中国认可
国际互认
检测
TESTING
CNAS L2264

SAR TEST REPORT

Applicant	MobiWire SAS
FCC ID	QPN-HALONA
Product	3G SmartPhone
Model	Mobiwire Halona
Report No.	RXA1608-0171SAR
Issue Date	September 6, 2016

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **IEEE 1528- 2013, ANSI/ IEEE C95.1-1992.** The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Performed by: Jiangpeng Lan   *Approved by: Kai Xu*

TA Technology (Shanghai) Co., Ltd.

No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000

Table of Contents

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd).**The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by CNAS or any government agencies.

1.2 Test facility

CNAS (accreditation number:L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (recognition number is 428261)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

1.3 Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City:	Shanghai
Post code:	201201
Country:	P. R. China
Contact:	Xu Kai
Telephone:	+86-021-50791141/2/3
Fax:	+86-021-50791141/2/3-8000
Website:	http://www.ta-shanghai.com
E-mail:	xukai@ta-shanghai.com

1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

2 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for the EUT are as follows:

Table 2.1: Highest Reported SAR

Mode	Highest Reported SAR (W/kg)			
	1g SAR Head	1g SAR Body-worn (Separation 10mm)	1g SAR Hotspot (Separation 10mm)	Product Specific 10-g SAR (Separation 0mm)
GSM 850	0.237	0.198	0.678	NA
GSM 1900	0.320	0.247	1.316	NA
Wi-Fi (2.4G)	1.049	0.203	0.203	NA
Bluetooth	NA	NA	NA	NA
Date of Testing:	August 15, 2016~ August 21, 2016			
Note: The device is in compliance with SAR for Uncontrolled Environment /General Population exposure limits (1.6 W/kg and 4.0 W/kg) specified in ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013.				

Table 2.2: Highest Simultaneous Transmission SAR

Exposure Configuration	1g SAR Head	1g SAR Body-worn (Separation 10mm)	1g SAR Hotspot (Separation 10mm)
Highest Simultaneous Transmission SAR (W/kg)	1.369	0.430	1.499
Note: 1. The detail for simultaneous transmission consideration is described in chapter 10.4.			

Note：The highest SAR for head, body, Hotspot and simultaneous transmission exposure conditions are 1.369W/kg, 0.430 W/kg and 1.499W/kg.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

3 Description of Equipment under Test

Client Information

Applicant	MobiWire SAS
Applicant address	79 AVENUE FRANCOIS ARAGO 92017 NANTERRE CEDEX France
Manufacturer	MOBIWIRE MOBILES (NINGBO) CO.,LTD
Manufacturer address	No.999,Dacheng East Road,Fenghua City,Zhejiang , P.R.China

Accessory Equipment Details

Name	Model	Manufacturer	Note
Battery	H353F	Ningbo Veken battery Co.,LTD.	/
Earphone	3.5mm 4-pole plug stereo headset	Shenzhen Juwei Electronics Co.,Ltd	/
Charger	A31-500550	Shenzhen Aohai Technology Co.,Ltd	/

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

General Technologies

Application Purpose:	Original Grant
EUT Stage:	Production Unit
Model:	Mobiwire Halona
IMEI:	359805070934731
Hardware Version:	V01A
Software Version:	V01_20160513_Halona_MobiWire_MP
Antenna Type:	Internal Antenna
Device Class:	B
Wi-Fi Hotspot	Wi-Fi 2.4G
Power Class:	GSM 850:4 GSM 1900:1
Power Level	GSM 850:level 5 GSM 1900:level 0

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Wireless Technology and Frequency Range

Wireless Technology		Modulation	Operating mode	Tx (MHz)
GSM	850	Voice(GMSK) GPRS(GMSK) EGPRS(Downlink)	☐Multi-slot Class:8-1UP ☐Multi-slot Class:10-2UP ☒Multi-slot Class:12-4UP ☐Multi-slot Class:33-4UP	824 ~ 849
	1900			1850 ~ 1910
	Does this device support DTM (Dual Transfer Mode)? ☐Yes ☒No			
BT	2.4G	Version 4.0 LE		2400 ~2480
Wi-Fi	2.4G	DSSS, OFDM	802.11b/g/n (HT20/HT40)	2402 ~2472
	Does this device support MIMO ☐Yes ☒No			

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

4 Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE 1528- 2013, ANSI/IEEE C95.1-1992, the following FCC Published RF exposure KDB procedures:

248227 D01 802.11 Wi-Fi SAR v02r02
447498 D01 General RF Exposure Guidance v06
648474 D04 Handset SAR v01r03
865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
865664 D02 RF Exposure Reporting v01r02
941225 D01 3G SAR Procedures v03r01
941225 D06 Hotspot Mode v02r01

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

5 Operational Conditions during Test

5.1 Test Positions

5.1.1 Against Phantom Head

Measurements were made in "cheek" and "tilt" positions on both the left hand and right hand sides of the phantom.

The positions used in the measurements were according to IEEE 1528 - 2013 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

5.1.2 Body Worn Configuration

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations.

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. Per FCC KDB Publication 648474 D04, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

5.2 Measurement Variability

Per FCC KDB Publication 865664 D01, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.

2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

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

4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

5.3 Test Configuration

5.3.1 GSM Test Configuration

According to specification 3GPP TS 51.010, the maximum power of the GSM can do the power reduction for the multi-slot. The allowed power reduction in the multi-slot configuration is as following:

Output power of reductions:

Table 5.1: The allowed power reduction in the multi-slot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power,(dB)
1	0
2	0 to 3,0
3	1,8 to 4,8
4	3,0 to 6,0

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

5.3.2 Wi-Fi Test Configuration

SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS procedure is applied to reduce the number of SAR tests; these are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the *initial test position(s)* by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The *initial test position(s)* is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s). When the *reported* SAR for the *initial test position* is:

- ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- 0.4 W/kg, SAR is repeated using the same wireless mode test configuration tested in the *initial test position* to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the *reported* SAR is ≤ 0.8 W/kg or all required test positions are tested.
  - ✧ For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
  - ✧ When it is unclear, all equivalent conditions must be tested.
- For all positions/configurations tested using the *initial test position* and subsequent test positions, when the *reported* SAR is > 0.8 W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the *reported* SAR is ≤ 1.2 W/kg or all required test channels are considered.
  - ✧ The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.

To determine the initial test position, Area Scans were performed to determine the position with the Maximum Value of SAR (measured). The position that produced the highest Maximum Value of SAR is considered the worst case position; thus used as the initial test position.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

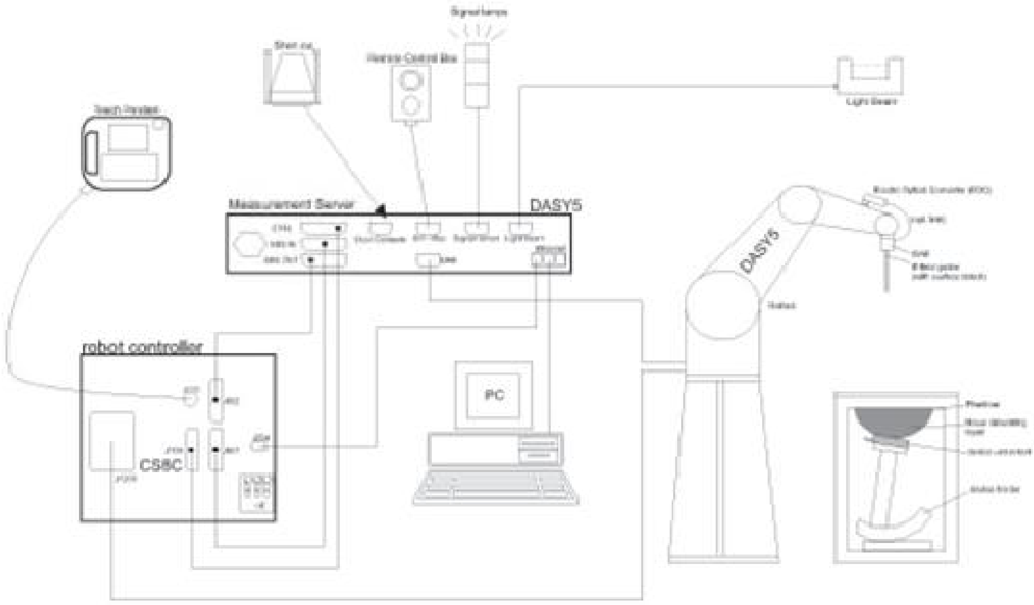
A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement. This RF signal utilized in SAR measurement has almost 100% duty cycle and its crest factor is 1.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

6 SAR Measurements System Configuration

6.1 SAR Measurement Set-up

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



- A standard high precision 6-axis robot 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 WinXP or Win7 and the DASY 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.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

6.2 DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

EX3DV4 Probe Specification

Construction	Symmetrical design with triangular core 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 (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 μW/g to > 100 mW/g Linearity: ± 0.2dB (noise: typically < 1 μW/g)
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure Scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

E-field Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than ± 10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

temperature probe is used in conjunction with the E-field probe.

SAR=C∆T/∆t

Where: ∆t = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

∆T = Temperature increase due to RF exposure.

Or

SAR=IEI²σ/ρ

Where: σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

6.3 SAR Measurement Procedure

Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

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 fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum 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 standard 1528 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.
Area scan parameters extracted from FCC KDB 865664 D01 SAR measurement 100 MHz to 6 GHz.

<table>
<tr><th></th><th>≤3 GHz</th><th>> 3 GHz</th></tr>
<tr><td>Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td>Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td rowspan="2">Maximum area scan spatial resolution: ΔxArea, ΔyArea</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">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.</td></tr>
</table>

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes base faces are centered on the maxima found in a preceding area scan job within the same procedure. 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.

Zoom scan parameters extracted from FCC KDB 865664 D01 SAR measurement 100 MHz to 6 GHz.

<table>
<tr><td colspan="3"></td><td>≤3GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: $\triangle x_{zoom}$ $\triangle y_{zoom}$</td><td>≤2GHz: ≤8mm
2 – 3GHz: ≤5mm*</td><td>3 – 4GHz: ≤5mm*
4 – 6GHz: ≤4mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">Uniform grid: $\triangle z_{zoom}(n)$</td><td>≤5mm</td><td>3 – 4GHz: ≤4mm
4 – 5GHz: ≤3mm
5 – 6GHz: ≤2mm</td></tr>
<tr><td rowspan="2">Graded grid</td><td>$\triangle z_{zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤4mm</td><td>3 – 4GHz: ≤3mm
4 – 5GHz: ≤2.5mm
5 – 6GHz: ≤2mm</td></tr>
<tr><td>$\triangle z_{zoom}(n>1)$: between subsequent points</td><td colspan="2">$\leq 1.5 \bullet \triangle z_{zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">X, y, z</td><td>≥30mm</td><td>3 – 4GHz: ≥28mm
4 – 5GHz: ≥25mm
5 – 6GHz: ≥22mm</td></tr>
<tr><td colspan="5">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 <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4W/kg, ≤8mm, ≤7mm and ≤5mm zoom scan resolution may be applied, respectively, for 2GHz to 3GHz, 3GHz to 4GHz and 4GHz to 6GHz.</td></tr>
</table>

Volume Scan Procedures

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

Power Drift Monitoring

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

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

7 Main Test Equipment

Name of Equipment	Manufacturer	Type/Model	Serial Number	Last Cal.	Cal. Due Date
Network analyzer	Agilent	E5071B	MY42404014	2016-05-21	2017-05-20
Dielectric Probe Kit	HP	85070E	US44020115	No Calibration Requested	
Power meter	Agilent	E4417A	GB41291714	2016-05-21	2017-05-20
Power sensor	Agilent	N8481H	MY50350004	2016-05-21	2017-05-20
Power sensor	Agilent	E9327A	US40441622	2016-05-21	2017-05-20
Dual directional coupler	Agilent	778D-012	50519	No Calibration Requested	
Dual directional coupler	Agilent	777D	50146	No Calibration Requested	
Amplifier	INDEXSAR	IXA-020	0401	No Calibration Requested	
Wideband radio communication tester	R&S	CMW 500	113645	2016-05-21	2017-05-20
BT Base Station Simulator	R&S	CBT	100271	2016-05-21	2017-05-20
E-field Probe	SPEAG	EX3DV4	3677	2015-12-10	2016-12-09
DAE	SPEAG	DAE4	871	2015-11-17	2016-11-16
Validation Kit 835MHz	SPEAG	D835V2	4d020	2014-08-28	2017-08-27
Validation Kit 1900MHz	SPEAG	D1900V2	5d060	2014-09-01	2017-08-31
Validation Kit 2450MHz	SPEAG	D2450V2	786	2014-09-01	2017-08-31
Temperature Probe	Tianjin jinming	JM222	AA1009129	2016-05-21	2017-05-20
Hygrothermograph	Tianjin jinming	WS-1	64591	2016-07-16	2017-07-15

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

8 Tissue Dielectric Parameter Measurements & System Verification

8.1 Tissue Verification

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance.

