A Test Lab Techno Corp.

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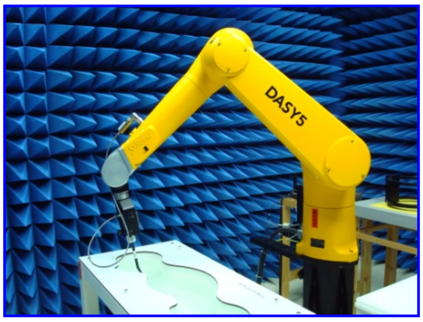
SAR EVALUATION REPORT

Test Report No.	:	1811FS19
Applicant	:	Yepzon Oy
Product Type	:	GPS Tracker
Trade Name	:	YEPZON
Model Number	:	Yepzon One 2.0
Date of Receipt	:	Nov. 20, 2018
Test Period	:	Nov. 21 ~ Nov. 22, 2018
Date of Issue	:	Dec. 14, 2018
Test Environment	:	Ambient Temperature： 22 ±2 ° C Relative Humidity：40 - 70 %
Standard	:	ANSI/IEEE C95.1-1992 / IEEE Std. 1528-2013 47 CFR Part §2.1093 KDB 865664 D01 v01r04 / KDB 865664 D02 v01r02 KDB 447498 D01 v06 / KDB 941225 D01 v03r01 KDB 248227 D01 v02r02
Test Lab Location	:	Chang-an Lab
Test Firm MRA designation number	:	TW0010



1. A Test Lab Techno Corp. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.
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Approved By	:	Edison Hu	Tested By	:	Kris Pan
		(Edison Hu)			(Kris Pan)

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1. Summary of Maximum Reported SAR Value

Equipment Class	Mode	Highest Reported			
		Head standalone $SAR_{1\,g}$ (W/kg)	Hotspot standalone $SAR_{1\,g}$ (W/kg)	Body standalone $SAR_{1\,g}$ (W/kg)	Extremity standalone $SAR_{1\,g}$ (W/kg)
Licensed	GPRS 850	---	---	0.89	---
	GPRS 1900	---	---	0.60	---
DTS	WLAN 2.4 GHz	---	---	N/A	---

NOTE: 1. The SAR limit (Head & Body: SAR1g 1.6 W/kg) for general population / uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.

2. The device is designed for WWAN and WLAN and cannot be transmitted simultaneously, hence combined SAR is not required.

2. Description of Equipment under Test (EUT)

<table>
<tr><td>Applicant</td><td colspan="2">Yepzon Oy
Finlaysoninkuja 9, 33210 , Tampere Finland</td></tr>
<tr><td>Manufacture</td><td colspan="2">VVDN Technologies Pvt. Ltd
B-22,Infocity Sector-34, Gurgaon-122001, Haryana,India</td></tr>
<tr><td>Product Type</td><td colspan="2">GPS Tracker</td></tr>
<tr><td>Trade Name</td><td colspan="2">YEPZON</td></tr>
<tr><td>Model Number</td><td colspan="2">Yepzon One 2.0</td></tr>
<tr><td>FCC ID</td><td colspan="2">2AENAYPZN1-20</td></tr>
<tr><td rowspan="6">RF Function</td><td>Operate Bands</td><td>Operate Frequency (MHz)</td></tr>
<tr><td>GSM/GPRS/EGPRS 850</td><td>824 - 850</td></tr>
<tr><td>GSM/GPRS/EGPRS 1900</td><td>1850 - 1910</td></tr>
<tr><td>IEEE 802.11b / 802.11g / 802.11n 2.4 GHz 20 MHz</td><td>2412 - 2472</td></tr>
<tr><td>IEEE 802.11n 2.4 GHz 40 MHz</td><td>2422 - 2462</td></tr>
<tr><td colspan="2">*GPRS Multi Class: 12</td></tr>
<tr><td>Antenna Type</td><td colspan="2">PCB Antenna</td></tr>
<tr><td rowspan="2">Battery Option</td><td colspan="2">Standard</td></tr>
<tr><td colspan="2">Trade Name: PKCELL
Model: LP553640
Spec: DC 3.7 V / 860 mAh</td></tr>
<tr><td>Device Category</td><td colspan="2">Portable Device</td></tr>
<tr><td>Application Type</td><td colspan="2">Certification</td></tr>
</table>

Note:The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

3. Introduction

The A Test Lab Techno Corp. has performed measurements of the maximum potential exposure to the user of **Yepzon Oy Trade Name : YEPZON Model(s) : Yepzon One 2.0**. The test procedures, as described in American National Standards, Institute C95.1-1999〔1〕were employed and they specify the maximum exposure limit of 1.6 mW/g as averaged over any 1 gram of tissue for portable devices being used within 20 cm between user and EUT in the uncontrolled environment. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the equipment used are included within this test report.

3.1 SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative (rate) of the incremental energy (dw) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Figure 2).

$$\text{SAR} = \frac{d}{dt}\left(\frac{dw}{dm}\right) = \frac{d}{dt}\left(\frac{dw}{\rho dv}\right)$$

Figure 2. SAR Mathematical Equation

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be related to the electrical field in the tissue by

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

Where :

σ = conductivity of the tissue (S/m)

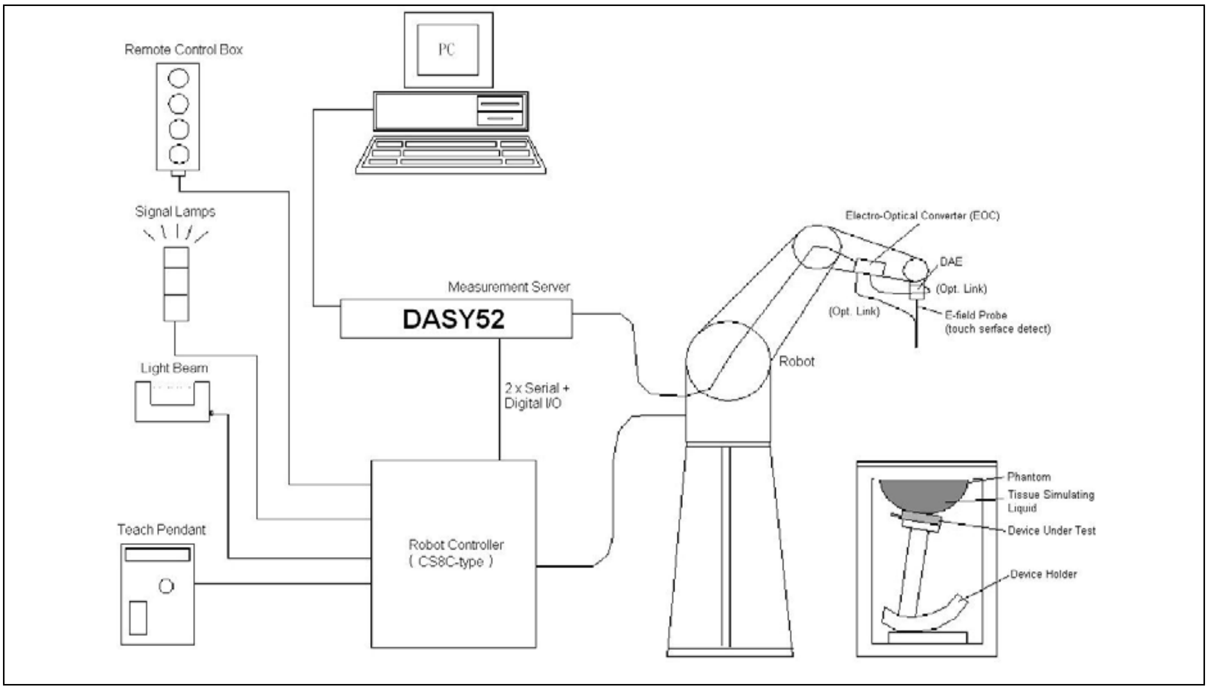
ρ = mass density of the tissue (kg/m3)

E = RMS electric field strength (V/m)

＊Note :

The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane〔2〕

4. SAR Measurement Setup



The DASY52 system for performing compliance tests consists of the following items:

1. A standard high precision 6-axis robot (Stäubli TX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. 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.
4. 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.
5. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
6. A computer operating Windows 2000 or Windows XP.
7. DASY52 software.
8. Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
9. The SAM twin phantom enabling testing left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. Validation dipole kits allowing validating the proper functioning of the system.

4.1 DASY E-Field Probe System

The SAR measurements were conducted with the dosimetric probe (manufactured by SPEAG), designed in the classical triangular configuration〔3〕and optimized for dosimetric evaluation. The probes is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multi-fiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped when reaching the maximum.

4.1.1 E-Field 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)
Dynamic Range	10 μW/g to 100 mW/g
	Linearity: ±0.2 dB (noise: typically <1 μW/g)
Directivity	±0.3 dB in brain tissue (rotation around probe axis)
	±0.5 dB in brain tissue (rotation normal probe axis)
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

Figure 3. E-field Probe

Figure 4. Probe setup on robot

4.1.2 E-Field Probe Calibration process

Dosimetric Assessment Procedure

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm^2) using an RF Signal generator, TEM cell, and RF Power Meter.

Free Space Assessment

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and in a waveguide or other methodologies 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 rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm^2.

Temperature Assessment

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated head tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where：

Δt = Exposure time (30 seconds),

C = Heat capacity of tissue (head or body),

ΔT = Temperature increase due to RF exposure.

