SAR TEST REPORT

Number 14-030828-01-01

Be based on

Part 2.1093, IEEE 1528-2003

For

Applicant	**POINTMOBILE CO.,LTD**
Manufacturer	**POINTMOBILE CO.,LTD**
Model or Type	**PM60** **Mobile Computer**
Final HW Version	**Rev02**
Final SW Version	**62.00 C2**
Test result	**Pass**

Issue To: **POINTMOBILE CO.,Ltd** Gasan-dong, B-9F Kabul Great Valley 32, Digital-ro9-gil, Geumcheon-gu, Seoul, Korea	**Date of Application**	**2014-06-01**
	Date of Report	**2014-12-12**
	Date of Issue	**2014-12-15**

This Test Report consists of 42 pages with Appendix A,B,C

The above test certificate is the accredited test results by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

Korea Testing Laboratory

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Test Report revision History

Revision	Date	Comments
00	2014-10-28	Initial Version
01	2014-11-27	SKUs revised on page 6
02	2014-12-15	Added 5GHz body results

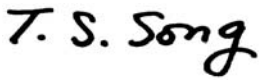
Signature

This Test Report is issued under the authority as below

Date : 15 December, 2014

Test Engineer : Jong-gon Ban

Reviewed/Approved by : Tae-Seung Song



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1. Administrative Information

1.1. Applicant Data

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1.2. Manufacturer Data (only if different from Appicant)

Company Name	
Address	
Contact Person	
Name	
E-mail	
Phone	

1.3. Testing Laboratory Data

The following list shows all places and laboratories involved for test result generation.

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2. EUT Information

2.1. General Description of the EUT

The following section lists all specifications of EUT (Equipment Under Test) involved in test. Additionally, KTL has received sufficient documentation from the client and/or manufacturer to perform the tests

General Information		
FCC ID & Model Number		FCC ID: **V2X-PM60-1**, Model Number: **PM60**
PM60	PM60G174356E0C	2G/3G, Wifi/BT, 2D (N560x), Camera,GPS, QWERTY, WEH6.5 : **Test sample selected**
	PM60G152356E0C	2G/3G, Wifi/BT, 1D(N4313), Camera, GPS, Numeric, WEH6.5
	PM60G154356E0C	2G/3G, Wifi/BT, 1D(N4313), Camera, GPS, QWERTY, WEH6.5
	PM60G152357E0C	2G/3G, Wifi/BT, 1D(N4313), Camera, GPS, Numeric, Android 4.2
	PM60G154357E0C	2G/3G, Wifi/BT, 1D(N4313), Camera, GPS, QWERTY, Android 4.2
	PM60G152356KKC	2G/3G-K, Wifi/BT, 1D(N4313), Camera, GPS, Numeric, WEH6.5
	PM60G172356KKC	2G/3G-K, Wifi/BT, 2D(N560x), Camera, GPS, Numeric, WEH6.5
	PM60G174356KKC	2G/3G-K, Wifi/BT, 2D (N560x), Camera,GPS, QWERTY, WEH6.5
	PM60G152357KKC	2G/3G-K, Wifi/BT, 1D(N4313), Camera, GPS, Numeric, Android 4.2
	PM60G172357KKC	2G/3G-K, Wifi/BT, 2D (N560x), Camera, GPS, Numeric, Android 4.2
	PM60G174357KKC	2G/3G-K, Wifi/BT, 2D (N560x), Camera, GPS, QWERTY, Android 4.2
	PM60G172356E0C	2G/3G, Wifi/BT, 2D (N560x)), Camera, GPS, Numeric, WEH6.5
	PM60G172357E0C	2G/3G, Wifi/BT, 2D (N560x), Camera, GPS, Numeric, Android 4.2
	PM60G174357E0C	2G/3G, Wifi/BT, 2D (N560x), Camera, GPS, QWERTY, Android 4.2
S canner/Decode Capabilities		1D Laser model: N4313 laser engine. 2D engine model: N560X 2D Imager.
GSM Specification		GSM/GPRS/EDGE850/1900, Multi-Slot Class 12
WCDMA Specification		UMTS850/1900
Antenna Type		Internal Antenna
WLAN Specification		802.11 b/g/n (HT20)
WLAN VoIP		Supported
Bluetooth Specification		V2.1+EDR
Mobile Hotspot		Not supported
Battery options		Li-ion, 3.7 V (4000mAh)
Device Dimension		Overall (Length x width) : 154 mm x 75 mm Overall Diagonal :158mm Display Diagonal : 89 mm

2.2. SAR Results Summaries

Band & Mode	Tx Frequency	SAR	
		1 g Head (W/kg)	1g Body (W/kg)
GSM/GPRS/EDGE 850	824.2 ~ 848.8 MHz	0.459	0.638
UMTS 850	826.4 ~ 846.6 MHz	0.564	0.686
GSM/GPRS/EDGE 1900	1850.2 ~ 1909.8 MHz	0.201	0.351
UMTS 1900	1852.4 ~ 1907.6 MHz	0.409	0.607
2.4 GHz WLAN	2412 ~ 2462 MHz	0.343	0.064
5.2 GHz WLAN	5180 ~ 5240 MHz	0.343	0.064
5.3 GHz WLAN	5260 ~ 5320 MHz	0.315	0.065
5.5 GHz WLAN	5500 ~ 5700 MHz	0.182	0.072
5.8 GHz WLAN	5745 ~ 5825 MHz	0.176	0.090

3. SAR DEFINITION

Specific Absortion Rate (SAR) is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density(p). It is also defined as the rate of RF energy absortion per unit mass at a point in an absorbing body. (see Figure.1)

$$SAR = \frac{d}{dt}\left(\frac{dU}{dm}\right) = \frac{d}{dt}\left(\frac{dU}{pdv}\right)$$

Figure 1 SAR Mathematical Equation

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

$$SAR = \sigma E^2 / p$$

Where :

σ = conductivity of the tissue-simulant material (S/m)
p = mass density of the tissue-simulant material (kg/m^3)
E = Total RMS electric field strength (V/m)

Note: The primary factors that control rate or energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.[4]

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with IEEE Standard 1528-2003 and the following published KDB procedures.

- FCC KDB Publication 941225 D01 SAR test for 3G devices v02
- FCC KDB Publication 941225 D03 SAR Test Reduction GSM GPRS EDGE v01
- FCC KDB Publication 447498 D01v05r02 (General SAR Guidance)
- FCC KDB Publication 648474 D04 Handset SAR v01r02
- FCC KDB Publication 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03
- FCC KDB Publication 865664 D02 SAR Reporting v01r01
- October 2013 TCB Workshop Notes (GPRS testing criteria)