Target values

Frequency (MHz)		Water (%)	Salt (%)	Sugar (%)	Glycol (%)	Preventol (%)	Cellulose (%)	ε_r	σ(s/m)
Head	835	41.45	1.45	56	0	0.1	1.0	41.5	0.90
	1900	55.242	0.306	0	44.452	0	0	40.0	1.40
	2450	62.7	0.5	0	36.8	0	0	39.2	1.80
Body	835	52.5	1.4	45	0	0.1	1.0	55.2	0.97
	1900	69.91	0.13	0	29.96	0	0	53.3	1.52
	2450	73.2	0.1	0	26.7	0	0	52.7	1.95

Measurements results

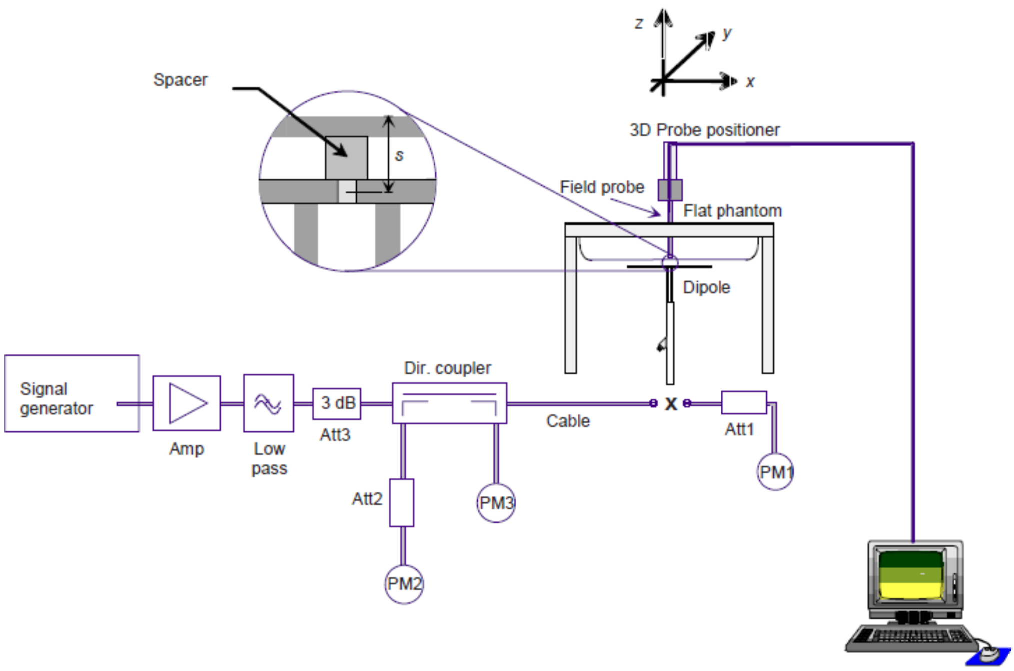
Frequency (MHz)		Test Date	Temp ℃	Measured Dielectric Parameters		Target Dielectric Parameters		Limit (Within ±5%)	
				ε_r	σ(s/m)	ε_r	σ(s/m)	Dev ε_r(%)	Dev σ(%)
835	Head	8/16/2016	21.5	41.4	0.88	41.5	0.90	-0.24	-2.22
	Body	8/15/2016	21.5	54.2	0.96	55.2	0.97	-1.81	-1.03
1900	Head	8/15/2016	21.5	40.1	1.41	40.0	1.40	0.25	0.71
	Body	8/16/2016	21.5	52.6	1.51	53.3	1.52	-1.31	-0.66
2450	Head	8/21/2016	21.5	38.6	1.81	39.2	1.80	-1.53	0.56
	Body	8/20/2016	21.5	52.5	1.98	52.7	1.95	-0.38	1.54
Note: The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm for measurements > 3 GHz.									

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

8.2 System Performance Check

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulates were measured using the dielectric probe kit and the network analyzer. A system check measurement for every day was made following the determination of the dielectric parameters of the Tissue simulates, using the dipole validation kit. The dipole antenna was placed under the flat section of the twin SAM phantom.

System check is performed regularly on all frequency bands where tests are performed with the DASY system.



Picture 1 System Performance Check setup

Picture 2 Setup Photo

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Justification for Extended SAR Dipole Calibrations

Usage of SAR dipoles calibrated less than 3 years ago but more than 1 year ago were confirmed in maintaining return loss (< - 20 dB, within 20% of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibrations in KDB 865664 D01:

Dipole		Date of Measurement	Return Loss(dB)	Δ %	Impedance (Ω)	ΔΩ
Dipole D835V2 SN: 4d020	Head Liquid	8/28/2014	-30.1	/	48.6	/
		8/27/2015	-31.1	3.3%	49.7	1.1Ω
	Body Liquid	8/28/2014	-23.3	/	54.0	/
		8/27/2015	-23.9	2.6%	53.5	0.5Ω
Dipole D1900V2 SN: 5d060	Head Liquid	9/1/2014	-22.8	/	54.1	/
		8/31/2015	-23.7	3.9%	55.4	1.3Ω
	Body Liquid	9/1/2014	-21.6	/	57.6	/
		8/31/2015	-20.8	3.7%	57.3	0.3Ω
Dipole D2450V2 SN: 786	Head Liquid	9/1/2014	-23.6	/	57.1	/
		8/31/2015	-23.9	1.3%	57.4	0.3Ω
	Body Liquid	9/1/2014	-23.7	/	56.0	/
		8/31/2015	-24	1.3%	55.8	0.2Ω

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

System Check results

Frequency (MHz)		Test Date	Temp ℃	250mW Measured SAR_{1g} (W/kg)	1W Normalized SAR_{1g} (W/kg)	1W Target SAR_{1g} (W/kg)	Δ % (Limit ±10%)	Plot No.
835	Head	8/16/2016	21.5	2.44	9.76	9.54	2.31%	1
	Body	8/15/2016	21.5	2.41	9.64	9.54	1.05%	2
1900	Head	8/15/2016	21.5	9.48	37.92	39.20	-3.27%	3
	Body	8/16/2016	21.5	9.93	39.72	40.00	-0.70%	4
2450	Head	8/21/2016	21.5	13.70	54.80	52.50	4.38%	5
	Body	8/20/2016	21.5	12.50	50.00	52.40	-4.58%	6
Note：Target Values used derive from the calibration certificate Data Storage and Evaluation.								

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

9 Normal and Maximum Output Power

KDB 447498 D01 at the maximum rated output power and within the tune-up tolerance range specified for the product, but not more than 2 dB lower than the maximum tune-up tolerance limit.

9.1 GSM Mode

GSM 850		Burst Average Power(dBm)			Division Factors (dB)	Frame-Average Power(dBm)			Burst Tune-up Limit (dBm)
Tx Channel		128	190	251		128	190	251	
Frequency(MHz)		824.2	836.6	848.8		824.2	836.6	848.8	
GSM(GMSK)		32.35	32.46	32.54	9.03	23.32	23.43	23.51	33.00
GPRS (GMSK)	1Txslot	32.28	32.44	32.50	9.03	23.25	23.41	23.47	33.00
	2Txslots	31.29	31.45	31.54	6.02	25.27	25.43	25.52	32.00
	3Txslots	29.49	29.61	29.72	4.26	25.23	25.35	25.46	30.00
	4Txslots	28.69	28.81	28.89	3.01	25.68	25.80	25.88	29.00
GSM 1900		Power(dBm)			Division Factors (dB)	Power(dBm)			Burst Tune-up Limit (dBm)
Tx Channel		512	661	810		512	661	810	
Frequency(MHz)		1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM(GMSK)		30.33	29.96	29.54	9.03	21.30	20.93	20.51	30.50
GPRS (GMSK)	1Txslot	30.25	29.94	29.50	9.03	21.22	20.91	20.47	30.50
	2Txslots	29.31	28.98	28.58	6.02	23.29	22.96	22.56	30.00
	3Txslots	27.53	27.21	26.82	4.26	23.27	22.95	22.56	28.00
	4Txslots	26.73	26.40	26.02	3.01	23.72	23.39	23.01	27.00

Notes: The worst-case configuration and mode for SAR testing is determined to be as follows:

1. Standalone: GSM 850 GMSK (GPRS) mode with 4 time slots for Max power, GSM 1900 GMSK (GPRS) mode with 4 time slots for Max power, based on the output power measurements above.
2. SAR is not required for EGPRS (8PSK) mode because its output power is less than that of GPRS Mode.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

9.2 WLAN Mode

Wi-Fi 2.4G Mode	Channel	Frequency (MHz)	Average Conducted Power (dBm) for Data Rates (bps)								Tune-up Limit (dBm)
			1M	2M	5.5M	11M	/	/	/	/	
802.11b	1	2412	17.94	17.73	17.88	17.70	/	/	/	/	18.50
	6	2437	17.91	17.86	17.99	17.83	/	/	/	/	18.50
	11	2462	17.98	18.05	18.11	18.01	/	/	/	/	18.50
Mode	Channel	Frequency (MHz)	6M	9M	12M	18M	24M	36M	48M	54M	Tune-up
802.11g	1	2412	13.88	13.73	13.68	13.62	13.50	13.32	13.18	13.11	16.50
	6	2437	15.95	15.93	15.87	15.77	15.70	15.56	15.20	15.17	16.50
	11	2462	14.43	13.88	13.83	14.26	13.67	14.01	13.65	13.34	16.50
Mode	Channel	Frequency (MHz)	6.5M	13M	19.5M	26M	39M	52M	58.5M	65M	Tune-up
802.11n (HT20)	1	2412	14.26	14.16	13.54	13.44	13.30	13.17	13.40	13.07	16.50
	6	2437	16.02	15.93	15.85	15.78	15.65	14.35	14.29	14.21	16.50
	11	2462	13.95	13.85	14.28	14.19	13.55	13.42	13.50	13.29	16.50
Mode	Channel	Frequency (MHz)	13.5M	27M	40.5M	54M	81M	108M	121.5M	135M	Tune-up
802.11n (HT40)	3	2422	13.93	13.55	13.34	13.87	13.28	13.12	13.01	12.97	16.50
	6	2437	15.96	15.90	15.79	15.69	15.57	14.28	14.42	14.12	16.50
	9	2452	13.93	14.32	13.75	13.89	13.76	13.63	13.28	13.47	16.50

Note. 1. SAR is not required for OFDM when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. The Tx power is set to 19 for 802.11 b mode, set to 17 for 802.11g mode(6M-36MHz), set to 16.5 for 802.11g mode(48MHz-54MHz),is set to 17 for 802.11n HT20/HT40 mode (MCS0- MCS4), is set to 16 for 802.11n HT20/HT40 mode (MCS5- MCS7)by software.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

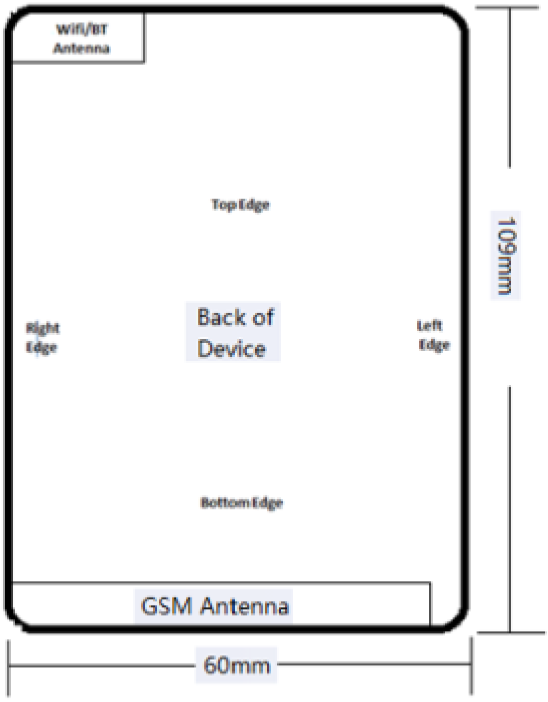
9.3 Bluetooth Mode

BT	Average Conducted Power (dBm)			Tune-up Limit (dBm)
	Channel/Frequency(MHz)			
	Ch 0/2402 MHz	Ch 39/2441 MHz	Ch 78/2480 MHz	
GFSK	4.98	5.34	5.21	5.50
π/4DQPSK	4.86	5.20	5.04	5.50
8DPSK	4.88	5.25	5.11	5.50
BT 4.0	Ch 0/2402 MHz	Ch 19/2440 MHz	Ch 39/2480 MHz	/
GFSK	-2.41	-1.96	-2.76	-1.50

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

10 Measured and Reported (Scaled) SAR Results

10.1 EUT Antenna Locations



Overall (Length x Width): 109 mm x 60.0mm Overall Diagonal: 120.0 mm/Display Diagonal: 89mm						
Distance of the Antenna to the EUT surface/edge						
Antenna	Back Side	Front side	Left Edge	Right Edge	Top Edge	Bottom Edge
GSM Antenna	0	0	9	0	93	0
BT/Wi-Fi Antenna	0	0	0	42	0	100.8
Hotspot mode, Positions for SAR tests						
Mode	Back Side	Front side	Left Edge	Right Edge	Top Edge	Bottom Edge
GSM 850/1900	Yes	Yes	Yes	Yes	N/A	Yes
Wi-Fi Antenna	Yes	Yes	Yes	N/A	Yes	N/A

Note: 1. Per KDB 941225 D06, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.
2.For smart phones with an overall diagonal dimension is 165.5mm. Per KDB 648474 D04, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension> 16.0 cm, 10-g extremity SAR must be tested as a phablet to determine SAR compliance.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

10.2 Standalone SAR test exclusion considerations

Per KDB 447498 D01, 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

- 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

Per KDB 447498 D01, when the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Bluetooth	Distance (mm)	MAX Power (dBm)	Frequency (MHz)	Ratio	Evaluation
Head	5	5.50	2441	1.108	No
Body-worn	10	5.50	2441	0.554	No

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

10.3 Measured SAR Results

TableTable 1: GSM 850

Test Position	Cover Type	Channel/ Frequency (MHz)	Time slot	Duty Cycle	Tune-up limit (dBm)	Conducted Power (dBm)	Drift (dB)	Measured SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)	Plot No.
Head SAR											
Left Cheek	standard	190/836.6	GSM	1:8.3	33.00	32.46	-0.039	0.209	1.13	0.237	7
Left Tilt	standard	190/836.6	GSM	1:8.3	33.00	32.46	0.080	0.120	1.13	0.136	/
Right Cheek	standard	190/836.6	GSM	1:8.3	33.00	32.46	0.026	0.196	1.13	0.222	/
Right Tilt	standard	190/836.6	GSM	1:8.3	33.00	32.46	0.025	0.115	1.13	0.130	/
Body-worn (Distance 10mm)											
Back Side	standard	190/836.6	GSM	1:8.3	33.00	32.46	0.040	0.175	1.13	0.198	8
Front Side	standard	190/836.6	GSM	1:8.3	33.00	32.46	-0.020	0.138	1.13	0.156	/
Hotspot (Distance 10mm)											
Back Side	standard	190/836.6	4Txslots	1:2.07	29.00	28.81	-0.040	0.649	1.04	0.678	9
Front Side	standard	190/836.6	4Txslots	1:2.07	29.00	28.81	-0.050	0.501	1.04	0.523	/
Left Edge	standard	190/836.6	4Txslots	1:2.07	29.00	28.81	0.030	0.212	1.04	0.221	/
Right Edge	standard	190/836.6	4Txslots	1:2.07	29.00	28.81	-0.070	0.211	1.04	0.220	/
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	standard	190/836.6	4Txslots	1:2.07	29.00	28.81	0.170	0.097	1.04	0.101	/

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2. Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

3. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.

4. Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was ≤ 1.2 W/kg, no additional SAR evaluations using a headset cable were required.

5. According to 648474 D04 Handset SAR v01r03，For Phablet, Since hotspot mode 1-g *reported* SAR < 1.2 W/kg, 10-g extremity SAR is no required.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Table 2: GSM 1900

Test Position	Cover Type	Channel/ Frequency (MHz)	Time slot	Duty Cycle	Tune-up limit (dBm)	Conducted Power (dBm)	Drift (dB)	Measured SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)	Plot No.
Head SAR											
Left Cheek	standard	661/1880	GSM	1:8.3	30.50	29.96	0.028	0.283	1.13	0.320	10
Left Tilt	standard	661/1880	GSM	1:8.3	30.50	29.96	-0.067	0.090	1.13	0.102	/
Right Cheek	standard	661/1880	GSM	1:8.3	30.50	29.96	-0.081	0.269	1.13	0.305	/
Right Tilt	standard	661/1880	GSM	1:8.3	30.50	29.96	0.043	0.165	1.13	0.187	/
Body-worn (Distance 10mm)											
Back Side	standard	661/1880	GSM	1:8.3	30.50	29.96	-0.120	0.218	1.13	0.247	11
Front Side	standard	661/1880	GSM	1:8.3	30.50	29.96	0.029	0.192	1.13	0.217	/
Hotspot (Distance 10mm)											
Back Side	Standard	810/1909.8	4Txslots	1:2.07	27.00	26.73	-0.070	1.020	1.06	1.085	/
	Standard	661/1880	4Txslots	1:2.07	27.00	26.40	-0.090	1.020	1.15	1.171	/
	Standard	512/1850.2	4Txslots	1:2.07	27.00	26.02	-0.140	1.050	1.25	1.316	12
Front Side	Standard	810/1909.8	4Txslots	1:2.07	27.00	26.73	-0.170	0.826	1.06	0.879	/
	Standard	661/1880	4Txslots	1:2.07	27.00	26.40	0.030	0.833	1.15	0.956	/
	Standard	512/1850.2	4Txslots	1:2.07	27.00	26.02	-0.110	0.797	1.25	0.999	/
Left Edge	standard	661/1880	4Txslots	1:2.07	27.00	26.40	0.050	0.121	1.15	0.139	/
Right Edge	standard	661/1880	4Txslots	1:2.07	27.00	26.40	-0.080	0.178	1.15	0.204	/
Top Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bottom Edge	standard	661/1880	4Txslots	1:2.07	27.00	26.40	-0.031	0.038	1.15	0.043	/
Back Side	Earphone	512/1850.2	GSM	1:8.3	30.50	30.33	0.009	0.978	1.04	1.017	/
Back Side	Repeated	512/1850.2	4Txslots	1:2.07	27.00	26.02	-0.170	0.887	1.25	1.112	/

Note: 1.The value with blue color is the maximum SAR Value of each test band.

2. Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s).

3. When multiple slots are used, SAR should be tested to account for the maximum source-based time-averaged output power.

4. Per FCC KDB Publication 648474 D04, SAR was evaluated without a headset connected to the device. Since the reported SAR was ≤ 1.2 W/kg, no additional SAR evaluations using a headset cable were required.

5. According to 648474 D04 Handset SAR v01r03，For Phablet, Since hotspot mode 1-g *reported* SAR < 1.2 W/kg, 10-g extremity SAR is no required.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Measurement Variability				
Test Position	**Channel/ Frequency(MHz)**	**MAX Measured SAR_{1g} (W/kg)**	**1st Repeated SAR_{1g} (W/kg)**	**Ratio**
Back Side	512/1850.2	1.050	0.887	1.18

Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Table 3: Wi-Fi (2.4G)

Test Position	Cover Type	Channel/ Frequency (MHz)	Mode 802.11b	Duty Cycle	Area Scan Max.SAR (W/Kg)	Tune-up limit (dBm)	Conducted Power (dBm)	Drift (dB)	Measured SAR_{1g} (W/kg)	Scaling Factor	Reported SAR_{1g} (W/kg)	Plot No.
Head SAR (Full Power)												
Left Cheek	standard	11/2462	DSSS	1:1	0.842	18.50	18.11	-0.071	0.929	1.09	1.016	/
		6/2437	DSSS	1:1	0.782	18.50	17.99	0.050	0.849	1.12	0.955	/
		1/2412	DSSS	1:1	0.826	18.50	17.94	-0.039	0.820	1.14	0.933	/
Left Tilt	standard	11/2462	DSSS	1:1	0.489	18.50	18.11	-0.070	0.489	1.09	0.535	/
Right Cheek	standard	11/2462	DSSS	1:1	0.554	18.50	18.11	-0.110	0.543	1.09	0.594	/
Right Tilt	standard	11/2462	DSSS	1:1	0.473	18.50	18.11	0.060	0.479	1.09	0.524	/
Left Cheek	Repeat	11/2462	DSSS	1:1	0.900	18.50	18.11	0.110	0.959	1.09	1.049	13
Hotspot (Distance 10mm)												
Back Side	standard	11/2462	DSSS	1:1	0.188	18.50	18.11	0.190	0.167	1.09	0.183	/
Front Side	standard	11/2462	DSSS	1:1	0.180	18.50	18.11	-0.030	0.186	1.09	0.203	14
Left Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Right Edge	standard	11/2462	DSSS	1:1	0.086	18.50	18.11	0.180	0.087	1.09	0.095	/
Top Edge	standard	11/2462	DSSS	1:1	0.123	18.50	18.11	0.160	0.122	1.09	0.133	/
Bottom Edge	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: 1. The value with blue color is the maximum SAR Value of each test band.

2. According to 648474 D04 Handset SAR v01r03，For Phablet, Since hotspot mode 1-g *reported* SAR < 1.2 W/kg, 10-g extremity SAR is no required.

MAX Adjusted SAR							
Mode	**Test Position**	**Channel/ Frequency(MHz)**	**MAX Measured SAR_{1g} (W/kg)**	**802.11b Tune-up limit (dBm)**	**Tune-up limit (dBm)**	**Scaling Factor**	**Adjusted SAR_{1g} (W/kg)**
802.11g	Left Cheek	6/2437	0.959	18.50	16.50	0.89	0.854
802.11n HT20	Left Cheek	6/2437	0.959	18.50	16.50	0.89	0.854
802.11n HT40	Left Cheek	6/2437	0.959	18.50	16.50	0.89	0.854

Note: SAR is not required for OFDM when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Measurement Variability				
Test Position	Channel/ Frequency(MHz)	MAX Measured SAR_{1g} (W/kg)	1st Repeated SAR_{1g} (W/kg)	Ratio
Left Cheek	11/2462	0.929	0.959	1.03
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once. 2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit). 3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20. 4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg				

Table 4: BT

Band	Configuration	Frequency (MHz)	Maximum Power (dBm)	Separation Distance (mm)	Estimated SAR (W/kg)
Bluetooth	Head	2441	5.50	5	0.148
Bluetooth	Body-worn	2441	5.50	10	0.074
For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01 based on the formula below. (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.					

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

10.4 Simultaneous Transmission Analysis

Simultaneous Transmission Configurations	Head	Body-worn	Hotspot
GSM(Voice) + Bluetooth(data)	Yes	Yes	N/A
GPRS/EDGE(Data) + Bluetooth(data)	N/A	Yes	N/A
GSM(Voice) + Wi-Fi-2.4GHz(data)	Yes	Yes	N/A
GPRS/EDGE(Data) + Wi-Fi-2.4GHz(data)	N/A	Yes	Yes
Wi-Fi-2.4GHz(data) + Bluetooth(data)	N/A	N/A	N/A

General Note:

1. The Scaled SAR summation is calculated based on the same configuration and test position.
2. Per KDB 447498 D01, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg, simultaneously transmission SAR measurement is not necessary.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

The maximum SAR_{1g} Value for GSM Antenna

Test Position / SAR_{1g}(W/kg)		GSM 850	GSM 1900	MAX. SAR_{1g}
Left Cheek		0.237	0.320	0.320
Left Tilt		0.136	0.102	0.136
Right Cheek		0.222	0.305	0.305
Right Tilt		0.130	0.187	0.187
Body worn	Back Side	0.198	0.247	0.247
	Front Side	0.156	0.217	0.217
Hotspot	Back Side	0.678	1.316	1.316
	Front Side	0.523	0.999	0.999
	Left Edge	0.221	0.139	0.221
	Right Edge	0.220	0.204	0.220
	Top Edge	0	0	0
	Bottom Edge	0.101	0.043	0.101

About BT and GSM Antenna

Test Position / SAR_{1g}(W/kg)		GSM antenna	BT	MAX. SAR_{1g}
Left Cheek		0.320	0.148	0.468
Left Tilt		0.136	0.148	0.284
Right Cheek		0.305	0.148	0.453
Right Tilt		0.187	0.148	0.335
Body worn	Back Side	0.247	0.074	0.321
	Front Side	0.217	0.074	0.291
Hotspot	Back Side	1.316	0.074	1.390
	Front Side	0.999	0.074	1.073
	Left Edge	0.221	0.074	0.295
	Right Edge	0.220	0.074	0.294
	Top Edge	0	0.074	0.074
	Bottom Edge	0.101	0.074	0.175
Note: 1.The value with blue color is the maximum ΣSAR_{1g} Value. 2. MAX. ΣSAR_{1g} =Unlicensed SAR_{MAX} +Licensed SAR_{MAX}				

MAX. ΣSAR_{1g} = 1.390 W/kg <1.6 W/kg and MAX, so the Simultaneous transimition SAR with volum scan are not required for BT and GSM Antenna.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

About Wi-Fi and GSM Antenna

Test Position \ SAR_{1g} (W/kg)		GSM antenna	Wi-Fi 2.4G	MAX. ΣSAR_{1g}
Left Cheek		0.320	1.049	1.369
Left Tilt		0.136	0.535	0.671
Right Cheek		0.305	0.594	0.899
Right Tilt		0.187	0.524	0.711
Body worn	Back Side	0.247	0.183	0.430
	Front Side	0.217	0.203	0.420
Hotspot	Back Side	1.316	0.183	1.499
	Front Side	0.999	0.203	1.202
	Left Edge	0.221	0	0.221
	Right Edge	0.220	0.095	0.315
	Top Edge	0	0.133	0.133
	Bottom Edge	0.101	0	0.101
Note: 1.The value with blue color is the maximum ΣSAR_{1g} Value. 2. MAX. ΣSAR_{1g} =Unlicensed SAR_{MAX} +Licensed SAR_{MAX}				

MAX. ΣSAR_{1g} = 1.499 W/kg <1.6 W/kg, so the Simultaneous transimition SAR with volum scan are not required for Wi-Fi and GSM Antenna.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

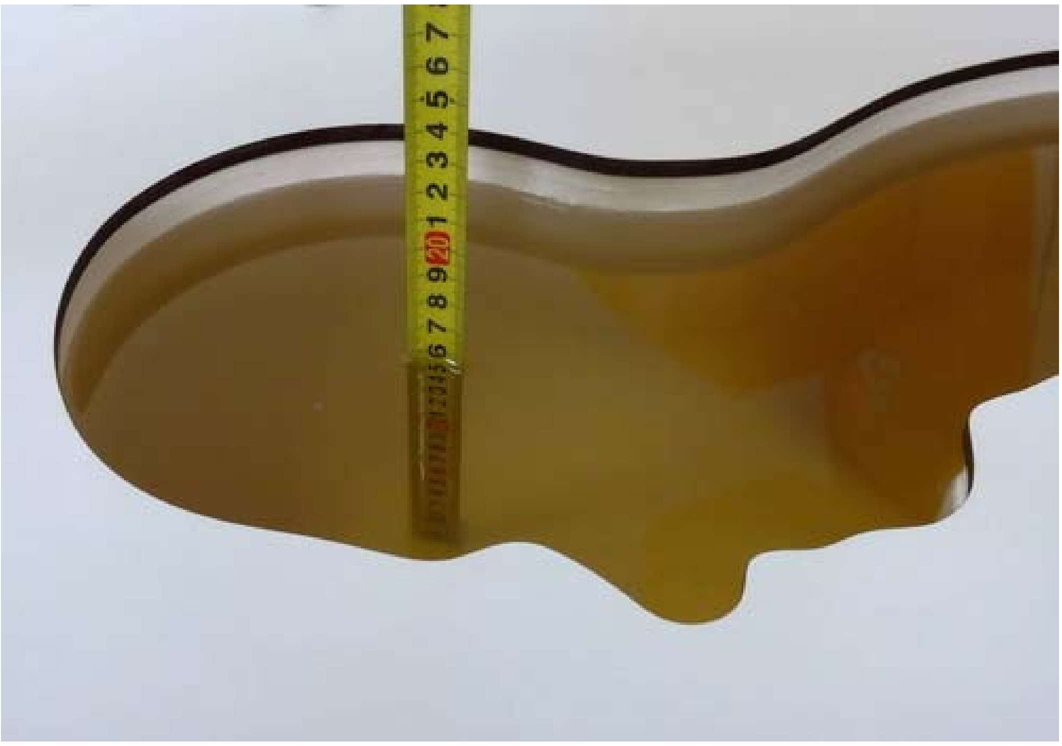
5. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, 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. This also applies to the 10-g SAR required for phablets in KDB Publication 648474.