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

Where：

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

4.2 Data Acquisition Electronic (DAE) System

Model：	DAE3, DAE4
Construction：	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range：	-100 to +300 mV (16 bit resolution and two range settings: 4 mV, 400 mV)
Input Offset Voltage：	< 5 μV (with auto zero)
Input Bias Current：	< 50 fA
Dimensions：	60 x 60 x 68 mm

4.3 Robot

Positioner：	Stäubli Unimation Corp. Robot Model: TX90XL
Repeatability：	±0.02 mm
No. of Axis：	6

4.4 Measurement Server

Processor：	PC/104 with a 400MHz intel ULV Celeron
I/O-board：	Link to DAE4 (or DAE3) 16-bit A/D converter for surface detection system Digital I/O interface Serial link to robot Direct emergency stop output for robot

4.5 Device Holder

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

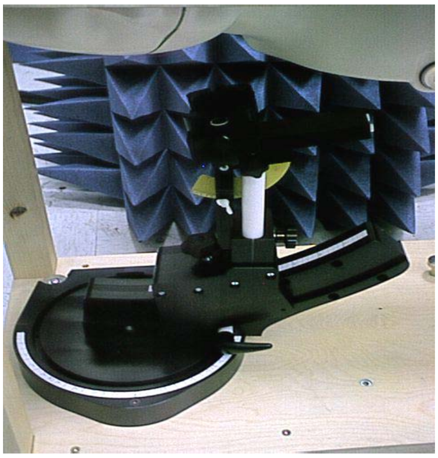


Figure 5. Device Holder

Figure 6. Device Holder for Laptops

4.6 Phantom - SAM v4.0

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.

Shell Thickness	2 ±0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	1000×500 mm (L×W)

Table 1. Specification of SAM v4.0

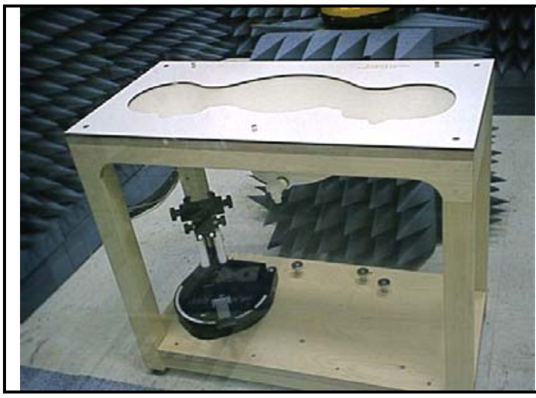


Figure 7. SAM Twin Phantom

4.7 Data Storage and Evaluation

4.7.1 Data Storage

The DASY software stores the assessed data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all the necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension DA4 or DA5. The post processing software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of erroneous parameter settings. For example, if a measurement has been performed with an incorrect crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be reevaluated.

4.7.2 Data Evaluation

The DASY post processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software：

Probe parameters：	- Sensitivity	*Normi, ai0, ai1, ai2*
	- Conversion factor	*ConvFi*
	- Diode compression point	*dcpi*
Device parameters：	- Frequency	*f*
	- Crest factor	*cf*
Media parameters：	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as：

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

With	*Vi*	= compensated signal of channel i (i = x, y, z)
	Ui	= input signal of channel i (i = x, y, z)
	cf	= crest factor of exciting field (DASY parameter)
	dcpi	= diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated：

E-field probes：

$$E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

H-field probes：

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

with *Vi* = compensated signal of channel i (i = x, y, z)

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

μV/(V/m)2 for E-field Probes

ConvF = sensitivity enhancement in solution

aij = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

Ei = electric field strength of channel i in V/*m*

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

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

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

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

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

with *SAR* = local specific absorption rate in mW/g

Etot = total field strength in V/m

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

ρ = equivalent tissue density in g/cm3

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

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

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

with *Ppwe* = equivalent power density of a plane wave in mW/cm2

Etot = total electric field strength in V/m

Htot = total magnetic field strength in A/m

5. *Tissue Simulating Liquids*

The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue.
The dielectric parameters of the liquids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an E5071B Network Analyzer.

IEEE SCC-34/SC-2 in 1528 recommended Tissue Dielectric Parameters

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in 1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in human head. Other head and body tissue parameters that have not been specified in 1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equation and extrapolated according to the head parameter specified in 1528.

Target Frequency	Head		Body	
(MHz)	εr	σ (S/m)	εr	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 - 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00
(εr = relative permittivity, σ = conductivity and ρ = 1000 kg/m3)				

Table 2. Tissue dielectric parameters for head and body phantoms

5.1 Ingredients

The following ingredients are used:

- Water: deionized water (pure H_2O), resistivity ≥ 16 M Ω -as basis for the liquid
- Sugar: refied white sugar (typically 99.7 % sucrose, available as crystal sugar in food shops) -to reduce relative permittivity
- Salt: pure NaCl -to increase conductivity
- Cellulose: Hydroxyethyl-cellulose, medium viscosity (75-125 mPa.s, 2 % in water, 20 °C), CAS # 54290 -to increase viscosity and to keep sugar in solution.
- Preservative: Preventol D-7 Bayer AG, D-51368 Leverkusen, CAS # 55965-84-9 -to prevent the spread of bacteria and molds
- DGBE: Diethylenglycol-monobuthyl ether (DGBE), Fluka Chemie GmbH, CAS # 112-34-5 -to reduce relative permittivity

5.2 Recipes

The following tables give the recipes for tissue simulating liquids to be used in different frequency bands.
Note: The goal dielectric parameters (at 22 ℃) must be achieved within a tolerance of ±5 % for εand ±5 % for σ.

Ingredients (% by weight)	Frequency (MHz)												Frequency (GHz)	
	750		835		1750		1900		2450		2600		5 GHz	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	39.28	51.30	41.45	52.40	54.50	40.20	54.90	40.40	62.70	73.20	60.30	71.40	65.5	78.6
Salt (NaCl)	1.47	1.42	1.45	1.50	0.17	0.49	0.18	0.50	0.50	0.10	0.60	0.20	0.00	0.00
Sugar	58.15	46.18	56.00	45.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HEC	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bactericide	0.10	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triton X-100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.2	10.7
DGBE	0.00	0.00	0.00	0.00	45.33	59.31	44.92	59.10	36.80	26.70	39.10	28.40	0.00	0.00
Dielectric Constant	41.88	54.60	42.54	56.10	40.10	53.60	39.90	54.00	39.80	52.50	39.80	52.50	35.1~ 36.2	47.9~ 49.3
Conductivity (S/m)	0.90	0.97	0.91	0.95	1.39	1.49	1.42	1.45	1.88	1.78	1.88	1.78	4.45~ 5.48	5.07~ 6.23
Diethylene Glycol Mono-hexlether	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.3	10.7

Salt: 99^{+} % Pure Sodium Chloride Sugar: 98^{+} % Pure Sucrose
Water: De-ionized, 16 $M\Omega^{+}$ resistivity HEC: Hydroxyethyl Cellulose
DGBE: 99^{+} % Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

5.3 Liquid Depth

According to KDB865664 ,the depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm with ≤ ± 0.5 cm variation for SAR measurements ≤ 3 GHz and ≥ 10.0 cm with ≤ ± 0.5 cm variation for measurements > 3 GHz.

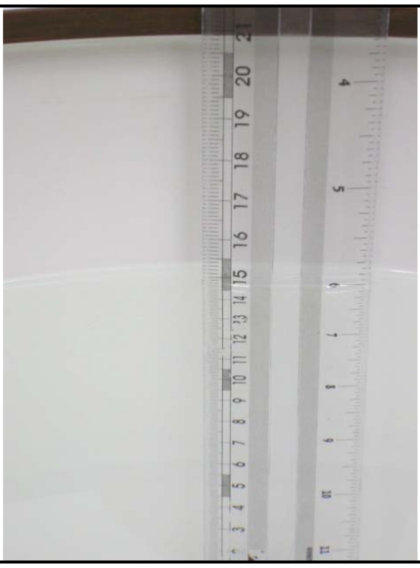


Figure 8. Body-Position

6. *SAR Testing with RF Transmitters*

6.1 SAR Testing with GSM/GPRS/EGPRS Transmitters

Configure the basestation to support GMSK and 8PSK call respectively, and set timeslot transmission for GMSK GSM/GPRS and 8PSK EDGE. Measure and record power outputs for both modulations, that test is applicable.

6.2 SAR Testing with 802.11 Transmitters

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.

- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is ≤ 1.2 W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.
- When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤ 1.2 W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

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.

6.3 Conducted Power

Band	Modulation	Data Rate	CH	Frequency (MHz)	Avg burst Conducted power (dBm)
GSM 850	GMSK	1Down1Up Duty factor 1/8	Lowest	824.2	31.46
			Middle	836.6	31.53
			Highest	848.8	31.69
GSM 1900	GMSK	1Down1Up Duty factor 1/8	Lowest	1850.2	28.72
			Middle	1880.0	29.09
			Highest	1909.8	29.10

Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)
IEEE 802.11b	1 M	1	2412.0	6.23
		6	2437.0	4.83
		11	2462.0	4.99
IEEE 802.11g	6 M	1	2412.0	6.85
		6	2437.0	5.40
		11	2462.0	5.69
IEEE 802.11n 2.4 GHz 20 MHz	13 M	1	2412.0	6.42
		6	2437.0	5.53
		11	2462.0	5.41
IEEE 802.11n 2.4 GHz 40 MHz	27 M	3	2422.0	6.79
		6	2437.0	6.02
		9	2452.0	5.97

6.4 Antenna location

Note：

We use a minimum distance of 5 mm to determine SAR test exclusion, so there was no need to provide antenna locations.

