution of the electric field strength *E* is measured in the tissue simulating liquid within the shell phantom. For this miniaturised field probes with high sensitivity and low field disturbance are used. Afterwards the corresponding SAR values are calculated with the known electrical conductivity σ and the mass density ρ of the tissue in the SEMCAD FDTD software. The software is able to determine the averaged SAR values (averaging region 1 g or 10 g) for compliance testing.

The measurements are done by two scans: first a coarse scan determines the region of the maximum SAR, afterwards the averaged SAR is measured in a second scan within the shape of a cube. The measurement time takes about 20 minutes.

4.1 Phantoms

TWIN SAM PHANTOM V4.0	
	Specific Anthropomorphic Mannequin defined in IEEE 1528 and IEC 62209-1 and delivered by Schmid & Partner Engineering AG. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. The details and the Certificate of conformity can be found in Fig. 9.
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions	Length: 1000 mm; Width: 500 mm Height: adjustable feet
Filling Volume	approx. 25 liters

4.2 E-Field-Probes

For the measurements the Dosimetric E-Field Probes ET3DV6R or EX3DV4 with following specifications are used. They are manufactured and calibrated in accordance with FCC [KDB 865664] recommendations annually by Schmid & Partner Engineering AG.

ET3DV6R	
Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system (ET3DV6 only) Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Dimensions	Overall length: 337 mm (Tip: 16 mm) Tip diameter: 6.8 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.7 mm
Frequency	10 MHz to 2.3 GHz Linearity: ± 0.2 dB (30 MHz to 2.3 GHz)
Directivity	Axial isotropy: ± 0.2 dB in TSL (rotation around probe axis) Spherical isotropy: ± 0.4 dB in TSL (rotation normal to probe axis)
Dynamic Range	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Calibration Range	450 MHz / 750 MHz / 900 MHz / 1750 MHz / 1900 MHz / 1950 MHz for head and body simulating liquid

EX3DV4	
Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	Axial isotropy: ± 0.3 dB in TSL (rotation around probe axis) Spherical isotropy: ± 0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 µW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
Calibration Range	1950 MHz / 2450 MHz / 2600 MHz / 3500 MHz / 5200 MHz / 5300 MHz / 5600 MHz / 5800 MHz for head and body simulating liquid

4.3 Measurement Procedure

The following steps are used for each test position:

- Establish a call with the maximum output power with a base station simulator or by software. The connection between the mobile phone and the base station simulator is established via air interface.
- Measurement of the local E-field value at a fixed location (P1). This value serves as a reference value for calculating a possible power drift.
- Measurement of the SAR distribution with resolution settings for area scan and zoom scan according KDB 865664 D01 as shown in Table 2.
- The used extrapolation and interpolation routines are all based on the modified Quadratic Shepard´s method [DASY4].
- Repetition of the E-field measurement at the fixed location (P1) and repetition of the whole procedure if the two results differ by more than ± 0.21dB.

			≤ 3 GHz	≥ 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 - 3 GHz: ≤ 12 mm	3 - 4 GHz: ≤ 12 mm 4 - 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: ΔX_{Zoom}, ΔY_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 - 3 GHz: ≤ 5 mm*	3 - 4 GHz: ≤ 5 mm* 4 - 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	Uniform grid: $\Delta Z_{Zoom}(n)$		≤ 5 mm	3 - 4 GHz: ≤ 4 mm 4 - 5 GHz: ≤ 3 mm 5 - 6 GHz: ≤ 2 mm
	graded grid	$\Delta Z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 - 4 GHz: ≤ 3 mm 4 - 5 GHz: ≤ 2.5 mm 5 - 6 GHz: ≤ 2 mm
		$\Delta Z_{Zoom}(n>1)$: between subsequent points	≤ 1.5· $\Delta Z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 - 4 GHz: ≥ 28 mm 4 - 5 GHz: ≥ 25 mm 5 - 6 GHz: ≥ 22 mm
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium: see draft standard IEEE P1528-2011 for details. * When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz				

Table 2: Parameters for SAR scan procedures.

4.4 Uncertainty Assessment

Table 3 includes the worst case uncertainty budget suggested by the KDB 865664 and determined by Schmid & Partner Engineering AG. The expanded uncertainty (K=2) is assessed to be ± 21.6%.

Uncertainty Budget of DASY4						
Error Sources	**Uncertainty Value**	**Probability Distribution**	**Divisor**	**c_i**	**Standard Uncertainty**	**v_i^2 or v_{eff}**
Measurement System						
Probe calibration	± 5.9 %	Normal	1	1	± 5.9 %	∞
Axial isotropy	± 4.7 %	Rectangular	√3	0.7	± 1.9 %	∞
Hemispherical isotropy	± 9.6 %	Rectangular	√3	0.7	± 3.9 %	∞
Boundary effects	± 1.0 %	Rectangular	√3	1	± 0.6 %	∞
Linearity	± 4.7 %	Rectangular	√3	1	± 2.7 %	∞
System detection limit	± 1.0 %	Rectangular	√3	1	± 0.6 %	∞
Readout electronics	± 1.0 %	Normal	1	1	± 1.0 %	∞
Response time	± 0.8 %	Rectangular	√3	1	± 0.5 %	∞
Integration time	± 2.6%	Rectangular	√3	1	± 1.5 %	∞
RF ambient conditions	± 3.0 %	Rectangular	√3	1	± 1.7 %	∞
Probe positioner	± 0.4 %	Rectangular	√3	1	± 0.2 %	∞
Probe positioning	± 2.9 %	Rectangular	√3	1	± 1.7 %	∞
Algorithm for max SAR eval.	± 1.0 %	Rectangular	√3	1	± 0.6 %	∞
Test Sample Related						
Device positioning	± 2.9 %	Normal	1	1	± 2.9 %	145
Device holder	± 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 (target)	± 5.0 %	Rectangular	√3	0.64	± 1.8 %	∞
Liquid conductivity (meas.)	± 2.5 %	Normal	1	0.64	± 1.6 %	∞
Liquid permittivity (target)	± 5.0 %	Rectangular	√3	0.6	± 1.7 %	∞
Liquid permittivity (meas.)	± 2.5 %	Normal	1	0.6	± 1.5 %	∞
Combined Uncertainty					**± 10.8 %**	

Table 3: Uncertainty budget of DASY4 up to 3 GHz.

5 Output Power and Tune-Up Information

5.1 Output Power Values for GSM and GPRS

This device supports GPRS Multislot class 10 and it is a class B device without DTM support. The device does also support a voice mode. According the following tables, GPRS 850/1900 with 2 TX represent the worst case, therefore measurements with two active time slots are conducted for GPRS 850/1900.

Burst Averaged Output Power per Slot [dBm]					
Band	Freq. [MHz]	CH	GSM (Voice)	GPRS (GMSK /CS1)	
				1TX	2 TX
850	824.2	128	32.4	32.3	32.3
	836.6	190	32.4	32.4	32.3
	848.8	251	32.5	32.4	32.4
1900	1850.2	512	30.3	30.3	30.2
	1880.0	661	29.7	29.7	29.6
	1909.8	810	29.2	29.3	29.3

Table 4: Measured output power for Buddi Click System - Clip from buddi Limited.

Frame Averaged Output Power over 8 Slots [dBm]				
Band	Freq. [MHz]	CH	GPRS (GMSK /CS1)	
			1TX	2 TX
850	824.2	128	23.3	26.3
	836.6	190	23.4	26.3
	848.8	251	23.4	26.4
1900	1850.2	512	21.3	24.2
	1880.0	661	20.7	23.6
	1909.8	810	20.3	23.3

Table 5: Measured output power for GPRS averaged over 8 slots for the Buddi Click System - Clip from buddi Limited.

5.2 Tune-Up Information

Tune-up procedure according KDB 447498 D01v05r02 is applicable. The measured SAR values are scaled according the tune-up information given by the manufacturer, shown below.

Tune-Up Information [dBm]					
Band	**Freq. [MHz]**	**CH**	**Output Power GSM (Voice)**	**Output Power GPRS (2TX)**	**Tune-Up Limit**
850	824.2	128	32.4	32.3	34
	836.6	190	32.4	32.3	
	848.8	251	32.5	32.4	
1900	1850.2	512	30.3	30.2	31
	1880.0	661	29.7	29.6	
	1909.8	810	29.2	29.3	

Table 6: Measured output power and tune-up information for Buddi Click System - Clip from buddi Limited..

5.3 SAR Test Exclusion Consideration

Standalone SAR Test Exclusion Considerations for Extremity Exposure						
Communication System	**Freq. [MHz]**	**Distance [mm]**	**Pavg [dBm]**	**Pavg [mW]**	**Threshold 1g Comparison Values**	**SAR Test Exclusion (Yes/No)**
SRD 900	921.0	5	6.0	4.0	0.8	Yes
GSM/GPRS 850	835.0	5	34.00	2511.0	459.0	No
GSM/GPRS 1900	1880.0	5	31.00	1259.0	345.0	No

Table 7: SAR test exclusion for extremity exposure.