5. DESCRIPTION OF SAR MEASUREMENT SYSTEM

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

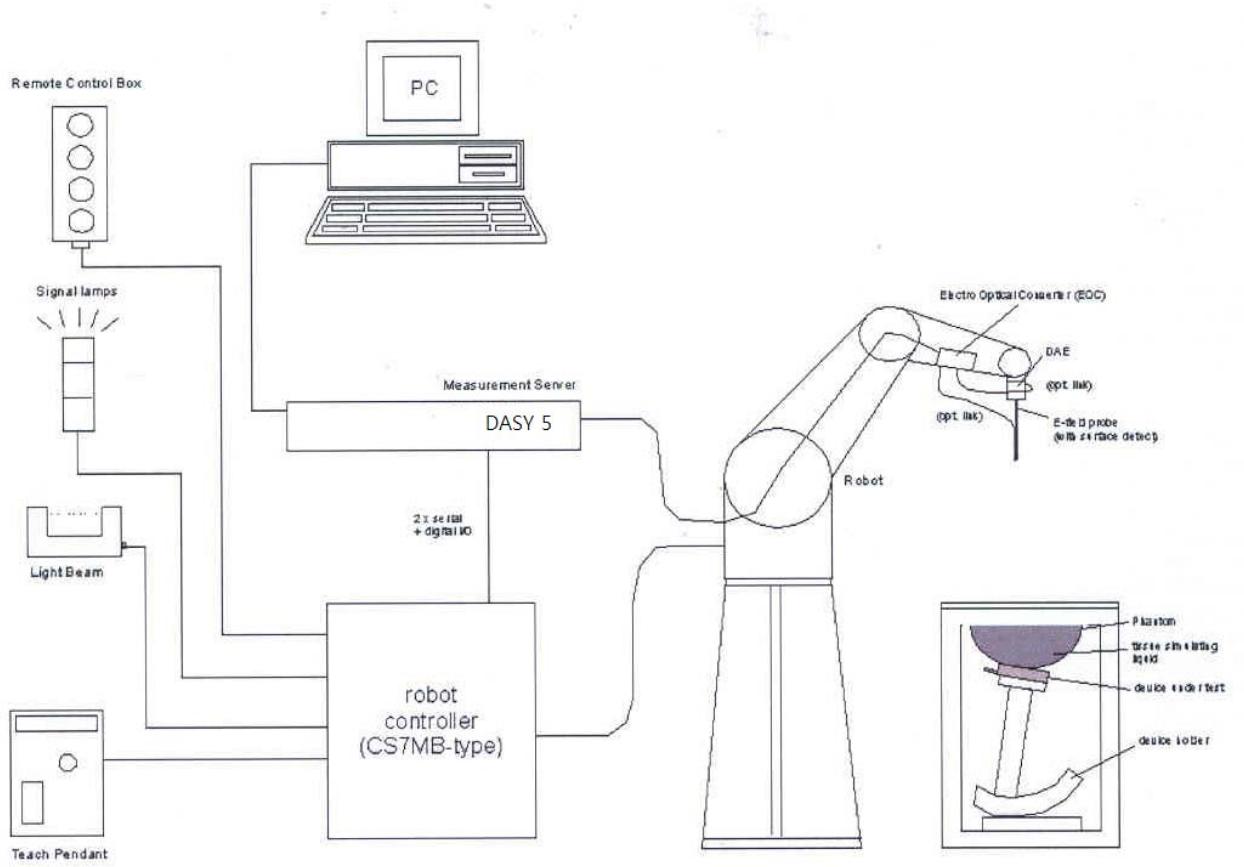


Figure 2 SAR Measurement System

- A standard high precision 6-axis robot with controller, teach pendant and software.
- Data acquisition electronics, DAE4 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain- switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit.
- Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines.
- The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts.
- The robot uses its own controller with a built in VME-bus computer. Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

6. SYSTEM VERIFICATION

6.1. Tissue Simulating Mixture Characterization

The mixture is characterized to obtain proper dielectric constant (permittivity) and conductivity of the tissue of interest. The tissue dielectric parameters recommended in IEEE 1528 have been used as targets for the compositions, and are to match within 5%, per the FC recommendations.

Ingredients (% by weight)	Frequency (MHz)							
	835		1900		2450		5200-5800	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body
Water	41.45	52.4	54.9	40.4	62.7	73.2	62.52	78.66
Salt (NaCl)	1.45	1.4	0.18	0.5	0.5	0.04	0.0	0.0
Sugar	56.0	45.0	0.0	58.0	0.0	0.0	0.0	0.0
HEC	1.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	36.8	0.0	17.24	10.67
DGBE	0.0	0.0	44.92	0.0	0.0	26.7	0.0	0.0
Diethylene glycol hexyl ether	-	-	-	-	-	-	17.24	10.67

Table 1 Composition of the Tissue Equivalent Materials

-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

6.2. Tissue Verification

The dielectric parameters of the brain and muscle simulating liquid were measured prior to SAR assessment using the SPEAG DAK-3.5 dielectric probe kit and Agilent 8753D Network Analyzer. The actual dielectric parameters are shown in the following table. The below measured tissue parameters were used in DASY software.

Freq. [MHz]	Liquid	Date	Liquid Temp [℃]	Parameters	Target Value	Measured Value	Dev. (%)	Limit (%)
835	Head	07/01/2014	22.5	εr	41.5	41.5	0.0	± 5
				σ	0.90	0.89	-1.1	± 5
835	Body	07/03/2014	22.7	εr	55.2	55.9	+1.2	± 5
				σ	0.97	0.96	-1.0	± 5
1900	Head	07/07/2014	22.3	εr	40.0	39.7	-0.7	± 5
				σ	1.40	1.45	+3.6	± 5
1900	Body	07/09/2014	22.2	εr	53.3	51.1	-4.1	± 5
				σ	1.52	1.57	+3.3	± 5
2450	Head	07/11/2014	22.6	εr	39.2	37.6	-4.1	± 5
				σ	1.80	1.82	+1.1	± 5
2450	Body	07/14/2014	22.8	εr	52.7	50.6	-4.0	± 5
				σ	1.95	1.88	-3.6	± 5
5200	Head	07/16/2014	22.4	εr	36.0	36.6	+1.7	± 5
				σ	4.66	4.73	+1.5	± 5
5200	Body	12/11/2014	21.5	εr	49.0	46.9	-4.3	± 5
				σ	5.30	5.43	+2.5	± 5
5500	Head	07/18/2014	22.2	εr	35.7	35.8	+0.3	± 5
				σ	4.97	5.05	+1.6	± 5
5500	Body	07/21/2014	22.3	εr	48.6	47.6	-2.1	± 5
				σ	5.7	5.78	+1.4	± 5
5800	Head	07/23/2014	22.5	εr	35.3	35.2	-0.3	± 5
				σ	5.27	5.5	+4.3	± 5
5800	Body	12/11/2014	21.0	εr	48.2	47.4	-1.7	± 5
				σ	6.00	5.94	-1.0	± 5

Table 2 Measured Simulating Liquid Dielectric Values

The humidity and dielectric/ambient temperatures are recorded during the assessment of the tissue material dielectric parameters. The difference between the ambient temperature of the liquid during the dielectric measurement and the temperature during tests was less than |2|°C.

6.3. System Validation

Prior to the SAR assessment, the system validation kit was used to verify that the DASY5 was operating within its specifications. The validation dipoles are highly symmetric and matched at the centre frequency for the specified liquid and distance to the phantom. The accurate distance between the liquid surface and the dipole centre is achieved with a distance holder that snaps onto the dipole. System validation is performed by feeding a known power level into a reference dipole, set at a known distance from the phantom. The measured SAR is compared to the theoretically derived level.

The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters typically every three to four days when the liquid parameters are re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

The measured 1g(10g) SAR should be within 10 % of the expected target reference values at the time of calibration by the calibration facility.

Tissue Frequency (MHz)	Tissue Type	Date	Probe SN	Dipole SN	Measured SAR 1g (W/kg)	Target SAR 1g (W/kg)	Deviation (%)	Limit (%)
835	Head	07/01/2014	3020	481	10.0	9.84	+1.6	±10
835	Body	07/03/2014	3020	481	10.4	10.0	+4.0	±10
1900	Head	07/07/2014	3020	5d038	42.0	40.4	+4.0	±10
1900	Body	07/09/2014	3020	5d038	42.4	40.8	+3.9	±10
2450	Head	07/11/2014	3020	746	54.8	52.8	+3.8	±10
2450	Body	07/14/2014	3020	746	52.4	50.0	+4.8	±10
5200	Head	07/16/2014	3905	1147	81.2	80.4	+0.1	±10
5200	Body	12/11/2014	3905	1147	76.0	82.8	+8.9	±10
5500	Head	07/18/2014	3905	1147	89.6	83.9	+6.8	±10
5500	Body	07/21/2014	3905	1147	85.0	78.0	+9.0	±10
5800	Head	07/23/2014	3905	1147	82.3	79.5	+3.5	±10
5800	Body	12/11/2014	3905	1147	75.1	75.2	+0.1	±10

Table 3 Deviation from Reference Validation Values

6.4. Justification for Extended SAR Dipole Calibrations

According to maintaining return loss and impedance requirements per extended calibrations in KDB 450824, usage of SAR dipole calibrated less than 2 years ago but more than 1 year ago was confirmed.

KDB 450824 requirements

a) return loss : < -20 dB, within 20% of prior calibration

b) impedance : within 5Ω from prior calibration.

