FCC SAR TEST REPORT

Test File No : F690501-RF-SAR000129

Equipment Under Test	Car Telematics Modem
Model Name	TM04ANNABM1
Applicant	LG Electronics Inc.
Address of Applicant	10, Magokjungang 10-ro, Gangseo-gu, Seoul, Korea
FCC ID	BEJTM04ANNABM1
Exposure Category	General Population/Uncontrolled Exposure
Standards	FCC 47 CFR Part 2 (2.1093) IEEE 1528, 2013
Receipt No.	GPRI2101000002SR
Date of Receipt	2021-01-04
Date of Test(s)	2021-02-02 ~2021-02-09
Date of Issue	2021-02-22
Test Result	Refer to the Page 5

In the configuration tested, the EUT complied with the standards specified above.

This test report does not assure KOLAS accreditation.

Remarks:

1) The results of this test report are effective only to the items tested.
2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.

Report prepared by /
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Test Engineer

Approved by /
Matthew Park
Technical Manager

Revision history

Revision	Date of issue	Revisions	Revised By
-	February 22 2021	Initial issue	-

Contents

1 Testing Laboratory

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2 Details of Manufacturer

Applicant	LG Electronics Inc.
Address	10, Magokjungang 10-ro, Gangseo-gu, Seoul, Korea
Email	seungho.hur@lge.com
Phone No.	+82 +10-2468-2972

3 Description of EUT(s)

EUT Type	Car Telematics Modem
Model Name	TM04ANNABM1
Serial Number	2003091014011
Mode of Operation	GSM850 / GSM1900 / WCDMA II / WCDMA IV / WCDMA V / LTE Band 2 / LTE Band 5 / LTE Band 7 / LTE Band 12 / LTE Band 66
Tx Frequency Range	GSM850 : 824.2 ~ 848.8 MHz GSM1900 : 1850.2 ~ 1909.8 MHz WCDMA V : 826.4 ~ 846.6 MHz WCDMA IV : 1712.4 ~ 1752.6 MHz WCDMA II : 1852.4 ~ 1907.6 MHz LTE Band 12 : 699.7 ~ 715.3 MHz LTE Band 5 (Cell) : 824.7 ~ 848.3 MHz LTE Band 66 (AWS) : 1710.7 ~ 1779.3 MHz LTE Band 2 (PCS) : 1850.7 ~ 1909.3 MHz LTE Band 7 : 2502.5 ~ 2567.5 MHz

4 The Highest Reported SAR Values

Equipment Class	Band	Highest Reported SAR 1g (W/kg)
PCE	GSM850	0.54
PCE	GSM1900	0.37
PCE	WCDMA V	0.31
PCE	WCDMA IV	0.38
PCE	WCDMA II	0.51
PCE	LTE Band 12	0.09
PCE	LTE Band 5 (Cell)	0.13
PCE	LTE Band 66 (AWS)	0.22
PCE	LTE Band 2 (PCS)	0.53
PCE	LTE Band 7	0.15

5 Test Methodology

ANSI/IEEE C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. It specifies the maximum exposure limit of 1.6 W/kg as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

Test tests documented in this report were performed in accordance with IEEE Standard 1528-2013 and the following published KDB procedures.

In additions;

☒	**KDB 865664 D01v01r04**	**SAR Measurement Requirements for 100 MHz to 6 GHz**
☒	**KDB 865664 D02v01r02**	**RF Exposure Compliance Reporting and Documentation Considerations**
☒	**KDB 447498 D01v06**	**Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies**
☐	KDB 447498 D02v02r01	SAR Measurement Procedures for USB Dongle Transmitters
☐	KDB 248227 D01v02r02	SAR Guidance For IEEE 802.11 (Wi-Fi) Transmitters
☐	KDB 615223 D01v01r01	802.16e/WiMax SAR Measurement Guidance
☐	KDB 616217 D04v01r02	SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers
☐	KDB 643646 D01v01r03	SAR Test Reduction Considerations for Occupational PTT Radios
☐	KDB 648474 D03v01r04	Evaluation and Approval Considerations for Handsets with Specific Wireless Charging Battery Covers
☐	KDB 648474 D04v01r03	SAR Evaluation Considerations for Wireless Handsets
☐	KDB 680106 D01v03r01	RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications
☒	**KDB 941225 D01v03r01**	**3G SAR Measurement Procedures**
☒	**KDB 941225 D05v02r05**	**SAR Evaluation Considerations for LTE Devices**
☐	KDB 941225 D06v02r01	SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities
☐	KDB 941225 D07v01r02	SAR Evaluation Procedures for UMPC Mini-Tablet Devices

6 Testing Environment

Ambient temperature	: 18°C ~ 25°C
Relative humidity	: 30% ~ 70%
Liquid temperature of during the test	: <± 2°C
Ambient noise & Reflection	: < 0.012 W/kg

7 Specific Absorption Rate (SAR)

7.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled

7.2 SAR Definition

The SAR definition is 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). The equation description is as below:

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

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

SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = C\left(\frac{\delta T}{\delta t}\right)$$

Where: C is the specific head capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

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

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

7.3 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate ("SAR") in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 ㎑ to 300 ㎓," ANSI/IEEE C95.3–2003, Copyright 2003 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting

source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 ㎑ to 6 ㎓. Portable devices that transmit at frequencies above 6 ㎓ are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter. Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 ㎓ should be made at a minimum distance of 5 cm from the radiating source.

(1) Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over an 10 grams of tissue (defined as a tissue volume in the shape of a cube). Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

(2) Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure. Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Partial Peak SAR (Partial)	1.60 m W/g	8.00 m W/g
Partial Average SAR (Whole Body)	0.08 m W/g	0.40 m W/g
Partial Peak SAR (Hands/Feet/Ankle/Wrist)	4.00 m W/g	20.00 m W/g

1. The spatial Peak value of the SAR averaged over any 1g gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
2. The spatial Average value of the SAR averaged over the whole body.
3. 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.

8 The SAR Measurement System

A block diagram of the SAR measurement System is given in Fig. 1. This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY system). The model EX3DV4 field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ ($|Ei|^2$)/ ρ where σ and ρ are the conductivity and mass density of the tissue-simulant.

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

- A standard high precision 6-axis robot (Staubli TX family) with controller, teach pendant and software. An arm extension is for accommodating the data acquisition electronics (DAE).
- A dosimeter 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.
- 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.

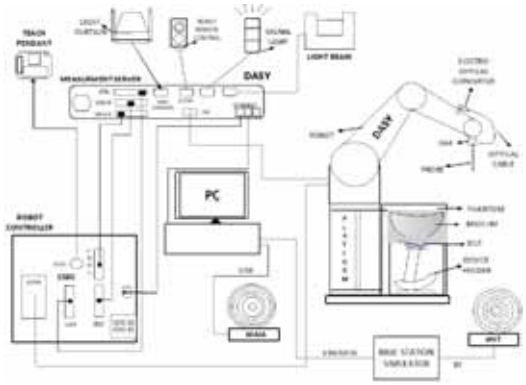


Fig a. The microwave circuit arrangement used for SAR system verification

- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows.
- DASY software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Verification dipole kits allowing to validate the proper functioning of the system.

9 System Components

9.1 Probe

Construction	:	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	:	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 835 and HSL1900. Additional CF-Calibration for other liquids and frequencies upon request.
Frequency	:	10 ㎒ to 6 ㎓; Linearity: ± 0.2 ㏈ (30 ㎒ to 6 ㎓)
Directivity	:	± 0.3 ㏈ in HSL (rotation around probe axis) ± 0.5 ㏈ in tissue material (rotation normal to probe axis)
Dynamic Range	:	10μW/g to > 100 m W/g; Linearity: ± 0.2 ㏈(noise: typically < 1 μW/g)
Dimensions	:	Overall length: 337 ㎜ (Tip length: 20 ㎜) Tip diameter: 2.5 ㎜ (Body diameter: 12 ㎜) Distance from probe tip to dipole centers: 1 ㎜
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 ㎓ with precision of better 30%


EX3DV4 E-Field Probe

NOTE:

1. The Probe parameters have been calibrated by the SPEAG. Please reference “APPENDIX C” for the Calibration Certification Report.

9.2 SAM Phantom

Construction	:	The SAM Phantom is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90 % of all users. 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 the 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 in the robot ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4, but has reinforced top structure
Shell Thickness	:	2.0 ㎜ ± 0.1 ㎜
Filling Volume	:	Approx. 25 liters


SAM Phantom

9.3 Device Holder

Construction: : In combination with the Twin SAM PhantomV4.0/V4.0C or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

Device Holder

10 SAR Measurement Procedures

10.1 Normal SAR Measurement Procedure

Step 1: 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. The minimum distance of probe sensors to surface is 1.4 ㎜. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2 and 3: Area Scan & Zoom Scan Procedures

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

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1. SAR drift shall be kept within ± 5 % and if it without ± 5 %, SAR retest according to measurement procedure step 1~4.

< Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04 >

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 mm ± 1 mm</td><td>½·δ·ln(2) mm ± 0.5 mm</td></tr>
<tr><td colspan="3">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 colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</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>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ 1.5·Δz_{Zoom}(n-1) mm</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 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 Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

11 Definition of Reference

11.1 Body-Worn Accessory Configurations

Body-worn operation configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. A device with a headset output is tested with a headset connected to the device.

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 supplied with the device, the device is tested with each accessory that contains a unique metallic component. 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 of available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration where a separation distances between the back of the device and the flat phantom is used. Test position spacing was documented.

12 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. 1. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. These tests were done at 750 / 835 / 1750 / 1900 / 2600 ㎒. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. (SAR values are normalized to 1W forward power delivered to the dipole). During the tests, the ambient temperature of the laboratory was in the range 18 ~ 25° C, the relative humidity was in the range 30 ~ 70 % R.H and the liquid depth above the ear reference points was ≥ 15 cm ± 5 mm (frequency ≤ 3 GHz) or ≥ 10 cm ± 5 mm (frequency > 3 G Hz)in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

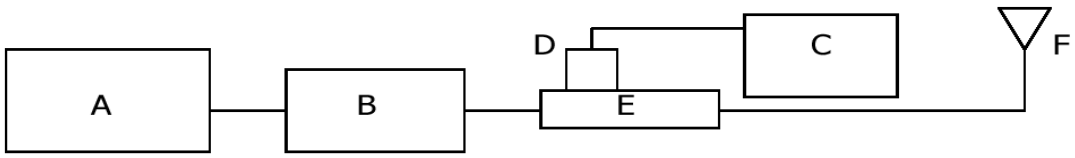


Fig 1. The microwave circuit arrangement used for SAR system verification

A. Agilent Model E4421B Signal Generator
Agilent Model E8247C Signal Generator
B. Empower RF System,Inc. Model 2002-BBS2C4AEL
BONN ELEKTRONIK Model BLMA1060-10 RF Amplifier
C. Agilent Model E4419B Power Meter
D. Agilent Model E9300H Power Sensor
E. Agilent Model 772D / 778D Dual Directional Coupler
F. Reference dipole Antenna

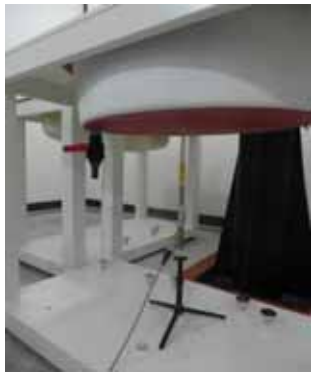


Photo of the dipole Antenna

SAR System Verification

Verification Kit	Probe S/N	Tissue	Target SAR 1 g from Calibration Certificate (1 W)	Measured SAR 1 g (0.1 W)	Normalized SAR 1 g (1 W)	Deviation (%)	Date	Liquid Temp. (°C)
D750V3 SN:1085	7574	750 Head	8.37	0.796	7.96	-4.90	2021-02-08	21.6
D835V2 SN:490	7574	835 Head	9.47	0.939	9.39	-0.84	2021-02-05	21.5
D1750V2 SN:1070	7574	1750 Head	36.10	3.75	37.50	3.88	2021-02-03	21.8
D1900V2 SN:5d033	7574	1900 Head	39.40	4.07	40.70	3.30	2021-02-02	21.6
D1900V2 SN:5d033	7574	1900 Head	39.40	3.92	39.20	-0.51	2021-02-04	21.9
D2600V2 SN:1124	7574	2600 Head	57.00	5.51	55.10	-3.33	2021-02-09	21.8