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

ANNEX A: Test Layout

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

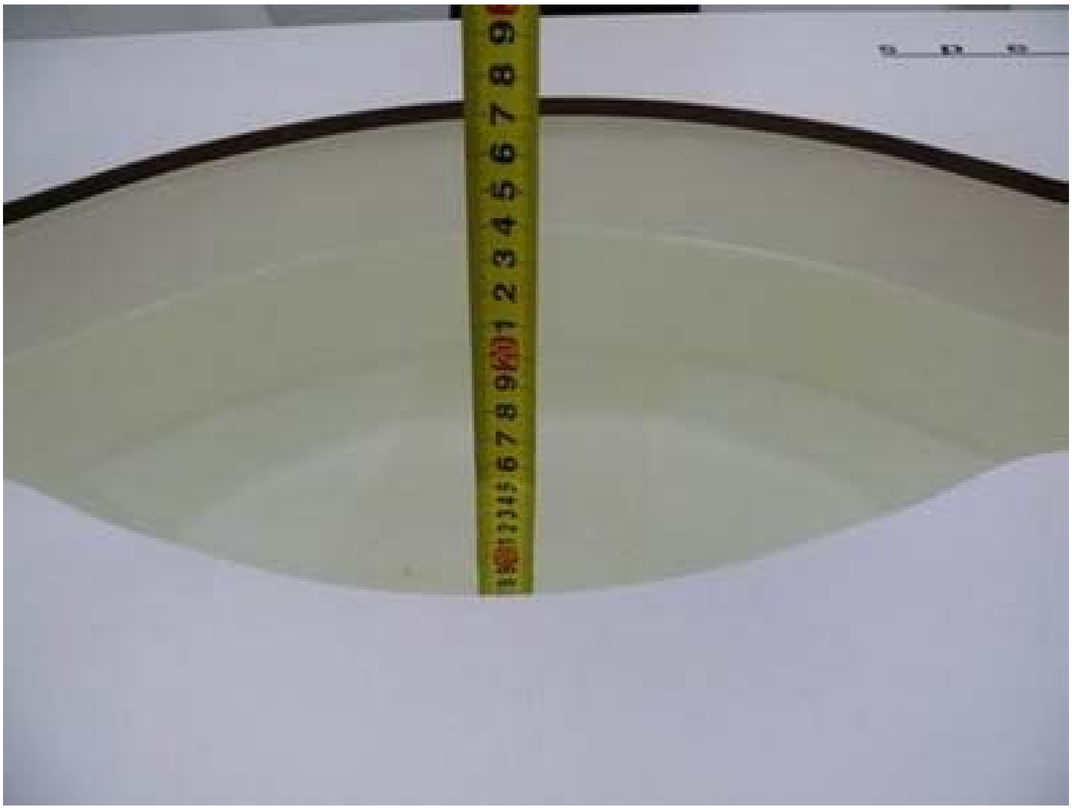


Picture 3: Liquid depth in the head Phantom (835MHz, 15.3cm depth)

Picture 4: Liquid depth in the flat Phantom (835MHz, 15.4cm depth)

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

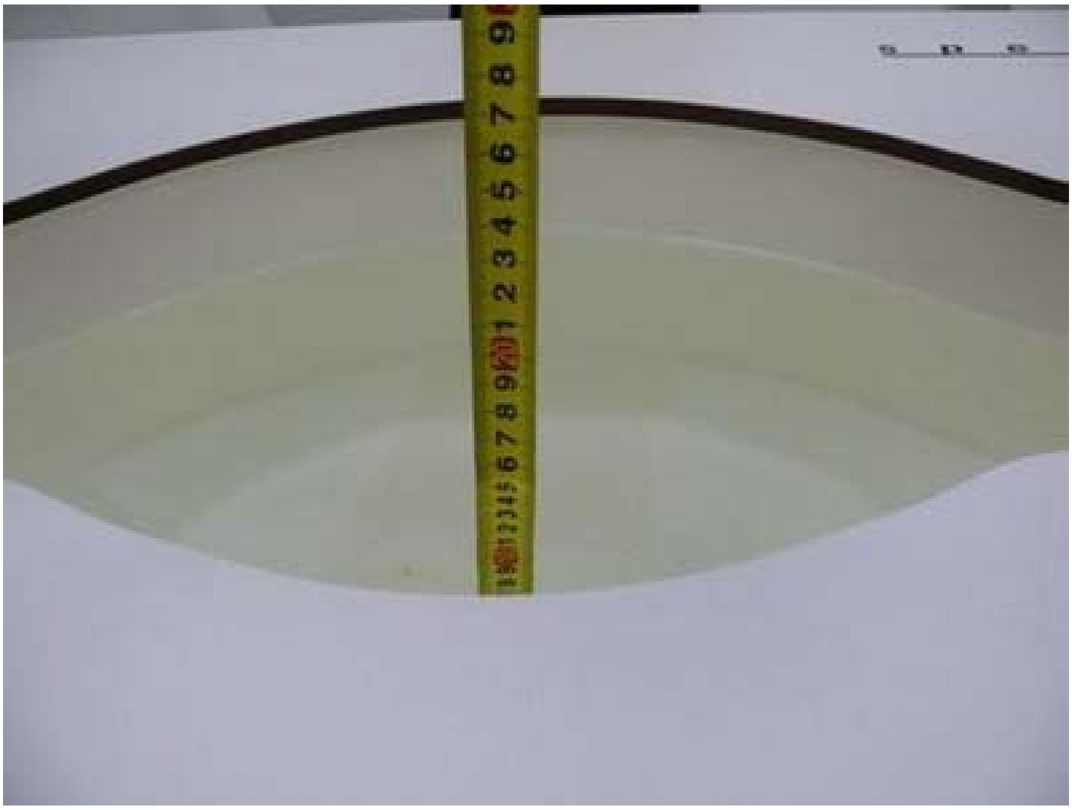
Picture 5: liquid depth in the head Phantom (1900 MHz, 15.3cm depth)



Picture 6: Liquid depth in the flat Phantom (1900 MHz, 15.2cm depth)

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Picture 7: Liquid depth in the head Phantom (2450 MHz, 15.4cm depth)



Picture 8: Liquid depth in the flat Phantom (2450 MHz, 15.3cm depth)

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

ANNEX B: System Check Results

Plot 1 System Performance Check at 835 MHz Head TSL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Date: 8/16/2016

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1

Medium parameters used: f = 835 MHz; σ = 0.88 mho/m; ε_r = 41.4; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(9.35, 9.35, 9.35); Calibrated: 12/10/2015;

Electronics: DAE4 Sn871; Calibrated: 12/8/2015

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=15mm, Pin=250mW/Area Scan (41x121x1): Measurement grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.64 mW/g

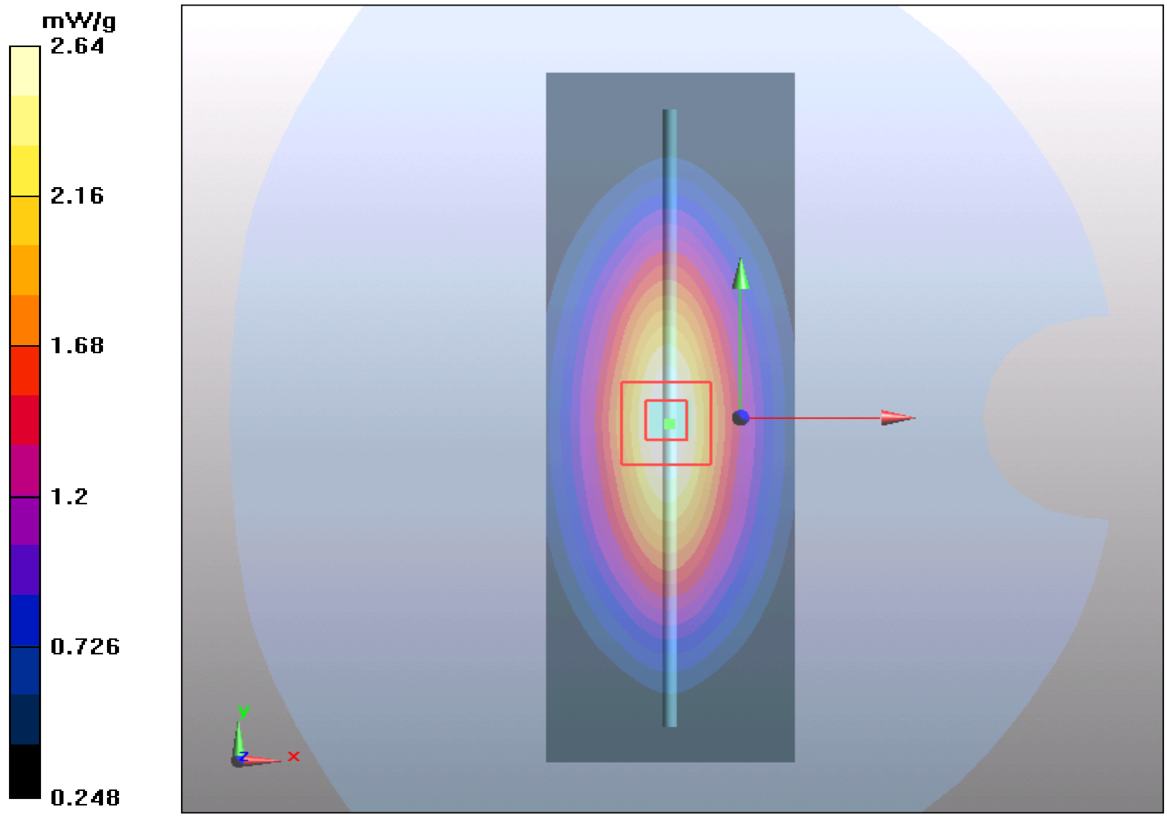
d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 54.4 V/m; Power Drift = -0.076 dB

Peak SAR (extrapolated) = 3.67 W/kg

SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.6 mW/g

Maximum value of SAR (measured) = 2.64 mW/g



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Plot 2 System Performance Check at 835 MHz Body TSL

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020

Date: 8/15/2016

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1

Medium parameters used: f = 835 MHz; σ = 0.96 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(9.42, 9.42, 9.42); Calibrated: 12/10/2015;

Electronics: DAE4 Sn871; Calibrated: 11/17/2015

Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=15mm, Pin=250mW/Area Scan (41x121x1): Measurement grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.58 mW/g

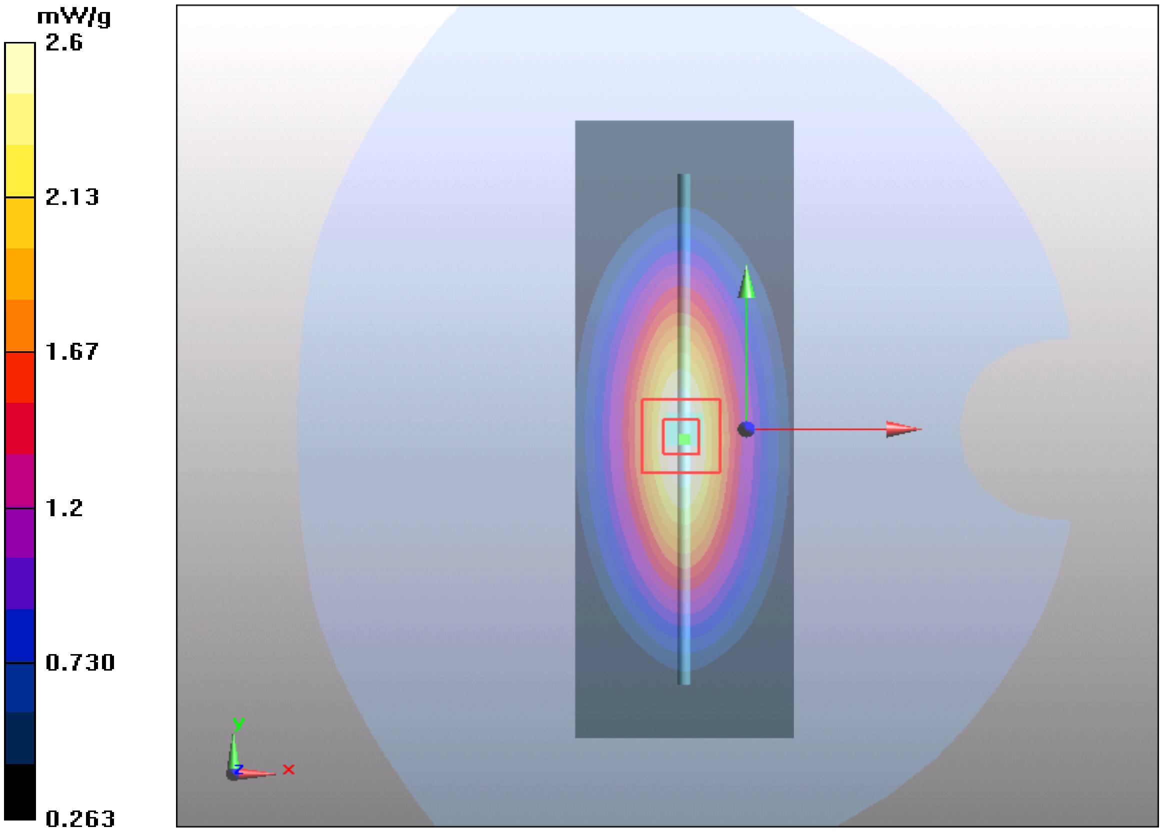
d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 51.9 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 3.5 W/kg