Following KDB 447498 D01v05r02, the above table shows the SAR test exclusion consideration for the applicable modes against the different device edges with the relevant distances.

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

[(max power of channel. incl. tune-up tolerance. mW)/(min test separation distance. mm)] [√f(GHz)]*

≤ 3.0 for 1g SAR and ≤ 7.5 for 10g extremity SAR

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

6 SAR Results

Following KDB 447498 D01v05r02, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.

Scaling Factor = tune-up limit power (mW) / RF power (mW)
Reported SAR = measured SAR * scaling factor

Furthermore. testing of other required channels within the operating mode of frequency band is not required when the reported SAR for the mid-band or highest output power channel is ≤ 0.4 W/kg for transmission band ≥ 200 MHz.

6.1 SAR Results for Voice Mode

SAR Results												
Band	Freq. [MHz]	Channel	Test Position	Spacing [mm]	Figure No.	Tune-Up Limit [dBm]	Output Power [dBm]	Measured SAR_{1g} [W/kg]	Power Drift [dBm]	Scaling Factor	Reported SAR_1 [W/kg]	Plot No.
GSM 850	836.6	190	Top	5	13	34.0	32.4	0.519	-0.055	1.445	0.750	
	836.6	190	Back		14		32.4	0.131	-0.156	1.445	0.189	
	824.2	128	Top		13		32.4	0.621	-0.020	1.445	0.898	1
	848.8	251	Top		13		32.5	0.532	-0.055	1.413	0.751	
PCS 1900	1880.0	661	Top	7	15	31	29.7	0.872	-0.129	1.349	1.176	
	1880.0	661	Back		16		29.7	0.190	-0.059	1.349	0.256	
	1850.2	512	Top		15		30.3	1.200*	-0.106	1.175	1.410	2
	1909.8	810	Top		15		29.2	0.723	-0.018	1.514	1.094	
	1850.2	512	*Variability test according KDB 865664					1.180	-0.090	1.175	1.387	

Table 8: Measured SAR results for speech functionality of Buddi Click System - Clip from buddi Limited.

6.2 SAR Results for GPRS Mode

The Buddi Click System - Clip transmits a burst of data approximately 12 seconds long every five minutes in worst case (panic mode).

Low Duty Cycle RF Exposure Evaluation			
Maximum Transmission Time [sec]	Duty Cycle Period		Duty Cycle
	Min	Sec	
12	5	300	4 %

Table 9: Duty cycle calculation for data transmission of Buddi Click System - Clip from buddi Limited.

According to the table above, the worst case data transmission duty cycle would result in a scaling of 12/300 = 4% applicable to the measured SAR values as shown in table 10.

Band	Freq. [MHz]	Channel	Test Position	Spacing [mm]	Figure No.	Tune-Up Limit [dBm]	Output Power [dBm]	Measured SAR_{1g} [W/kg]	Power Drift [dBm]	Scaling Factor	Reported SAR_1 [W/kg]	Plot No.
SAR Results												
	Measured SAR Results for GPRS											
GPRS 850 (2TX)	836.6	190	Top	0	17	34.0	32.3	1.960	-0.095	1.479	2.899	
	836.6	190	Back		18		32.3	0.178	-0.146	1.479	0.263	
	824.2	128	Top		17		32.3	2.100*	0.084	1.479	3.106	3
	848.8	251	Top		17		32.4	1.910	-0.092	1.445	2.761	
	824.2	128	*Variability test according KDB 865664					2.040	-0.165	1.479	3.017	
GPRS 1900 (2TX)	1880.0	661	Top	0	17	31	29.6	5.670	-0.198	1.380	7.827	4
	1880.0	661	Back		18		29.6	0.578	-0.170	1.380	0.798	
	1850.2	512	Top		17		30.2	6.040*	-0.086	1.202	7.262	5
	1909.8	810	Top		17		29.3	4.060	-0.040	1.479	6.005	
	1850.2	512	*Variability test according KDB 865664					5.820	0.011	1.202	6.997	
	Scaled SAR Results for GPRS to 4% Duty Cycle Transmission (W/C = Panic Mode)											
GPRS 850 (2TX)	836.6	190	Top	0	17	34.0	32.3	0.078	-0.095	1.479	0.116	
	836.6	190	Back		18		32.3	0.007	-0.146	1.479	0.011	
	824.2	128	Top		17		32.3	0.084	0.084	1.479	0.124	
	848.8	251	Top		17		32.4	0.076	-0.092	1.445	0.110	
	824.2	128	*Variability test according KDB 865664					0.082	-0.165	1.479	0.121	
GPRS 1900 (2TX)	1880.0	661	Top	0	17	31	29.6	0.227	-0.198	1.380	0.313	
	1880.0	661	Back		18		29.6	0.023	-0.170	1.380	0.032	
	1850.2	512	Top		17		30.2	0.242	-0.086	1.202	0.290	
	1909.8	810	Top		17		29.3	0.162	-0.040	1.479	0.240	
	1850.2	512	*Variability test according KDB 865664					0.233	0.011	1.202	0.280	

Table 10: Measured and scaled SAR results for GPRS data transmission of Buddi Click System - Clip from buddi Limited.

To control the output power stability during the SAR test the used DASY4 system calculates the power drift by measuring the e-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in the above tables labeled as: (Drift[dB]). This ensures that the power drift during one measurement is within 5%.

6.3 Estimated SAR for Standalone SAR Excluded Modes

Estimated SAR					
Band	Frequency [GHz]	Distance [mm]	Pavg [dBm]	Pavg [mW]	Estimated SAR_{1g} [W/kg]
SRD 900	0.921	5	6.0	4.0	0.102

Table 11: Estimated stand alone SAR.

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.

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

6.4 Multiple Transmitter Information

According KDB 447498, the following table gives an overview about the ∑SAR for simultaneous transmitting modes. When ∑SAR > 1.6 W/kg. a SAR test exclusion is determined by the SAR to peak location separation ratio.

The ratio is determined by $(SAR1 + SAR2)^{1.5}/Ri$ rounded to two decimal digits and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion. Where Ri is the separation distance between the peak SAR locations for the antenna pair in mm. When SAR is measured for both antennas in a pair the peak location separation distance is computed by the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$ where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the area scans or extrapolated peak SAR locations in the zoom scans as appropriate.

Simultaneous Transmission Scenario SAR [W/kg]				
Exposure Position	Worst Case GSM/GPRS	Worst Case SRD	ΣSAR	SPLSR
Top	1.410	0.102	1.512	No

Table 12: Worst case SAR test exclusion consideration for the applicable modes for 2G (GSM/GPRS) and SRD transmission.

7 Appendix

7.1 Administrative Data

Date of Validation:	835 MHz Head (GSM850):	September 30, 2014
	835 MHz Body (GPRS850):	November 14, 2014
	1900 MHz Head (PCS1900):	November 10, 2014
	1900 MHz Body (GPRS1900):	October 22, 2014

Date of Measurement: September 30, 2014 - November 14, 2014
Data Stored: TRaC_60320_6140200
Contact: IMST GmbH
Carl-Friedrich-Gauß-Str. 2 - 4
D-47475 Kamp-Lintfort. Germany
Tel.: +49- 2842-981 378
Fax: +49- 2842-981 399
email: vandenBosch@imst.de

7.2 Device under Test and Test Conditions

MTE: Buddi Click System - Clip from buddi Limited
Date of Receipt: September 29, 2014
SN: C00020
FCC ID: ZDL353A
Equipment Class: Portable device
RF Exposure Environment: General Population/ Uncontrolled Exposure;
Power Supply: Internal Battery
Antenna: integrated
Used Accessory: N.A.

Standard	TX Range [MHz]	RX Range [MHz]	Used Channels	Crest Factor	Phantom
GSM 850	824.2 – 848.8	869.2 – 893.8	128, 190, 251	8.3	SAM Twin Phantom V4.0
PCS 1900	1850.2 –1909.8	1930.2 – 1989.8	512, 661, 810	8.3	
GPRS 850	824.2 – 848.8	869.2 – 893.8	128, 190, 251	4	
GPRS 1900	1850.2 –1909.8	1930.2 – 1989.8	512, 661, 810	4	

Table 13: Used channels and crest factors during the test.

7.3 Tissue Recipes

The following recipes are provided in percentage by weight.