D835V2 S/N:481					
Head/Body	**Date of Measurement**	**Return Loss (dB)**	**Δ%**	**Impedance (Ω)**	**ΔΩ**
Body	**04/25/2013**	-22.4	-	46.5	-
	04/03/2014	-19.5	-12.9	43.4	-3.1
D1900V2 S/N:5d038					
Head/Body	**Date of Measurement**	**Return Loss (dB)**	**Δ%**	**Impedance (Ω)**	**ΔΩ**
Body	**05/29/2013**	-22.5	-	47.5	-
	05/12/2014	-20.1	-10.6	45.7	-1.8

7. SAR MEASUREMENT PROCEDURE USING DASY5

The SAR evaluation is performed with the SPEAG DASY5 system as following;

Step 1: Power Reference Measurement

A measurement of the SAR value at a fixed location is used as a reference value for assessing the power drop of the EUT. The SAR at this point is measured at the start of the test and then again at the end of the test.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine scanning measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2dB range is required in IEEE Standards 1528 and IEC 62209 standards. If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters are as below table from KDB 865664 D01 SAR Measurement 100MHz to 6GHz v01r01.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1g and 10g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube shoes base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1g and 10g and displays these values next to the job's label.

Zoom Scan Parameters are as below table from KDB 865664 D01 SAR Measurement 100MHz to 6GHz v01r01.

Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details. * When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

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.

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not lager than the step size in Z-direction.

8. DESCRIPTION OF TEST POSITION

SAR measurements were performed in the “cheek” and “tilted” positions on left and right sides of the phantom according to IEEE 1528. Both were measured in the head section of the SAM Twin Phantom.

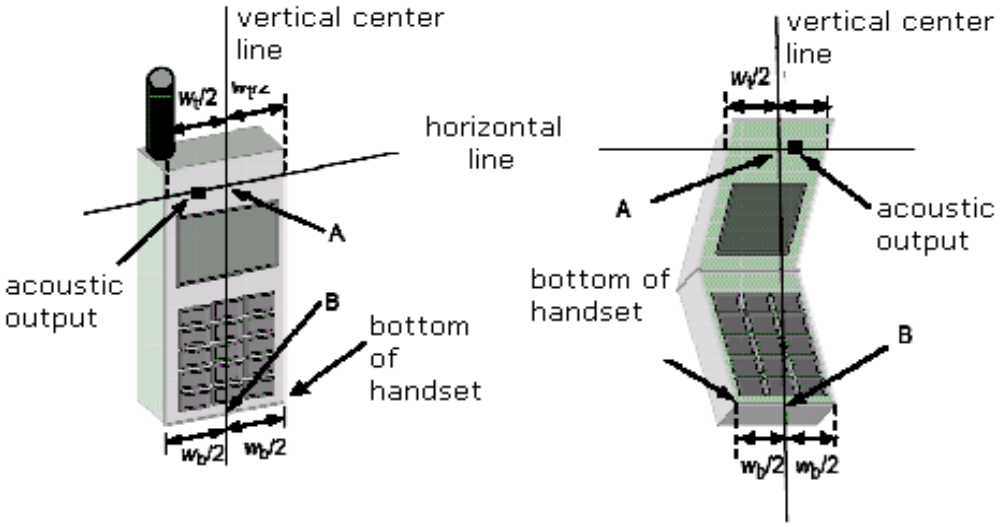


Figure 3 Handset vertical and horizontal reference line

8.1. Cheek Position

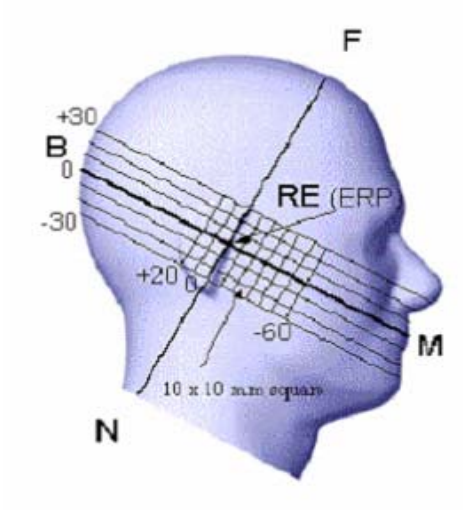


Figure 4 Side view of SAM phantom

The device was positioned with the vertical center line of the body of the device and the horizontal line crossing the center (see Figure 3) of the ear piece in a plane parallel to the sagittal plane of the phantom(see Figure 4). While maintaining the device in this plane, it was aligned the vertical center line with the reference plane containing the three ear and mouth reference points(M, RE and LE) and aligned the center of the ear piece with the line RE-LE. Then device was translated towards the phantom with the ear piece aligned with the line LE-RE until it touched the ear. While maintaining the device in the reference plane and maintaining the device contact with the ear, the bottom of the device was moved until any point on the front side is in contact with the cheek of the phantom.(see Figure 5)

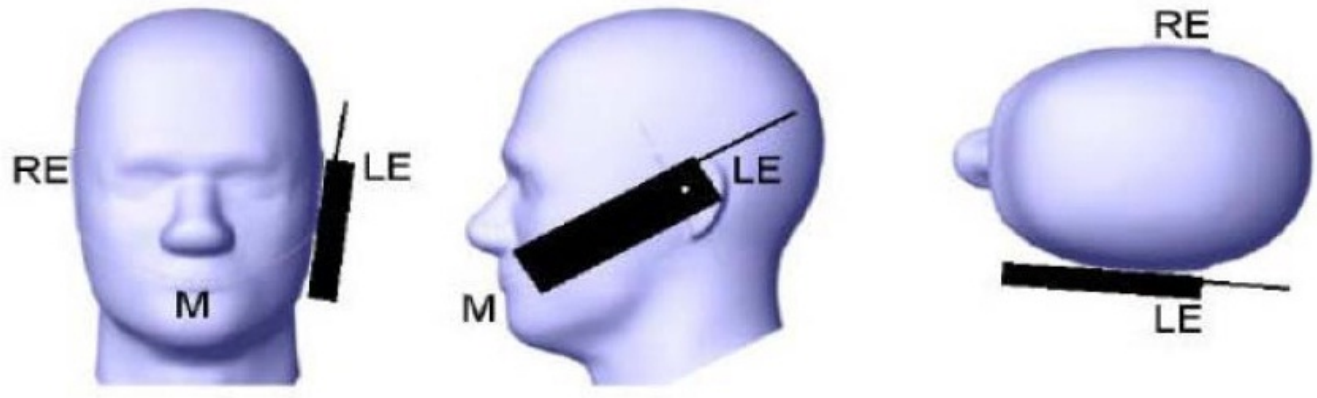


Figure 5 Cheek/Touch Position

8.2. Tilt Position

The device was positioned in the “Cheek” position. While maintaining the device in the reference plane described above cheek position and pivoting against the ear, device was moved outward away from the mouth by an angle of 15 degrees. (see Figure 6)

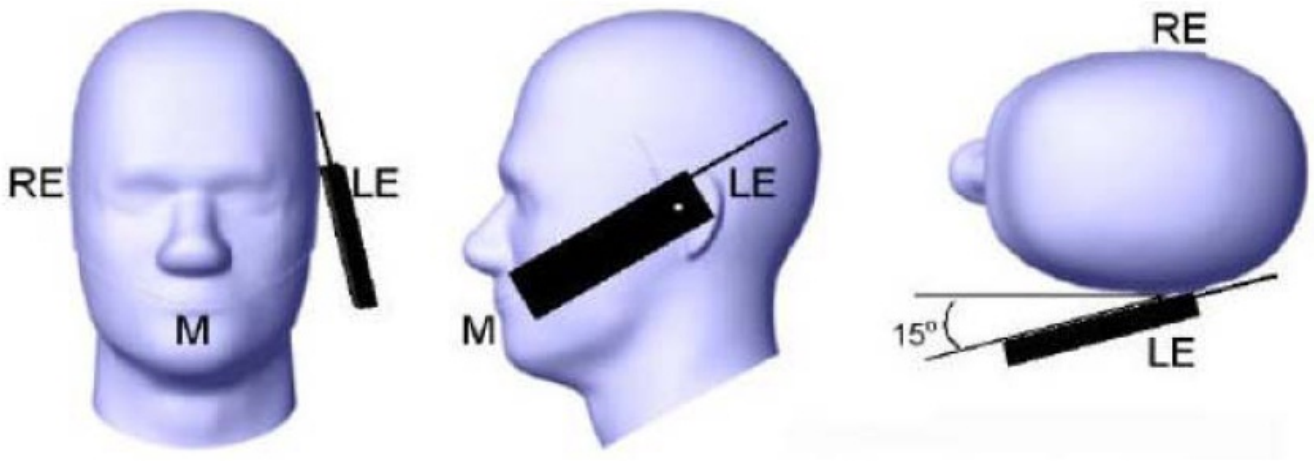


Figure 6 Ear/Tilt Position

Body-worn operating configurations are tested without the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration.