6.5 Stand-alone SAR Evaluate

Transmitter and antenna implementation as below:

Band	WWAN Ant	WLAN Ant
WWAN	V	---
WLAN	---	V

Stand-alone transmission configurations as below:

Band	Front	Back	Side 1	Side 2	Side 3	Side 4
GPRS 850	V	V	V	V	V	V
GPRS 1900	V	V	V	V	V	V
WLAN 2.4 GHz	---	---	---	---	---	---

Note: The "-" on behalf of Stand-alone SAR is not required (Refer to KDB447498 D01 v06 4.3.1 for the Standalone SAR test exclusion considerations)

Ant. Used	Band	Frequency	Tune-Power		Distance of Ant. To User (mm)					
		(GHz)	(dBm)	(mW)	Front	Back	Side1	Side2	Side3	Side4
WWAN Ant	GPRS 850	0.8488	32	1585	5	5	5	5	5	5
	GPRS 1900	1.9098	29.5	891	5	5	5	5	5	5
WLAN Ant	WLAN 2.4 GHz	2.462	7	5	5	5	5	5	5	5

Ant. Used	Band	Frequency (GHz)	Tune-Power (dBm)	Tune-Power (mW)	Calculated value and evaluated result: Front	Back	Side1	Side2	Side3	Side4	Exclusion threshold
WWAN Ant	GPRS 850	0.8488	32	1585	292.1 MEASURE	292.1 MEASURE	292.1 MEASURE	292.1 MEASURE	292.1 MEASURE	292.1 MEASURE	3
	GPRS 1900	1.9098	29.5	891	246.3 MEASURE	246.3 MEASURE	246.3 MEASURE	246.3 MEASURE	246.3 MEASURE	246.3 MEASURE	3
WLAN Ant	WLAN 2.4 GHz	2.462	7	5	1.6 EXEMPT	1.6 EXEMPT	1.6 EXEMPT	1.6 EXEMPT	1.6 EXEMPT	1.6 EXEMPT	3

Note:

1. The test reduction for distance less than 50 mm and more than 50mm. Use the max power to make sure minimum distance by evaluated for SAR testing.
2. For 100 MHz to 6 GHz and test separation distances > 50 mm, According to KDB 447498, if the calculated Power threshold is less than the output power then SAR testing is required.
3. For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following: According to KDB 447498, if the calculated threshold value are > 3 then Body SAR and > 7.5 then Limbs SAR testing are required.
4. When an antenna qualifies for the standalone SAR test exclusion of KDB 447498 section 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to KDB 447498 section "4.3.2. Simultaneous transmission SAR test exclusion considerations b)".
5. We used highest frequency and power, that result should be evaluated the worst case.
6. Power and distance are rounded to the nearest mW and mm before calculate.
7. The result is rounded to one decimal place for comparison.

6.6 Simultaneous Transmitting Evaluate

Simultaneous transmission configurations as below:

Condition	Side	Frequency Band: WWAN Ant	WLAN Ant
1	Front	---	---
2	Back	---	---
3	1	---	---
4	2	---	---
5	3	---	---
6	4	---	---

6.6.1 SAR to peak location separation ratio (SPLSR)

When the sum of SAR is larger than the limit, 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.

All of sum of SAR < 1.6 W/kg, therefore SPLSR is not required.

6.7 SAR test reduction according to KDB

General:

- The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used were according to FCC, Supplement C [June 2001], IEEE1528-2013.
- All modes of operation were investigated, and worst-case results are reported.
- Tissue parameters and temperatures are listed on the SAR plots.
- Batteries are fully charged for all readings.
- When the Channel's SAR 1 g of maximum conducted power is > 0.8 mW/g, low, middle and high channel are supposed to be tested.

KDB 447498:

- The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used were according to IEEE1528-2013.

KDB 865664:

- Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.
- When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
- 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.
- 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.

KDB 941225:

- In order to qualify for the above test reduction, the maximum burst-averaged output power for each mode (GMS/GPRS/EDGE) and the corresponding multi-slot class must be clearly identified in the SAR report for each frequency band.We perform worst case SAR with maximum time-average power on GMS/GPRS/EDGE mode.

KDB 248227:

- Refer 6.2 SAR Testing with 802.11 Transmitters.

7. System Verification and Validation

7.1 Symmetric Dipoles for System Verification

Construction	Symmetrical dipole with l/4 balun enables measurement of feed point impedance with NWA matched for use near flat phantoms filled with head simulating solutions Includes distance holder and tripod adaptor Calibration Calibrated SAR value for specified position and input power at the flat phantom in head simulating solutions.
Return Loss	> 20 dB at specified verification position
Options	Dipoles for other frequencies or solutions and other calibration conditions are available upon request

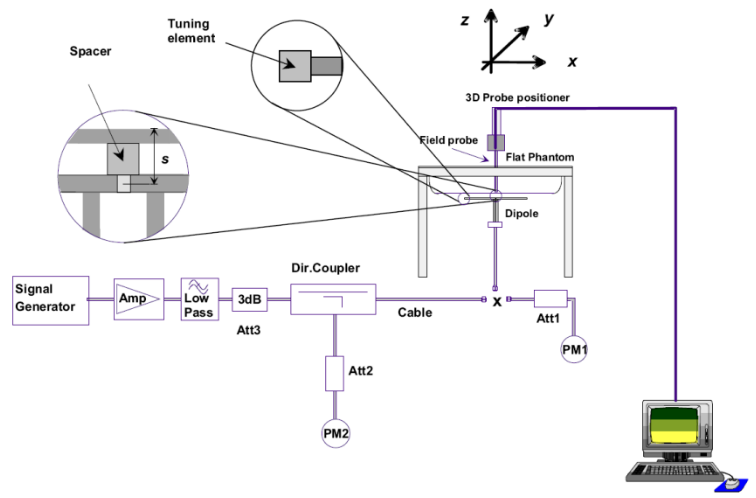


Figure 9. System Verification Setup Diagram

Figure 10. Validation Kit

7.2 Liquid Parameters

In order to comply with the target values of IEC 62209-2, we carry the same decimal place as the target value and provide it in the report. Because the gap between the values is very small, so it look same after the carry in some coefficients.

Liquid Verify								
Ambient Temperature： 22 ± 2 °C；Relative Humidity：40 -70 %								
Liquid Type	Frequency	Temp (°C)	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)	Measured Date
835 MHz (Body)	820 MHz	22	εr	55.26	56.40	1.99 %	+5 %	Nov. 21, 2018
			σ	0.969	0.988	2.06 %	+5 %	
	835 MHz	22	εr	55.20	56.31	1.99 %	+5 %	
			σ	0.970	1.001	3.09 %	+5 %	
	850 MHz	22	εr	55.15	56.27	1.99 %	+5 %	
			σ	0.988	1.015	3.03 %	+5 %	
1900 MHz (Body)	1850 MHz	22	εr	53.30	52.69	-1.13 %	+5 %	Nov. 21, 2018
			σ	1.520	1.504	-1.32 %	+5 %	
	1880 MHz	22	εr	53.30	52.66	-1.13 %	+5 %	
			σ	1.520	1.537	1.32 %	+5 %	
	1910 MHz	22	εr	53.30	52.59	-1.31 %	+5 %	
			σ	1.520	1.565	3.29 %	+5 %	

Table 3. Measured Tissue dielectric parameters for body phantoms

7.3 Verification Summary

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ± 10 %. The measured SAR will be normalized to 1 W input power. The verification was performed at 835 and 1900 MHz.

Mixture Type	Frequency (MHz)	Power	SAR_{1g} (W/Kg)	SAR_{10g} (W/Kg)	Drift (dB)	Difference percentage		Probe	Dipole	1 W Target		Date
						1 g	10 g	Model / Serial No.	Model / Serial No.	SAR_{1g} (W/Kg)	SAR_{10g} (W/Kg)	
Body	835	250 mW	2.45	1.67	0.05	1.4 %	2.8 %	EX3DV4 SN3847	D835V2 SN4d082	9.66	6.50	Nov. 21, 2018
		Normalize to 1 Watt	9.80	6.68								
Body	1900	250 mW	10.7	5.51	-0.05	5.9 %	1.1 %	EX3DV4 SN3847	D1900V2 SN5d111	40.40	21.80	Nov. 21, 2018
		Normalize to 1 Watt	42.80	22.04								

7.4 Validation Summary

Per FCC KDB 865664 D02 v01r02, SAR system validation status should be documented to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in IEEE 1528-2013 and FCC KDB 865664 D01v01r04. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters as below.

Probe Type Model / Serial No.	Prob Cal. Point (MHz)	Head / Body	Cond.	Perm.	CW Validation			Mod. Validation			Date
			εr	σ	Sensitivity	Probe Linearity	Probe Isotropy	Mod. Type	Duty Factor	PAR	
EX3DV4 SN3847	820	Body	56.40	0.988	Pass	Pass	Pass	GMSK	Pass	N/A	Nov. 21, 2018
EX3DV4 SN3847	835	Body	56.31	1.001	Pass	Pass	Pass	GMSK	Pass	N/A	
EX3DV4 SN3847	850	Body	56.27	1.015	Pass	Pass	Pass	GMSK	Pass	N/A	
EX3DV4 SN3847	1850	Body	52.69	1.504	Pass	Pass	Pass	GMSK	Pass	N/A	Nov. 21, 2018
EX3DV4 SN3847	1880	Body	52.66	1.537	Pass	Pass	Pass	GMSK	Pass	N/A	
EX3DV4 SN3847	1910	Body	52.59	1.565	Pass	Pass	Pass	GMSK	Pass	N/A	