835 MHz Head:	57.90%	Sugar
	40.29%	De-Ionized Water
	1.38%	Salt
	0.24%	Hydroxyetyl-cellulose
	0.19%	Preventol D7
1900 MHz Head:	44.51%	Diethylenglykol-monobutylether
	55.41%	De-Ionized Water
	0.08%	Salt
835 MHz Body:	52.40 %	De-Ionized Water
	01.50 %	Salt
	45.00 %	Sugar
	00.10 %	Preventol D7
	01.00 %	Hydroxyetyl-Cellulose
1900 MHz Body:	29.68 %	Diethylenglykol-monobutylether
	70.00 %	De-Ionized Water
	0.32 %	Salt

7.4 Material Parameters

For the measurement of the following parameters the HP 85070B dielectric probe kit is used representing the open-ended coaxial probe measurement procedure. The measured values should be within ± 5% of the recommended values given by the FCC.

Tissue Simulating Liquids			
Frequency		ε_r	**σ [S/m]**
835 MHz Head (GSM 850)	Recommended Value	41.50 ± 2.00	0.90 ± 0.04
	Measured Value (Ch. 128)	41.90	0.88
	Measured Value (Ch. 190)	41.80	0.89
	Measured Value (Ch. 251)	41.60	0.90
1900 MHz Head (PCS 1900)	Recommended Value	40.00 ± 2.00	1.40 ± 0.06
	Measured Value (Ch. 512)	39.80	1.38
	Measured Value (Ch. 661)	39.60	1.40
	Measured Value (Ch. 810)	39.50	1.44
835 MHz Body (GPRS 850)	Recommended Value	55.20 ± 2.70	0.97 ± 0.10
	Measured Value (Ch. 128)	55.90	0.98
	Measured Value (Ch. 190)	55.90	0.99
	Measured Value (Ch. 251)	55.70	1.00
1900 MHz Body (GPRS 1900)	Recommended Value	53.30 ± 2.70	1.52 ± 0.15
	Measured Value (Ch. 512)	54.70	1.46
	Measured Value (Ch. 661)	54.70	1.50
	Measured Value (Ch. 810)	54.70	1.53

Table 14: Parameters of the tissue simulating liquids.

7.5 Simplified Performance Checking

The simplified performance check was realized using the dipole validation kits. The input power of the dipole antennas were 250 mW (cw signal) and they were placed under the flat part of the SAM phantom. The target and measured results are listed in the table 15 - 16 and shown in figure 4 - 7. The target values were adopted from the calibration certificates which are attached in the appendix. Table 17 includes the uncertainty assessment for the system performance checking which was suggested by the KDB 865664 and determined by Schmid & Partner Engineering AG. The expanded uncertainty (K=2) is assessed to be ± 16.8%. To justify the two year calibration interval of the used validation dipoles, IMST consider the requirements in 3.2.2 of KDB 865664. The result of the annual SAR target, impedance and return loss assessment, conducted by IMST, show no significant deviation to dipole calibration results..

Dipole Target Results					
Band	**Available Dipoles**		**SAR_{1g} [W/kg]**	**ε_r**	**σ [S/m]**
GSM 850	D835V2, SN #437	Target Values Head	2.60	42.10	0.88
PCS 1900	D1900V2, SN #5d051		9.80	41.40	1.43
GPRS 850	D835V2, SN #437	Target Values Body	2.50	56.20	0.96
GPRS 1900	D1900V2, SN #5d051		9.53	55.00	1.51

Table 15: Dipole target results as given by the calibration certificates.

Dipole Validation Results					
Band	**Used Dipoles**		**SAR_{1g} [W/kg]**	**ε_r**	**σ [S/m]**
GSM 850	D835V2, SN #437	Measured Values Head	2.56	41.80	0.89
PCS 1900	D1900V2, SN #5d051		9.69	39.50	1.43
GPRS 850	D835V2, SN #437	Measured Values Body	2.45	55.90	0.99
GPRS 1900	D1900V2, SN #5d051		9.74	54.70	1.52

Table 16: Measured dipole validation results.

Test Laboratory: IMST GmbH, DASY Blue (I); File Name: 300914_b_1579.da4

DUT: Dipole 835 MHz SN437; Type: D835V2; Serial: D835V2 - SN:437
Program Name: System Performance Check at 835 MHz

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 41.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6R - SN1579; ConvF(6.42, 6.42, 6.42); Calibrated: 28.01.2014
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 23.01.2014
- Phantom: SAM Sugar 1059; Type: Speag; Serial: 1059
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=250mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.74 mW/g
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.3 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 3.60 W/kg
SAR(1 g) = 2.56 mW/g; SAR(10 g) = 1.71 mW/g
Maximum value of SAR (measured) = 2.78 mW/g

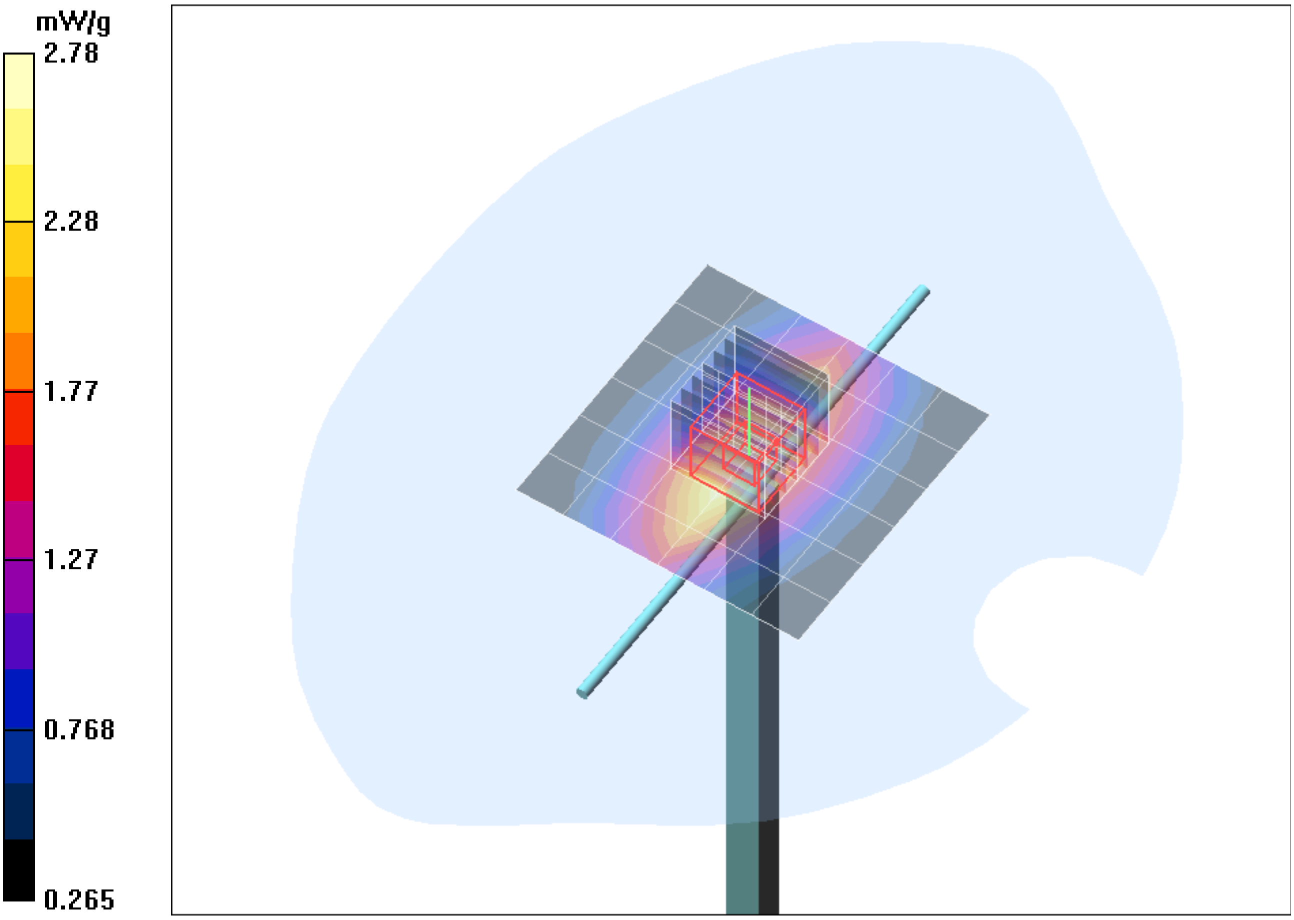


Fig. 4: Validation measurement 835 MHz head (September 30, 2014), coarse grid.