SAR(1 g) = 2.41 mW/g; SAR(10 g) = 1.6 mW/g

Maximum value of SAR (measured) = 2.6 mW/g



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Plot 3 System Performance Check at 1900 MHz Head TSL

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060

Date: 8/15/2016

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; σ = 1.41 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.96, 7.96, 7.96); Calibrated: 12/10/2015;

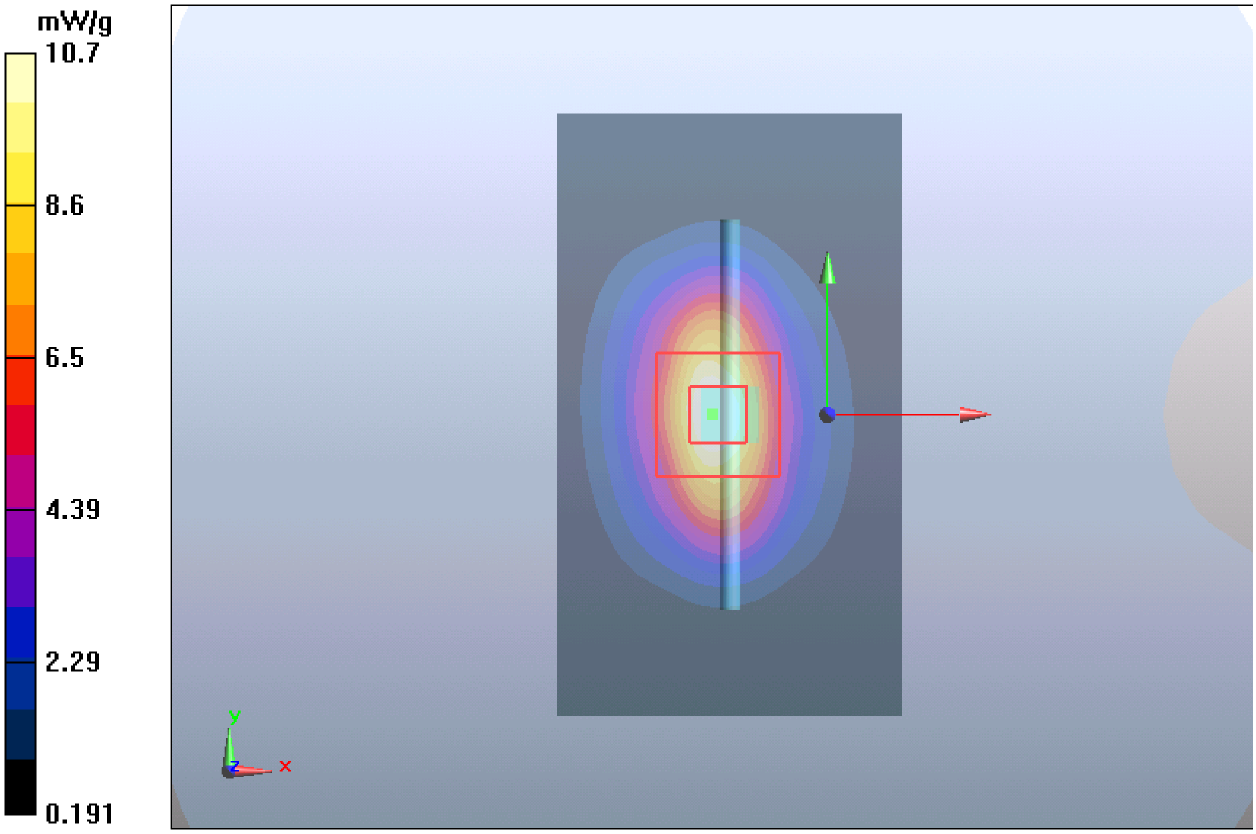
Electronics: DAE4 Sn871; Calibrated: 11/17/2015

Phantom: SAM 1; Type: QD000P40CD; Serial: TP:1666

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=250mW/Area Scan (41x71x1): Measurement grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 11.3 mW/g

d=10mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 85.5 V/m; Power Drift = 0.028 dB
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 9.48 mW/g; SAR(10 g) = 4.9 mW/g
Maximum value of SAR (measured) = 10.7 mW/g



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Plot 4 System Performance Check at 1900 MHz Body TSL

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060

Date: 8/16/2016

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; σ = 1.51 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.42, 7.42, 7.42); Calibrated: 12/10/2015;

Electronics: DAE4 Sn871; Calibrated: 11/17/2015

Phantom: SAM 1; Type: QD000P40CD; Serial: TP:1666

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=250mW/Area Scan (41x71x1): Measurement grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 12.2 mW/g

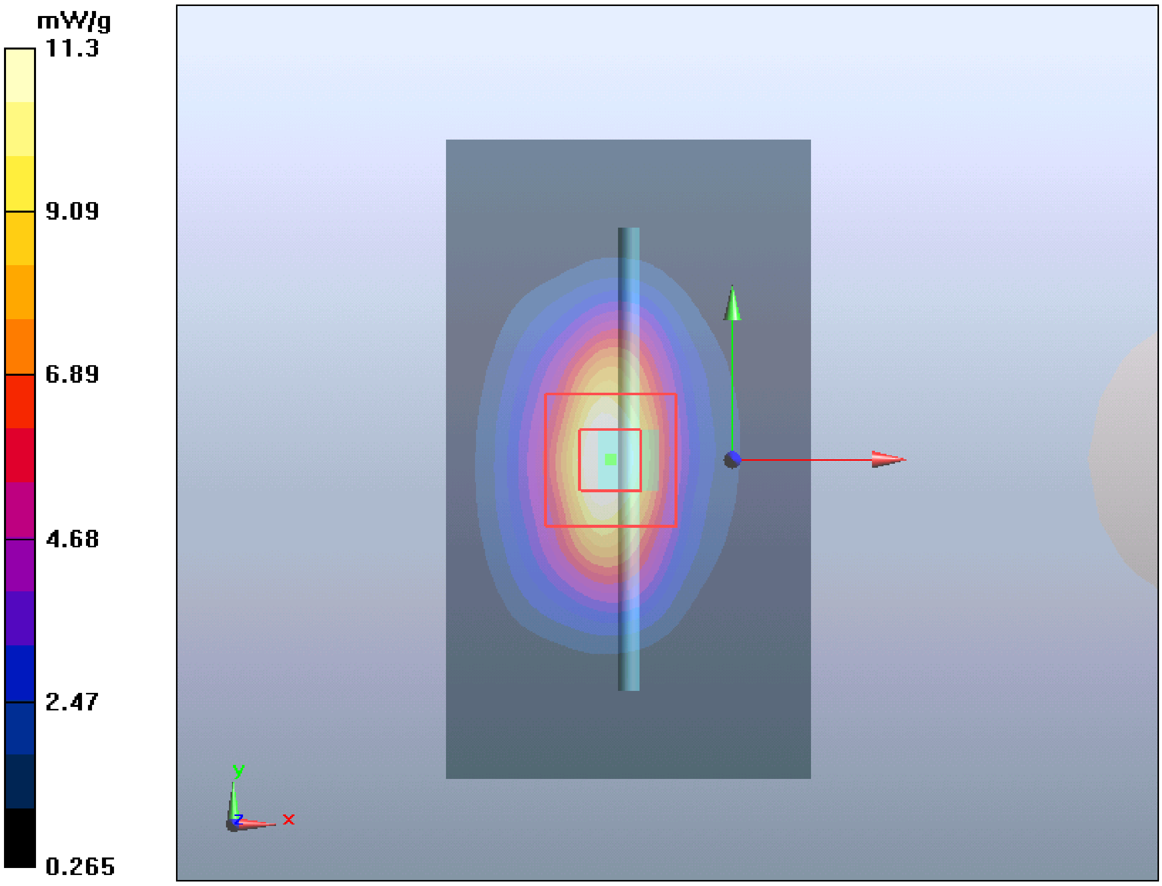
d=10mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 82.3 V/m; Power Drift = 0.068 dB

Peak SAR (extrapolated) = 17.8 W/kg

SAR(1 g) = 9.93 mW/g; SAR(10 g) = 5.25 mW/g

Maximum value of SAR (measured) = 11.3 mW/g



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Plot 5 System Performance Check at 2450 MHz Head TSL

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786

Date: 8/21/2016

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2450 MHz; σ = 1.81 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.39, 7.39, 7.39); Calibrated: 12/10/2015;

Electronics: DAE4 Sn871; Calibrated: 11/17/2015

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=250mW/Area Scan (41x71x1): Measurement grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 18.2 mW/g

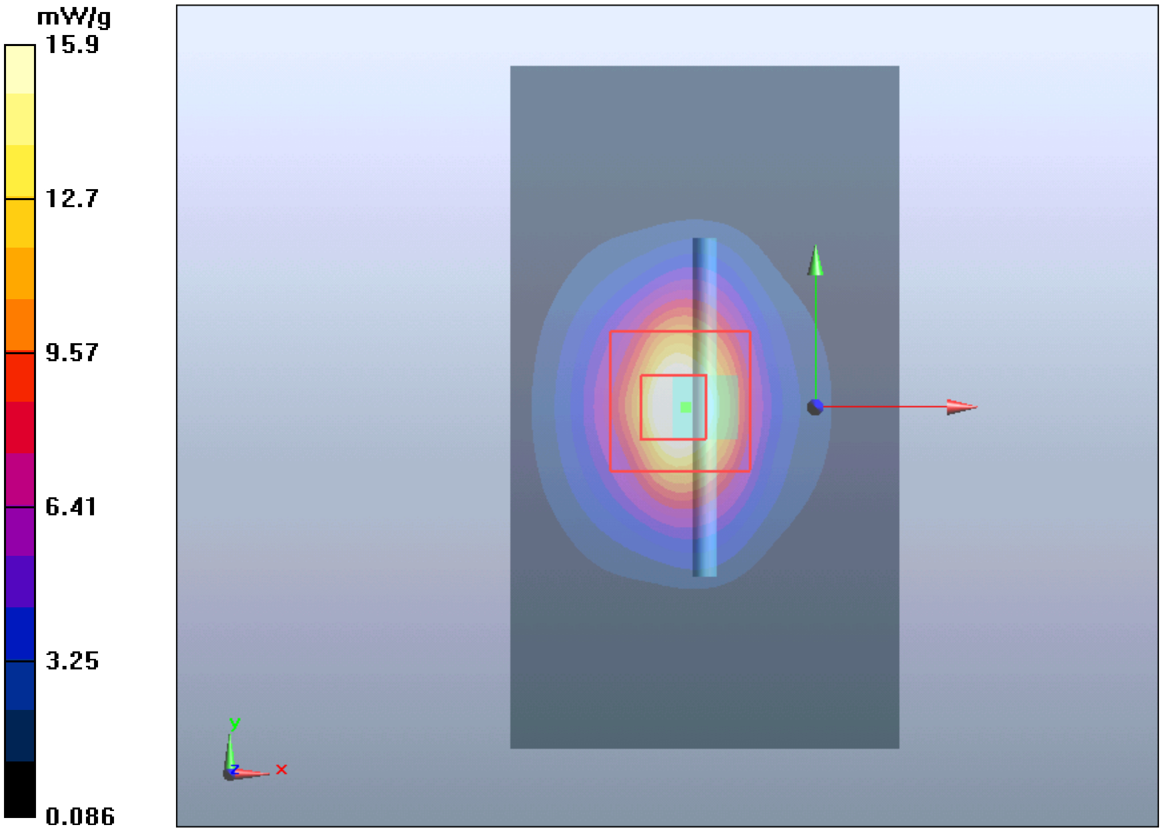
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.8 V/m; Power Drift = 0.075 dB

Peak SAR (extrapolated) = 30 W/kg

SAR(1 g) = 13.7 mW/g; SAR(10 g) = 6.22 mW/g

Maximum value of SAR (measured) = 15.9 mW/g



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Plot 6 System Performance Check at 2450 MHz Body TSL

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786

Date: 8/20/2016

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2450 MHz; σ = 1.98 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.22, 7.22, 7.22); Calibrated: 12/10/2015;