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

8.3. Body Holster/ Belt Clip Configurations

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the device and the flat phantom is used. Test position spacing was documented.

Transmitters that are designed to operate in front of a person's face, as the push-to-talk configurations, are test for SAR compliance with the front of the device positioned to face the flat phantom in brain fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

In all cases SAR measurements are performed to investigate the worst-case positioning. Worst-case positioning is then documented and used to perform Body SAR testing.

9. MEASUREMENT UNCERTAINTY

Applicable for frequencies up to 6GHz

Uncertainty Component	Tol. (%)	Prob Dist	Div	c_i 1g	c_i 10g	u_i(%) 1g	u_i(%) 10g	v_i
Measurement System								
Probe Calibration	± 6.55	N	1	1	1	± 6.55	± 6.55	∞
Axial Isotropy	± 4.70	R	√3	0.7	0.7	± 1.90	± 1.90	∞
Hemispherical Isotropy	± 9.60	R	√3	0.7	0.7	± 3.38	± 3.38	∞
Linearity	± 4.70	R	√3	1	1	± 2.71	± 2.71	∞
System Detection Limits	± 1.00	R	√3	1	1	± 0.58	± 0.58	∞
Boundary Effect	± 1.00	R	√3	1	1	± 0.58	± 0.58	∞
Response Time	± 0.80	R	√3	1	1	± 0.46	± 0.46	∞
RF Ambient conditions	± 3.00	R	√3	1	1	± 1.73	± 1.73	∞
Readout Electronics	± 1.00	N	1	1	1	± 1.00	± 1.00	∞
Integration time	± 2.60	R	√3	1	1	± 1.50	± 1.50	∞
Probe Positioner	± 0.40	R	√3	1	1	± 0.23	± 0.23	∞
Probe Positioning	± 2.90	R	√3	1	1	± 1.67	± 1.67	∞
Max. SAR evaluation	± 1.00	R	√3	1	1	± 0.58	± 0.58	∞
Test Sample Related								
Device Positioning	± 2.90	N	1	1	1	± 2.90	± 2.90	145
Device Holder	± 3.60	N	1	1	1	± 3.60	± 3.60	5
Power Drift	± 5.00	R	√3	1	1	± 2.89	± 2.89	∞
Phantom and Setup								
Phantom Uncertainty	± 4.00	R	√3	1	1	± 2.31	± 2.31	∞
Liquid Conductivity (target)	± 5.00	R	√3	0.64	0.43	± 1.85	± 1.24	∞
Liquid Conductivity (meas.)	± 2.07	N	1	0.78	0.71	± 1.61	± 1.47	9
Liquid Permittivity (target)	± 5.00	R	√3	0.60	0.49	1.73	1.43	∞
Liquid Permittivity (meas.)	± 3.07	N	1	0.26	0.26	± 0.80	± 0.80	9
Combined Std. Uncertainty (k=1)			RSS			10.43	10.33	
Expanded STD Uncertainty (95% CONFIDENCE LEVEL)			**k=2**			20.87	20.66	

Table 4 Uncertainty Budget

10. FCC RF Exposure Limits

HUMAN EXPOSURE	UNCONTROLLED ENVIRONMENT General Population (W/Kg) or (mW/g)	CONTROLLED ENVIRONMENT Occupational (W/Kg) or (mW/g)
SPATIAL PEAK SAR (Brain)	1.60	8.00
SPATIAL AVERAGE SAR (Whole Body)	0.08	0.40
SPATIAL PEAK SAR (Hand / Feet / Ankle / Wrist)	4.00	20.00

Table 5 Safety Limits for Partial Body Exposure

NOTE :

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

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

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

11. RF CONDUCTED POWERS

11.1. Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v05.

Band & Mode		Voice [dBm]	Burst Average GMSK [dBm]				Burst Average 8PSK [dBm]			
		1TX Slot	1TX Slot	2TX Slot	3TX Slot	4TX Slot	1TX Slot	1TX Slot	1TX Slot	1TX Slot
GSM/GPRS/ EDGE 850	Maximum	34.0	34.0	31.0	29.2	28.0	28.0	25.0	23.2	22.0
	Nominal	33.0	33.0	30.0	28.2	27.0	27.0	24.0	22.2	21.0
GSM/GPRS/ EDGD1900	Maximum	31.0	31.0	28.0	26.2	25.0	27.0	24.0	22.2	21.0
	Nominal	30.0	30.0	27.0	25.2	24.0	26.0	23.0	21.2	20.0

Mode		Modulated Average Power (dBm)
GSM850	Maximum	34
	Nominal	33
GSM1900	Maximum	31
	Nominal	30
UMTS Band V(850)	Maximum	25
	Nominal	24
UMTS Band II(1900)	Maximum	25
	Nominal	24
IEEE 802.11b (2.4G)	Maximum	16
	Nominal	14.5
IEEE 802.11g (2.4G)	Maximum	16
	Nominal	14.5
IEEE 802.11n (2.4G)	Maximum	15
	Nominal	13.5
IEEE 802.11a (5G)	Maximum	15
	Nominal	13.5
IEEE 802.11n (5G)	Maximum	14
	Nominal	12.5

***Output Power Tolerance**:

- GSM: [Min: - 2 dB / Max: + 1 dB]
- WCDMA: [Min: - 3 dB / Max: + 1dB]
- WLAN 2.4 GHz: [Min: - 2.5 dB / Max: +1.5 dB]
- WLAN 5 GHz: [Min: -2.5 dB / Max: +1.5 dB]

11.2. SAR scaling factors sample calculation

Scaled SAR results are derived after scaling factors are applied to the measured values as below. Scaling for maximum tune-up tolerance must be considered separately.

SAR Section	Test Position	Mode	Scan	Dist. (mm)	Freq. (MHz)	CH #	Power (dBm)		SAR 1g (W/kg)	Scaling Factor	Scaled SAR 1g (W/kg)	Plot. No.
							Max. allowed	Mea-sured				
Body	Rear	RMC	1D N4313	15	835	4175	25.00	23.87	0.529	1.296	0.686	6

*Scaled SAR = Measured SAR x Scaling Factor

0.686 = 0.529 x 1.296

11.3. GSM/GPRS/EDGE Conducted output Power Measurements

Conducted output power measurements were performed with a base station simulator under digital average power. SAR measurements for GSM/GPRS/EDGE modes were performed with a base station simulator R&S CMU200. Communication between the device and the emulator was established by air link. Set base station emulator to allow DUT to radiate maximum output power during all tests. Followings are the worst configuration setup for SAR tests.

* GSM voice: Head SAR
* GPRS Multi-slots: Body SAR with GPRS Multi-slot Class12 with CS 1 (GMSK)

Note;

CS1/MCS7 coding scheme was used in GPRS/EDGE output power measurements and SAR Testing, as a condition where GMSK/8PSK modulation was ensured. Investigation has shown that CS1 - CS4/ MCS5 –MCS9 settings do not have any impact on the output levels in the GPRS/EDGE modes.