Test Laboratory: Imst GmbH, DASY Yellow (II); File Name: 101114_y_1579.da4

DUT: Dipole 1900 MHz SN: 5d051; Type: D1900V2; Serial: D1900V2 - SN5d051
Program Name: System Performance Check at 1900 MHz

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.43 mho/m; ε_r = 39.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6R - SN1579; ConvF(5.19, 5.19, 5.19); Calibrated: 28.01.2014
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 23.07.2014
- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=250mW/Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 10.5 mW/g
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.3 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 16.7 W/kg
SAR(1 g) = 9.69 mW/g; SAR(10 g) = 5.09 mW/g
Maximum value of SAR (measured) = 10.9 mW/g

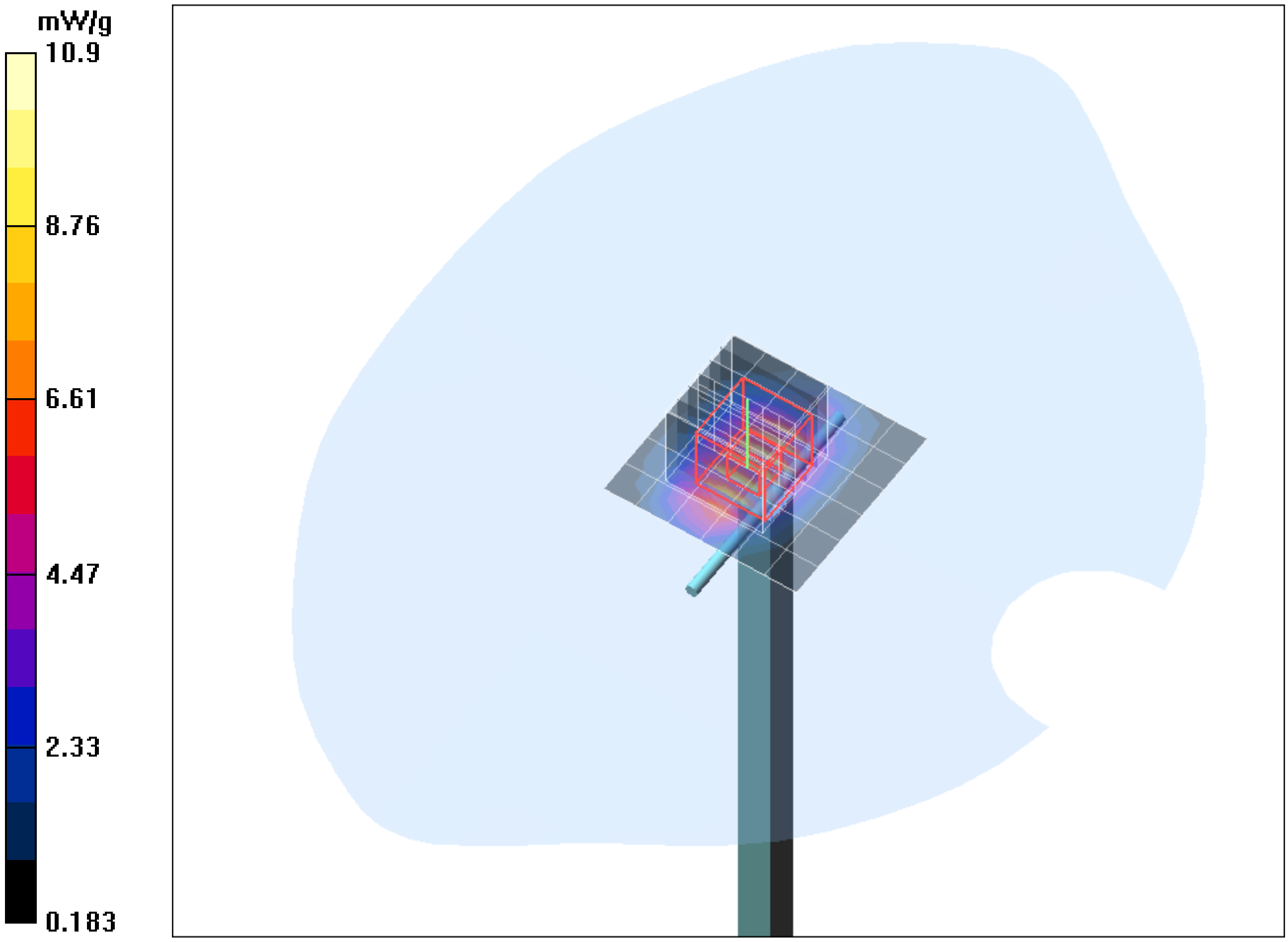


Fig. 5: Validation measurement 1900 MHz head (November 10. 2014), coarse grid.

Test Laboratory: IMST GmbH, DASY Blue (I); File Name: 141114_b_1579.da4

DUT: Dipole 835 MHz SN437; Type: D835V2; Serial: D835V2 - SN:437
Program Name: System Performance Check at 835 MHz

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6R - SN1579; ConvF(6.25, 6.25, 6.25); Calibrated: 28.01.2014
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 23.01.2014
- Phantom: SAM Sugar 1059; Type: Speag; Serial: 1059
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=250mW/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.60 mW/g
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.4 V/m; Power Drift = 0.000 dB
Peak SAR (extrapolated) = 3.48 W/kg
SAR(1 g) = 2.45 mW/g; SAR(10 g) = 1.6 mW/g
Maximum value of SAR (measured) = 2.65 mW/g

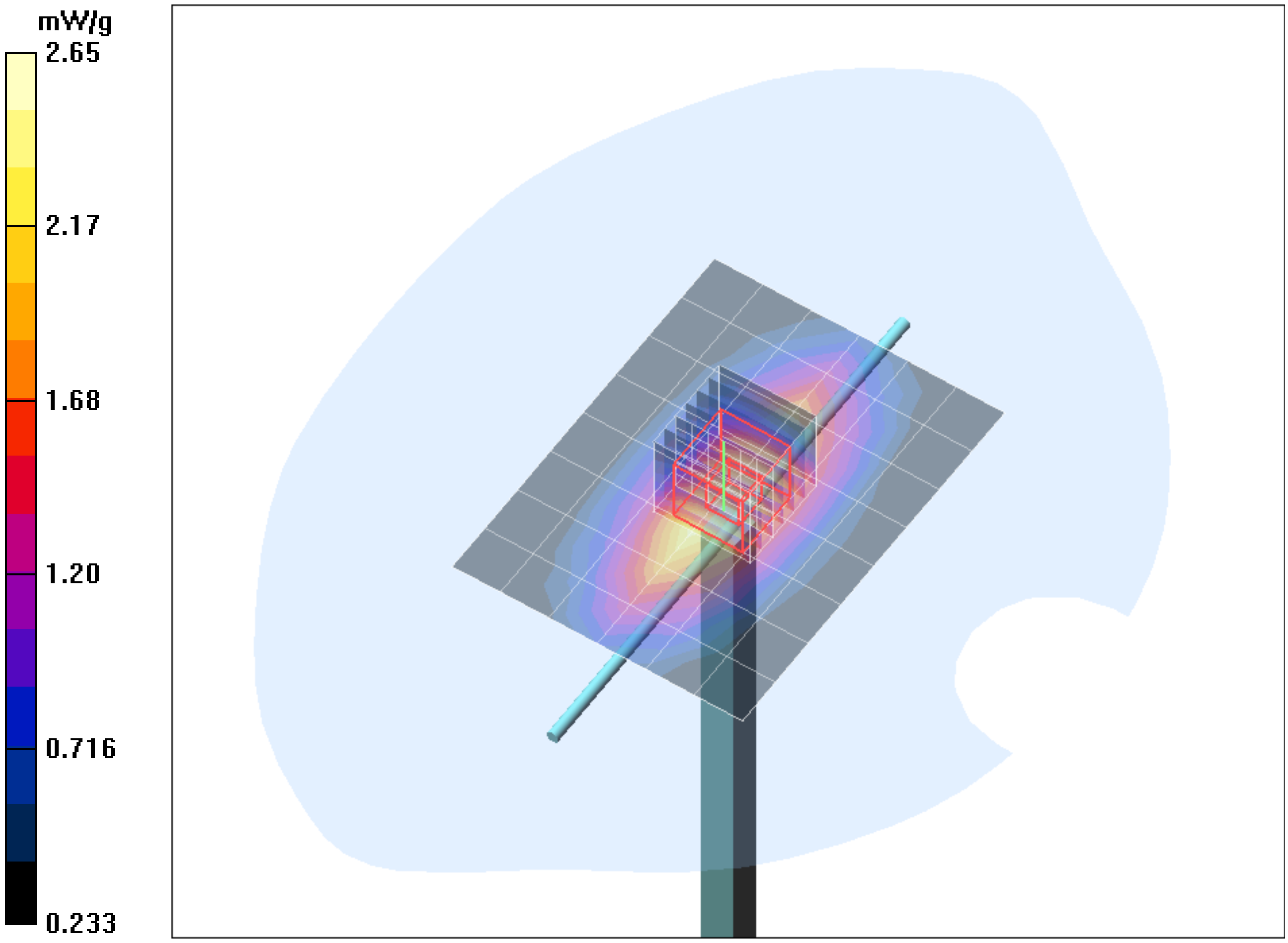


*Fig. 6: Validation measurement 835 MHz body (**November** 14, 2014), coarse grid.*

Test Laboratory: Imst GmbH, DASY Yellow (II); File Name: [221014_y_1579.da4]