Table1. Results system verification

13 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this simulant fluid were measured by using the Speag Model DAK-3.5 Dielectric Probe in conjunction with Agilent E5071C Network Analyzer (300 ㎑ - 6 ㎓) by using a procedure detailed in Section V.

f (㎒)	Tissue type	Limits / Measured	Dielectric Parameters		
			Permittivity	Conductivity	Simulated Tissue Temp(℃)
750.0	Head	Measured, 2021-02-08	40.68	0.91	21.6
		Target Tissue	*41.90*	*0.89*	
		Deviation (%)	**-2.91**	**2.25**	
704.0		Measured, 2021-02-08	41.44	0.89	
		Deviation (%)	**-1.10**	**0.00**	
711.0		Measured, 2021-02-08	41.32	0.89	
		Deviation (%)	**-1.38**	**0.00**	
835.0	Head	Measured, 2021-02-05	41.91	0.91	21.5
		Target Tissue	*41.50*	*0.90*	
		Deviation (%)	**0.99**	**1.11**	
829.0		Measured, 2021-02-05	41.99	0.91	
		Deviation (%)	**1.18**	**1.11**	
836.6		Measured, 2021-02-05	41.88	0.91	
		Deviation (%)	**0.92**	**1.11**	
1750.0	Head	Measured, 2021-02-03	39.44	1.38	21.8
		Target Tissue	*40.10*	*1.37*	
		Deviation (%)	**-1.65**	**0.73**	
1720.0		Measured, 2021-02-03	39.56	1.35	
		Deviation (%)	**-1.35**	**-1.46**	
1732.4		Measured, 2021-02-03	39.49	1.36	
		Deviation (%)	**-1.52**	**-0.73**	
1900.0	Head	Measured, 2021-02-02	41.36	1.39	21.6
		Target Tissue	*40.00*	*1.40*	
		Deviation (%)	**3.40**	**-0.71**	
1860.0		Measured, 2021-02-02	41.46	1.35	
		Deviation (%)	**3.65**	**-3.57**	
1900.0		Measured, 2021-02-02	41.36	1.39	
		Deviation (%)	**3.40**	**-0.71**	
1900.0	Head	Measured, 2021-02-04	38.75	1.38	21.9
		Target Tissue	*40.00*	*1.40*	
		Deviation (%)	**-3.13**	**-1.43**	
1880.0		Measured, 2021-02-04	38.80	1.38	
		Deviation (%)	**-3.00**	**-1.43**	
2600.0	Head	Measured, 2021-02-09	38.11	2.01	21.8
		Target Tissue	*39.00*	*1.96*	
		Deviation (%)	**-2.28**	**2.55**	
2535.0		Measured, 2021-02-09	38.24	1.93	
		Deviation (%)	**-1.95**	**-1.53**	

The composition of the brain & muscle tissue simulating liquid

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% by weight)	Frequency (㎒)									
	450		835		900		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.91	46.21	40.29	50.75	40.29	50.75	55.24	70.17	55.00	68.64
Salt (NaCl)	3.79	2.34	1.38	0.94	1.38	0.94	0.31	0.39	-	-
Sugar	56.93	51.17	57.90	-	57.90	-	-	-	-	-
HEC	0.25	0.15	0.24	0.10	0.24	0.10	-	-	-	-
Bactericide	0.12	0.08	0.18	-	0.18	-	-	-	-	-
Triton X-100	-	-	-	-	-	-	-	-	-	-
DGBE	-	-	-	-	-	-	44.45	70.17	45.00	31.37
Dielectric Constant	43.5	56.7	41.5	55.2	41.5	55.0	40.0	53.3	39.2	52.7
Conductivity (S/m)	0.87	0.94	0.90	0.97	0.97	1.05	1.40	1.52	1.80	1.95

Salt: 99 $^{+}$% Pure Sodium Chloride Sugar: 98 $^{+}$% Pure Sucrose

Water: De-ionized, 16 MΩ^{+} 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

14 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 ㏈, within 20 % of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibrations in KDB publication 865664 D01V01r04:

750V3_Head (SN : 1085)				
750 GHz				
Measurement Date	Return Loss (㏈)	Δ%	Impedance (Ω)	ΔΩ
2019 / 03 / 21	-27.13	-	54.58	-
2020 / 04 / 16	-27.66	-1.95	53.76	-1.50

15 Instruments List

Test Platform	SPEAG DASY System				
Manufacture	SPEAG				
Description	SAR Test System (Frequency range 300 MHz – 6 GHz)				
Software Reference	DASY52: 52.10.4(1527) SEMCAD X: 14.6.14(7483)				
Equipment	**Type**	**Serial Number**	**Cal Date**	**Cal Interval**	**Cal Due**
Phantom	SAM Phantom	TP-1300	N/A	N/A	N/A
Phantom	SAM Phantom	TP-1720	N/A	N/A	N/A
Phantom	SAM Phantom	TP-1721	N/A	N/A	N/A
Verification Dipole	D750V3	1085	2019-03-21	Biennial	2021-03-21
Verification Dipole	D835V2	490	2020-05-19	Biennial	2022-05-19
Verification Dipole	D1750V2	1070	2020-07-22	Biennial	2022-07-22
Verification Dipole	D1900V2	5d033	2020-05-26	Biennial	2022-05-26
Verification Dipole	D2600V2	1124	2020-07-21	Biennial	2021-07-21
DAE	DAE4	1340	2020-05-28	Annual	2021-05-28
E-Field Probe	EX3DV4	7574	2020-07-10	Annual	2021-07-10
Dielectric Assessment Kit	DAK-3.5	1107	2020-05-19	Annual	2021-05-19
Network Analyzer	E5071C	MY46111535	2020-05-13	Annual	2021-05-13
Power Meter	E4419B	GB43311125	2020-04-29	Annual	2021-04-29
Power Meter	E4419B	GB43311715	2020-03-06	Annual	2021-03-06
Power Sensor	E9300H	MY41495307	2020-05-15	Annual	2021-05-15
Power Sensor	E9300H	MY41495314	2020-04-29	Annual	2021-04-29
Signal Generator	E4421B	MY43350132	2020-03-03	Annual	2021-03-03
Signal Generator	E8247C	MY43321024	2020-06-03	Annual	2021-06-03
Power Amplifier	2002-BBS2C4AEL	1029 D/C 0341	2020-12-01	Annual	2021-12-01
Power Amplifier	BLMA1060-10	1711221	2020-06-05	Annual	2021-06-05
Dual Directional Coupler	778D	MY52180497	2020-03-06	Annual	2021-03-06
Dual Directional Coupler	772D	MY52180226	2020-03-06	Annual	2021-03-06
LP Filter	LA-15N	LF02	2020-03-06	Annual	2021-03-06
LP Filter	LA-30N	LF03	2020-03-06	Annual	2021-03-06
Attenuator	05AS102-K03	A1	2020-12-04	Annual	2021-12-04
Attenuator	05AS102-K20	A4	2020-12-04	Annual	2021-12-04
Attenuator	RFHB1210NC2	A5	2020-06-05	Annual	2021-06-05
Hygro-Thermometer	BJ5478	12091382-1	2020-06-04	Annual	2021-06-04
Digital Thermometer	SDT25	19041500179	2020-09-17	Annual	2021-09-17
Communication Tester	MT8820C	6201074216	2020-12-21	Annual	2021-12-21

16 FCC Power Measurement Procedures

The SAR measurement Software calculates a reference point at the start and end of the test to check for power drifts. If conducted power deviations of more than 5 % occurred, the tests were repeated.

17 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v06, When SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported SAR. Test highest reported SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

18 Maximum Output Power Specifications

This device operates using the following maximum output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v06

GSM Maximum Power

Band	Maximum/ Normal	Maximum Output Power (dBm)				
		GSM Voice	GPRS		EGPRS	
			1Tx	2Tx	1Tx	2Tx
GSM 850	**Maximum**	**34.00**	**34.00**	**34.00**	**28.00**	**28.00**
	Normal	33.00	33.00	33.00	27.00	27.00
GSM 1900	**Maximum**	**31.00**	**31.00**	**31.00**	**27.00**	**27.00**
	Normal	30.00	30.00	30.00	26.00	26.00

WCDMA Maximum Power

Mode	Maximum/Normal	Maximum Output Power (dBm)				
		3GPP WCDMA AMR / RMC	3GPP HSDPA	3GPP HSUPA	3GPP DC-HSDPA	3GPP HSPA+
WCDMA II	**Maximum**	**25.00**	**25.00**	**25.00**	**25.00**	**25.00**
	Normal	24.00	24.00	24.00	24.00	24.00
WCDMA IV	**Maximum**	**25.00**	**25.00**	**25.00**	**25.00**	**25.00**
	Normal	24.00	24.00	24.00	24.00	24.00
WCDMA V	**Maximum**	**25.00**	**25.00**	**25.00**	**25.00**	**25.00**
	Normal	24.00	24.00	24.00	24.00	24.00

LTE Maximum Power

Mode / Band		Modulated Average
LTE Band 12	**Maximum**	**24.0**
	Nominal	23.0
LTE Band 5	**Maximum**	**24.0**
	Nominal	23.0
LTE Band 66	**Maximum**	**24.0**
	Nominal	23.0
LTE Band 2	**Maximum**	**24.0**
	Nominal	23.0
LTE Band 7	**Maximum**	**24.0**
	Nominal	23.0

19 RF Conducted Power Measurement

The device in LTE was controlled by using a Communication tester. The EUT was set to maximum power level during all tests. The DASY system measures power drift during SAR testing by comparing e-field in the same location at the beginning and at the end of measurement.

19.1 GSM

1. Both burst-averaged and calculated frame-averaged powers are included. Frame-averaged power was calculated from the measured burst-averaged power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
2. The source-based frame-averaged output power was evaluated for 1Tx, 2Tx slot configurations. The configuration with the highest target frame averaged output power was evaluated for Car Telematics Modem SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots were tested.
3. GPRS output powers were measured with coding scheme setting of 1(CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our investigation has shown that CS1 – CS4 settings do not have any impact on the output levels or modulations in the GPRS modes.
4. EGPRS output powers were measured with coding scheme setting of 5(CS5) on the base station simulator. CS5 was configured to measure EGPRS output power measurements and SAR to ensure 8PSK modulation in the signal. Our investigation has shown that CS5 – CS9 settings do not have any impact on the output levels or modulations in the GPRS modes.
5. For body SAR testing, the EUT was set in GPRS multi-slot class 12 with 2uplink slots for GSM850&GSM1900 due to maximum source-based time-averaged output power.

19.2 WCDMA

19.2.1 Output Power Verification

Maximum output power is measured on the High, Middle and Low channels for each applicable transmission band according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all “1s”.

19.2.2 Body SAR Measurements

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all “1s”.

19.2.3 Procedures Used to Establish RF Signal for SAR HSDPA Data Devices

Body SAR is not required for handsets with HSDPA capabilities when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75 % of the SAR limit. Otherwise, SAR is Measured for HSDPA, using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA, on the maximum output channel with the body exposure configuration that results in the highest SAR in 12.2 kbps RMC for that RF channel.

Sub-Test 1 Setup for Release 5 HSDPA

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	CM (dB)(2)
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.
Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

19.2.4 SAR Measurements for Conditions for HSUPA Data Devices

Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75 % of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2, according to the highest body SAR configuration in 12.1 kbps RMC without HSPA. When VOIP is applicable for head exposure, SAR is not required when the maximum output of each RF channel with HSPA is less than ¼ dB higher than that measured using 12.2 kbps RMC; otherwise, the same HSPA configuration used for body measurement should be used to test for head exposure.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}(1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM(2) (dB)	MPR (dB)	AG(4) Index	E-TFCI
1	11/15(3)	15/15(3)	64	11/15(3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}: 47/15 β_{ed2}: 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15(4)	15/15(4)	64	15/15(4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

19.3 LTE

19.3.1 SAR measurement Conditions for LTE

LTE modes were tested according to FCC KDB 941225 D05v02r05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluation SAR. Anritsu MT8820C was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

19.3.2 Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

19.3.3 MPR

MPR is permanently implemented for this device by the manufacture. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3.-1

19.3.4 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

19.3.5 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05V02r05

a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
   i. The required channel and offset combination with the highest maximum output power is required for SAR.
   ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel
   iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.

b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.

c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.

d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Section 5.2.1, through 5.2.3 is less than or equal to 1/2 dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is < 1.45 W/kg.