8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Cal. Date	Cal.Period
SPEAG	835 MHz System Validation Kit	D835V2	4d082	09/06/2018	1 year
SPEAG	1900 MHz System Validation Kit	D1900V2	5d111	09/11/2018	1 year
SPEAG	Dosimetric E-Field Probe	EX3DV4	3847	04/26/2018	1 year
SPEAG	Data Acquisition Electronics	DAE4	541	03/22/2018	1 year
SPEAG	Measurement Server	SE UMS 011 AA	1025	NCR	
SPEAG	Device Holder	N/A	N/A	NCR	
SPEAG	Phantom	SAM V4.0	TP-1009	NCR	
SPEAG	Robot	Staubli TX90XL	F16/54FTA1/A/01	NCR	
SPEAG	Software	DASY52 V52.10 (0)	N/A	NCR	
SPEAG	Software	SEMCAD X V14.6.10(7417)	N/A	NCR	
R&S	Wireless Communication Test Set	CMU200	112387	03/08/2018	1 year
Agilent	ENA Series Network Analyzer	E5071B	MY42404655	04/17/2018	1 year
Agilent	Dielectric Probe Kit	85070C	US99360094	NCR	
HILA	Digital Thermometer	TM-906	GF-006	05/22/2018	1 year
Agilent	Power Sensor	8481H	3318A20779	06/12/2018	1 year
Agilent	Power Meter	EDM Series E4418B	GB40206143	06/12/2018	1 year
Agilent	Signal Generator	E8257D	MY44320425	03/08/2018	1 year
Agilent	Dual Directional Coupler	778D	50334	NCR	
Woken	Dual Directional Coupler	0100AZ20200801O	11012409517	NCR	
Mini-Circuits	Power Amplifier	EMC014225P	980292	NCR	
Mini-Circuits	Power Amplifier	EMC2830P	980293	NCR	
Aisi	Attenuator	IEAT 3dB	N/A	NCR	

Table 4. Test Equipment List

9. Measurement Uncertainty

Measurement uncertainties in SAR measurements are difficult to quantify due to several variables including biological, physiological, and environmental. However, we estimate the measurement uncertainties in $SAR_{1\,g}$ to be less than ±21.88 % for 300 MHz ~3 GHz and 3 GHz ~ 6 GHz ±25.37 % 〔8〕.

According to Std. C95.3〔9〕, the overall uncertainties are difficult to assess and will vary with the type of meter and usage situation. However, accuracy's of ±1 to 3 dB can be expected in practice, with greater uncertainties in near-field situations and at higher frequencies (shorter wavelengths), or areas where large reflecting objects are present. Under optimum measurement conditions, SAR measurement uncertainties of at least ±2 dB can be expected.

Uncertainty of a Measure SAR of EUT with DASY System

Item	Uncertainty Component	Uncertainty Value	Prob. Dist	Div.	c_i (1 g)	c_i (10 g)	Std. Unc. (1-g)	Std. Unc. (10-g)	v_i or V_{eff}
Measurement System									
u1	Probe Calibration (*k*=1)	±6.0 %	Normal	1	1	1	±6.0 %	±6.0 %	∞
u2	Axial Isotropy	±4.7 %	Rectangular	$\sqrt{3}$	0.7	0.7	±1.9 %	±1.9 %	∞
u3	Hemispherical Isotropy	±9.6 %	Rectangular	$\sqrt{3}$	0.7	0.7	±3.9 %	±3.9 %	
u4	Boundary Effect	±1.0 %	Rectangular	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
u5	Linearity	±4.7 %	Rectangular	$\sqrt{3}$	1	1	±2.7 %	±2.7 %	∞
u6	System Detection Limit	±1.0 %	Rectangular	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
u7	Readout Electronics	±0.3 %	Normal	1	1	1	±0.3 %	±0.3 %	∞
u8	Response Time	±0.8 %	Rectangular	$\sqrt{3}$	1	1	±0.5 %	±0.5 %	∞
u9	Integration Time	±1.9 %	Rectangular	$\sqrt{3}$	1	1	±1.1 %	±1.1 %	∞
u10	RF Ambient Conditions	±3.0 %	Rectangular	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
u11	RF Ambient Reflections	±3.0 %	Rectangular	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
u12	Probe Positioner Mechanical Tolerance	±0.4 %	Rectangular	$\sqrt{3}$	1	1	±0.2 %	±0.2 %	∞
u13	Probe Positioning with respect to Phantom Shell	±2.9 %	Rectangular	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
u14	Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	±1.0 %	Rectangular	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Test sample Related									
u15	Test sample Positioning	±2.9 %	Normal	1	1	1	±2.9 %	±2.9 %	89
u16	Device Holder Uncertainty	±3.6 %	Normal	1	1	1	±3.6 %	±3.6 %	5
u17	Output Power Variation - SAR drift measurement	±5.0 %	Rectangular	$\sqrt{3}$	1	1	±2.9 %	±2.9 %	∞
Phantom and Tissue Parameters									
u18	Phantom Uncertainty (shape and thickness tolerances)	±4.0 %	Rectangular	$\sqrt{3}$	1	1	±2.3 %	±2.3 %	∞
u19	Liquid Conductivity - deviation from target values	±5.0 %	Rectangular	$\sqrt{3}$	0.64	0.43	±1.8 %	±1.2 %	∞
u20	Liquid Conductivity - measurement uncertainty	±2.5 %	Normal	1	0.64	0.43	±1.6 %	±1.08 %	69
u21	Liquid Permittivity - deviation from target values	±5.0 %	Rectangular	$\sqrt{3}$	0.6	0.49	±1.7 %	±1.4 %	∞
u22	Liquid Permittivity - measurement uncertainty	±2.5 %	Normal	1	0.6	0.49	±1.5 %	±1.23 %	69
Combined standard uncertainty			RSS				±10.94 %	±10.71 %	380
Expanded uncertainty (95 % CONFIDENCE LEVEL)			*k*=2				±21.88 %	±21.41 %	

Table 5. Uncertainty Budget for frequency range 300 MHz to 3 GHz

Uncertainty of a Measure SAR of EUT with DASY System

Item	Uncertainty Component	Uncertainty Value	Prob. Dist	Div.	c_i (1 g)	c_i (10 g)	Std. Unc. (1-g)	Std. Unc. (10-g)	v_i or V_{eff}
Measurement System									
u1	Probe Calibration (k=1)	±6.5 %	Normal	1	1	1	±6.5 %	±6.5 %	∞
u2	Axial Isotropy	±4.7 %	Rectangular	$\sqrt{3}$	0.7	0.7	±1.9 %	±1.9 %	∞
u3	Hemispherical Isotropy	±9.6 %	Rectangular	$\sqrt{3}$	0.7	0.7	±3.9 %	±3.9 %	
u4	Boundary Effect	±2.0 %	Rectangular	$\sqrt{3}$	1	1	±1.2 %	±1.2 %	∞
u5	Linearity	±4.7 %	Rectangular	$\sqrt{3}$	1	1	±2.7 %	±2.7 %	∞
u6	System Detection Limit	±1.0 %	Rectangular	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
u7	Readout Electronics	±0.0 %	Normal	1	1	1	±0.0 %	±0.0 %	∞
u8	Response Time	±0.8 %	Rectangular	$\sqrt{3}$	1	1	±0.5 %	±0.5 %	∞
u9	Integration Time	±2.8 %	Rectangular	$\sqrt{3}$	1	1	±2.8 %	±2.8 %	∞
u10	RF Ambient Conditions	±3.0 %	Rectangular	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
u11	RF Ambient Reflections	±3.0 %	Rectangular	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
u12	Probe Positioner Mechanical Tolerance	±0.7 %	Rectangular	$\sqrt{3}$	1	1	±0.7 %	±0.7 %	∞
u13	Probe Positioning with respect to Phantom Shell	±9.9 %	Rectangular	$\sqrt{3}$	1	1	±5.7 %	±5.7 %	∞
u14	Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	±3.0 %	Rectangular	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
Test sample Related									
u15	Test sample Positioning	±2.9 %	Normal	1	1	1	±2.9 %	±2.9 %	89
u16	Device Holder Uncertainty	±3.6 %	Normal	1	1	1	±3.6 %	±3.6 %	5
u17	Output Power Variation - SAR drift measurement	±5.0 %	Rectangular	$\sqrt{3}$	1	1	±2.9 %	±2.9 %	∞
Phantom and Tissue Parameters									
u18	Phantom Uncertainty (shape and thickness tolerances)	±4.0 %	Rectangular	$\sqrt{3}$	1	1	±2.3 %	±2.3 %	∞
u19	Liquid Conductivity - deviation from target values	±5.0 %	Rectangular	$\sqrt{3}$	0.64	0.43	±1.8 %	±1.2 %	∞
u20	Liquid Conductivity - measurement uncertainty	±2.5 %	Normal	1	0.64	0.43	±1.6 %	±1.08 %	69
u21	Liquid Permittivity - deviation from target values	±5.0 %	Rectangular	$\sqrt{3}$	0.6	0.49	±1.7 %	±1.4 %	∞
u22	Liquid Permittivity - measurement uncertainty	±2.5 %	Normal	1	0.6	0.49	±1.5 %	±1.23 %	69
Combined standard uncertainty			RSS				±12.68 %	±12.48 %	700
Expanded uncertainty (95 % CONFIDENCE LEVEL)			k=2				±25.37 %	±24.97 %	

Table 6. Uncertainty Budget for frequency range 3 GHz to 6 GHz

10. Measurement Procedure

The measurement procedures are as follows:

1. For WLAN function, engineering testing software installed on Notebook can provide continuous transmitting signal.
2. Measure output power through RF cable and power meter
3. Set scan area, grid size and other setting on the DASY software
4. Find out the largest SAR result on these testing positions of each band
5. Measure SAR results for other channels in worst SAR testing position if the SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

1. Power reference measurement
2. Area scan
3. Zoom scan
4. Power drift measurement

10.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1 g and 10 g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1 g and 10 g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages

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

10.2 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures points and step size follow as below. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

Grid Type	Frequency		Step size (mm)			X*Y*Z (Point)	Cube size			Step size		
			X	Y	Z		X	Y	Z	X	Y	Z
uniform grid	≦ 3 GHz	≦2 GHz	≤ 8	≤ 8	≤ 5	5*5*7	32	32	30	8	8	5
		2 G - 3 G	≤ 5	≤ 5	≤ 5	7*7*7	30	30	30	5	5	5
	3 - 6 GHz	3 - 4 GHz	≤ 5	≤ 5	≤ 4	7*7*8	30	30	28	5	5	4
		4 - 5 GHz	≤ 4	≤ 4	≤ 3	8*8*10	28	28	27	4	4	3
		5 - 6 GHz	≤ 4	≤ 4	≤ 2	8*8*12	28	28	22	4	4	2

(Our measure settings are refer KDB Publication 865664 D01v01r04)

10.3 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 1 g aggregate SAR, the DUT 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.