Figure 7 Power Measurement Setup

11.4. GSM/GPRS/EDGE Conducted output Powers

Band	Mode	Multi Slot	Maximum Burst-Averaged Output Power (dBm)			Calculated Maximum Frame-Averaged Output Power(dBm)		
			128CH	190CH	251CH	128CH	190CH	251CH
GSM850	GSM	1 Tx slot	33.16	33.23	33.21	24.13	24.20	24.18
	GPRS	1 Tx slot	33.13	33.21	33.18	24.10	24.18	24.15
		2 Tx slots	30.60	30.73	30.61	**24.58**	**24.71**	**24.59**
		3 Tx slots	28.71	28.74	28.87	24.44	24.47	24.60
		4 Tx slots	27.22	27.44	27.32	24.21	24.43	24.31
	EDGE	1 Tx slot	27.13	27.01	26.89	18.10	17.98	17.86
		2 Tx slots	23.70	23.62	23.45	17.68	17.60	17.43
		3 Tx slots	21.96	21.83	21.70	17.69	17.56	17.43
		4 Tx slots	21.25	21.13	20.99	18.24	18.12	17.98
Band	**Mode**	**Multi Slot**	**Maximum Burst-Averaged Output Power (dBm)**			**Calculated Maximum Frame-Averaged Output Power(dBm)**		
			512CH	**661CH**	**810CH**	**512CH**	**661CH**	**810CH**
GSM1900	GSM	1 Tx slot	29.76	29.56	30.01	20.73	20.53	20.98
	GPRS	1 Tx slot	29.68	29.65	29.71	20.65	20.62	20.68
		2 Tx slots	26.79	26.65	26.78	**20.77**	**20.63**	**20.76**
		3 Tx slots	24.82	24.81	24.86	20.55	20.54	20.59
		4 Tx slots	23.40	23.59	23.44	20.39	20.58	20.43
	EDGE	1 Tx slot	26.51	25.75	25.71	17.48	16.72	16.68
		2 Tx slots	23.23	22.81	22.57	17.21	16.79	16.55
		3 Tx slots	21.81	21.23	21.01	17.54	16.96	16.74
		4 Tx slots	20.42	19.85	19.64	17.41	16.84	16.63

Note:

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 2 Tx slots GPRS modes were selected for SAR testing according to the highest frame-averaged output power table according to KDB 941225 D03v01.

11.5. UMTS Conducted output Power Measurements

Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01 “SAR Measurement Procedures for 3G Devices” V2, October 2007.

The device was placed into a simulated call using a base station simulator R&S CMU200. Establishing connections in this manner ensure a consistent means for SAR and are recommended for evaluating SAR. EUTs were evaluated prior to testing, with a fully charged battery and were configured to operate at maximum output power.

Output Power Verification

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

Head SAR Measurements

SAR for head exposure configurations is measured using the 12.2 kbps RMC with TPC bits configured to all “1s”. SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2 kbps AMR is less than ¼ dB higher than that measured in 12.2 kbps RMC. Otherwise, SAR is measured on the maximum output channel in 12.2 AMR with a 3.4 kbps SRB (signaling radio bearer) using the exposure configuration that results in the highest SAR for that RF channel in 12.2 RMC.

Body SAR Measurements

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

Handsets with Release 5 HSDPA

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 using12.2 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 12.2kbps 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.

Handsets with Release 6 HSPA (HSDPA/HSUPA)

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.

11.6. UMTS Conducted output Powers

Band	Mode	3GPP 34.121 Subtest	Conducted Powers (dBm)		
			4132CH	4175CH	4233CH
WCDMA850	WCDMA	12.2 kbps RMC	**23.86**	**23.87**	**24.11**
		12.2 kbps AMR	23.84	23.85	24.06
	HSDPA	Subtest 1	23.50	23.50	23.41
		Subtest 2	23.70	23.69	23.42
		Subtest 3	23.20	23.20	23.16
		Subtest 4	23.18	23.21	23.01
	HSUPA	Subtest 1	22.48	22.92	22.61
		Subtest 2	21.67	21.42	21.43
		Subtest 3	21.84	21.89	22.01
		Subtest 4	21.70	21.68	21.80
		Subtest 5	22.50	23.01	23.37

Band	Mode	3GPP 34.121 Subtest	Conducted Powers (dBm)		
			9262CH	9400CH	9538CH
WCDMA1900	WCDMA	12.2 kbps RMC	**23.71**	**23.71**	**23.70**
		12.2 kbps AMR	23.66	23.68	23.68
	HSDPA	Subtest 1	23.40	23.81	23.25
		Subtest 2	23.61	23.54	23.33
		Subtest 3	23.20	23.24	22.85
		Subtest 4	23.28	23.29	23.15
	HSUPA	Subtest 1	22.81	22.83	22.60
		Subtest 2	21.70	21.56	21.45
		Subtest 3	22.06	21.93	21.93
		Subtest 4	22.00	21.52	21.49
		Subtest 5	22.39	22.60	22.44

Note:

1. The UMTS output powers were measured according to the test requirements outlined in section 5.2 of 3GPP TS34.121-1.
2. UMTS SAR was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v02.
3. HSPA SAR was not required since the average output power of the HSPA subsets was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.
4. 3GPP MPR setting was applied to the each HSPA subtest modes.

11.7. 802.11b/g/n (2.4GHz) Conducted Output Powers

Required Test channels

Mode	Band	Frequency (GHz)	Channel	"Default Test Channels"	
				802.11b	802.11g
802.11b	2.4 GHz	2.412	1#	√	▽
		2.437	6	√	▽
		2.462	11#	√	▽

Notes:
√ = "default test channels"
▽ = possible 802.11g channels with maximum average output 1/4 dB higher than the "default test channels"
= when output power is reduced for channel 1 and/or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

Conducted Output Powers

WLAN mode	Worst Power Data Rate [Mbps]	Conducted Powers (dBm)		
		2412MHz	2437MHz	2462MHz
802.11b	1	13.93	**14.12**	14.03
	2	14.01	13.95	13.93
	5.5	13.90	13.82	14.08
	11	13.95	13.96	14.08
802.11g	6	14.08	14.08	14.09
	9	13.94	14.20	13.95
	12	13.96	14.71	14.16
	18	14.12	**14.97**	14.25
	24	13.95	13.99	14.32
	36	14.08	14.28	14.06
	48	13.88	13.87	13.87
	54	13.51	13.80	13.71
802.11n	MCS0	13.61	13.82	13.80
	MCS1	13.96	13.98	13.98
	MCS2	13.85	13.97	13.85
	MCS3	13.61	14.25	13.90
	MCS4	13.94	13.87	13.99
	MCS5	13.47	13.33	13.54
	MCS6	13.53	13.35	13.36
	MCS7	12.50	12.75	12.62

Note: Per KDB 248227 D01, SAR is not required for 802.11n mode when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b mode.

11.8. 802.11a/n(5GHz) Conducted Output Powers

Required Test channels

WLAN mode		Band	Frequency (GHz)	Channel	"Default Test Channels"	
					802.11a	
802.11a	UNII (15.407)	5.2 GHz	5.180	36		
			5.200	40		*
			5.220	44		*
			5.240	48	√	
		5.3 GHz	5.260	52		
			5.280	56		*
			5.300	60	√	*
			5.320	64		
		5.5 GHz	5.500	100	√	*
			5.520	104		
			5.540	108		*
			5.560	112		*
			5.580	116		
			5.600	120		*
			5.620	124		
			5.640	128		*
			5.660	132		*
			5.680	136		
			5.700	140		*
	DTS (15.247)	5.8 GHz	5.745	149	√	
			5.765	153		*
			5.785	157		
			5.805	161		*
			5.825	165		

Note :
√ = "default test channels"
* = possible 802.11a channels with maximum average output > the "default test channels"

802.11a Conducted Output Powers

Mode	Freq. (MHz)	Channel	802.11a (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36	10.44	10.51	10.38	10.37	10.66	10.51	10.41	10.35
802.11a	5220	42	10.49	10.44	10.41	10.47	10.53	10.52	10.53	10.46
802.11a	5240	**48** √	**10.76**	10.71	10.70	10.67	10.73	10.74	10.71	10.66
802.11a	5260	52	10.64	10.59	10.60	10.56	10.62	10.60	10.62	10.59
802.11a	5280	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5300	**60** √	11.24	11.20	**11.29**	11.18	11.22	11.22	11.19	11.19
802.11a	5320	64	11.23	11.20	11.18	11.18	11.19	11.17	11.21	11.17
802.11a	5500	**100***	12.48	12.39	12.30	12.41	**13.11**	12.43	12.42	12.39
802.11a	5520	104	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5540	108	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5560	112	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5580	116	12.02	11.99	11.94	11.99	11.96	11.96	11.99	11.94
802.11a	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5660	132	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5680	136	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5700	140	10.11	10.03	10.09	10.05	10.03	10.01	10.05	9.99
802.11a	5745	**149** √	9.93	9.84	9.83	9.88	**9.96**	9.90	9.80	9.73
802.11a	5765	153	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5785	157	8.71	8.66	8.64	8.65	8.61	8.60	8.64	8.66
802.11a	5805	161	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11a	5825	165	7.95	7.88	7.84	7.85	7.92	7.90	7.83	7.84

Note:

Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02.