GSM Conducted power

Mode		Burst-Conducted Average Power(dBm)				
		GSM	GPRS		EGPRS	
		Voice	1Tx	2Tx	1Tx	2Tx
GSM850	**Maximum**	**34.00**	**34.00**	**34.00**	**28.00**	**28.00**
	128	33.08	32.90	32.71	26.73	26.43
	190	33.13	32.91	32.72	26.86	26.58
	251	33.02	32.62	32.53	26.79	26.66
GSM1900	**Maximum**	**31.00**	**31.00**	**31.00**	**27.00**	**27.00**
	512	30.23	29.56	29.48	25.48	25.44
	661	30.30	29.58	29.50	25.37	25.45
	810	30.26	29.55	29.47	25.49	25.50
Mode		Frame-Conducted Average Power(dBm)				
		GSM	GPRS		EGPRS	
		Voice	1Tx	2Tx	1Tx	2Tx
GSM850	**Maximum**	**24.97**	**24.97**	**27.98**	**18.97**	**21.98**
	128	24.05	23.87	26.69	17.70	20.41
	190	24.10	23.88	26.70	17.83	20.56
	251	23.99	23.59	26.51	17.76	20.64
GSM1900	**Maximum**	**21.97**	**21.97**	**24.98**	**17.97**	**20.98**
	512	21.20	20.53	23.46	16.23	19.42
	661	21.27	20.55	23.48	16.34	19.43
	810	21.23	20.52	23.45	16.24	19.48

WCDMA Conducted power

Mode	3GPP 34.121	Normal Power (dBm)		
Channel	Subtest	4132	4183	4233
WCDMA V	12.2 Kbps AMR	23.21	23.15	23.15
	12.2 Kbps RMC	23.23	**23.25**	23.21
HSDPA	Subtest 1	22.43	22.32	22.26
	Subtest 2	22.41	22.34	22.26
	Subtest 3	21.86	21.84	21.72
	Subtest 4	21.92	21.82	21.70
HSUPA	Subtest 1	22.34	22.23	22.20
	Subtest 2	20.34	20.31	20.29
	Subtest 3	21.33	21.25	21.22
	Subtest 4	20.37	20.33	20.30
	Subtest 5	22.30	22.15	22.15
DC-HSDPA	Subtest 1	22.35	22.25	22.15
	Subtest 2	22.31	22.21	22.11
	Subtest 3	21.77	21.71	21.65
	Subtest 4	21.89	21.79	21.69
HSPA+		21.84	21.67	21.62
Mode	3GPP 34.121	Normal Power (dBm)		
Channel	Subtest	1312	1412	1513
WCDMA IV	12.2 Kbps AMR	23.37	23.31	23.18
	12.2 Kbps RMC	23.40	**23.41**	23.28
HSDPA	Subtest 1	22.67	22.62	22.56
	Subtest 2	22.63	22.57	22.50
	Subtest 3	22.11	22.06	22.05
	Subtest 4	22.13	22.10	22.02
HSUPA	Subtest 1	22.65	22.61	22.59
	Subtest 2	20.69	20.63	20.60
	Subtest 3	21.67	21.65	21.59
	Subtest 4	20.68	20.62	20.52
	Subtest 5	22.58	22.51	22.49
DC-HSDPA	Subtest 1	22.57	22.55	22.51
	Subtest 2	22.53	22.49	22.35
	Subtest 3	22.00	22.01	21.95
	Subtest 4	21.91	21.95	21.89
HSPA+		22.08	21.86	21.70

Mode	3GPP 34.121	Normal Power (dBm)		
Channel	Subtest	9262	9400	9538
WCDMA II	12.2 Kbps AMR	23.35	23.26	23.19
	12.2 Kbps RMC	23.37	**23.39**	23.24
HSDPA	Subtest 1	22.44	22.44	22.32
	Subtest 2	22.39	22.39	22.29
	Subtest 3	21.91	21.84	21.89
	Subtest 4	21.94	21.90	21.88
HSUPA	Subtest 1	22.31	22.43	22.33
	Subtest 2	20.35	20.31	20.21
	Subtest 3	21.30	21.25	21.22
	Subtest 4	20.42	20.35	20.33
	Subtest 5	22.29	22.39	22.26
DC-HSDPA	Subtest 1	22.33	22.34	22.25
	Subtest 2	22.29	22.30	22.22
	Subtest 3	21.81	21.71	21.66
	Subtest 4	21.83	21.72	21.64
HSPA+		21.84	21.79	21.58

Note

1. WCDMA SAR was tested under RMC 12.2 kbps with HSPA inactive per KDB Publication 941225 D02v01. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg

LTE Conducted power

LTE Band 12 1.4MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			23017 (699.7 MHz)	23095 (707.5 MHz)	23173 (715.3 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.48	22.55	22.48	0
	1	2	22.62	22.60	22.51	
	1	5	22.48	22.55	22.61	
	3	0	22.50	22.59	22.48	
	3	2	22.63	22.62	22.66	
	3	3	22.60	22.55	22.64	
	6	0	21.62	22.63	21.62	0-1
16QAM	1	0	21.78	21.83	21.79	0-1
	1	2	21.92	21.93	20.81	
	1	5	21.89	21.82	21.89	
	3	0	21.64	21.68	21.60	
	3	2	21.78	21.74	21.79	
	3	3	21.70	21.66	21.73	
	6	0	20.70	20.64	20.70	0-2

LTE Band 12 3MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			23025 (700.5 MHz)	23095 (707.5 MHz)	23165 (714.5 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.41	22.43	22.51	0
	1	7	22.41	22.42	22.52	
	1	14	22.41	22.43	22.51	
	8	0	21.58	21.58	21.69	0-1
	8	4	21.57	21.59	21.67	
	8	7	21.58	21.67	21.66	
	15	0	21.49	21.67	21.68	
16QAM	1	0	21.72	21.83	21.78	0-1
	1	7	21.71	21.86	21.79	
	1	14	21.71	21.81	21.80	
	8	0	20.64	20.76	20.77	0-2
	8	4	20.64	20.78	20.76	
	8	7	20.62	20.77	20.76	
	15	0	20.50	20.70	20.71	

LTE Band 12 5MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			23035 (701.5 MHz)	23095 (707.5 MHz)	23155 (713.5 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.54	22.56	22.56	0
	1	12	22.52	22.55	22.57	
	1	24	22.55	22.55	22.56	
	12	0	21.67	21.73	21.60	0-1
	12	6	21.68	21.73	21.60	
	12	13	21.68	21.73	21.60	
	25	0	21.67	21.68	21.50	
16QAM	1	0	21.85	21.83	21.76	0-1
	1	12	21.81	21.84	21.77	
	1	24	21.81	21.87	21.72	
	12	0	20.73	20.77	20.58	0-2
	12	6	20.72	20.77	20.58	
	12	13	20.74	20.78	20.56	
	25	0	20.70	20.70	20.52	

LTE Band 12 10MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			23060 (704.0 MHz)	23095 (707.5 MHz)	23130 (711.0 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.64	22.66	22.63	0
	1	25	22.61	22.65	22.60	
	1	49	22.67	22.68	**22.69**	
	25	0	21.71	21.60	21.70	0-1
	25	12	21.73	21.60	21.71	
	25	25	21.69	21.63	21.67	
	50	0	21.70	21.71	21.68	
16QAM	1	0	21.93	21.95	21.96	0-1
	1	25	21.98	21.93	21.93	
	1	49	21.96	21.96	22.00	
	25	0	20.76	20.64	20.74	0-2
	25	12	20.74	20.64	20.73	
	25	25	20.75	20.62	20.69	
	50	0	20.72	20.71	20.71	

LTE Band 5 1.4MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			20407 (824.7 MHz)	20525 (836.5 MHz)	20643 (848.3 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.66	22.68	22.76	0
	1	2	22.68	22.66	22.81	
	1	5	22.67	22.68	22.81	
	3	0	22.71	22.69	22.79	
	3	2	22.67	22.70	22.80	
	3	3	22.68	22.69	22.79	
	6	0	21.70	21.68	21.82	0-1
16QAM	1	0	22.00	22.00	22.09	0-1
	1	2	21.99	22.02	22.05	
	1	5	21.97	22.00	22.07	
	3	0	21.82	21.85	21.92	
	3	2	21.79	21.80	21.89	
	3	3	21.80	21.79	21.93	
	6	0	20.76	20.76	20.87	0-2

LTE Band 5 3MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			20415 (825.5 MHz)	20525 (836.5 MHz)	20635 (847.5 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.46	22.39	22.41	0
	1	7	22.46	22.38	22.41	
	1	14	22.45	22.38	22.56	
	8	0	21.50	21.37	21.42	0-1
	8	4	21.49	21.37	21.41	
	8	7	21.48	21.37	21.44	
	15	0	21.46	21.38	21.52	
16QAM	1	0	21.77	21.69	21.71	0-1
	1	7	21.76	21.66	21.72	
	1	14	21.81	21.65	21.72	
	8	0	20.55	20.45	20.47	0-2
	8	4	20.57	20.46	20.49	
	8	7	20.55	20.45	20.50	
	15	0	20.49	20.42	20.57	

LTE Band 5 5MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			20425 (826.5 MHz)	20525 (836.5 MHz)	20625 (846.5 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.54	22.67	22.61	0
	1	12	22.61	22.65	22.60	
	1	24	22.62	22.65	22.59	
	12	0	21.59	21.52	21.61	0-1
	12	6	21.61	21.54	21.61	
	12	13	21.62	21.56	21.60	
	25	0	21.62	21.51	21.58	
16QAM	1	0	21.93	21.92	21.88	0-1
	1	12	21.90	21.93	21.89	
	1	24	21.94	21.95	21.89	
	12	0	20.66	20.59	20.66	0-2
	12	6	20.65	20.60	20.65	
	12	13	20.64	20.61	20.64	
	25	0	20.59	20.53	20.60	

LTE Band 5 10MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			20450 (829.0 MHz)	20525 (836.5 MHz)	20600 (844.0 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	**22.90**	22.57	22.72	0
	1	25	22.63	21.27	22.74	
	1	49	22.65	22.75	22.69	
	25	0	21.73	21.85	21.71	0-1
	25	12	21.70	21.88	21.80	
	25	25	21.73	21.85	21.74	
	50	0	21.67	21.75	21.77	
16QAM	1	0	22.01	22.16	21.95	0-1
	1	25	21.94	22.19	22.07	
	1	49	21.95	22.17	21.96	
	25	0	20.74	20.87	20.71	0-2
	25	12	20.71	20.88	20.84	
	25	25	20.76	20.89	20.74	
	50	0	20.69	20.76	20.78	

LTE Band 66 1.4MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			131979 (1710.7 MHz)	132322 (1745.0 MHz)	132665 (1779.3 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.47	22.20	22.14	0
	1	2	22.53	22.26	22.30	
	1	5	22.46	22.14	22.17	
	3	0	21.52	21.17	21.26	
	3	2	21.54	21.23	21.23	
	3	3	21.51	21.16	21.19	
	6	0	21.46	21.20	21.21	0-1
16QAM	1	0	21.87	21.41	21.49	0-1
	1	2	21.95	21.54	21.53	
	1	5	21.81	21.34	21.40	
	3	0	20.61	20.28	20.30	
	3	2	20.67	20.26	20.22	
	3	3	20.67	20.25	20.24	
	6	0	20.62	20.23	20.25	0-2

LTE Band 66 3MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			131987 (1711.5 MHz)	132322 (1745.0 MHz)	132657 (1778.5 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.48	22.22	22.04	0
	1	7	22.54	22.28	22.20	
	1	14	22.47	22.16	22.07	
	8	0	21.53	21.19	21.16	0-1
	8	4	21.55	21.25	21.13	
	8	7	21.52	21.18	21.09	
	15	0	21.47	21.22	21.11	
16QAM	1	0	21.88	21.43	21.39	0-1
	1	7	21.96	21.56	21.43	
	1	14	21.82	21.36	21.30	
	8	0	20.62	20.30	20.20	0-2
	8	4	20.68	20.28	20.12	
	8	7	20.68	20.27	20.14	
	15	0	20.63	20.25	20.15	