10.4 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation. Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

10.5 Power Drift Monitoring

All SAR testing is under the DUT 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 DUT 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 drift more than 5 %, the SAR will be retested.

11. SAR Test Results Summary

1. This sample only supports 1slot.
2. When the WWAN band channel's reported SAR1g of the position is > 0.8 W/kg, low, middle and high channel are supposed to be tested.
3. Require the middle channel to be tested first, if the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.
4. The device is designed for WWAN and WLAN and cannot be transmitted simultaneously, hence combined SAR is not required.
5. Also mention the reason for N/A of WLAN, as per KDB 447498 D01 v06 4.3.1, as a separate note.

11.1 Head SAR Measurement

Evaluated head SAR is not available.

11.2 Body SAR Measurement

Index.	Band	Frequency		Test Mode	Test Position	Spacing (mm)	EUT & Accessory	SAR_{1g} (W/kg)	Burst Avg Power	Max tune-up	Tune-up Scaling Factor	Duty Cycle Scaling Factor	Reported SAR_{1g} (W/kg)
		Ch.	MHz										
#7	GSM 850	128	824.2	GPRS (1 Tx slot)	Front	5	---	0.782	31.46	32	1.132	1.000	**0.89**
#1	GSM 850	190	836.6	GPRS (1 Tx slot)	Front	5	---	0.737	31.53	32	1.114	1.000	0.82
#8	GSM 850	251	848.8	GPRS (1 Tx slot)	Front	5	---	0.725	31.69	32	1.074	1.000	0.78
#2	GSM 850	190	836.6	GPRS (1 Tx slot)	Back	5	---	0.479	31.53	32	1.114	1.000	0.53
#3	GSM 850	190	836.6	GPRS (1 Tx slot)	Side 1	5	---	0.0044	31.53	32	1.114	1.000	0.01
#4	GSM 850	190	836.6	GPRS (1 Tx slot)	Side 2	5	---	0.074	31.53	32	1.114	1.000	0.08
#5	GSM 850	190	836.6	GPRS (1 Tx slot)	Side 3	5	---	0.289	31.53	32	1.114	1.000	0.32
#6	GSM 850	190	836.6	GPRS (1 Tx slot)	Side 4	5	---	0.084	31.53	32	1.114	1.000	0.09
#9	GSM 1900	661	1880.0	GPRS (1 Tx slot)	Front	5	---	0.541	29.09	29.5	1.099	1.000	**0.60**
#10	GSM 1900	661	1880.0	GPRS (1 Tx slot)	Back	5	---	0.299	29.09	29.5	1.099	1.000	0.33
#11	GSM 1900	661	1880.0	GPRS (1 Tx slot)	Side 1	5	---	0.00769	29.09	29.5	1.099	1.000	0.01
#12	GSM 1900	661	1880.0	GPRS (1 Tx slot)	Side 2	5	---	0.083	29.09	29.5	1.099	1.000	0.09
#13	GSM 1900	661	1880.0	GPRS (1 Tx slot)	Side 3	5	---	0.091	29.09	29.5	1.099	1.000	0.10
#14	GSM 1900	661	1880.0	GPRS (1 Tx slot)	Side 4	5	---	0.338	29.09	29.5	1.099	1.000	0.37

11.3 Hot-spot mode SAR Measurement

Hot-spot mode SAR is not available.

11.4 Extremity SAR Measurement

Evaluated extremity SAR is not available.

11.5 SAR Variability Measurement

SAR Measurement Variability is not available.

11.6 Std. C95.1-1992 RF Exposure Limit

Human Exposure	Population Uncontrolled Exposure (W/kg) or (mW/g)	Occupational Controlled Exposure (W/kg) or (mW/g)
Spatial Peak SAR* (head)	1.60	8.00
Spatial Peak SAR** (Whole Body)	0.08	0.40
Spatial Peak SAR*** (Partial-Body)	1.60	8.00
Spatial Peak SAR**** (Hands / Feet / Ankle / Wrist)	4.00	20.00

Table 7. Safety Limits for Partial Body Exposure

Notes：

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

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

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

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

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

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

12. References

[1] Std. C95.1-1999, "*American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300KHz to 100GHz",* New York.

[2] NCRP, National Council on Radiation Protection and Measurements, "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields", NCRP report NO. 86, 1986.

[3] T. Schmid, O. Egger, and N. Kuster, "Automatic E-field scanning system for dosimetric assessments", IEEE Transactions on Microwave Theory and Techniques, vol. 44, pp, 105-113, Jan. 1996.

[4] K. Poković, T. Schmid, and N. Kuster, "Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequency", in ICECOM'97, Dubrovnik, October 15-17, 1997, pp.120-124.

[5] K. Poković, T. Schmid, and N. Kuster, "E-field probe with improved isotropy in brain simulating liquids", in Proceedings of the ELMAR, Zadar, Croatia, 23-25 June, 1996, pp.172-175.

[6] N. Kuster, and Q. Balzano, "Energy absorption mechanism by biological bodies in the near field of dipole antennas above 300MHz", IEEE Transaction on Vehicular Technology, vol. 41, no. 1, Feb. 1992, pp. 17-23.

[7] Robert J. Renka, "Multivariate Interpolation Of Large Sets Of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988 , pp. 139-148.

[8] N. Kuster, R. Kastle, T. Schmid, Dosimetric evaluation of mobile communications equipment with known precision, IEEE Transaction on Communications, vol. E80-B, no. 5, May 1997, pp. 645-652.

[9] Std. C95.3-1991, "IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave, New York: IEEE, Aug. 1992.

[10] CENELEC CLC/SC111B, European Prestandard (prENV 50166-2), Human Exposure to Electromagnetic Fields High-frequency: 10KHz-300GHz, Jan. 1995.

[11] IEEE Std 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

Appendix A - System Performance Check

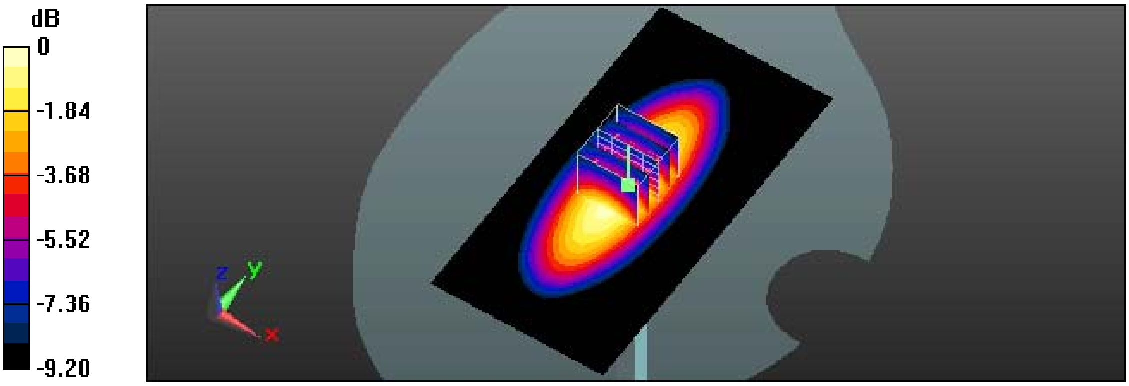
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/21 PM 05:55:08
System Performance Check at 835MHz_20181121_Body
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 1.001 S/m; ε_r = 56.307; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.48, 9.48, 9.48); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

System Performance Check at 835MHz/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.15 W/kg

System Performance Check at 835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 57.48 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 3.53 W/kg
SAR(1 g) = 2.45 W/kg; SAR(10 g) = 1.67 W/kg
Maximum value of SAR (measured) = 3.17 W/kg



0 dB = 3.17 W/kg = 5.01 dBW/kg

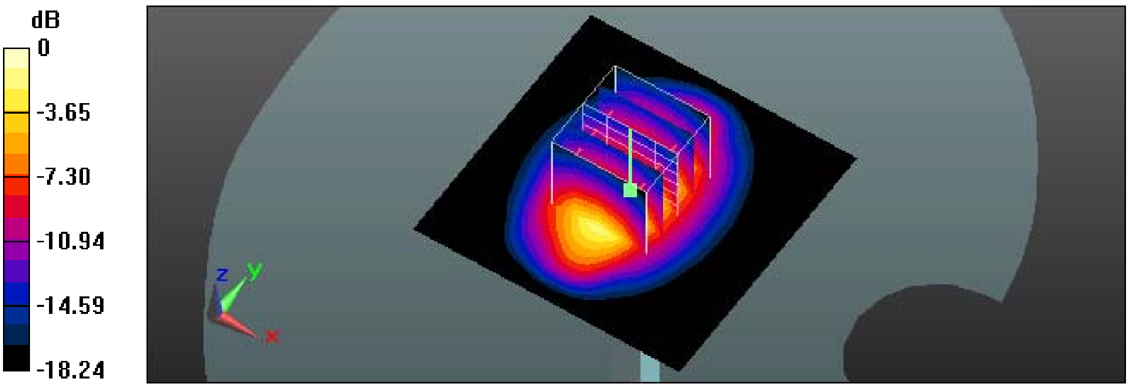
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/21 PM 10:27:13
System Performance Check at 1900MHz_20181121_Body
DUT: Dipole D1900V2; Type: D1900V2; Serial: D1900V2 - SN:5d111

Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.556 S/m; ε_r = 52.626; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.7, 7.7, 7.7); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

System Performance Check at 1900MHz/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 16.6 W/kg

System Performance Check at 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 106.1 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 19.8 W/kg
SAR(1 g) = 10.7 W/kg; SAR(10 g) = 5.51 W/kg
Maximum value of SAR (measured) = 16.7 W/kg



0 dB = 16.7 W/kg = 12.23 dBW/kg

Appendix B - SAR Measurement Data

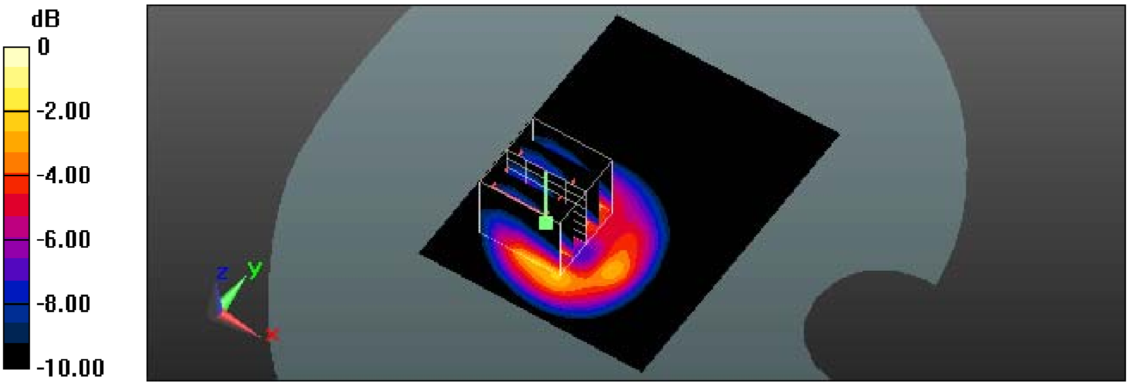
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/21 PM 07:22:03
7_GSM850 CH 128_GPRS (1 Tx slot)_Front_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS 850 (1Down, 1Up) (0); Frequency: 824.2 MHz;Duty Cycle: 1:8.00018
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.992 S/m; ε_r = 56.366; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.48, 9.48, 9.48); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.18 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.03 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 0.782 W/kg; SAR(10 g) = 0.425 W/kg
Maximum value of SAR (measured) = 1.17 W/kg



0 dB = 1.17 W/kg = 0.68 dBW/kg

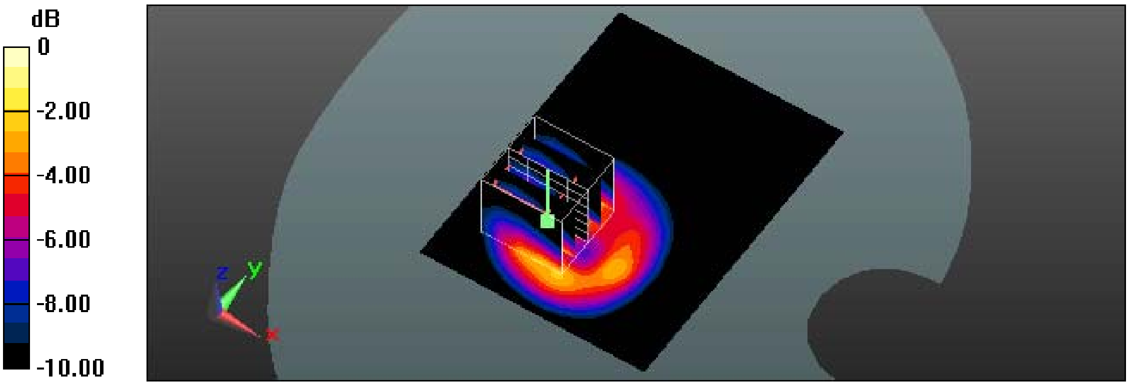
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/21 PM 07:02:36
1_GSM850 CH 190_GPRS (1 Tx slot)_Front_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS 850 (1Down, 1Up) (0); Frequency: 836.6 MHz;Duty Cycle: 1:8.00018
Medium parameters used: f = 837 MHz; σ = 1.003 S/m; ε_r = 56.304; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.48, 9.48, 9.48); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.09 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.28 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.737 W/kg; SAR(10 g) = 0.401 W/kg
Maximum value of SAR (measured) = 1.10 W/kg



0 dB = 1.10 W/kg = 0.41 dBW/kg

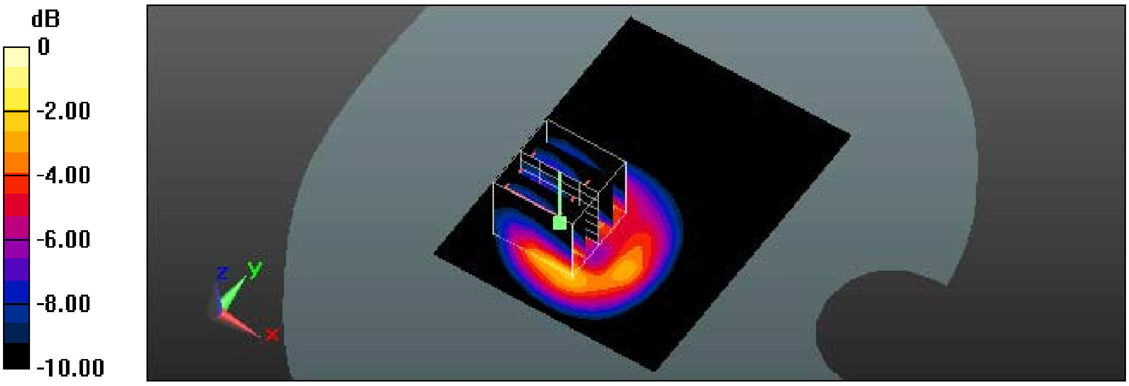
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/21 PM 07:39:27
8_GSM850 CH 251_GPRS (1 Tx slot)_Front_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS 850 (1Down, 1Up) (0); Frequency: 848.8 MHz;Duty Cycle: 1:8.00018
Medium parameters used: f = 849 MHz; σ = 1.014 S/m; ε_r = 56.273; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.48, 9.48, 9.48); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.08 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.828 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.725 W/kg; SAR(10 g) = 0.393 W/kg
Maximum value of SAR (measured) = 1.06 W/kg



0 dB = 1.06 W/kg = 0.25 dBW/kg

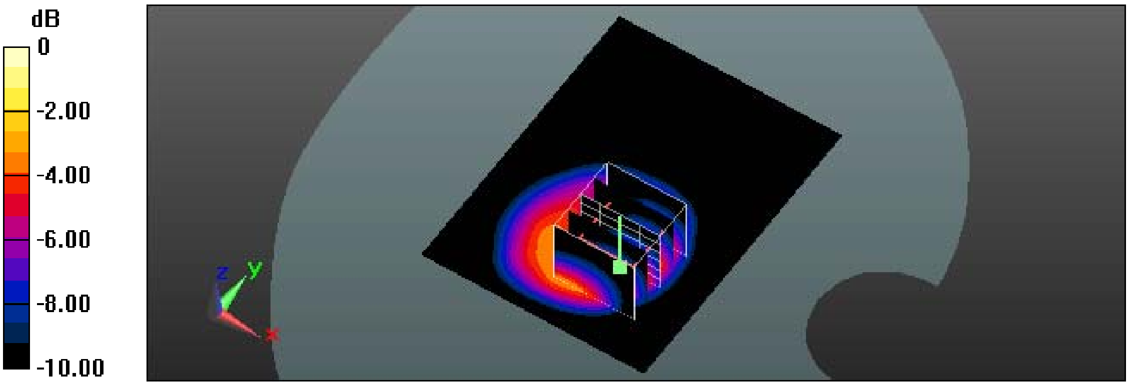
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/21 PM 08:09:48
2_GSM850 CH 190_GPRS (1 Tx slot)_Back_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS 850 (1Down, 1Up) (0); Frequency: 836.6 MHz;Duty Cycle: 1:8.00018
Medium parameters used: f = 837 MHz; σ = 1.003 S/m; ε_r = 56.304; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.48, 9.48, 9.48); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.714 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.99 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.910 W/kg
SAR(1 g) = 0.479 W/kg; SAR(10 g) = 0.255 W/kg
Maximum value of SAR (measured) = 0.758 W/kg



0 dB = 0.758 W/kg = -1.20 dBW/kg

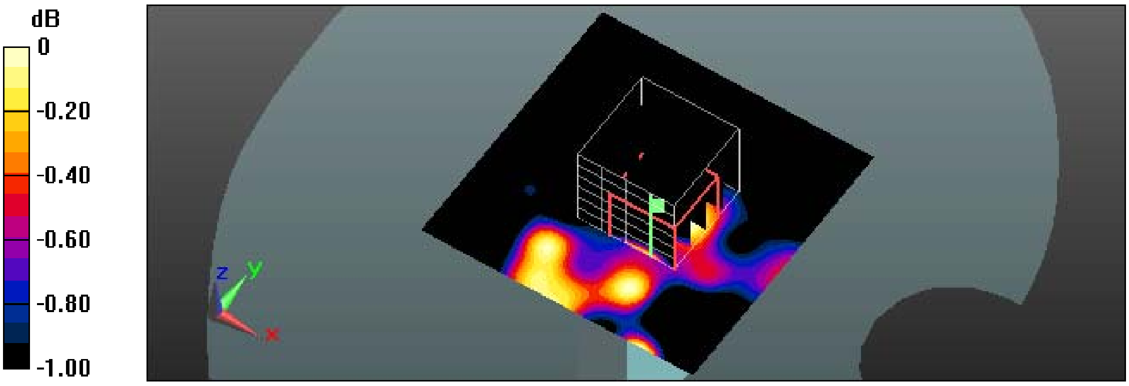
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/21 PM 08:30:47
3_GSM850 CH 190_GPRS (1 Tx slot)_Side 1_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS 850 (1Down, 1Up) (0); Frequency: 836.6 MHz;Duty Cycle: 1:8.00018
Medium parameters used: f = 837 MHz; σ = 1.003 S/m; ε_r = 56.304; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.48, 9.48, 9.48); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.00537 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.293 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.00638 W/kg
SAR(1 g) = 0.0044 W/kg; SAR(10 g) = 0.00339 W/kg
Maximum value of SAR (measured) = 0.00519 W/kg