Electronics: DAE4 Sn871; Calibrated: 11/17/2015

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

d=10mm, Pin=250mW/Area Scan (41x71x1): Measurement grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 16 mW/g

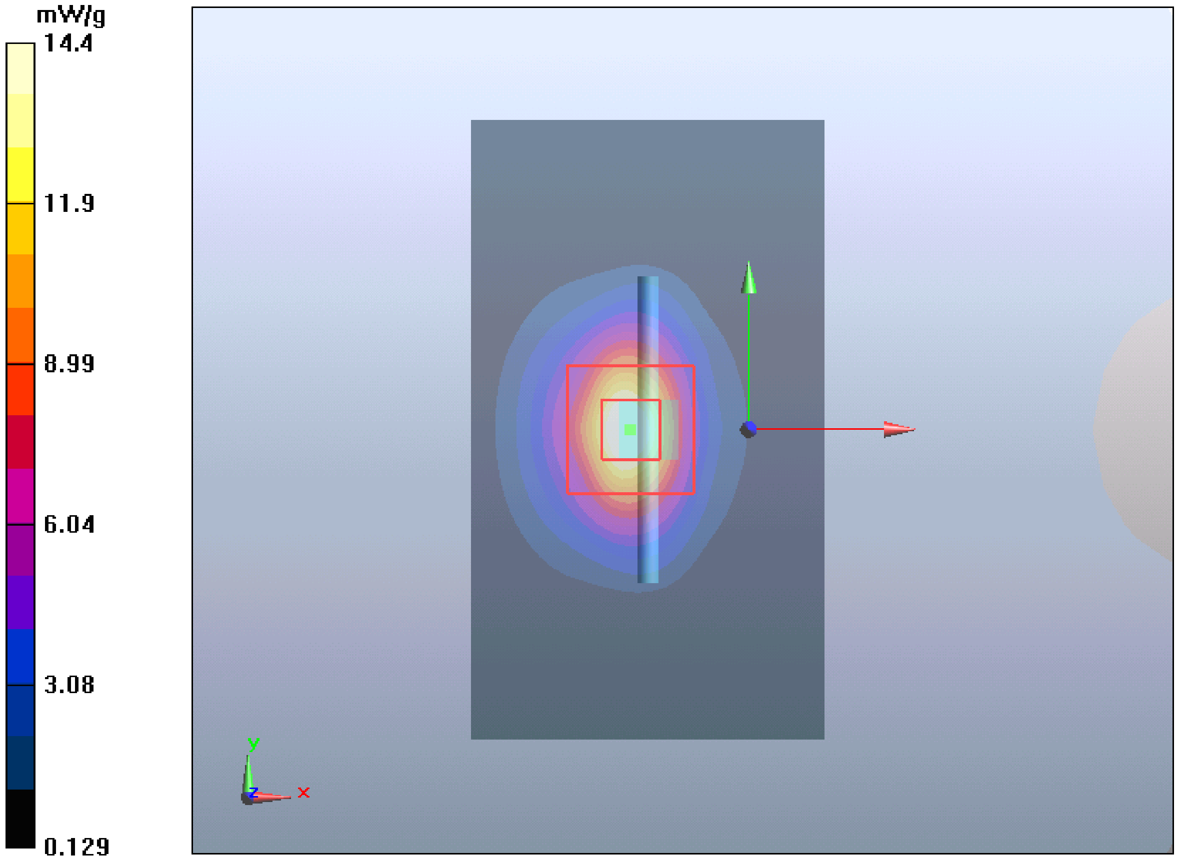
d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 81.2 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 25.4 W/kg

SAR(1 g) = 12.5 mW/g; SAR(10 g) = 6.20 mW/g

Maximum value of SAR (measured) = 14.4 mW/g



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

ANNEX C: Highest Graph Results

Plot 7 GSM 850 Left Cheek Middle

Date: 8/16/2016

Communication System: UID 0, GSM 850 (0); Frequency: 836.6 MHz;Duty Cycle: 1:8.30042

Medium parameters used: f = 837 MHz; σ = 0.885 S/m; ε_r = 41.372; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(9.35, 9.35, 9.35); Calibrated: 12/10/2015;

Electronics: DAE4 Sn871; Calibrated: 11/17/2015

Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Cheek Middle/Area Scan (61x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.220 W/kg

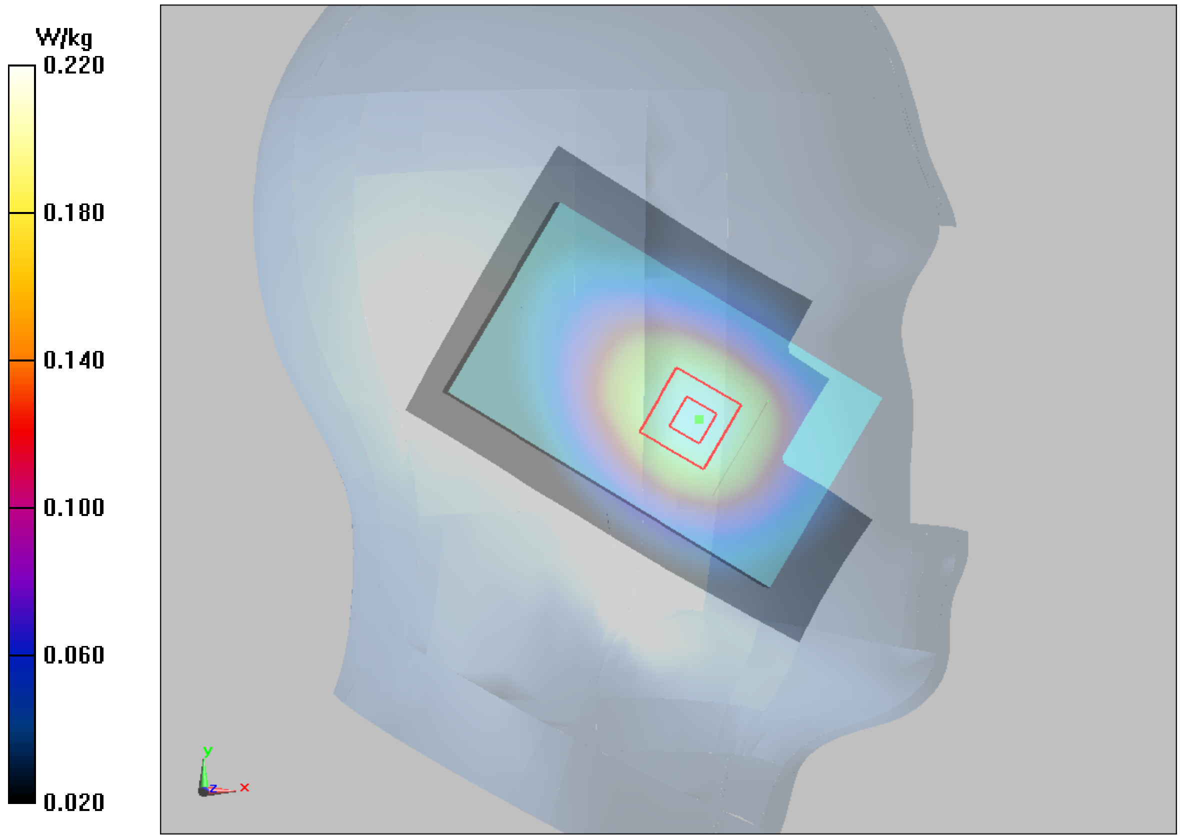
Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.221 V/m; Power Drift = -0.039 dB

Peak SAR (extrapolated) = 0.257 W/kg

SAR(1 g) = 0.209 W/kg; SAR(10 g) = 0.156 W/kg

Maximum value of SAR (measured) = 0.220 W/kg



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Plot 8 GSM 850 Back Side Middle (Distance 10mm)

Date: 8/15/2016

Communication System: UID 0, GSM (0); Frequency: 836.6 MHz;Duty Cycle: 1:8.30042

Medium parameters used: f = 837 MHz; σ = 0.967 S/m; ε_r = 54.144; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(9.42, 9.42, 9.42); Calibrated: 12/10/2015;

Electronics: DAE4 Sn871; Calibrated: 11/17/2015

Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Back Side Middle/Area Scan (61x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.187 W/kg

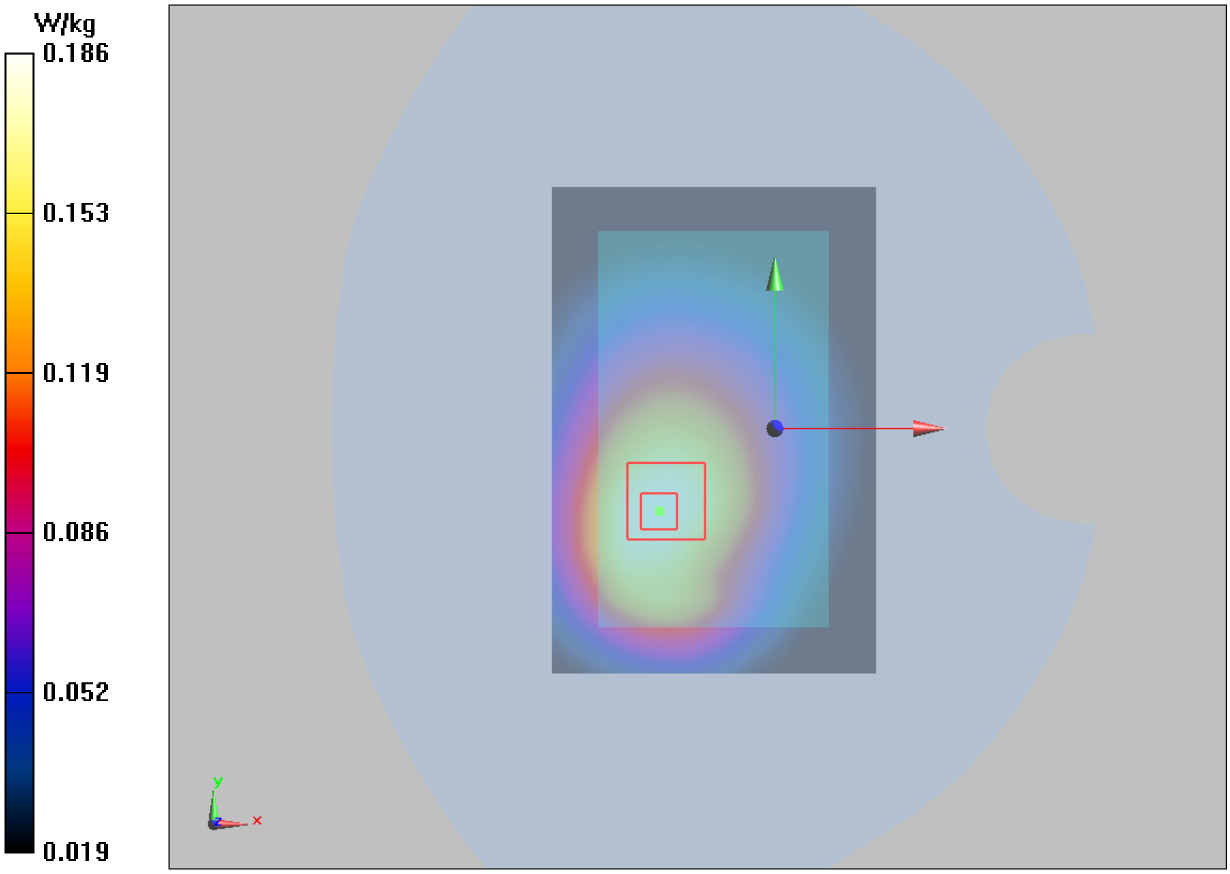
Back Side Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.85 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.229 W/kg

SAR(1 g) = 0.175 W/kg; SAR(10 g) = 0.126 W/kg

Maximum value of SAR (measured) = 0.186 W/kg



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Plot 9 GSM 850 GPRS (4Txslots) Back Side Middle (Distance 10mm)

Date: 8/15/2016

Communication System: UID 0, 4 slot GPRS (0); Frequency: 836.6 MHz;Duty Cycle: 1:2.07491

Medium parameters used: f = 837 MHz; σ = 0.967 S/m; ε_r = 54.144; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(9.42, 9.42, 9.42); Calibrated: 12/10/2015;

Electronics: DAE4 Sn871; Calibrated: 11/17/2015

Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Back Side Middle/Area Scan (61x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.687 W/kg