LTE Band 66 5MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			131997 (1712.5 MHz)	132322 (1745.0 MHz)	132647 (1777.5 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.49	22.34	22.30	0
	1	12	22.51	22.30	22.11	
	1	24	22.52	22.26	22.07	
	12	0	21.60	21.35	21.29	0-1
	12	6	21.59	21.34	21.16	
	12	13	21.60	21.31	21.15	
	25	0	21.58	21.15	21.14	
16QAM	1	0	22.01	21.60	21.51	0-1
	1	12	21.87	21.58	21.33	
	1	24	21.91	21.51	21.35	
	12	0	20.70	20.41	20.33	0-2
	12	6	20.76	20.36	20.24	
	12	13	20.71	20.32	20.18	
	25	0	20.69	20.32	20.17	

LTE Band 66 10MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			132022 (1715.0 MHz)	132322 (1745.0 MHz)	132622 (1775.0 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.88	22.77	22.34	0
	1	25	22.75	22.51	22.33	
	1	49	22.74	22.43	22.26	
	25	0	21.88	21.58	21.52	0-1
	25	12	21.85	21.57	21.49	
	25	25	21.80	21.50	21.35	
	50	0	21.83	21.56	21.44	
16QAM	1	0	22.10	21.95	21.59	0-1
	1	25	22.06	21.74	21.67	
	1	49	22.08	21.68	21.56	
	25	0	20.90	20.62	20.56	0-2
	25	12	20.87	20.59	20.51	
	25	25	20.84	20.54	20.36	
	50	0	20.82	20.57	20.47	

LTE Band 66 15MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			132047 (1717.5 MHz)	132322 (1745.0 MHz)	132597 (1772.5 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	23.09	22.90	22.91	0
	1	36	22.91	22.31	22.71	
	1	74	22.72	22.24	22.68	
	36	0	22.03	21.44	21.89	0-1
	36	18	22.06	21.41	21.83	
	36	37	22.11	21.34	21.85	
	75	0	21.62	21.39	21.84	
16QAM	1	0	22.09	21.96	22.21	0-1
	1	36	22.06	21.57	21.96	
	1	74	21.78	21.41	21.92	
	36	0	20.72	20.46	20.94	0-2
	36	18	20.69	20.39	20.84	
	36	37	20.60	20.31	20.81	
	75	0	20.67	20.39	20.85	

LTE Band 66 20MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			132072 (1720.0 MHz)	132322 (1745.0 MHz)	132572 (1770.0 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	**23.22**	23.05	23.10	0
	1	50	22.96	22.66	22.77	
	1	99	23.03	22.65	22.66	
	50	0	22.14	22.05	22.01	0-1
	50	25	22.04	21.94	21.90	
	50	50	21.98	21.78	21.90	
	100	0	22.10	21.87	21.91	
16QAM	1	0	22.52	22.21	22.37	0-1
	1	50	22.38	21.81	22.05	
	1	99	22.16	21.77	21.89	
	50	0	21.11	20.88	21.02	0-2
	50	25	21.01	20.69	20.92	
	50	50	21.04	20.56	20.93	
	100	0	20.97	20.71	20.94	

LTE Band 2 1.4MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			18607 (1850.7 MHz)	18900 (1880.0 MHz)	19193 (1909.3 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.09	21.88	22.21	0
	1	2	22.10	21.87	22.21	
	1	5	22.18	21.89	22.18	
	3	0	22.23	21.87	22.20	
	3	2	22.23	21.88	22.20	
	3	3	22.22	21.89	22.20	
	6	0	21.20	20.88	21.18	0-1
16QAM	1	0	21.45	21.17	21.41	0-1
	1	2	21.45	21.12	21.46	
	1	5	21.47	21.10	21.47	
	3	0	21.32	21.00	21.29	
	3	2	21.31	21.01	21.31	
	3	3	21.33	21.01	21.33	
	6	0	20.26	19.96	20.26	0-2

LTE Band 2 3MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			18615 (1851.5 MHz)	18900 (1880.0 MHz)	19185 (1908.5 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.19	21.97	22.26	0
	1	7	22.19	21.92	22.28	
	1	14	22.17	21.95	22.27	
	8	0	21.16	22.25	21.28	0-1
	8	4	21.16	21.02	21.28	
	8	7	21.15	21.00	21.27	
	15	0	21.14	21.00	21.27	
16QAM	1	0	21.44	21.26	21.53	0-1
	1	7	21.38	21.26	21.47	
	1	14	21.28	21.32	21.45	
	8	0	20.22	20.07	20.36	0-2
	8	4	20.23	20.10	20.35	
	8	7	20.25	20.08	20.35	
	15	0	20.21	20.05	20.32	

LTE Band 2 5MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			18625 (1852.5 MHz)	18900 (1880.0 MHz)	19175 (1907.5 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.28	22.11	22.54	0
	1	12	22.29	22.10	22.53	
	1	24	22.28	22.10	22.53	
	12	0	21.25	21.08	21.51	0-1
	12	6	21.27	21.07	21.51	
	12	13	21.26	21.08	21.51	
	25	0	21.23	21.05	21.50	
16QAM	1	0	21.60	21.40	21.76	0-1
	1	12	21.54	21.42	21.78	
	1	24	21.56	21.41	21.72	
	12	0	20.32	20.13	20.49	0-2
	12	6	20.32	20.14	20.49	
	12	13	20.33	20.14	20.46	
	25	0	20.28	20.11	20.45	

LTE Band 2 10MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			18650 (1855.0 MHz)	18900 (1880.0 MHz)	19150 (1905.0 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.45	22.29	22.22	0
	1	25	22.52	22.32	22.23	
	1	49	22.48	22.31	22.21	
	25	0	21.26	21.07	21.29	0-1
	25	12	21.26	21.07	21.30	
	25	25	21.27	21.07	21.31	
	50	0	21.24	21.03	21.36	
16QAM	1	0	21.75	21.54	21.61	0-1
	1	25	21.71	21.56	21.60	
	1	49	21.76	21.58	21.65	
	25	0	20.30	20.11	20.43	0-2
	25	12	20.32	20.10	20.41	
	25	25	20.19	20.11	20.41	
	50	0	20.27	20.07	20.37	

LTE Band 2 15MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			18675 (1857.5 MHz)	18900 (1880.0 MHz)	19125 (1902.5 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.41	22.20	22.34	0
	1	36	22.39	22.20	22.33	
	1	74	22.39	22.21	22.32	
	36	0	21.36	21.14	21.28	0-1
	36	18	21.36	21.14	21.26	
	36	37	21.36	21.14	21.26	
	75	0	21.27	21.08	21.32	
16QAM	1	0	21.66	21.53	21.59	0-1
	1	36	21.62	21.48	21.61	
	1	74	21.64	21.52	21.59	
	36	0	20.40	20.17	20.29	0-2
	36	18	20.40	20.18	20.29	
	36	37	20.39	20.17	20.29	
	75	0	20.31	20.12	20.34	

LTE Band 2 20MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			18700 (1860.0 MHz)	18900 (1880.0 MHz)	19100 (1900.0 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	**22.64**	22.60	22.56	0
	1	50	22.62	22.60	22.56	
	1	99	22.60	22.60	22.59	
	50	0	21.37	21.26	21.49	0-1
	50	25	21.44	21.26	21.48	
	50	50	21.47	21.25	21.50	
	100	0	21.40	21.20	21.43	
16QAM	1	0	21.95	21.76	21.80	0-1
	1	50	21.96	21.88	21.85	
	1	99	21.92	21.80	21.81	
	50	0	20.50	20.20	20.51	0-2
	50	25	20.49	20.21	20.50	
	50	50	20.51	20.21	20.51	
	100	0	20.41	20.14	20.45	

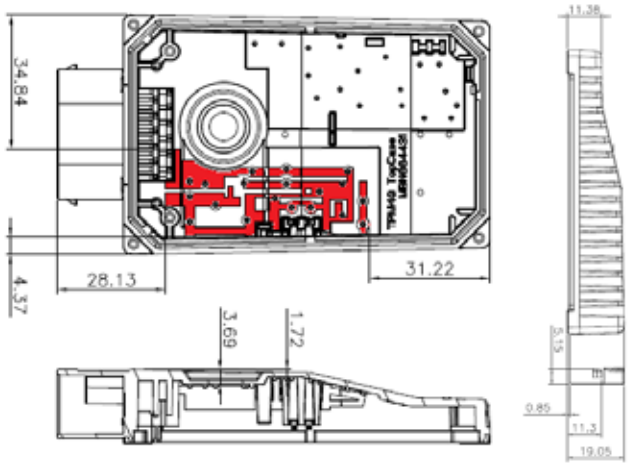
LTE Band 7 5MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			20775 (2502.5 MHz)	21100 (2535.0 MHz)	21425 (2567.5 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.96	23.23	23.01	0
	1	12	22.99	23.20	23.00	
	1	24	23.06	23.24	23.02	
	12	0	22.08	22.16	22.08	0-1
	12	6	22.06	22.16	22.08	
	12	13	22.09	22.17	22.07	
	25	0	22.18	22.17	22.04	
16QAM	1	0	22.40	22.46	22.32	0-1
	1	12	22.41	22.48	22.24	
	1	24	22.39	22.45	22.23	
	12	0	21.11	21.02	21.00	0-2
	12	6	21.10	21.09	21.00	
	12	13	21.13	21.07	21.01	
	25	0	21.21	21.08	20.97	

LTE Band 7 10MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			20800 (2505.0 MHz)	21100 (2535.0 MHz)	21400 (2565.0 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.75	23.17	22.89	0
	1	25	22.73	23.18	22.87	
	1	49	22.74	23.17	22.89	
	25	0	21.83	22.16	21.90	0-1
	25	12	21.84	22.17	21.89	
	25	25	21.84	22.19	21.88	
	50	0	21.80	22.14	21.96	
16QAM	1	0	22.08	22.45	22.21	0-1
	1	25	22.47	22.48	22.17	
	1	49	22.48	22.43	22.18	
	25	0	21.23	21.10	20.94	0-2
	25	12	21.24	21.11	20.93	
	25	25	21.23	21.10	20.93	
	50	0	21.10	21.05	20.98	

LTE Band 7 15MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			20825 (2507.5 MHz)	21100 (2535.0 MHz)	21375 (2562.5 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	22.96	23.31	23.17	0
	1	36	22.90	23.31	23.17	
	1	74	22.89	23.32	23.19	
	36	0	21.94	22.43	22.17	0-1
	36	18	21.94	22.42	22.07	
	36	37	23.10	22.40	22.06	
	75	0	22.10	22.29	22.01	
16QAM	1	0	22.52	22.52	22.39	0-1
	1	36	22.49	22.51	22.40	
	1	74	22.49	22.55	22.39	
	36	0	21.23	21.36	21.08	0-2
	36	18	21.26	21.35	21.06	
	36	37	21.27	21.34	21.07	
	75	0	21.20	21.28	21.01	

LTE Band 7 20MHz Bandwidth						
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed Per 3GPP[dB]
			20850 (2510.0 MHz)	21100 (2535.0 MHz)	21350 (2560.0 MHz)	
			Conducted Power [dBm]			
QPSK	1	0	23.01	23.07	23.04	0
	1	50	22.99	23.08	23.05	
	1	99	23.00	**23.33**	23.04	
	50	0	22.06	22.15	21.89	0-1
	50	25	22.06	22.16	21.90	
	50	50	22.07	22.17	21.90	
	100	0	22.00	22.12	21.95	
16QAM	1	0	22.34	22.33	23.06	0-1
	1	50	22.35	22.28	22.59	
	1	99	22.35	22.27	22.54	
	50	0	21.08	21.06	21.11	0-2
	50	25	21.08	21.06	21.18	
	50	50	21.07	21.05	21.21	
	100	0	21.02	21.04	21.24	