DUT: Dipole 1900 MHz SN: 5d051; Type: D1900V2; Serial: D1900V2 - SN5d051
Program Name: System Performance Check at 1900 MHz

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.52 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6R - SN1579; ConvF(4.49, 4.49, 4.49); Calibrated: 28.01.2014
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 23.07.2014
- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=250mW/Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 10.9 mW/g
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.9 V/m; Power Drift = 0.000 dB
Peak SAR (extrapolated) = 16.1 W/kg
SAR(1 g) = 9.74 mW/g; SAR(10 g) = 5.13 mW/g
Maximum value of SAR (measured) = 11.1 mW/g

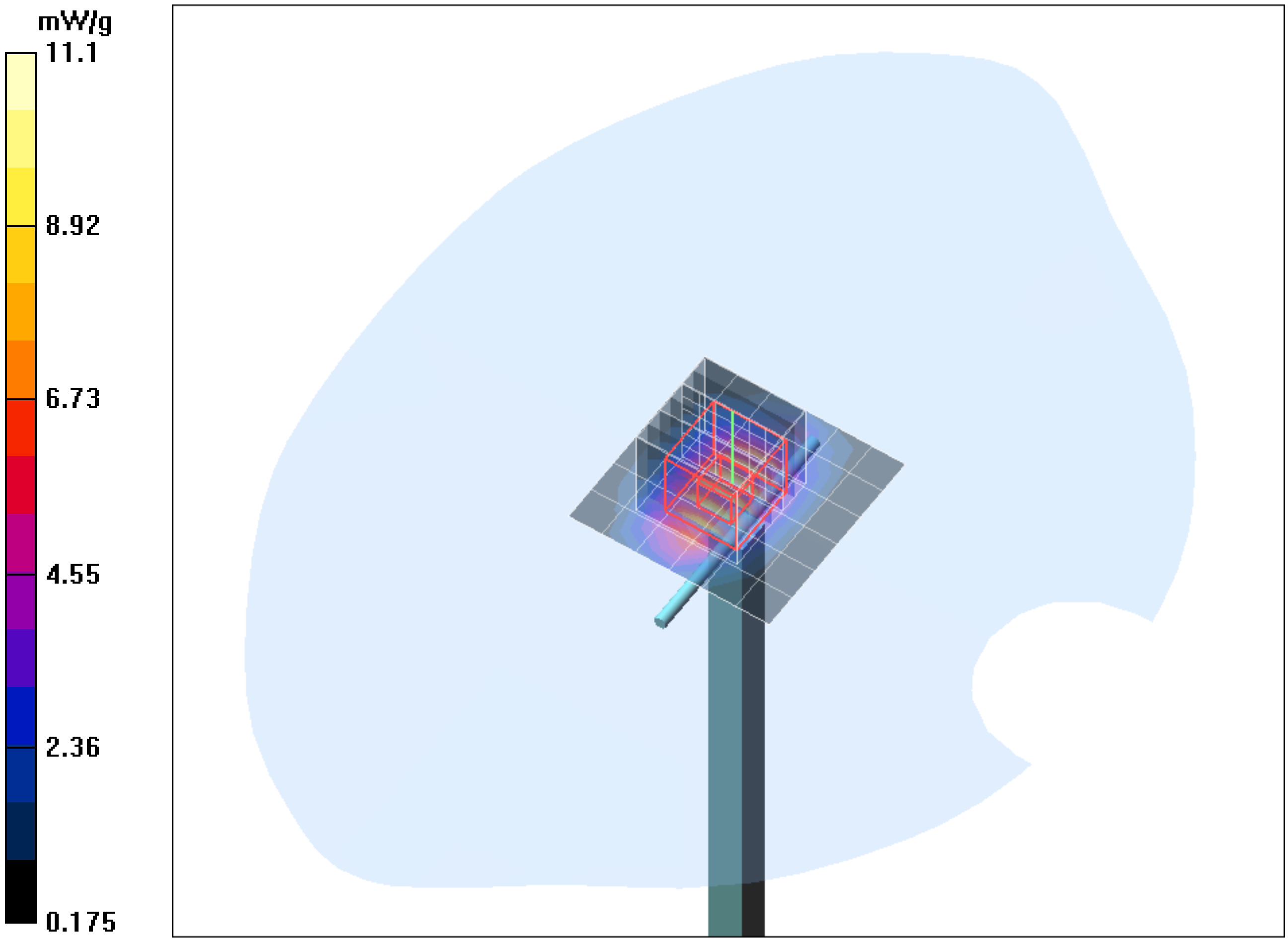


Fig. 7: Validation measurement 1900 MHz body (October 22, 2014), coarse grid.

Uncertainty Budget						
Error Sources	**Uncertainty Value**	**Probability Distribution**	**Divisor**	**c_i**	**Standard Uncertainty**	**v_i^2 or v_{eff}**
Measurement System						
Probe calibration	± 4.8 %	Normal	1	1	± 4.8 %	∞
Axial isotropy	± 4.7 %	Rectangular	√3	1	± 2.7 %	∞
Hemispherical isotropy	± 0 %	Rectangular	√3	1	± 0 %	∞
Boundary effects	± 1.0 %	Rectangular	√3	1	± 0.6 %	∞
Linearity	± 4.7 %	Rectangular	√3	1	± 2.7 %	∞
System detection limit	± 1.0 %	Rectangular	√3	1	± 0.6 %	∞
Readout electronics	± 1.0 %	Normal	1	1	± 1.0 %	∞
Response time	± 0 %	Rectangular	√3	1	± 0 %	∞
Integration time	± 0%	Rectangular	√3	1	± 0 %	∞
RF ambient conditions	± 3.0 %	Rectangular	√3	1	± 1.7 %	∞
Probe positioner	± 0.4 %	Rectangular	√3	1	± 0.2 %	∞
Probe positioning	± 2.9 %	Rectangular	√3	1	± 1.7 %	∞
Algorithms for max SAR eval.	± 1.0 %	Rectangular	√3	1	± 0.6 %	∞
Dipole						
Dipole Axis to Liquid Distance	± 2.0 %	Rectangular	1	1	± 1.2 %	∞
Input power and SAR drift mea.	± 4.7 %	Rectangular	√3	1	± 2.7 %	∞
Phantom and Set-up						
Phantom uncertainty	± 4.0 %	Rectangular	√3	1	± 2.3 %	∞
Liquid conductivity (target)	± 5.0 %	Rectangular	√3	0.64	± 1.8 %	∞
Liquid conductivity (meas.)	± 2.5 %	Normal	1	0.64	± 1.6 %	∞
Liquid permittivity (target)	± 5.0 %	Rectangular	√3	0.6	± 1.7 %	∞
Liquid permittivity (meas.)	± 2.5 %	Normal	1	0.6	± 1.5 %	∞
Combined Uncertainty					± 8.4 %	

Table 17: Uncertainty budget for the system performance check up to 3 GHz.

7.6 Environment

To comply with the required noise level (less than 12 mW/kg) periodically measurements without a DUT were conducted.

Humidity: 40% ± 5 %

7.7 Test Equipment

SAR Equipment				
Test Equipment	**Model**	**Serial Number**	**Last Calibration**	**Next Calibration**
DASY4 Systems				
Software Versions DASY4	V4.7	N/A	N/A	N/A
Software Versions SEMCAD	V1.8	N/A	N/A	N/A
Dosimetric E-Field Probe	ET3DV6	1579	01/2014	01/2015
Data Acquisition Electronics	DAE 3	335	01/2014	01/2015
Data Acquisition Electronics	DAE 4	631	07/2014	07/2015
Phantom	SAM	1059	N/A	N/A
Phantom	SAM	1176	N/A	N/A
Phantom	SAM	1340	N/A	N/A
Phantom	SAM	1341	N/A	N/A
Dipoles				
Validation Dipole	D835V2	437	02/2014	02/2016
Validation Dipole	D1900V2	5d051	09/2013	09/2015
Material Measurement				
Network Analyzer	E5071C	MY46103220	07/2013	07/2015
Dielectric Probe Kit	HP85070B	US33020263	N/A	N/A

Table 18: SAR equipment.

Test Equipment				
Test Equipment	**Model**	**Serial Number**	**Last Calibration**	**Next Calibration**
Power Meters				
Power Meter. Agilent	E4416A	GB41050414	12/2012	12/2014
Power Meter. Agilent	E4417A	GB41050441	12/2012	12/2014
Power Meter. Anritsu	ML2487A	6K00002319	02/2014	02/2016
Power Meter. Anritsu	ML2488A	6K00002078	02/2014	02/2016
Power Sensors				
Power Sensor. Agilent	E9301H	US40010212	12/2012	12/2014
Power Sensor. Agilent	E9301A	MY41495584	12/2012	12/2014
Power Sensor. Anritsu	MA2481B	031600	02/2014	02/2016
Power Sensor. Anritsu	MA2490A	031565	02/2014	02/2016
RF Sources				
Network Analyzer	E5071C	MY46103220	07/2013	07/2015
Rohde & Schwarz	SME300	100142	N/A	N/A
Amplifiers				
Mini Circuits	ZHL-42	D012296	N/A	N/A
Mini Circuits	ZHL-42	D031104#01	N/A	N/A
Mini Circuits	ZVE-8G	D031004	N/A	N/A
Radio Tester				
Rohde & Schwarz	CMU200	835305/050	N/A	N/A

Table 19: Test equipment.