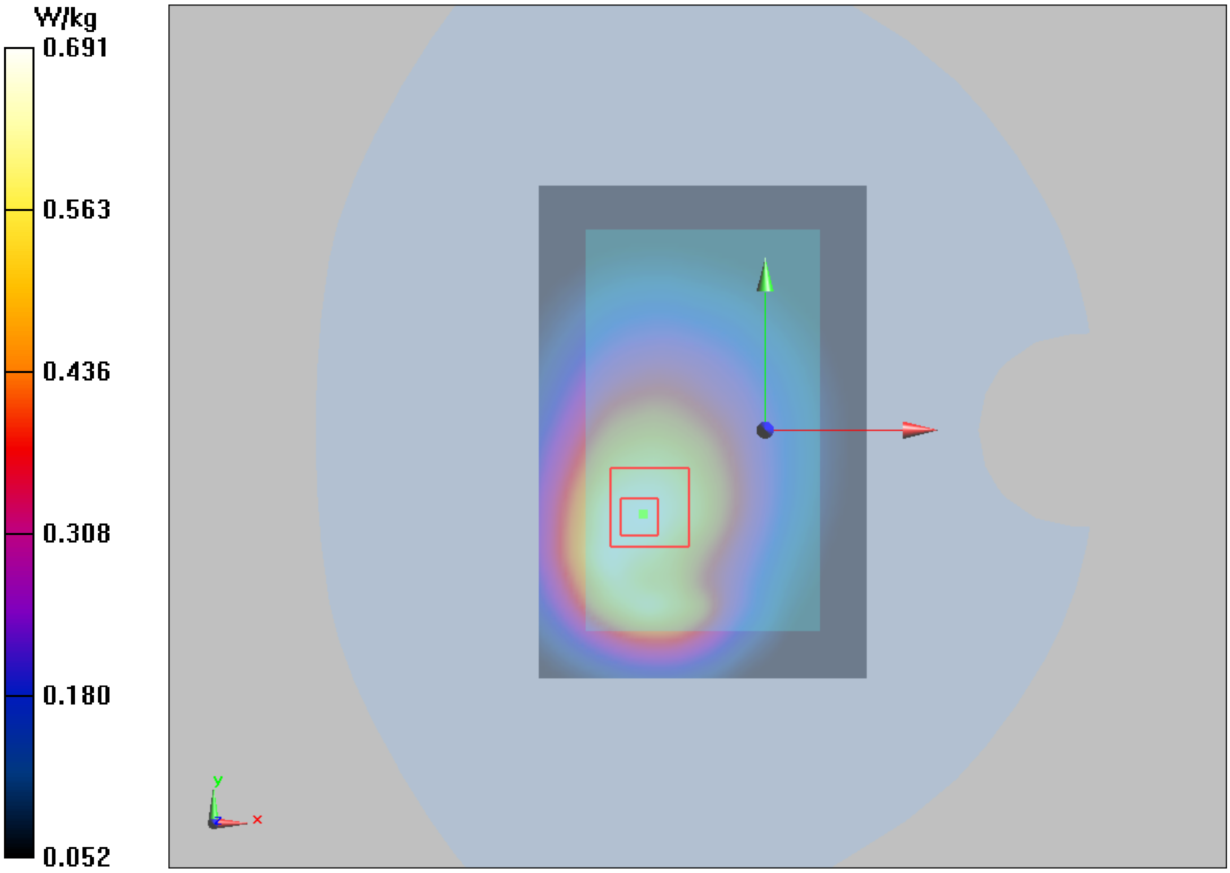
Back Side Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.51 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.874 W/kg

SAR(1 g) = 0.649 W/kg; SAR(10 g) = 0.460 W/kg

Maximum value of SAR (measured) = 0.691 W/kg



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Plot 10 GSM 1900 Left Cheek Middle

Date: 8/15/2016

Communication System: UID 0, GSM (0); Frequency: 1880 MHz;Duty Cycle: 1:8.30042

Medium parameters used: f = 1880 MHz; σ = 1.413 S/m; ε_r = 39.917; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.96, 7.96, 7.96); Calibrated: 12/10/2015;

Electronics: DAE4 Sn871; Calibrated: 11/17/2015

Phantom: SAM 1; Type: QD000P40CD; Serial: TP:1666

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Cheek Middle/Area Scan (61x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.304 W/kg

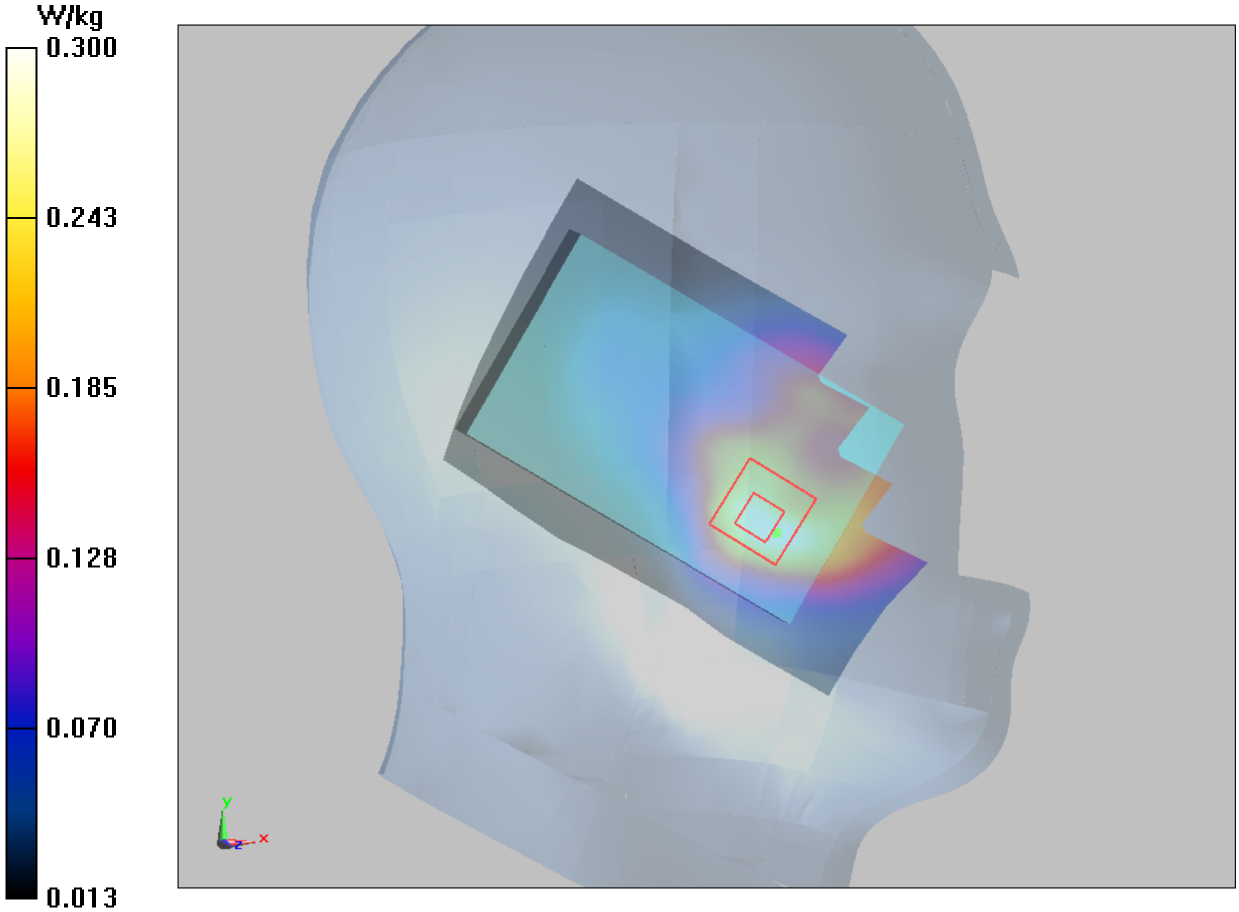
Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.621 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 0.424 W/kg

SAR(1 g) = 0.283 W/kg; SAR(10 g) = 0.174 W/kg

Maximum value of SAR (measured) = 0.300 W/kg



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Plot 11 GSM 1900 Back Side Middle (Distance 10mm)

Date: 8/16/2016

Communication System: UID 0, GSM (0); Frequency: 1880 MHz;Duty Cycle: 1:8.30042

Medium parameters used: f = 1880 MHz; σ = 1.494 S/m; ε_r = 52.613; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.42, 7.42, 7.42); Calibrated: 12/10/2015;

Electronics: DAE4 Sn871; Calibrated: 11/17/2015

Phantom: SAM 1; Type: QD000P40CD; Serial: TP:1666

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Back Side Middle/Area Scan (61x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.243 W/kg

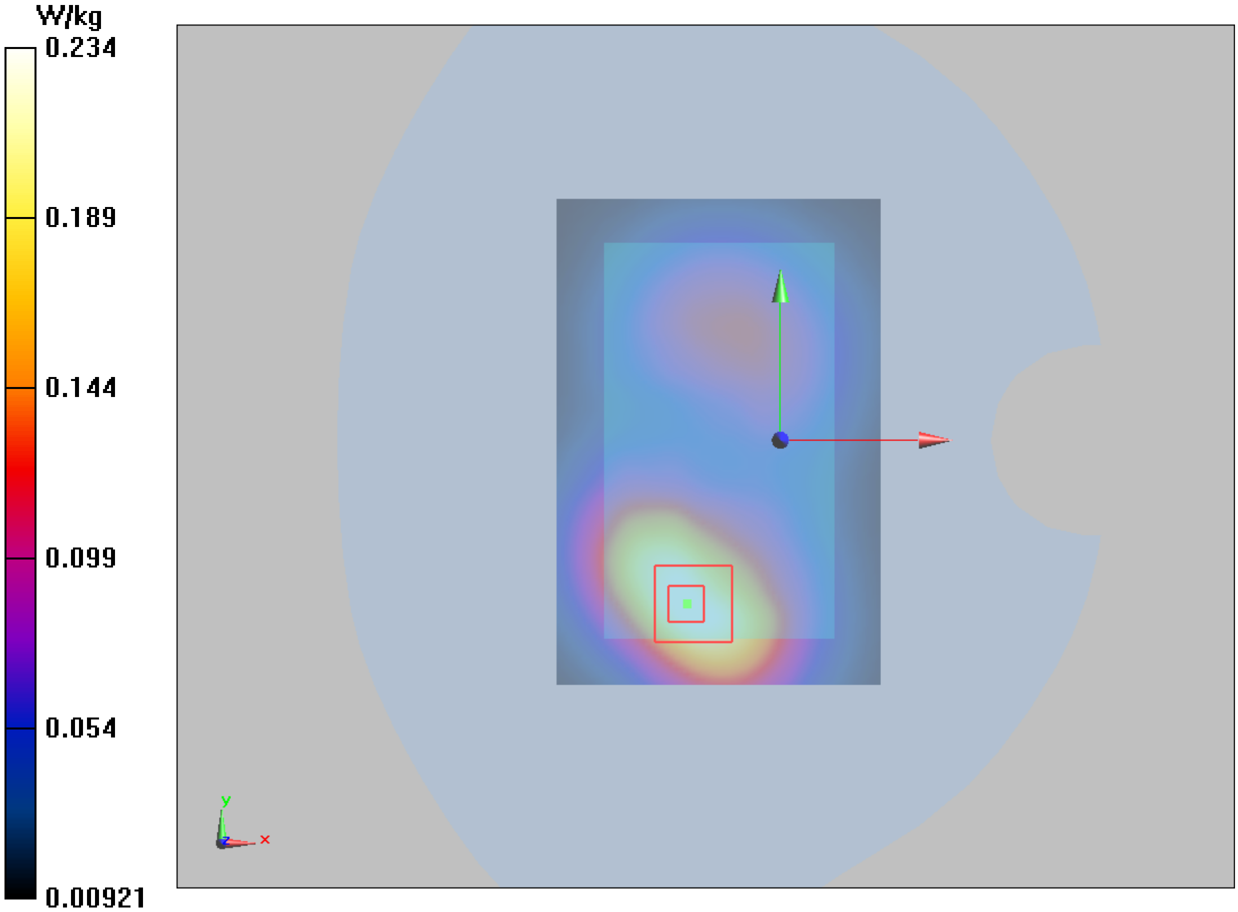
Back Side Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.432 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.364 W/kg

SAR(1 g) = 0.218 W/kg; SAR(10 g) = 0.136 W/kg

Maximum value of SAR (measured) = 0.234 W/kg



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Plot 12 GSM 1900 GPRS (4Txslots) Back Side Low (Distance 10mm)

Date: 8/16/2016

Communication System: UID 0, 4 slot GPRS (0); Frequency: 1850.2 MHz;Duty Cycle: 1:2.07491

Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.465 S/m; ε_r = 52.676; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.42, 7.42, 7.42); Calibrated: 12/10/2015;

Electronics: DAE4 Sn871; Calibrated: 11/17/2015

Phantom: SAM 1; Type: QD000P40CD; Serial: TP:1666

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Back Side Low/Area Scan (61x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.12 W/kg