- For 5GHz, highest average RF output power channels for the lowest data rate for IEEE 802.11a were selected for SAR evaluation.
- When the maximum extrapolated peak SAR of the zoom scan for the maximum output channel is <1.6 W/kg and the reported 1g averaged SAR I <0.8 W/kg, SAR testing on other channels is not required.

√ = SAR Measured default test channels

* = SAR Measured channel which has higher output power than default test channels

802.11n Conducted Output Powers

Mode	Freq. (MHz)	Channel	802.11n (5GHz) Conducted Power [dBm]							
			Data Rate [Mbps]							
			6.5	13	19.5	26	39	52	58.5	65
802.11n	5180	36	10.27	10.41	10.34	10.41	10.37	10.35	10.30	10.39
802.11n	5200	40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5220	44	9.98	10.41	10.40	10.36	10.41	10.38	10.37	10.38
802.11n	5240	48	10.33	10.68	10.63	10.72	10.61	10.63	10.60	10.57
802.11n	5260	52	10.64	10.58	10.59	10.61	10.51	10.55	10.55	10.52
802.11n	5280	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5300	60	11.17	11.17	11.13	11.12	11.18	11.11	11.11	11.17
802.11n	5320	64	10.83	11.15	11.17	11.15	11.08	11.11	11.15	11.11
802.11n	5500	100	12.94	12.42	12.40	12.37	12.44	12.35	12.44	12.39
802.11n	5520	104	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5540	108	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5560	112	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5580	116	12.94	12.42	12.40	12.37	12.44	12.35	12.44	12.39
802.11n	5600	120	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5620	124	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5640	128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5660	132	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5680	136	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5700	140	10.55	10.03	10.03	10.00	10.01	10.03	9.97	9.99
802.11n	5745	149	9.43	9.85	9.80	9.80	9.81	9.84	9.80	9.84
802.11n	5765	153	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5785	157	9.17	8.50	8.65	8.62	8.61	8.62	8.57	8.67
802.11n	5805	161	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
802.11n	5825	165	8.93	7.82	7.83	7.82	7.81	7.83	7.85	7.87

Note:

Justification for reduced test configurations for WIFI channels per KDB Publication 248227 D01v01r02.

- For 5GHz, highest average RF output power channels for the lowest data rate for IEEE 802.11a were selected for SAR evaluation.

11.9. Bluetooth Conducted Output Powers

Modulation	Max Allowed Output Power (mW)
Bluetooth (GFSK, 8-DPSK)	2.52 (4dBm)

Per FCC KDB 447498 D01v05, the SAR exclusion threshold for distance <50mm is defined by the following equation:

$$\frac{Max\ Power\ of\ Channel\ (mW)}{Test\ Separation\ Dist\ (mm)} * \sqrt{Frequency(GHz)} \leq 3.0$$

Based on the maximum conducted power of Bluetooth (rounded to the nearest mW) and the antenna to user separation distance, **Bluetooth body-worn accessory SAR was not required**. [(2.52/15)*√ 2.441] = 0.26 < 3.0

12. SAR TEST CONDITIONS & ANTENNA INFORMATION

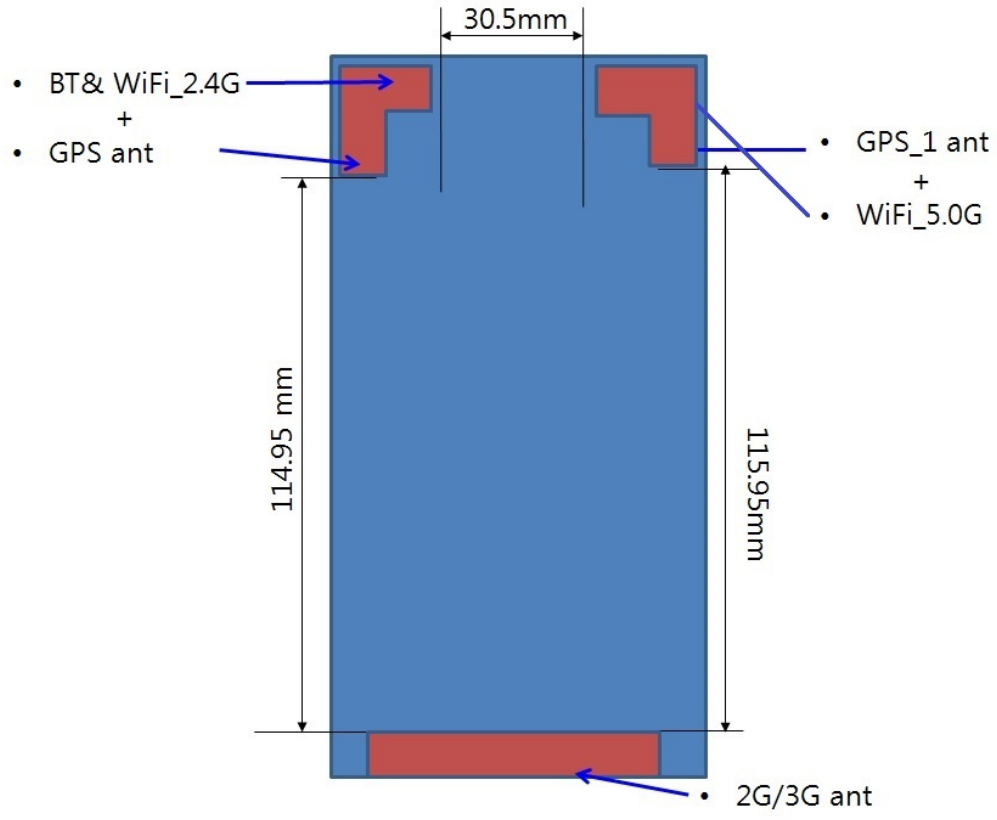
12.1. Standalone SAR Measurements

Test Modes	Head SAR	Body SAR	Note
WWAN	Yes	Yes	
2.4 GHz WLAN	Yes	Yes	
5.0 GHz WLAN	Yes	Yes	
Bluetooth	No	No	SAR is not required according to the KDB 447498 D01 - 1g SAR test Exclusion thresholds conditions.