7.8 Certificates of Conformity

Schmid & Partner Engineering AG **s p e a g**

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 44 245 9700, Fax +41 44 245 9779
info@speag.com, http://www.speag.com

Certificate of conformity

Item	Dosimetric Assessment System DASY4
Type No	SD 000 401A, SD 000 402A
Software Version No	DASY 4.7
Manufacturer / Origin	Schmid & Partner Engineering AG Zeughausstrasse 43, CH-8004 Zürich, Switzerland

References

[1] IEEE 1528-2003, "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques, December 2003
[2] EN 50361:2001, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz – 3 GHz)", July 2001
[3] IEC 62209 – 1, "Specific Absorption Rate (SAR) in the frequency range of 300 MHz to 3 GHz – Measurement Procedure, Part 1: Hand-held mobile wireless communication devices", February 2005
[4] IEC 62209 – 2, Draft Version 0.9, "Evaluation of Human Exposure to Radio Frequency Fields from Handheld and Body-Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6 GHz: Human models, Instrumentation and Procedures
Part 2: Procedure to determine the Specific Absorption Rate (SAR) for ... including accessories and multiple transmitters", December 2004
[5] OET Bulletin 65, Supplement C, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", Edition 01-01
[6] ANSI-C63.19-2006, "American National Standard for Methods of Measurement of Compatibility between Wireless Communication Devices and Hearing Aids", June 2006
[7] ANSI-C63.19-2007, "American National Standard for Methods of Measurement of Compatibility between Wireless Communication Devices and Hearing Aids", June 2007

Conformity

We certify that this **system is designed to be fully compliant** with the standards [1 – 7] for RF emission tests of wireless devices.

Uncertainty

The uncertainty of the measurements with this system was evaluated according to the above standards and is documented in the applicable chapters of the DASY4 system handbook.
The uncertainty values represent current state of methodology and are subject to changes. They are applicable to all laboratories using DASY4 provided the following requirements are met (responsibility of the system end user):

1) the system is used by an experienced engineer who follows the manual and the guidelines taught during the training provided by SPEAG,
2) the probe and validation dipoles have been calibrated for the relevant frequency bands and media within the requested period,
3) the DAE has been calibrated within the requested period,
4) the "minimum distance" between probe sensor and inner phantom shell and the radiation source is selected properly,
5) the system performance check has been successful,
6) the operational mode of the DUT is CW, CDMA, FDMA or TDMA (GSM, DCS, PCS, IS136, PDC) and the measurement/integration time per point is ≥ 500 ms,
7) if applicable, the probe modulation factor is evaluated and applied according to field level, modulation and frequency,
8) the dielectric parameters of the liquid are conformant with the standard requirement,
9) the DUT has been positioned as described in the manual.
10) the uncertainty values from the calibration certificates, and the laboratory and measurement equipment dependent uncertainties, are updated by end user accordingly.

Date 24.4.2008 **Signature / Stamp**

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Fig. 8: Certificate of conformity for the used DASY4 system

**Schmid & Partner
Engineering AG**

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Certificate of conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 BA
Series No	TP-1002 and higher
Manufacturer / Origin	Untersee Composites Hauptstr. 69 CH-8559 Fruthwilen Switzerland

Tests

The series production process used allows the limitation to test of first articles.
Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series units (called samples).

Test	Requirement	Details	Units tested
Shape	Compliance with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness	Compliant with the requirements according to the standards	2mm +/- 0.2mm in specific areas	First article, Samples
Material parameters	Dielectric parameters for required frequencies	200 MHz – 3 GHz Relative permittivity < 5 Loss tangent < 0.05.	Material sample TP 104-5
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards	Liquid type HSL 1800 and others according to the standard.	Pre-series, First article

Standards

[1] CENELEC EN 50361
[2] IEEE P1528-200x draft 6.5
[3] IEC PT 62209 draft 0.9
(*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standard [1] and draft standards [2] and [3].

Date 18.11.2001

Signature / Stamp

Schmid & Partner
Engineering AG
Zeughausstrasse 43, CH-8004 Zurich
Tel. +41 1 245 97 00, Fax +41 1 245 97 79

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Fig. 9: Certificate of conformity for the used SAM phantom.

7.9 Pictures of the Device under Test

Fig. 10 - 12 show the device under test.

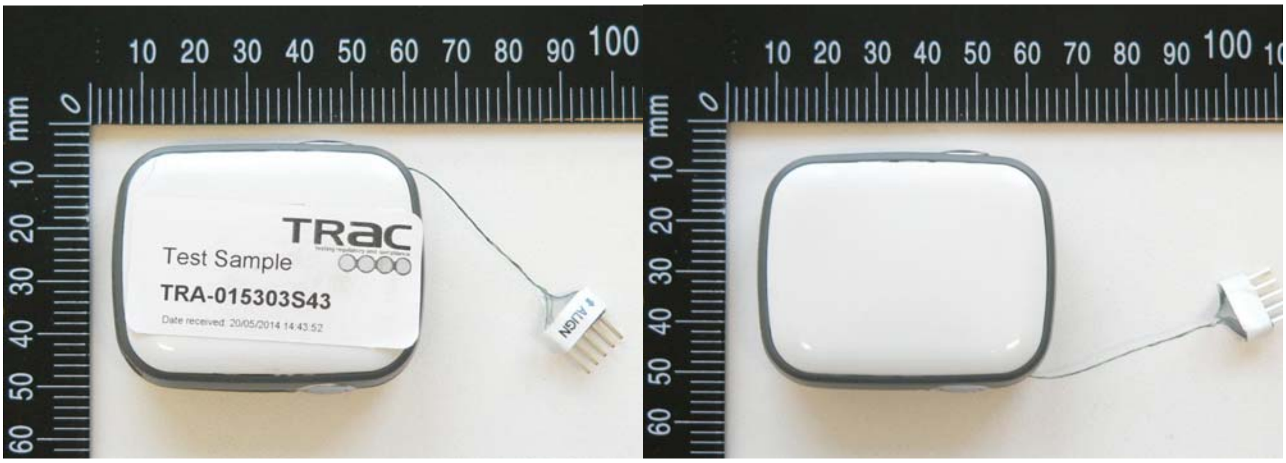

Fig. 10: Top and back view of the Buddi Click System - Clip from buddi Limited.

Fig. 11: Side view of the Buddi Click System - Clip from buddi Limited.

Fig. 12: Top view of the Buddi Click System - Clip without the housing.

7.10 Test Positions for the Device under Test

Figure 13 - 18 show the test position for the SAR measurements.