20 DUT Antenna Locations



GSM	GSM 850, 1900
FDD	WCDMA B2, 4, 5 LTE B2, 5, 7, 12, 66

<The Distance information of Antenna to Edges of Car Telematics Modem>

21 SAR Data Summary

21.1 SAR data

GSM 850 SAR

EUT Position	Mode	Traffic Channel		Separation Distance (mm)	Power(dBm)		Scaling Factor (Power)	Cube	1 g SAR (W/kg)	Scaled SAR (W/kg)	Plot No.
		Frequency (MHz)	Channel		Measured Power	Tune-Up Limit					
Front	GPRS 2TX	836.60	190	25	32.72	34.00	1.343	-	**0.399**	**0.536**	**A6**
Rear		836.60	190	25	32.72	34.00	1.343	-	0.127	0.171	-
Right Edge		836.60	190	25	32.72	34.00	1.343	-	0.298	0.400	-
Left Edge		836.60	190	25	32.72	34.00	1.343	-	0.040	0.054	-
Bottom		836.60	190	25	32.72	34.00	1.343	-	0.071	0.095	-
Additional GSM(Voice) Test											
Front	GSM	836.60	190	25	33.13	34.00	1.222	-	0.201	0.246	-
Rear		836.60	190	25	33.13	34.00	1.222	-	0.074	0.090	-
Right Edge		836.60	190	25	33.13	34.00	1.222	-	0.137	0.167	-
Left Edge		836.60	190	25	33.13	34.00	1.222	-	0.020	0.024	-
Bottom		836.60	190	25	33.13	34.00	1.222	-	0.034	0.042	-

GSM 1900 SAR

EUT Position	Mode	Traffic Channel		Separation Distance (mm)	Power(dBm)		Scaling Factor (Power)	Cube	1 g SAR (W/kg)	Scaled SAR (W/kg)	Plot No.
		Frequency (MHz)	Channel		Measured Power	Tune-Up Limit					
Front	GPRS 2TX	1880.00	661	25	29.50	31.00	1.413	-	**0.264**	**0.373**	**A7**
Rear		1880.00	661	25	29.50	31.00	1.413	-	0.037	0.052	-
Right Edge		1880.00	661	25	29.50	31.00	1.413	-	0.177	0.250	-
Left Edge		1880.00	661	25	29.50	31.00	1.413	-	0.027	0.038	-
Bottom		1880.00	661	25	29.50	31.00	1.413	-	0.038	0.054	-
Front	GSM	1880.00	661	25	30.30	31.00	1.175	-	0.129	0.152	-
Rear		1880.00	661	25	30.30	31.00	1.175	-	0.017	0.020	-
Right Edge		1880.00	661	25	30.30	31.00	1.175	-	0.089	0.105	-
Left Edge		1880.00	661	25	30.30	31.00	1.175	-	0.006	0.007	-
Bottom		1880.00	661	25	30.30	31.00	1.175	-	0.023	0.027	-

WCDMA V SAR

EUT Position	Mode	Traffic Channel		Separation Distance (mm)	Power(dBm)		Scaling Factor (Power)	Cube	1 g SAR (W/kg)	Scaled SAR (W/kg)	Plot No.
		Frequency (MHz)	Channel		Measured Power	Tune-Up Limit					
Front	RMC	836.60	4183	25	23.25	25.00	1.496	-	**0.206**	**0.308**	**A8**
Rear		836.60	4183	25	23.25	25.00	1.496	-	0.080	0.120	-
Right Edge		836.60	4183	25	23.25	25.00	1.496	-	0.148	0.221	-
Left Edge		836.60	4183	25	23.25	25.00	1.496	-	0.019	0.028	-
Bottom		836.60	4183	25	23.25	25.00	1.496	-	0.034	0.051	-

WCDMA IV SAR

EUT Position	Mode	Traffic Channel		Separation Distance (mm)	Power(dBm)		Scaling Factor (Power)	Cube	1 g SAR (W/kg)	Scaled SAR (W/kg)	Plot No.
		Frequency (MHz)	Channel		Measured Power	Tune-Up Limit					
Front	RMC	1732.40	1412	25	23.41	25.00	1.442	-	**0.261**	**0.376**	**A9**
Rear		1732.40	1412	25	23.41	25.00	1.442	-	0.025	0.036	-
Right Edge		1732.40	1412	25	23.41	25.00	1.442	-	0.165	0.238	-
Left Edge		1732.40	1412	25	23.41	25.00	1.442	-	0.025	0.036	-
Bottom		1732.40	1412	25	23.41	25.00	1.442	-	0.016	0.023	-

WCDMA II SAR

EUT Position	Mode	Traffic Channel		Separation Distance (mm)	Power(dBm)		Scaling Factor (Power)	Cube	1 g SAR (W/kg)	Scaled SAR (W/kg)	Plot No.
		Frequency (MHz)	Channel		Measured Power	Tune-Up Limit					
Front	RMC	1880.00	9400	25	23.39	25.00	1.449	-	**0.352**	**0.510**	**A10**
Rear		1880.00	9400	25	23.39	25.00	1.449	-	0.040	0.058	-
Right Edge		1880.00	9400	25	23.39	25.00	1.449	-	0.237	0.343	-
Left Edge		1880.00	9400	25	23.39	25.00	1.449	-	0.025	0.036	-
Bottom		1880.00	9400	25	23.39	25.00	1.449	-	0.061	0.088	-

LTE Band 12 SAR

EUT Position	Mode	Traffic Channel		RB Size	RB Offset	Separation Distance (mm)	Power(dBm)		Scaling Factor (Power)	Cube	1g SAR(W/Kg)		Plot No.
		Frequency (MHz)	Channel				Measured Power	Tune-Up Limit			Measured SAR	Scaled SAR	
Front	QPSK	711.00	23130	1	49	25	22.69	24.00	1.352	-	**0.065**	**0.088**	**A11**
		704.00	23060	25	12	25	21.73	23.00	1.340	-	0.034	0.046	-
Rear	QPSK	711.00	23130	1	49	25	22.69	24.00	1.352	-	0.032	0.043	-
		704.00	23060	25	12	25	21.73	23.00	1.340	-	0.017	0.023	-
Right Edge	QPSK	711.00	23130	1	49	25	22.69	24.00	1.352	-	0.036	0.049	-
		704.00	23060	25	12	25	21.73	23.00	1.340	-	0.022	0.029	-
Left Edge	QPSK	711.00	23130	1	49	25	22.69	24.00	1.352	-	0.011	0.015	-
		704.00	23060	25	12	25	21.73	23.00	1.340	-	0.007	0.009	-
Bottom	QPSK	711.00	23130	1	49	25	22.69	24.00	1.352	-	0.009	0.012	-
		704.00	23060	25	12	25	21.73	23.00	1.340	-	0.002	0.003	-

LTE Band 5 SAR

EUT Position	Mode	Traffic Channel		RB Size	RB Offset	Separation Distance (mm)	Power(dBm)		Scaling Factor (Power)	Cube	1g SAR(W/Kg)		Plot No.
		Frequency (MHz)	Channel				Measured Power	Tune-Up Limit			Measured SAR	Scaled SAR	
Front	QPSK	829.00	20450	1	0	25	22.90	24.00	1.288	-	0.071	0.091	-
		836.50	20525	25	12	25	21.88	23.00	1.294	-	**0.102**	**0.132**	**A12**
Rear	QPSK	829.00	20450	1	0	25	22.90	24.00	1.288	-	0.056	0.072	-
		836.50	20525	25	12	25	21.88	23.00	1.294	-	0.038	0.049	-
Right Edge	QPSK	829.00	20450	1	0	25	22.90	24.00	1.288	-	0.055	0.071	-
		836.50	20525	25	12	25	21.88	23.00	1.294	-	0.097	0.126	-
Left Edge	QPSK	829.00	20450	1	0	25	22.90	24.00	1.288	-	0.005	0.006	-
		836.50	20525	25	12	25	21.88	23.00	1.294	-	0.012	0.016	-
Bottom	QPSK	829.00	20450	1	0	25	22.90	24.00	1.288	-	0.008	0.010	-
		836.50	20525	25	12	25	21.88	23.00	1.294	-	0.015	0.019	-

LTE Band 66 SAR

EUT Position	Mode	Traffic Channel		RB Size	RB Offset	Separation Distance (mm)	Power(dBm)		Scaling Factor (Power)	Cube	1g SAR(W/Kg)		Plot No.
		Frequency (MHz)	Channel				Measured Power	Tune-Up Limit			Measured SAR	Scaled SAR	
Front	QPSK	1720.00	132072	1	0	25	23.22	24.00	1.197	-	**0.181**	**0.217**	**A13**
		1720.00	132072	50	0	25	22.14	23.00	1.219	-	0.161	0.196	-
Rear	QPSK	1720.00	132072	1	0	25	23.22	24.00	1.197	-	0.016	0.019	-
		1720.00	132072	50	0	25	22.14	23.00	1.219	-	0.013	0.016	-
Right Edge	QPSK	1720.00	132072	1	0	25	23.22	24.00	1.197	-	0.128	0.153	-
		1720.00	132072	50	0	25	22.14	23.00	1.219	-	0.107	0.130	-
Left Edge	QPSK	1720.00	132072	1	0	25	23.22	24.00	1.197	-	0.016	0.019	-
		1720.00	132072	50	0	25	22.14	23.00	1.219	-	0.012	0.015	-
Bottom	QPSK	1720.00	132072	1	0	25	23.22	24.00	1.197	-	0.007	0.008	-
		1720.00	132072	50	0	25	22.14	23.00	1.219	-	0.009	0.011	-

LTE Band 2 SAR

EUT Position	Mode	Traffic Channel		RB Size	RB Offset	Separation Distance (mm)	Power(dBm)		Scaling Factor (Power)	Cube	1g SAR(W/Kg)		Plot No.
		Frequency (MHz)	Channel				Measured Power	Tune-Up Limit			Measured SAR	Scaled SAR	
Front	QPSK	1860.00	18700	1	0	25	22.64	24.00	1.368	-	**0.390**	**0.534**	**A14**
		1900.00	19100	50	50	25	21.50	23.00	1.413	-	0.171	0.242	-
Rear	QPSK	1860.00	18700	1	0	25	22.64	24.00	1.368	-	0.008	0.011	-
		1900.00	19100	50	50	25	21.50	23.00	1.413	-	0.020	0.028	-
Right Edge	QPSK	1860.00	18700	1	0	25	22.64	24.00	1.368	-	0.237	0.324	-
		1900.00	19100	50	50	25	21.50	23.00	1.413	-	0.108	0.153	-
Left Edge	QPSK	1860.00	18700	1	0	25	22.64	24.00	1.368	-	0.029	0.040	-
		1900.00	19100	50	50	25	21.50	23.00	1.413	-	0.019	0.027	-
Bottom	QPSK	1860.00	18700	1	0	25	22.64	24.00	1.368	-	0.056	0.077	-
		1900.00	19100	50	50	25	21.50	23.00	1.413	-	0.019	0.027	-

LTE Band 7 SAR

EUT Position	Mode	Traffic Channel		RB Size	RB Offset	Separation Distance (mm)	Power(dBm)		Scaling Factor (Power)	Cube	1g SAR(W/Kg)		Plot No.
		Frequency (MHz)	Channel				Measured Power	Tune-Up Limit			Measured SAR	Scaled SAR	
Front	QPSK	2535.00	21100	1	99	25	23.33	24.00	1.167	-	0.104	0.121	-
		2535.00	21100	50	50	25	22.17	23.00	1.211	-	**0.121**	**0.147**	**A15**
Rear	QPSK	2535.00	21100	1	99	25	23.33	24.00	1.167	-	N/A	N/A	-
		2535.00	21100	50	50	25	22.17	23.00	1.211	-	N/A	N/A	-
Right Edge	QPSK	2535.00	21100	1	99	25	23.33	24.00	1.167	-	0.076	0.089	-
		2535.00	21100	50	50	25	22.17	23.00	1.211	-	0.084	0.102	-
Left Edge	QPSK	2535.00	21100	1	99	25	23.33	24.00	1.167	-	N/A	N/A	-
		2535.00	21100	50	50	25	22.17	23.00	1.211	-	N/A	N/A	-
Bottom	QPSK	2535.00	21100	1	99	25	23.33	24.00	1.167	-	0.016	0.019	-
		2535.00	21100	50	50	25	22.17	23.00	1.211	-	0.019	0.023	-

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in FCC KDB Publication 447498 D01v06.
2. Liquid tissue depth was at least 15 cm for all frequencies.
3. All modes of operation were investigated, and worst-case results are reported.
4. The EUT is tested 2nd hot-spot peak, if it is less than 2 dB below the highest peak.
5. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
6. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
7. Per FCC KDB 865664 D01V01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 23 for variability analysis.
8. This device is operating by connecting power supply therefore battery is not required
9. This device is operating by connecting power supply on 'Top' position therefore the position has not measured SAR

WCDMA Notes:

1. WCDMA mode in Body SAR was tested under RMC 12.2 kbps with HSPA inactive per KDB Publication 941225 D01v03r01. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.
2. Per FCC KDB Publication 447498 D01v06, 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). When the maximum output power variation across the required test channels is > 1/2 dB, instead of the middle channel, the highest output power channel must be used

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r05. The general test procedures used for testing can be found in Section 5.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3-6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator.
4. This device supports LTE capabilities with overlapping transmission frequency rages. When the supported frequency range of an LTE Band falls completely within an LTE band with a larger transmission frequency range, both LTE bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both LTE bands share the same transmission path and signal characteristics, SAR was only assessed for the band with larger transmission frequency range.