0 dB = 0.00519 W/kg = -22.85 dBW/kg

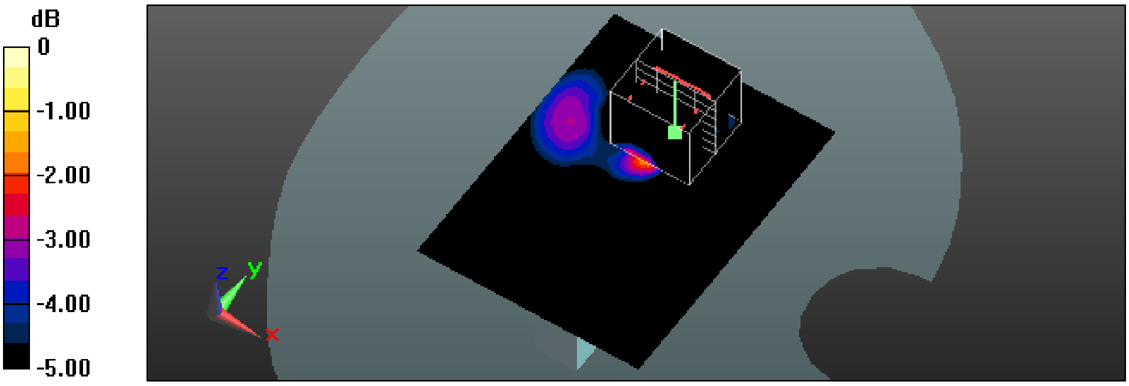
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/21 PM 09:06:19
4_GSM850 CH 190_GPRS (1 Tx slot)_Side 2_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS 850 (1Down, 1Up) (0); Frequency: 836.6 MHz;Duty Cycle: 1:8.00018
Medium parameters used: f = 837 MHz; σ = 1.003 S/m; ε_r = 56.304; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.48, 9.48, 9.48); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.120 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.926 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.156 W/kg
SAR(1 g) = 0.074 W/kg; SAR(10 g) = 0.036 W/kg
Maximum value of SAR (measured) = 0.116 W/kg



0 dB = 0.116 W/kg = -9.36 dBW/kg

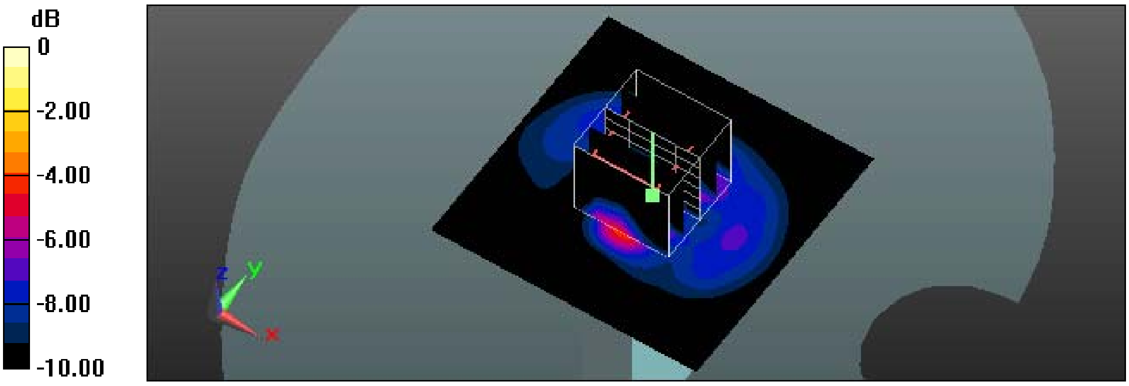
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/21 PM 08:49:21
5_GSM850 CH 190_GPRS (1 Tx slot)_Side 3_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS 850 (1Down, 1Up) (0); Frequency: 836.6 MHz;Duty Cycle: 1:8.00018
Medium parameters used: f = 837 MHz; σ = 1.003 S/m; ε_r = 56.304; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.48, 9.48, 9.48); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.479 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.92 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.759 W/kg
SAR(1 g) = 0.289 W/kg; SAR(10 g) = 0.124 W/kg
Maximum value of SAR (measured) = 0.475 W/kg



0 dB = 0.475 W/kg = -3.23 dBW/kg

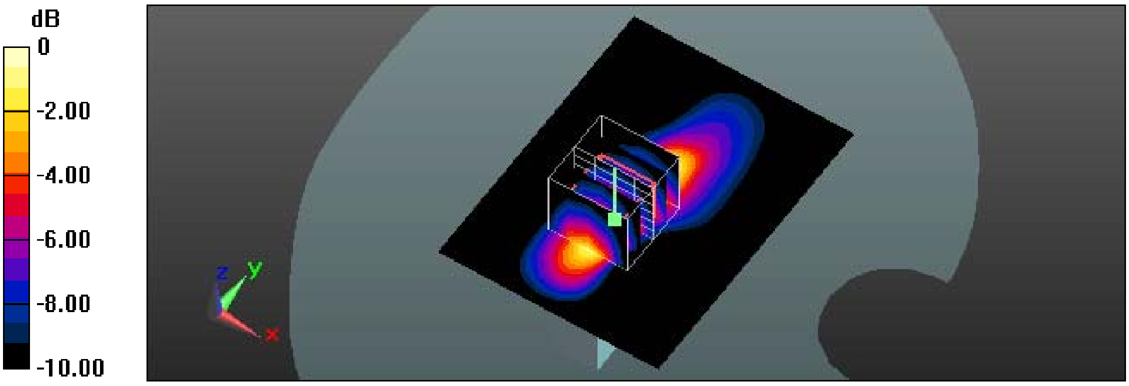
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/21 PM 09:24:00
6_GSM850 CH 190_GPRS (1 Tx slot)_Side 4_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS 850 (1Down, 1Up) (0); Frequency: 836.6 MHz;Duty Cycle: 1:8.00018
Medium parameters used: f = 837 MHz; σ = 1.003 S/m; ε_r = 56.304; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(9.48, 9.48, 9.48); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.116 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.712 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 0.149 W/kg
SAR(1 g) = 0.084 W/kg; SAR(10 g) = 0.046 W/kg
Maximum value of SAR (measured) = 0.120 W/kg



0 dB = 0.120 W/kg = -9.21 dBW/kg

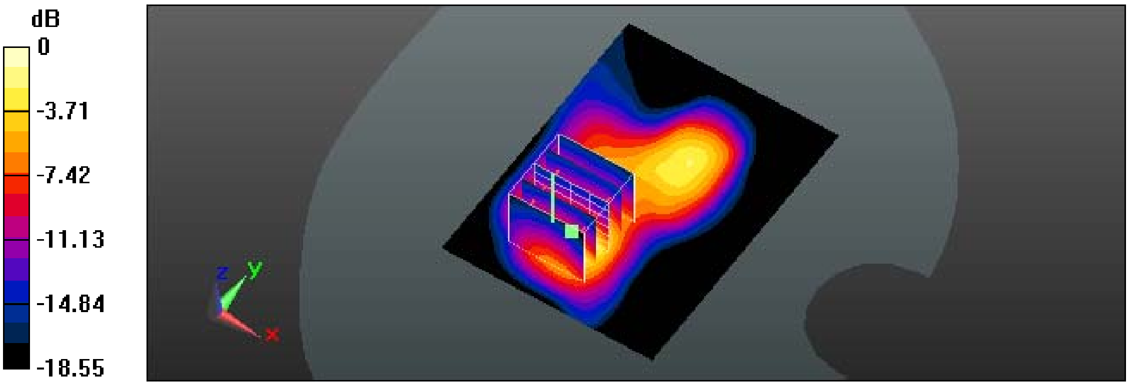
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/22 AM 09:40:40
9_GSM1900 CH 661_GPRS (1 Tx slot)_Front_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS PCS (1Down,1Up) (0); Frequency: 1880 MHz;Duty Cycle: 1:8.00018
Medium parameters used: f = 1880 MHz; σ = 1.537 S/m; ε_r = 52.658; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.7, 7.7, 7.7); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.956 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.00 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.541 W/kg; SAR(10 g) = 0.267 W/kg
Maximum value of SAR (measured) = 0.851 W/kg