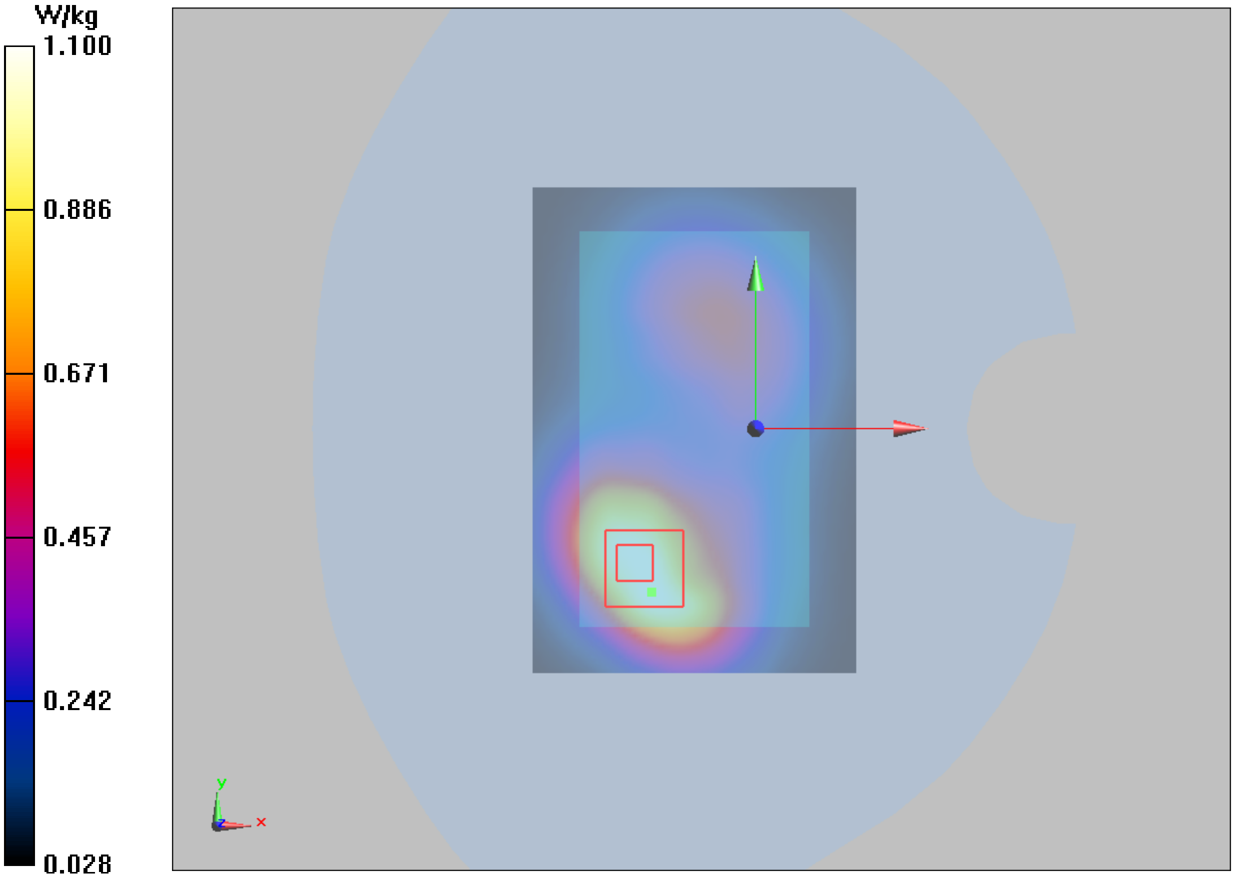
Back Side Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.77 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 1.88 W/kg

SAR(1 g) = 1.05 W/kg; SAR(10 g) = 0.625 W/kg

Maximum value of SAR (measured) = 1.10 W/kg



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Plot 13 802.11b Left Cheek High (1st Repeated SAR)

Date: 8/21/2016

Communication System: UID 0, 802.11 b (0); Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2462 MHz; σ = 1.824 S/m; ε_r = 38.584; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Left Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.39, 7.39, 7.39); Calibrated: 12/10/2015;

Electronics: DAE4 Sn871; Calibrated: 11/17/2015

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Cheek High/Area Scan (81x111x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 1.04 W/kg

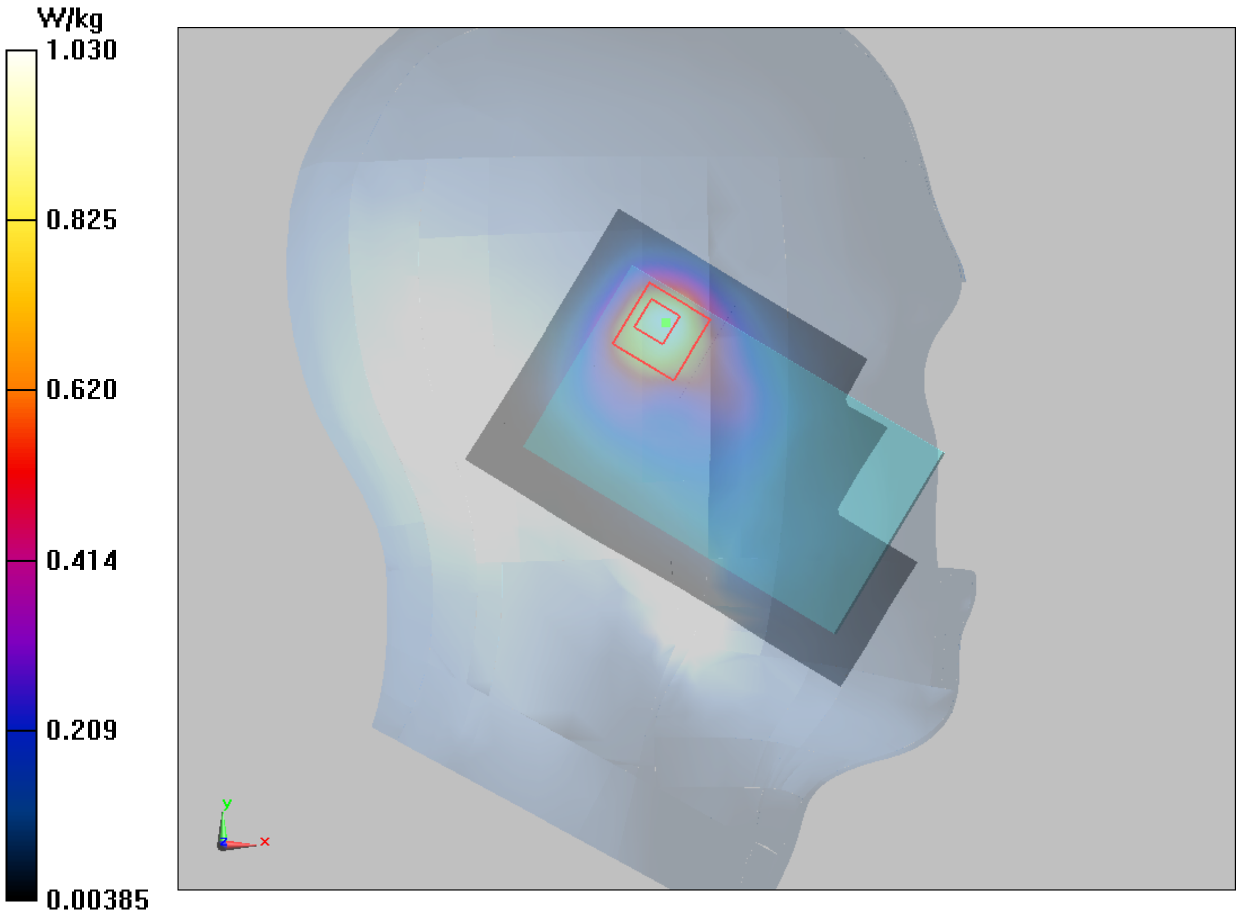
Left Cheek High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.29 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 2.15 W/kg

SAR(1 g) = 0.959 W/kg; SAR(10 g) = 0.461 W/kg

Maximum value of SAR (measured) = 1.03 W/kg



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

Plot 14 802.11b Front Side High (Distance 10mm)

Date: 8/20/2016

Communication System: UID 0, 802.11 b (0); Frequency: 2462 MHz;Duty Cycle: 1:1

Medium parameters used: f = 2462 MHz; σ = 1.993 S/m; ε_r = 52.463; ρ = 1000 kg/m^3

Ambient Temperature:22.3 ℃ Liquid Temperature: 21.5℃

Phantom section: Flat Section

DASY5 Configuration:

Sensor-Surface: 4mm (Mechanical Surface Detection)

Probe: EX3DV4 - SN3677; ConvF(7.22, 7.22, 7.22); Calibrated: 12/10/2015;

Electronics: DAE4 Sn871; Calibrated: 11/17/2015

Phantom: SAM1; Type: SAM; Serial: TP-1534

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Front Side High/Area Scan (91x131x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 0.202 W/kg

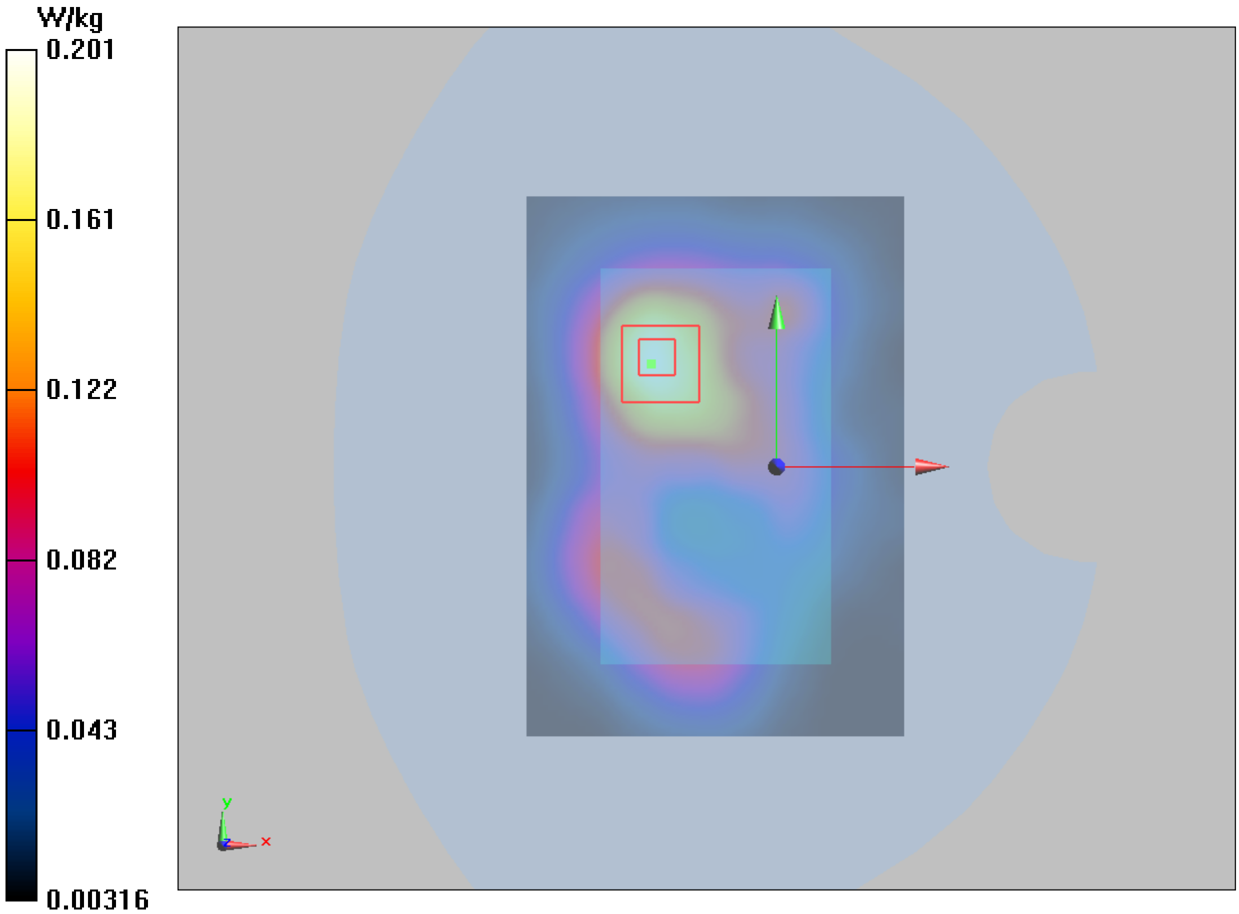
Front Side High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.586 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.302 W/kg

SAR(1 g) = 0.186 W/kg; SAR(10 g) = 0.110 W/kg

Maximum value of SAR (measured) = 0.201 W/kg



This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

ANNEX D: Probe Calibration Certificate

In Collaboration with
s p e a g
CALIBRATION LABORATORY
Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2218 Fax: +86-10-62304633-2209
E-mail: cttl@chinattl.com Http://www.chinattl.cn

CALIBRATION No. L0570

Client TA(Shanghai) Certificate No: Z15-97193

CALIBRATION CERTIFICATE

Object EX3DV4 - SN:3677

Calibration Procedure(s) FD-Z11-2-004-01
Calibration Procedures for Dosimetric E-field Probes

Calibration date: December 10, 2015

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	01-Jul-15 (CTTL, No.J15X04256)	Jun-16
Power sensor NRP-Z91	101547	01-Jul-15 (CTTL, No.J15X04256)	Jun-16
Power sensor NRP-Z91	101548	01-Jul-15 (CTTL, No.J15X04256)	Jun-16
Reference10dBAttenuator	18N50W-10dB	13-Mar-14(TMC,No.JZ14-1103)	Mar-16
Reference20dBAttenuator	18N50W-20dB	13-Mar-14(TMC,No.JZ14-1104)	Mar-16
Reference Probe EX3DV4	SN 7307	27-Feb-15(SPEAG,No.EX3-7307_Feb15)	Feb-16
DAE4	SN 771	27-Jan-15(SPEAG, No.DAE4-771_Jan15)	Jan -16
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGeneratorMG3700A	6201052605	01-Jul-15 (CTTL, No.J15X04255)	Jun-16
Network Analyzer E5071C	MY46110673	03-Feb-15 (CTTL, No.J15X00728)	Feb-16

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: December 11, 2015

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: Z15-97193 Page 1 of 11

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2218 Fax: +86-10-62304633-2209
E-mail: cttl@chinattl.com Http://www.chinattl.cn

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i θ=0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below ConvF).
- *NORM(f)x,y,z = NORMx,y,z* frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- *Ax,y,z; Bx,y,z; Cx,y,z;VRx,y,z:*A,B,C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle:* The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.

In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2218 Fax: +86-10-62304633-2209
E-mail: cttl@chinattl.com Http://www.chinattl.cn

Probe EX3DV4

SN: 3677

Calibrated: December 10, 2015

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: Z15-97193 Page 3 of 11

This report shall not be reproduced except in full, without the written approval of TA Technology (Shanghai) Co., Ltd.