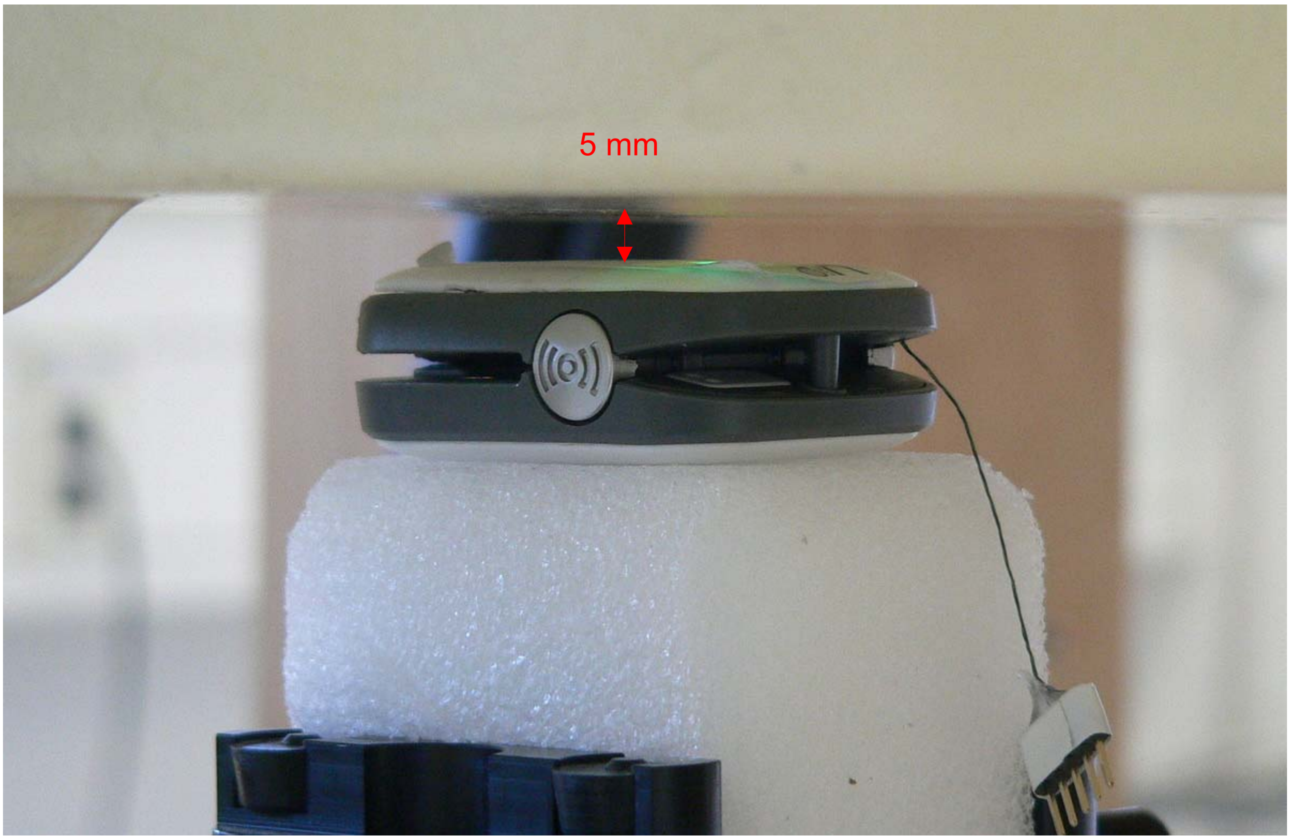

Fig. 13: GSM 850, top side of Buddi Click System - Clip, 5 mm gap.

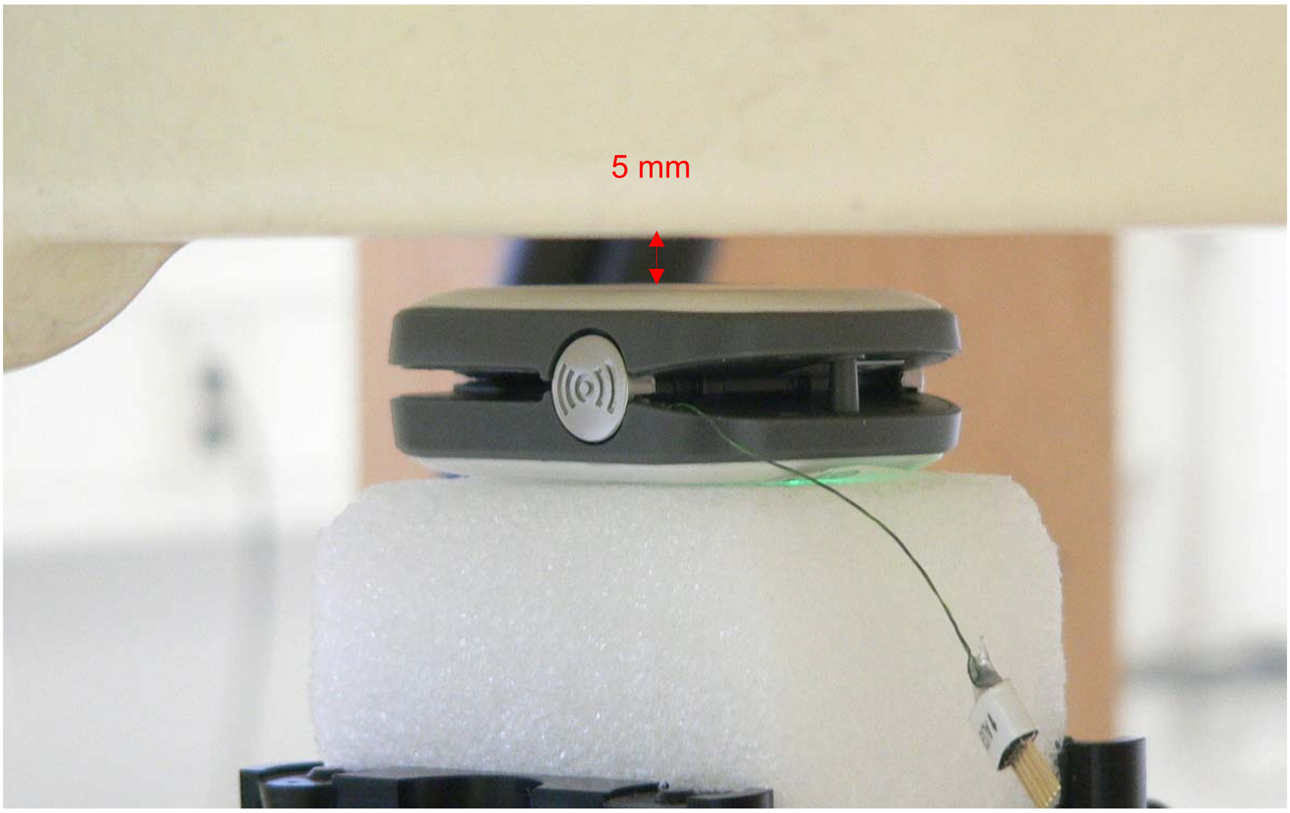

Fig. 14: GSM 850, back side of Buddi Click System - Clip, 5 mm gap.

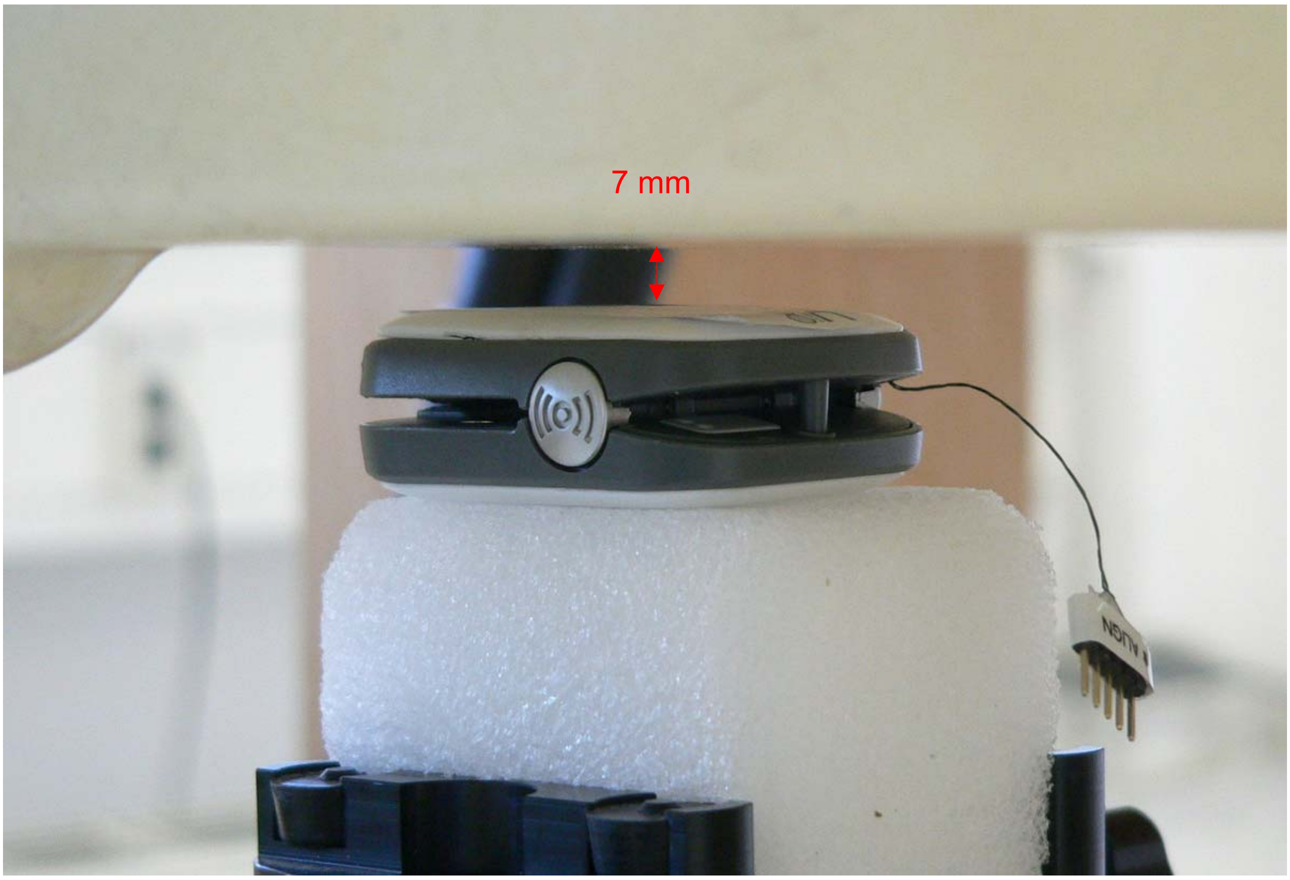

Fig. 15: PCS 1900, top side of Buddi Click System - Clip, 7 mm gap.