12.2. Simultaneous SAR Measurements

RF Exposure Condition	Capable Transmit Configurations
Head	WWAN+BT only
Body	WWAN+BT only
Hotspot & WiFi Direct	Not supported

12.3. Antenna Information



13. SAR MEASUREMENT RESULTS

13.1. GSM850 SAR Measurement Results

SAR Section	Test Position	Mode	Scanner	Keypad Type	Dist. (mm)	Freq. (MHz)	CH #	Power (dBm)		SAR 1g (W/kg)	Scaling Factor	Scaled SAR 1g (W/kg)	Plot. No.
								Max. allowed	Mea-sured				
Head	Left Touch	Voice	2D N560x	QWERTY	N/A	836.6	190	34.00	33.23	0.248	1.193	0.296	-
	Left Tilt	Voice	2D N560x	QWERTY	N/A	836.6	190	34.00	33.23	0.199	1.193	0.237	-
	Right Touch	Voice	2D N560x	QWERTY	N/A	836.6	190	34.00	33.23	0.317	1.193	0.378	-
	Right Tilt	Voice	2D N560x	QWERTY	N/A	836.6	190	34.00	33.23	0.211	1.193	0.252	-
	Right Touch	Voice	2D N560x	NUMERIC	N/A	836.6	190	34.00	33.23	0.372	1.193	0.444	-
	Right Touch	Voice	1D N4313	NUMERIC	N/A	836.6	190	34.00	33.23	0.385	1.193	**0.459**	**1**
Body	Front	Voice	2D N560x	QWERTY	15	836.6	190	34.00	33.23	0.281	1.193	0.335	-
	Rear	Voice	2D N560x	QWERTY	15	836.6	190	34.00	33.23	0.347	1.193	0.414	-
	Rear	GPRS 2TX	2D N560x	QWERTY	15	836.6	190	31.00	30.73	0.337	1.064	0.359	-
	Rear	Voice	2D N560x	NUMERIC	15	836.6	190	34.00	33.23	0.403	1.193	0.481	-
	Rear	Voice	1D N4313	NUMERIC	15	836.6	190	34.00	33.23	0.535	1.193	**0.638**	**2**
	ANSI/IEEE C95.1 – 1992-Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							**1.6 W/kg (mW/g)** Averaged over 1 gram					

13.2. GSM1900 SAR Measurement Results

SAR Section	Test Position	Mode	Scanner	Keypad Type	Dist. (mm)	Freq. (MHz)	CH #	Power (dBm)		SAR 1g (W/kg)	Scaling Factor	Scaled SAR 1g (W/kg)	Plot. No.
								Max. allowed	Mea-sured				
Head	Right Touch	Voice	2D N560x	QWERTY	N/A	1880	661	31.00	29.56	0.089	1.393	0.124	-
	Right Tilt	Voice	2D N560x	QWERTY	N/A	1880	661	31.00	29.56	0.041	1.393	0.057	-
	Left Touch	Voice	2D N560x	QWERTY	N/A	1880	661	31.00	29.56	0.097	1.393	0.135	-
	Left Tilt	Voice	2D N560x	QWERTY	N/A	1880	661	31.00	29.56	0.037	1.393	0.052	-
	Left Touch	Voice	2D N560x	NUMERIC	N/A	1880	661	31.00	29.56	0.081	1.393	0.113	-
	Left Touch	Voice	1D N4313	NUMERIC	N/A	1880	661	31.00	29.56	0.145	1.393	**0.202**	**3**
Body	Front	Voice	2D N560x	QWERTY	15	1880	661	31.00	29.56	0.103	1.393	0.144	-
	Rear	Voice	2D N560x	QWERTY	15	1880	661	31.00	29.56	0.238	1.393	0.332	-
	Rear	GPRS 2TX	2D N560x	QWERTY	15	1880	661	28.00	26.65	0.244	1.365	0.333	-
	Rear	GPRS 2TX	2D N560x	NUMERIC	15	1880	661	28.00	26.65	0.252	1.393	**0.351**	**4**
	Rear	GPRS 2TX	1D N4313	NUMERIC	15	1880	661	28.00	26.65	0.177	1.393	0.247	-

	ANSI/IEEE C95.1 – 1992-Safety Limit Spatial Peak Uncontrolled Exposure/ General Population	**1.6 W/kg (mW/g)** Averaged over 1 gram

13.3. UMTS850 SAR Measurement Results

SAR Section	Test Position	Mode	Scanner	Keypad Type	Dist. (mm)	Freq. (MHz)	CH #	Power (dBm)		SAR 1g (W/kg)	Scaling Factor	Scaled SAR 1g (W/kg)	Plot. No.
								Max. allowed	Mea-sured				
Head	Left Touch	RMC	2D N560x	QWERTY	N/A	835	4175	25.00	23.87	0.325	1.296	0.421	-
	Left Tilt	RMC	2D N560x	QWERTY	N/A	835	4175	25.00	23.87	0.279	1.296	0.362	-
	Right Touch	RMC	2D N560x	QWERTY	N/A	835	4175	25.00	23.87	0.365	1.296	0.473	-
	Right Tilt	RMC	2D N560x	QWERTY	N/A	835	4175	25.00	23.87	0.297	1.296	0.385	-
	Right Touch	RMC	2D N560x	NUMERIC	N/A	835	4175	25.00	23.87	0.408	1.296	0.529	-
	Right Touch	RMC	1D N4313	NUMERIC	N/A	835	4175	25.00	23.87	0.435	1.296	**0.564**	**5**
Body	Front	RMC	2D N560x	QWERTY	15	835	4175	25.00	23.87	0.379	1.296	0.491	-
	Rear	RMC	2D N560x	QWERTY	15	835	4132	25.00	23.87	0.493	1.296	0.639	-
	Rear	RMC	2D N560x	NUMERIC	15	835	4175	25.00	23.87	0.498	1.296	0.645	-
	Rear	RMC	1D N4313	NUMERIC	15	835	4175	25.00	23.87	0.529	1.296	**0.686**	**6**
	ANSI/IEEE C95.1 – 1992-Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							**1.6 W/kg (mW/g)** Averaged over 1 gram					

13.4. UMTS1900 SAR Measurement Results

SAR Section	Test Position	Mode	Scanner	Keypad Type	Dist. (mm)	Freq. (MHz)	CH #	Power (dBm)		SAR 1g (W/kg)	Scaling Factor	Scaled SAR 1g (W/kg)	Plot. No.
								Max. allowed	Mea-sured				
Head	Right Touch	RMC	2D N560x	QWERTY	N/A	1880	9400	25.00	23.71	0.177	1.345	0.238	-
	Right Tilt	RMC	2D N560x	QWERTY	N/A	1880	9400	25.00	23.71	0.090	1.345	0.121	-
	Left Touch	RMC	2D N560x	QWERTY	N/A	1880	9400	25.00	23.71	0.215	1.345	0.289	-
	Left Tilt	RMC	2D N560x	QWERTY	N/A	1880	9400	25.00	23.71	0.081	1.345	0.109	-
	Left Touch	RMC	2D N560x	NUMERIC	N/A	1880	9400	25.00	23.71	0.194	1.345	0.261	-
	Left Touch	RMC	1D N4313	NUMERIC	N/A	1880	9400	25.00	23.71	0.304	1.345	**0.409**	**7**
Body	Front	RMC	2D N560x	QWERTY	15	1880	9400	25.00	23.71	0.189	1.345	0.254	-
	Rear	RMC	2D N560x	QWERTY	15	1880	9400	25.00	23.71	0.451	1.345	**0.607**	**8**
	Rear	RMC	2D N560x	NUMERIC	15	1880	9400	25.00	23.71	0.412	1.345	0.554	-
	Rear	RMC	1D N4313	NUMERIC	15	1880	9400	25.00	23.71	0.444	1.345	0.597	-
	ANSI/IEEE C95.1 – 1992-Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							**1.6 W/kg (mW/g)** Averaged over 1 gram					