22 SAR Measurement Variability

22.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, 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 power supply 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 performed 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

22.2 Measurement Uncertainty

The measured SAR was < 1.5 W/kg for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

Appendixes List

Appendix A	A.1 Verification Test Plots for 750MHz
	A.2 Verification Test Plots for 835MHz
	A.3 Verification Test Plots for 1750MHz
	A.4 Verification Test Plots for 1900MHz
	A.5 Verification Test Plots for 2600MHz
	A.6 SAR Test Plots for GSM850
	A.7 SAR Test Plots for GSM1900
	A.8 SAR Test Plots for WCDMA V
	A.9 SAR Test Plots for WCDMA IV
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	A.11 SAR Test Plots for LTE Band 12
	A.12 SAR Test Plots for LTE Band 5
	A.13 SAR Test Plots for LTE Band 66
	A.14 SAR Test Plots for LTE Band 2
	A.15 SAR Test Plots for LTE Band 7
Appendix B	B.1 Calibration certificate for Probe
	B.2 Calibration certificate for DAE
	B.3 Calibration certificate for Dipole

Appendix A.1 Verification Test Plots for 750MHz

Date: 2021-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: 750MHz Verification 2021_02_08.da53:0

Input Power : 100 mW

Ambient Temp : 23.2°C Tissue Temp : 21.6°C

DUT: Dipole 750 MHz D750V3; Type: D750V3; Serial: D750V3 - SN:1085

Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1
Medium parameters used (extrapolated): f= 750 MHz; σ = 0.906 S/m; ε_r = 40.676; ρ = 1000 kg/m^3
Phantom section: Flat Section

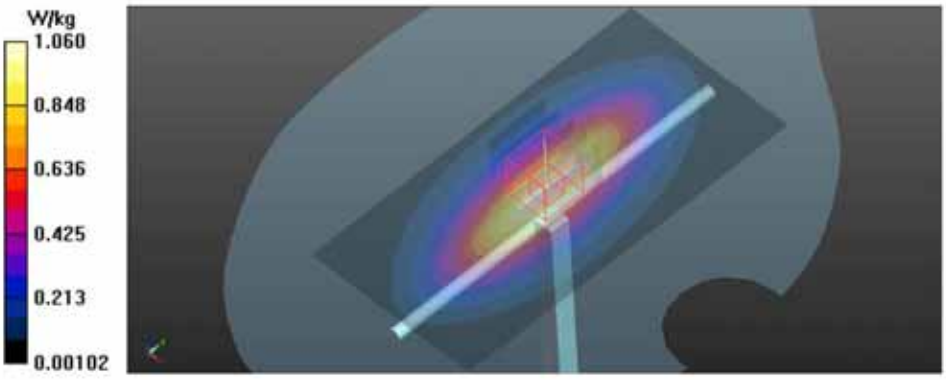
DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(9.68, 9.68, 9.68) @ 750 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM with CRP v5.0_TP-1721; Type: QD000P40CD; Serial: TP-1721
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/750MHz Verification/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Info: Extrapolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.06 W/kg

Verification/750MHz Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.76 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.796 W/kg; SAR(10 g) = 0.526 W/kg
Smallest distance from peaks to all points 3 dB below = 16 mm
Ratio of SAR at M2 to SAR at M1 = 67.2%

Info: Extrapolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.06 W/kg



Appendix A.2 Verification Test Plots for 835MHz

Date: 2021-02-05

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: 835MHz Verification_2021_02_05.da53:0

Input Power : 100 mW

Ambient Temp : 23.0°C Tissue Temp : 21.5°C

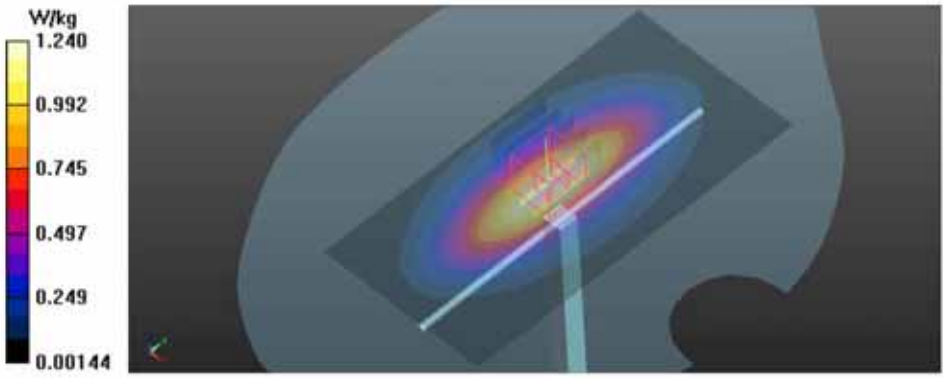
DUT: Dipole 835 MHz D835V2; Type: D835V2; Serial: D835V2 - SN:490

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.91 S/m; ε_r = 41.905; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(9.26, 9.26, 9.26) @ 835 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM 1300 (20deg probe tilt); Type: QD000P40CD; Serial: TP:1300
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/835MHz Verification/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.24 W/kg

Verification/835MHz Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 38.49 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.39 W/kg
SAR(1 g) = 0.939 W/kg; SAR(10 g) = 0.615 W/kg
Smallest distance from peaks to all points 3 dB below = 16 mm
Ratio of SAR at M2 to SAR at M1 = 66.9%
Maximum value of SAR (measured) = 1.25 W/kg



Appendix A.3 Verification Test Plots for 1750MHz

Date: 2021-02-03

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: 1750MHz Verification_2020_02_03.da53:0

Input Power : 100 mW

Ambient Temp : 23.0°C Tissue Temp : 21.8°C

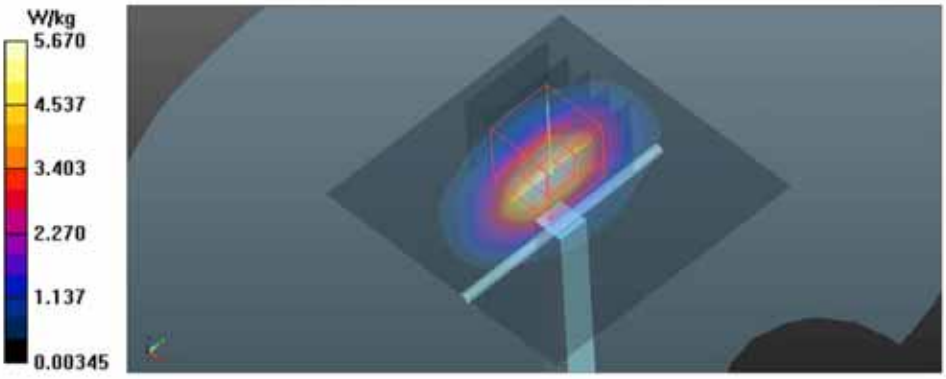
DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: D1750V2 - SN:1070

Communication System: UID 0, CW (0); Frequency: 1750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1750 MHz; σ = 1.38 S/m; ε_r = 39.44; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(8.21, 8.21, 8.21) @ 1750 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM 1300 (20deg probe tilt); Type: QD000P40CD; Serial: TP:1300
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/1750MHz Verification/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 5.67 W/kg

Verification/1750MHz Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 58.50 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 6.95 W/kg
SAR(1 g) = 3.75 W/kg; SAR(10 g) = 1.96 W/kg
Smallest distance from peaks to all points 3 dB below = 10.1 mm
Ratio of SAR at M2 to SAR at M1 = 53.5%
Maximum value of SAR (measured) = 5.86 W/kg



Appendix A.4 Verification Test Plots for 1900MHz

Date: 2021-02-02

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: 1900MHz Verification_2021_02_02.da53:0

Input Power : 100 mW

Ambient Temp : 23.2℃ Tissue Temp : 21.6℃

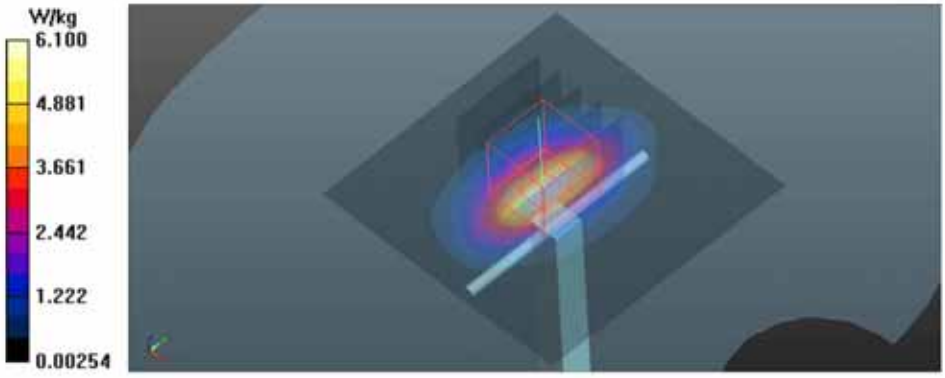
DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: D1900V2 - SN:5d033

Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.391 S/m; ε_r = 41.362; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(7.91, 7.91, 7.91) @ 1900 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM with CRP; Type: SAM; Serial: TP:1720
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/1900MHz Verification/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 6.10 W/kg

Verification/1900MHz Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 67.91 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 7.30 W/kg
SAR(1 g) = 4.07 W/kg; SAR(10 g) = 2.14 W/kg
Smallest distance from peaks to all points 3 dB below = 9.6 mm
Ratio of SAR at M2 to SAR at M1 = 55.6%
Maximum value of SAR (measured) = 6.24 W/kg



Date: 2021-02-04

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: 1900MHz Verification_2021_02_04.da53:0

Input Power : 100 mW

Ambient Temp : 23.2℃ Tissue Temp : 21.9℃

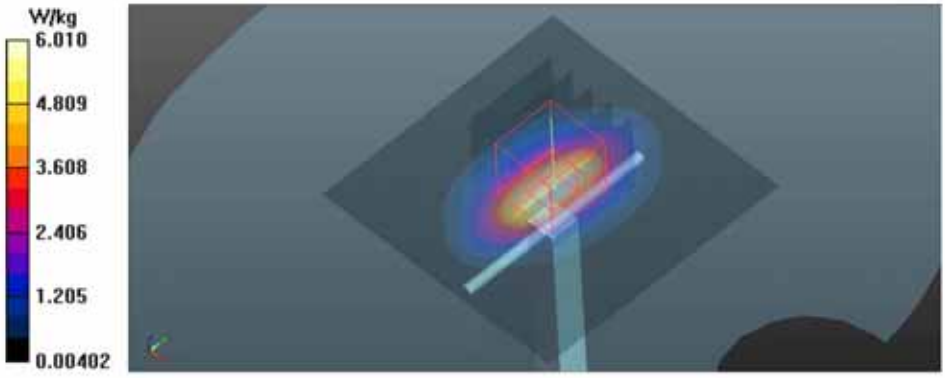
DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: D1900V2 - SN:5d033

Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.38 S/m; ε_r = 38.752; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(7.91, 7.91, 7.91) @ 1900 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM with CRP; Type: SAM; Serial: TP:1720
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/1900MHz Verification/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 6.01 W/kg

Verification/1900MHz Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 65.42 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 7.02 W/kg
SAR(1 g) = 3.92 W/kg; SAR(10 g) = 2.07 W/kg
Smallest distance from peaks to all points 3 dB below = 9.6 mm
Ratio of SAR at M2 to SAR at M1 = 55.8%
Maximum value of SAR (measured) = 6.00 W/kg



Appendix A.5 Verification Test Plots for 2600MHz

Date: 2021-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: 2600MHz Verification 2021_02_09.da53:0