0 dB = 0.851 W/kg = -0.70 dBW/kg

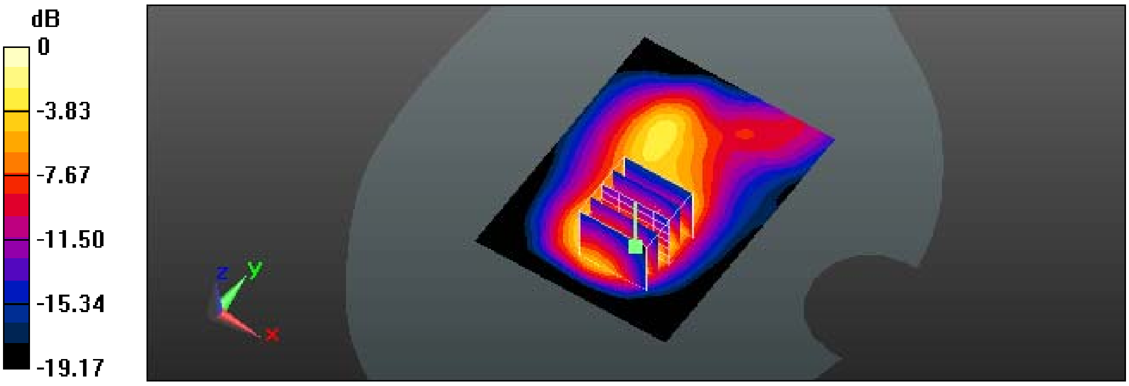
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/22 AM 10:07:20
10_GSM1900 CH 661_GPRS (1 Tx slot)_Back_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS PCS (1Down,1Up) (0); Frequency: 1880 MHz;Duty Cycle: 1:8.00018
Medium parameters used: f = 1880 MHz; σ = 1.537 S/m; ε_r = 52.658; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.7, 7.7, 7.7); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.573 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.97 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.587 W/kg
SAR(1 g) = 0.299 W/kg; SAR(10 g) = 0.153 W/kg
Maximum value of SAR (measured) = 0.440 W/kg



0 dB = 0.440 W/kg = -3.57 dBW/kg

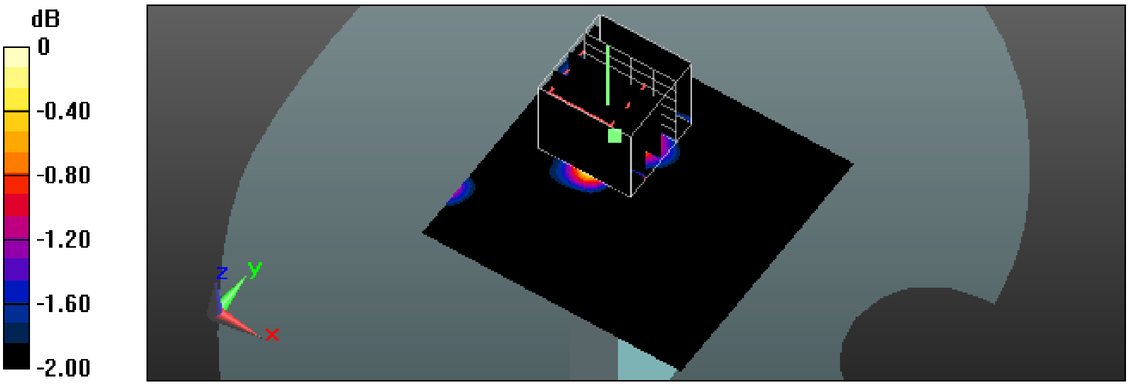
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/22 AM 01:21:57
11_GSM1900 CH 661_GPRS (1 Tx slot)_Side 1_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS PCS (1Down,1Up) (0); Frequency: 1880 MHz;Duty Cycle: 1:8.00018
Medium parameters used: f = 1880 MHz; σ = 1.537 S/m; ε_r = 52.658; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.7, 7.7, 7.7); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0131 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.567 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.0140 W/kg
SAR(1 g) = 0.00769 W/kg; SAR(10 g) = 0.0048 W/kg
Maximum value of SAR (measured) = 0.0121 W/kg



0 dB = 0.0121 W/kg = -19.17 dBW/kg

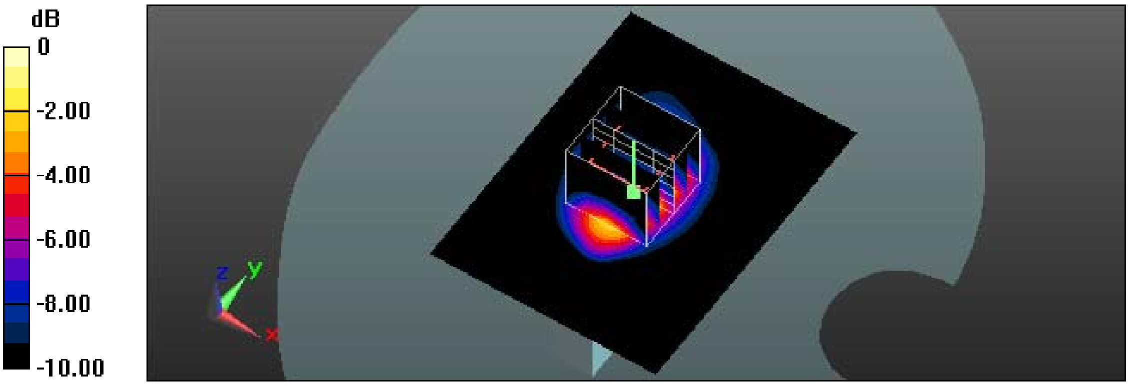
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/21 PM 11:12:06
12_GSM1900 CH 661_GPRS (1 Tx slot)_Side 2_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS PCS (1Down,1Up) (0); Frequency: 1880 MHz;Duty Cycle: 1:8.00018
Medium parameters used: f = 1880 MHz; σ = 1.537 S/m; ε_r = 52.658; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.7, 7.7, 7.7); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.125 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.218 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.154 W/kg
SAR(1 g) = 0.083 W/kg; SAR(10 g) = 0.044 W/kg
Maximum value of SAR (measured) = 0.128 W/kg



0 dB = 0.128 W/kg = -8.93 dBW/kg

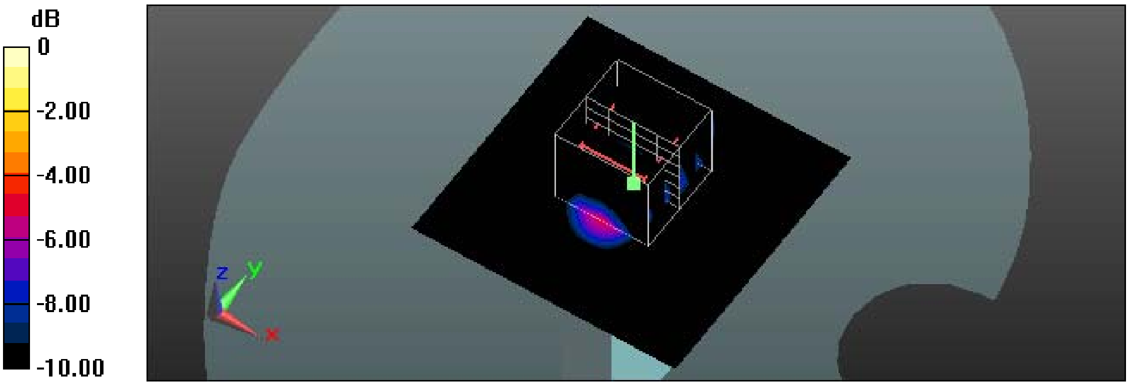
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/22 AM 01:36:56
13_GSM1900 CH 661_GPRS (1 Tx slot)_Side 3_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS PCS (1Down,1Up) (0); Frequency: 1880 MHz;Duty Cycle: 1:8.00018
Medium parameters used: f = 1880 MHz; σ = 1.537 S/m; ε_r = 52.658; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.7, 7.7, 7.7); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.136 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.582 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.192 W/kg
SAR(1 g) = 0.091 W/kg; SAR(10 g) = 0.041 W/kg
Maximum value of SAR (measured) = 0.152 W/kg



0 dB = 0.152 W/kg = -8.18 dBW/kg

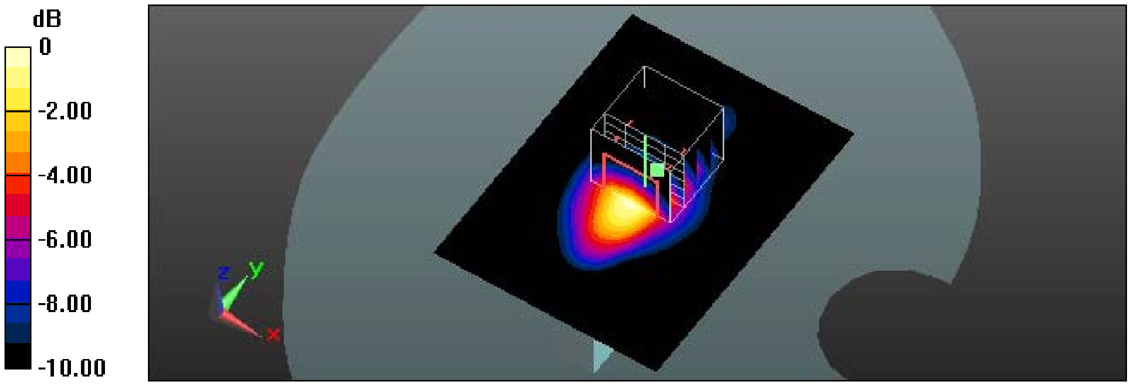
Test Laboratory: A Test Lab Techno Corp.
Date/Time: 2018/11/21 PM 10:49:34
14_GSM1900 CH 661_GPRS (1 Tx slot)_Side 4_5mm
DUT: Yepzon One 2.0; Type: GPS Tracker

Communication System: UID 0, GPRS PCS (1Down,1Up) (0); Frequency: 1880 MHz;Duty Cycle: 1:8.00018
Medium parameters used: f = 1880 MHz; σ = 1.537 S/m; ε_r = 52.658; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)
DASY5.2 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3847; ConvF(7.7, 7.7, 7.7); Calibrated: 2018/4/26;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn541; Calibrated: 2018/3/22
- Phantom: SAM (20deg probe tilt) with CRP v4.0; Type: QD000P40CD; Serial: TP:1009
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.567 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.73 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.632 W/kg
SAR(1 g) = 0.338 W/kg; SAR(10 g) = 0.177 W/kg
Maximum value of SAR (measured) = 0.526 W/kg



0 dB = 0.526 W/kg = -2.79 dBW/kg