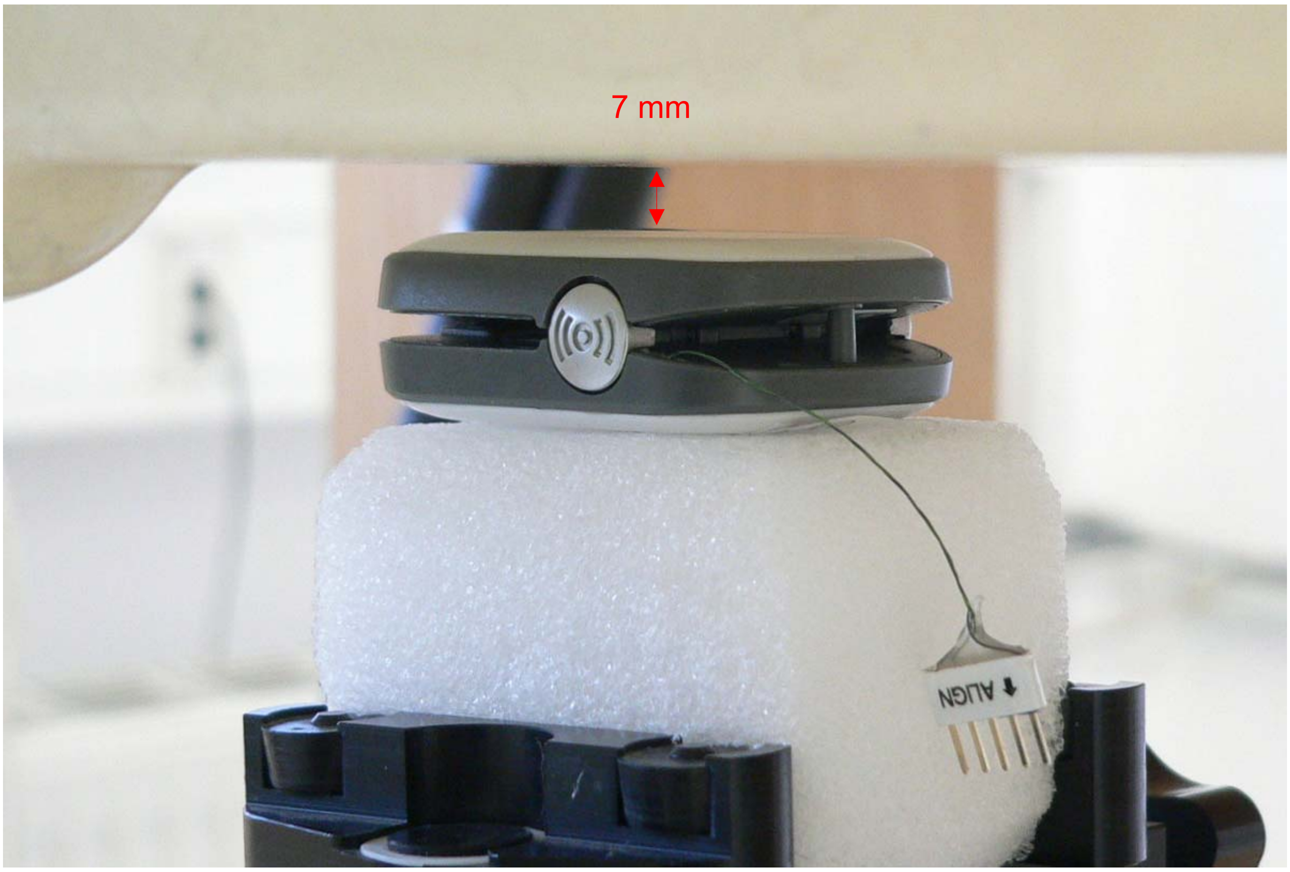

Fig. 16: PCS 1900, back side of Buddi Click System - Clip, 7 mm gap.

Fig. 17: GPRS 850/1900, top side of Buddi Click System - Clip, 0 mm gap.

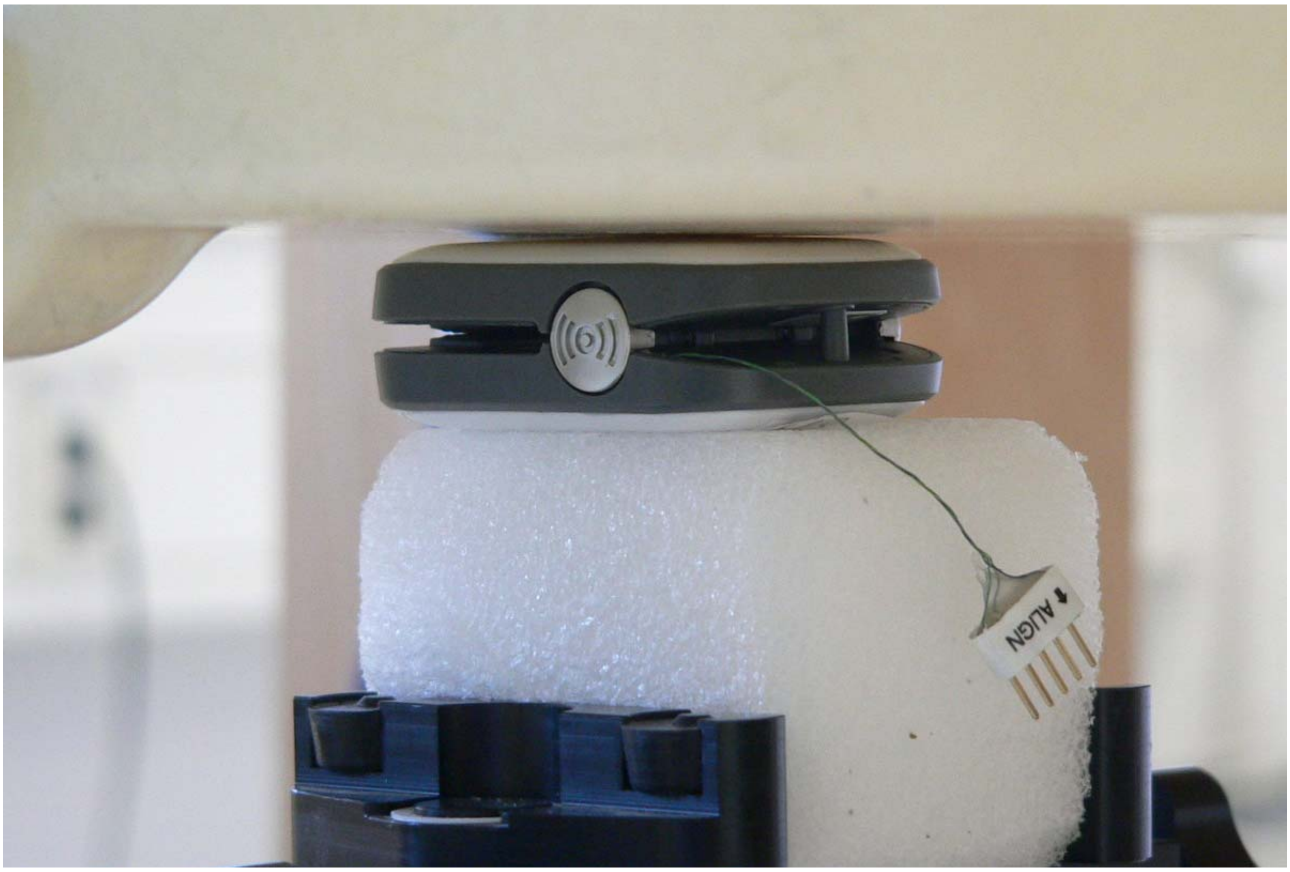

Fig. 18: GPRS 850/1900, back side of Buddi Click System - Clip, 0 mm gap.

7.11 Pictures to Demonstrate the Required Liquid Depth

Figure 19 - 20 show the liquid depth in the used SAM phantom.

Fig. 19: Liquid depth for 850 MHz

Fig. 20: Liquid depth for 1900 MHz

8 References

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[ICNIRP 1998]	ICNIRP: Guidelines for Limiting Exposure to Time-varying Electric. Magnetic. and Electromagnetic Fields (up to 300 GHz). In: Health Physics. Vol. 74. No. 4. 494-522. 1998.
[DASY4]	Schmid & Partner Engineering AG: DASY4 Manual. April 2008
[KDB 447498]	447498 D01 v05r02 General RF Exposure Guidance. February 07. 2014
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[KDB 648474]	648474 D04 v01r02 SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas, December 04, 2013
[47 CFR]	Code of Federal Regulations; Title 47. Telecommunications