Input Power : 100 mW

Ambient Temp : 22.8°C Tissue Temp : 21.8°C

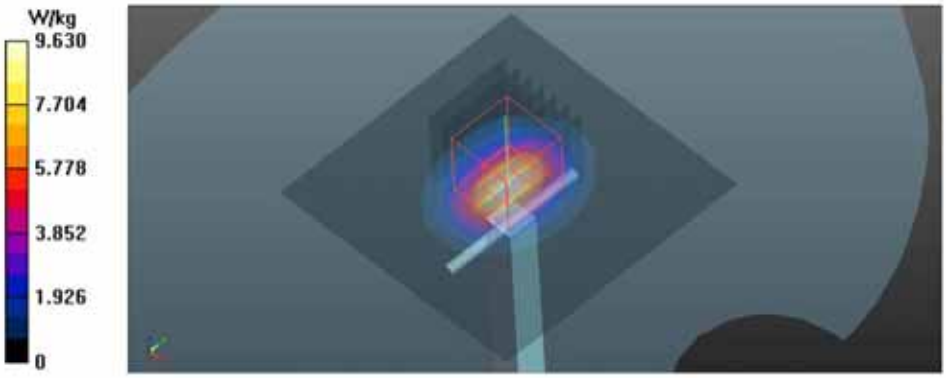
DUT: Dipole 2600 MHz D2600V2; Type: D2600V2; Serial: D2600V2 - SN:1124

Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.012 S/m; ε_r = 38.105; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(7.14, 7.14, 7.14) @ 2600 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM with CRP; Type: SAM; Serial: TP:1720
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/2600 MHz Verification/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 9.63 W/kg

Verification/2600 MHz Verification/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 72.74 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 12.2 W/kg
SAR(1 g) = 5.51 W/kg; SAR(10 g) = 2.42 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 44.6%
Maximum value of SAR (measured) = 9.67 W/kg



Appendix A.6 SAR Test Plots for GSM850

Date: 2021-02-05

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: GPRS 850_Front_CH190_2Tx.da53:0

Ambient Temp : 23.0℃ Tissue Temp : 21.5℃

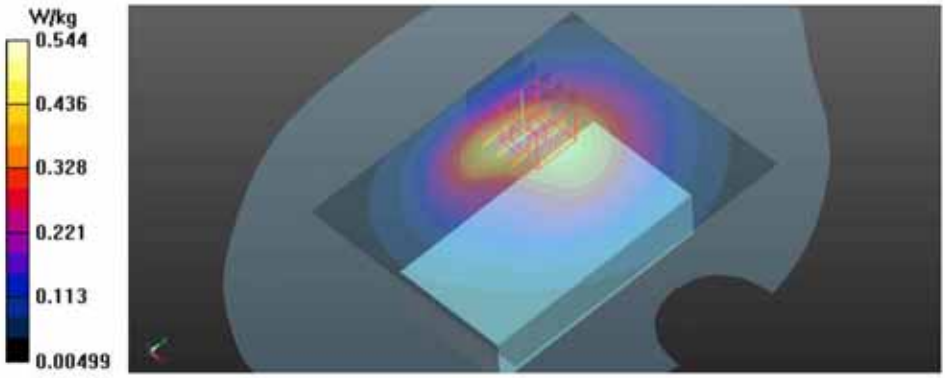
DUT: TM04ANNABM1; Type: LG Electronics; Serial: 2003091014011

Communication System: UID 0, GPRS850 2TX (0); Frequency: 836.6 MHz;Duty Cycle: 1:4.1505
Medium parameters used: f = 837 MHz; σ = 0.911 S/m; ε_r = 41.878; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(9.26, 9.26, 9.26) @ 836.6 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM 1300 (20deg probe tilt); Type: QD000P40CD; Serial: TP:1300
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Body/GPRS 850_Front_CH190_2Tx/Area Scan (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.544 W/kg

Body/GPRS 850_Front_CH190_2Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.77 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.601 W/kg
SAR(1 g) = 0.399 W/kg; SAR(10 g) = 0.272 W/kg
Smallest distance from peaks to all points 3 dB below = 21.8 mm
Ratio of SAR at M2 to SAR at M1 = 66.4%
Maximum value of SAR (measured) = 0.530 W/kg



Appendix A.7 SAR Test Plots for GSM1900

Date: 2021-02-02

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: GPRS 1900_Front_CH661_2Tx.da53:0

Ambient Temp : 23.2℃ Tissue Temp : 21.6℃

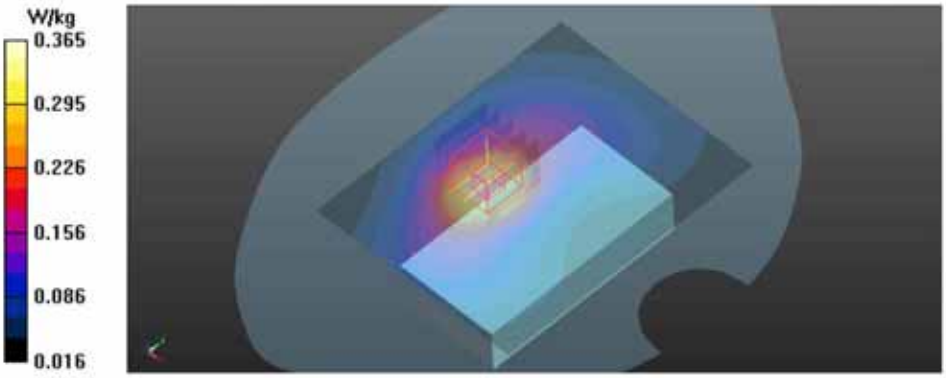
DUT: TM04ANNABM1; Type: LG Electronics; Serial: 2003091014011

Communication System: UID 0, GPRS1900 2TX (0); Frequency: 1880 MHz;Duty Cycle: 1:4.1505
Medium parameters used: f = 1880 MHz; σ = 1.371 S/m; ε_r = 41.397; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(7.91, 7.91, 7.91) @ 1880 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM with CRP; Type: SAM; Serial: TP:1720
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Body/GPRS 1900_Front_CH661_2Tx/Area Scan (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.365 W/kg

Body/GPRS 1900_Front_CH661_2Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.78 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.408 W/kg
SAR(1 g) = 0.264 W/kg; SAR(10 g) = 0.167 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 64.4%
Maximum value of SAR (measured) = 0.358 W/kg



Appendix A.8 SAR Test Plots for WCDMA V

Date: 2021-02-05

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: WCDMA FDD V_Front_CH4183.da53:0

Ambient Temp : 23.0℃ Tissue Temp : 21.5℃

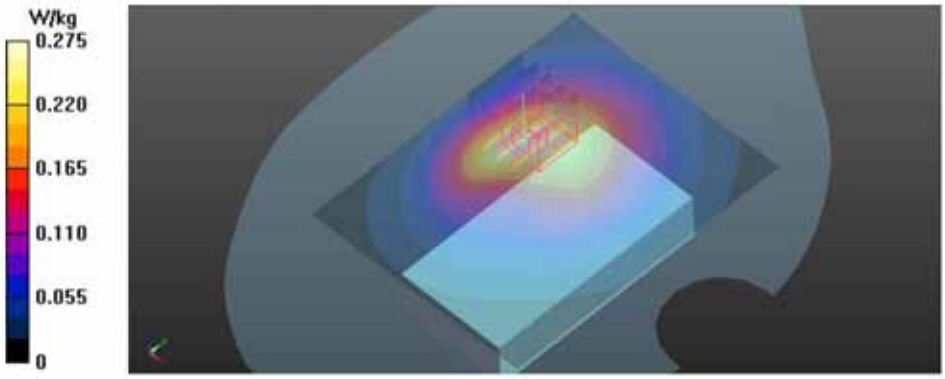
DUT: TM04ANNABM1; Type: LG Electronics; Serial: 2003091014011

Communication System: UID 0, WCDMA5 (0); Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 837 MHz; σ = 0.911 S/m; ε_r = 41.878; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(9.26, 9.26, 9.26) @ 836.6 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM 1300 (20deg probe tilt); Type: QD000P40CD; Serial: TP:1300
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Body/WCDMA FDD V_Front_CH4183/Area Scan (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.275 W/kg

Body/WCDMA FDD V_Front_CH4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.65 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.312 W/kg
SAR(1 g) = 0.206 W/kg; SAR(10 g) = 0.140 W/kg
Smallest distance from peaks to all points 3 dB below = 22.7 mm
Ratio of SAR at M2 to SAR at M1 = 66%
Maximum value of SAR (measured) = 0.275 W/kg



Appendix A.9 SAR Test Plots for WCDMA IV

Date: 2021-02-03

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: WCDMA FDD IV_Front_CH1412.da53:0

Ambient Temp : 23.0℃ Tissue Temp : 21.8℃

DUT: TM04ANNABM1; Type: LG Electronics; Serial: 2003091014011

Communication System: UID 0, WCDMA4 (0); Frequency: 1732.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1732.4 MHz; σ = 1.36 S/m; ε_r = 39.493; ρ = 1000 kg/m^3
Phantom section: Flat Section

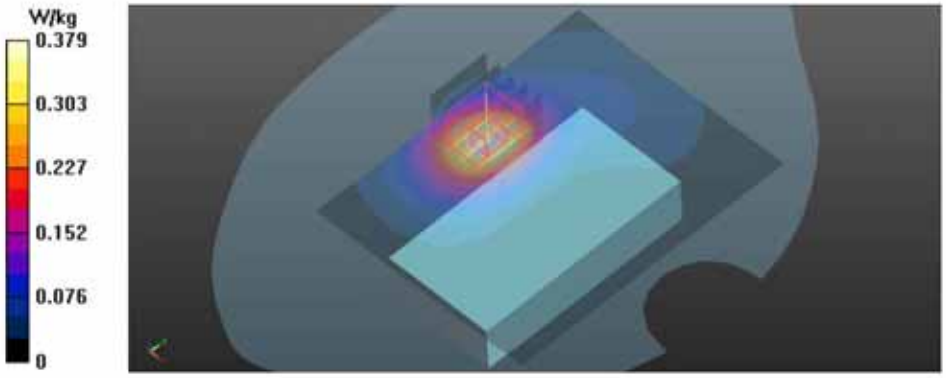
DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(8.21, 8.21, 8.21) @ 1732.4 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM 1300 (20deg probe tilt); Type: QD000P40CD; Serial: TP:1300
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Body/WCDMA FDD IV_Front_CH1412/Area Scan (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.379 W/kg

Body/WCDMA FDD IV_Front_CH1412/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.045 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.421 W/kg
SAR(1 g) = 0.261 W/kg; SAR(10 g) = 0.159 W/kg
Smallest distance from peaks to all points 3 dB below = 19.3 mm
Ratio of SAR at M2 to SAR at M1 = 62.4%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.363 W/kg



Appendix A.10 SAR Test Plots for WCDMA II

Date: 2021-02-04

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: WCDMA FDD II_Front_CH9400.da53:0

Ambient Temp : 23.2℃ Tissue Temp : 21.9℃

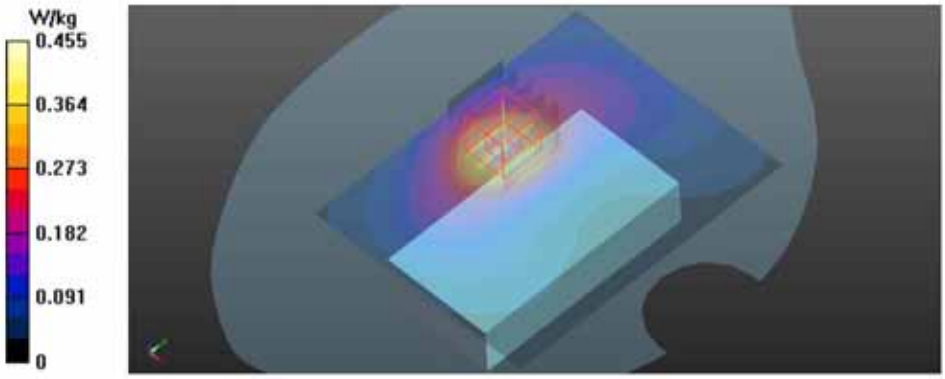
DUT: TM04ANNABM1; Type: LG Electronics; Serial: 2003091014011

Communication System: UID 0, WCDMA2 (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.376 S/m; ε_r = 38.804; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(7.91, 7.91, 7.91) @ 1880 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM with CRP; Type: SAM; Serial: TP:1720
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Body/WCDMA FDD II_Front_CH9400/Area Scan (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.455 W/kg

Body/WCDMA FDD II_Front_CH9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.66 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.549 W/kg
SAR(1 g) = 0.352 W/kg; SAR(10 g) = 0.220 W/kg
Smallest distance from peaks to all points 3 dB below = 23.8 mm
Ratio of SAR at M2 to SAR at M1 = 64.3%
Maximum value of SAR (measured) = 0.480 W/kg



Appendix A.11 SAR Test Plots for LTE Band 12

Date: 2021-02-08

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: LTE Band 12_10MHz_1RB_49 Offset_QPSK_Front_CH23130.da53:0

Ambient Temp : 23.2℃ Tissue Temp : 21.6℃

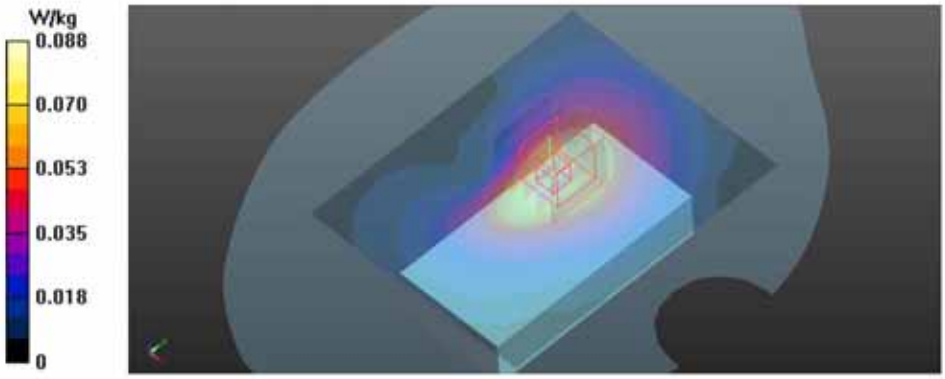
DUT: TM04ANNABM1; Type: LG Electronics; Serial: 2003091014011

Communication System: UID 0, LTE Band 12 (0); Frequency: 711 MHz;Duty Cycle: 1:1
Medium parameters used: f = 711 MHz; σ = 0.891 S/m; ε_r = 41.324; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(9.68, 9.68, 9.68) @ 711 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM with CRP v5.0_TP-1721; Type: QD000P40CD; Serial: TP-1721
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Body/LTE Band 12_10MHz_1RB_49 Offset_QPSK_Front_CH23130/Area Scan (81x101x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0877 W/kg

Body/LTE Band 12_10MHz_1RB_49 Offset_QPSK_Front_CH23130/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.23 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.0980 W/kg
SAR(1 g) = 0.065 W/kg; SAR(10 g) = 0.045 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 66.3%
Maximum value of SAR (measured) = 0.0858 W/kg



Appendix A.12 SAR Test Plots for LTE Band 5

Date: 2021-02-05

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: LTE Band 5_10MHz_25RB_12 Offset_QPSK_Front_CH20525.da53:0

Ambient Temp : 23.0℃ Tissue Temp : 21.5℃

DUT: TM04ANNABM1; Type: LG Electronics; Serial: 2003091014011

Communication System: UID 0, LTE Band 5 (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.911 S/m; ε_r = 41.885; ρ = 1000 kg/m^3
Phantom section: Flat Section

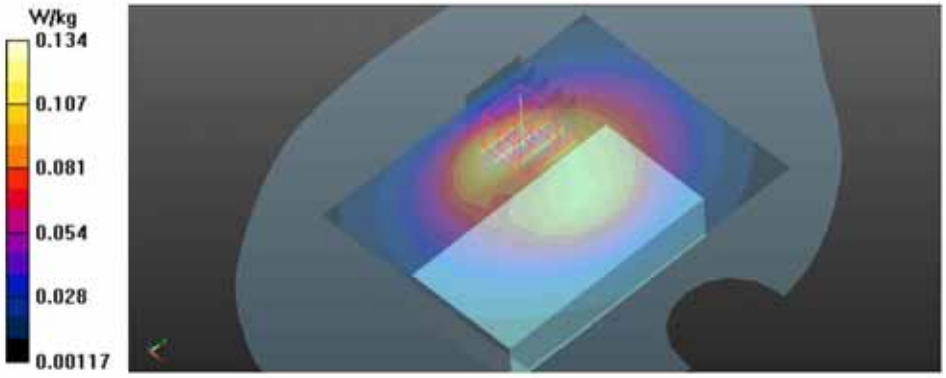
DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(9.26, 9.26, 9.26) @ 836.5 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM 1300 (20deg probe tilt); Type: QD000P40CD; Serial: TP:1300
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Body/LTE Band 5_10MHz_25RB_12 Offset_QPSK_Front_CH20525/Area Scan (81x101x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.134 W/kg

Body/LTE Band 5_10MHz_25RB_12 Offset_QPSK_Front_CH20525/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.24 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.160 W/kg
SAR(1 g) = 0.102 W/kg; SAR(10 g) = 0.067 W/kg
Smallest distance from peaks to all points 3 dB below = 19.5 mm
Ratio of SAR at M2 to SAR at M1 = 63.8%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.139 W/kg



Appendix A.13 SAR Test Plots for LTE Band 66

Date: 2021-02-03

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: LTE Band 66_20MHz_1RB_0 Offset_QPSK_Front_CH132072.da53:0

Ambient Temp : 23.0℃ Tissue Temp : 21.8℃

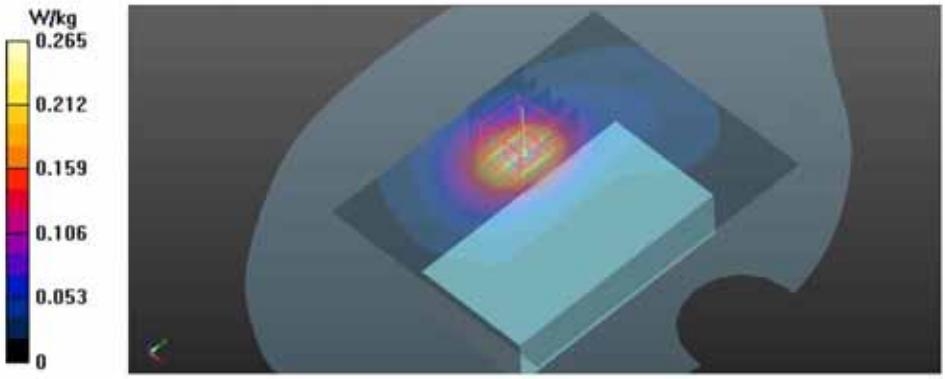
DUT: TM04ANNABM1; Type: LG Electronics; Serial: 2003091014011

Communication System: UID 0, LTE Band 66 (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.35 S/m; ε_r = 39.555; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(8.21, 8.21, 8.21) @ 1720 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM 1300 (20deg probe tilt); Type: QD000P40CD; Serial: TP:1300
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Body/LTE Band 66_20MHz_1RB_0 Offset_QPSK_Front_CH132072/Area Scan (81x101x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.265 W/kg

Body/LTE Band 66_20MHz_1RB_0 Offset_QPSK_Front_CH132072/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.263 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.293 W/kg
SAR(1 g) = 0.181 W/kg; SAR(10 g) = 0.110 W/kg
Smallest distance from peaks to all points 3 dB below = 17.9 mm
Ratio of SAR at M2 to SAR at M1 = 61.8%
Maximum value of SAR (measured) = 0.253 W/kg



Appendix A.14 SAR Test Plots for LTE Band 2

Date: 2021-02-02

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: LTE Band 2_20MHz_1RB_0 Offset_QPSK_Front_CH18700.da53:0

Ambient Temp : 23.2℃ Tissue Temp : 21.6℃

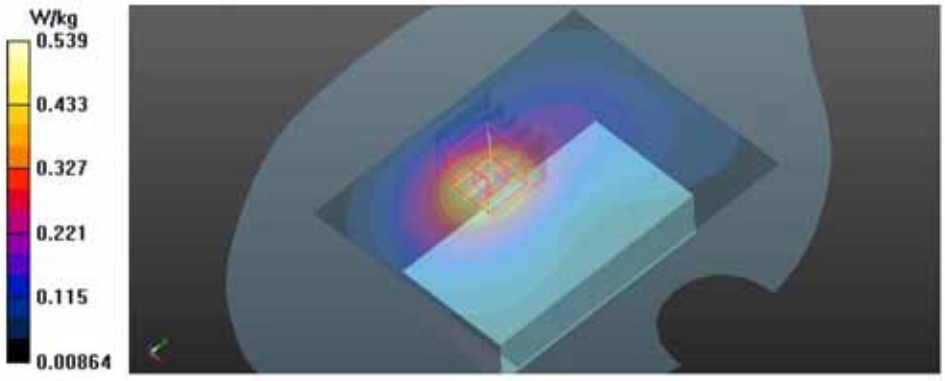
DUT: TM04ANNABM1; Type: LG Electronics; Serial: 2003091014011

Communication System: UID 0, LTE Band 2 (0); Frequency: 1860 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1860 MHz; σ = 1.351 S/m; ε_r = 41.461; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(7.91, 7.91, 7.91) @ 1860 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM with CRP; Type: SAM; Serial: TP:1720
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Body/LTE Band 2_20MHz_1RB_0 Offset_QPSK_Front_CH18700/Area Scan (81x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.539 W/kg

Body/LTE Band 2_20MHz_1RB_0 Offset_QPSK_Front_CH18700/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.25 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.594 W/kg
SAR(1 g) = 0.390 W/kg; SAR(10 g) = 0.247 W/kg
Smallest distance from peaks to all points 3 dB below = 22.6 mm
Ratio of SAR at M2 to SAR at M1 = 65.6%
Maximum value of SAR (measured) = 0.524 W/kg



Appendix A.15 SAR Test Plots for LTE Band 7

Date: 2021-02-09

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: LTE Band 7_20MHz_50RB_50 Offset_QPSK_Front_CH21100.da53:0

Ambient Temp : 22.8°C Tissue Temp : 21.8°C

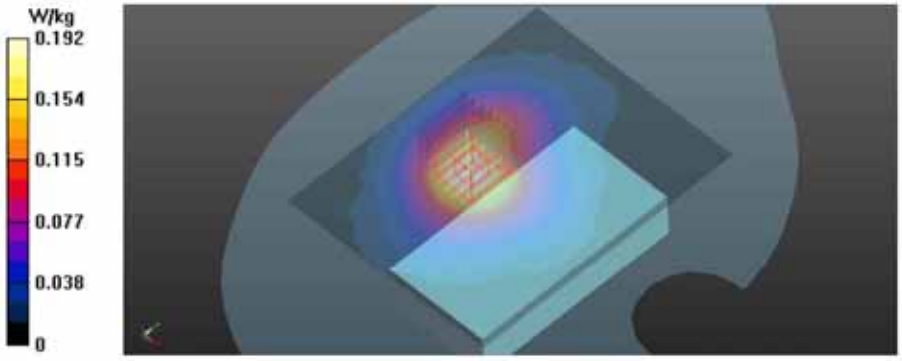
DUT: TM04ANNABM1; Type: LG Electronics; Serial: 2003091014011

Communication System: UID 0, LTE Band 7 (0); Frequency: 2535 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2535 MHz; σ = 1.934 S/m; ε_r = 38.237; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY52 Configuration:
- Probe: EX3DV4 - SN7574; ConvF(7.14, 7.14, 7.14) @ 2535 MHz; Calibrated: 2020-07-10
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2020-05-28
- Phantom: SAM with CRP; Type: SAM; Serial: TP:1720
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Body/LTE Band 7_20MHz_50RB_50 Offset_QPSK_Front_CH21100/Area Scan (121x151x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.192 W/kg

Body/LTE Band 7_20MHz_50RB_50 Offset_QPSK_Front_CH21100/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.641 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.237 W/kg
SAR(1 g) = 0.121 W/kg; SAR(10 g) = 0.066 W/kg
Smallest distance from peaks to all points 3 dB below = 21.2 mm
Ratio of SAR at M2 to SAR at M1 = 48.5%
Maximum value of SAR (measured) = 0.190 W/kg



-THE END-