13.1. WLAN (2.4GHz) SAR Measurements Results

SAR Section	Test Position	Mode	Scanner	Keypad Type	Dist. (mm)	Freq. (MHz)	CH #	Power (dBm)		SAR 1g (W/kg)	Scaling Factor	Scaled SAR 1g (W/kg)	Plot. No.
								Max. allowed	Mea-sured				
Head	Right Touch	802.11b	2D N560x	QWERTY	N/A	2437	6	16.00	14.12	0.132	1.531	0.202	-
	Right Tilt	802.11b	2D N560x	QWERTY	N/A	2437	6	16.00	14.12	0.154	1.531	0.236	-
	Left Touch	802.11b	2D N560x	QWERTY	N/A	2437	6	16.00	14.12	0.224	1.531	**0.343**	**9**
	Left Tilt	802.11b	2D N560x	QWERTY	N/A	2437	6	16.00	14.12	0.192	1.531	0.294	-
	Left Touch	802.11b	2D N560x	NUMERIC	N/A	2437	6	16.00	14.12	0.175	1.531	0.268	-
	Left Touch	802.11b	1D N4313	NUMERIC	N/A	2437	6	16.00	14.12	0.218	1.531	0.334	-
	Right Touch	802.11g	2D N560x	QWERTY	N/A	2437	6	16.00	14.97	0.045	1.267	0.057	
	Right Tilt	802.11g	2D N560x	QWERTY	N/A	2437	6	16.00	14.97	0.051	1.267	0.065	
	Left Touch	802.11g	2D N560x	QWERTY	N/A	2437	6	16.00	14.97	0.079	1.267	0.100	
	Left Tilt	802.11g	2D N560x	QWERTY	N/A	2437	6	16.00	14.97	0.069	1.267	0.087	
	Left Touch	802.11g	2D N560x	NUMERIC	N/A	2437	6	16.00	14.97	0.059	1.267	0.075	
	Left Touch	802.11g	1D N4313	NUMERIC	N/A	2437	6	16.00	14.97	0.075	1.267	0.095	
Body	Front	802.11b	2D N560x	QWERTY	15	2437	6	16.00	14.12	0.042	1.531	**0.064**	**10**
	Rear	802.11b	2D N560x	QWERTY	15	2437	6	16.00	14.12	0.022	1.531	0.034	-
	Front	802.11b	2D N560x	NUMERIC	15	2437	6	16.00	14.12	0.030	1.531	0.046	
	Front	802.11b	1D N4313	NUMERIC	15	2437	6	16.00	14.12	0.035	1.531	0.054	-
	Front	802.11g	2D N560x	QWERTY	15	2437	6	16.00	14.97	0.013	1.267	0.016	
	Rear	802.11g	2D N560x	QWERTY	15	2437	6	16.00	14.97	0.007	1.267	0.009	
	Front	802.11g	2D N560x	NUMERIC	15	2437	6	16.00	14.97	0.010	1.267	0.013	
	Front	802.11g	1D N4313	NUMERIC	15	2437	6	16.00	14.97	0.011	1.267	0.014	
	ANSI/IEEE C95.1 – 1992-Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							**1.6 W/kg (mW/g)** Averaged over 1 gram					

13.2. WLAN (5GHz) SAR Measurements Results

SAR Section	Test Position	Mode	Scanner	Keypad Type	Dist. (mm)	Freq. (MHz)	CH #	Power (dBm)		SAR 1g (W/kg)	Scaling Factor	Scaled SAR 1g (W/kg)	Plot. No.
								Max. allowed	Mea-sured				
Head	Right Touch	802.11a	2D N560x	QWERTY	N/A	5240	48	15.00	10.76	0.203	1.394	0.283	-
	Right Tilt	802.11a	2D N560x	QWERTY	N/A	5240	48	15.00	10.76	0.223	1.394	0.310	-
	Left Touch	802.11a	2D N560x	QWERTY	N/A	5240	48	15.00	10.76	0.223	1.394	0.310	-
	Left Tilt	802.11a	2D N560x	QWERTY	N/A	5240	48	15.00	10.76	0.246	1.394	**0.343**	**11**
	Left Tilt	802.11a	2D N560x	NUMERIC	N/A	5240	48	15.00	10.76	0.162	1.394	0.225	-

	Left Tilt	802.11a	1D N4313	NUMERIC	N/A	5240	48	15.00	10.76	0.179	1.394	0.250	-
	Left Touch	802.11a	2D N560x	QWERTY	N/A	5300	60	15.00	11.29	0.203	1.329	0.270	-
	Left Tilt	802.11a	2D N560x	QWERTY	N/A	5300	60	15.00	11.29	0.229	1.329	0.304	-
	Right Touch	802.11a	2D N560x	QWERTY	N/A	5300	60	15.00	11.29	0.204	1.329	0.271	-
	Right Tilt	802.11a	2D N560x	QWERTY	N/A	5300	60	15.00	11.29	0.237	1.329	0.315	-
	Right Tilt	802.11a	2D N560x	NUMERIC	N/A	5300	60	15.00	11.29	0.163	1.329	0.217	-
	Right Tilt	802.11a	1D N4313	NUMERIC	N/A	5300	60	15.00	11.29	0.163	1.329	0.217	-
	Right Touch	802.11a	2D N560x	QWERTY	N/A	5500	100	15.00	13.11	0.075	1.541	0.116	-
	Right Tilt	802.11a	2D N560x	QWERTY	N/A	5500	100	15.00	13.11	0.093	1.541	0.143	-
	Left Touch	802.11a	2D N560x	QWERTY	N/A	5500	100	15.00	13.11	0.083	1.541	0.128	-
	Left Tilt	802.11a	2D N560x	QWERTY	N/A	5500	100	15.00	13.11	0.100	1.541	0.154	-
	Left Tilt	802.11a	2D N560x	NUMERIC	N/A	5500	100	15.00	13.11	0.056	1.541	0.086	-
	Left Tilt	802.11a	1D N4313	NUMERIC	N/A	5500	100	15.00	13.11	0.118	1.541	0.182	-
	Right Touch	802.11a	2D N560x	QWERTY	N/A	5745	149	15.00	9.96	0.091	1.506	0.137	-
	Right Tilt	802.11a	2D N560x	QWERTY	N/A	5745	149	15.00	9.96	0.114	1.506	0.172	-
	Left Touch	802.11a	2D N560x	QWERTY	N/A	5745	149	15.00	9.96	0.102	1.506	0.154	-
	Left Tilt	802.11a	2D N560x	QWERTY	N/A	5745	149	15.00	9.96	0.116	1.506	0.175	-
	Left Tilt	802.11a	2D N560x	NUMERIC	N/A	5745	149	15.00	9.96	0.113	1.506	0.170	-
	Left Tilt	802.11a	1D N4313	NUMERIC	N/A	5745	149	15.00	9.96	0.117	1.506	0.176	-
Body	Front	802.11a	2D N560x	QWERTY	15	5240	48	15.00	10.76	0.045	1.394	0.063	-
	Rear	802.11a	2D N560x	QWERTY	15	5240	48	15.00	10.76	0.010	1.394	0.014	-
	Front	802.11a	2D N560x	NUMERIC	15	5240	48	15.00	10.76	0.044	1.394	0.061	-
	Front	802.11a	1D N4313	NUMERIC	15	5240	48	15.00	10.76	0.046	1.394	0.064	-
	Front	802.11a	2D N560x	QWERTY	15	5300	60	15.00	11.29	0.049	1.329	0.065	-
	Rear	802.11a	2D N560x	QWERTY	15	5300	60	15.00	11.29	0.032	1.329	0.043	-
	Front	802.11a	2D N560x	NUMERIC	15	5300	60	15.00	11.29	0.048	1.329	0.064	-
	Front	802.11a	1D N4313	NUMERIC	15	5300	60	15.00	11.29	0.048	1.329	0.064	-
	Front	802.11a	2D N560x	QWERTY	15	5500	100	15.00	13.11	0.028	1.541	0.043	-
	Rear	802.11a	2D N560x	QWERTY	15	5500	100	15.00	13.11	0.044	1.541	0.068	-
	Rear	802.11a	2D N560x	NUMERIC	15	5500	100	15.00	13.11	0.047	1.541	0.072	-
	Rear	802.11a	1D N4313	NUMERIC	15	5500	100	15.00	13.11	0.034	1.541	0.052	-
	Front	802.11a	2D N560x	QWERTY	15	5745	149	15.00	9.96	0.021	1.506	0.032	-
	Rear	802.11a	2D N560x	QWERTY	15	5745	149	15.00	9.96	0.060	1.506	0.090	12
	Rear	802.11a	2D N560x	NUMERIC	15	5745	149	15.00	9.96	0.030	1.506	0.045	-

	Rear	802.11a	1D N4313	NUMERIC	15	5745	149	15.00	9.96	0.048	1.506	0.072	-
	ANSI/IEEE C95.1 – 1992-Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							**1.6 W/kg (mW/g)** Averaged over 1 gram					

13.3. SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2003, FCC KDB Procedure.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. 2D scanner(N560x) base model was fully tested. And 1D scanners (N4313) base model were tested at the worst configurations.
4. Liquid tissue depth was at least 15.0 cm for all frequencies.
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 447498 D01v05.
7. Per FCC KDB 648474 D04v01, SAR was evaluated without a headset connected to the device. Since the standalone reported SAR was less than 1.2 W/kg, no additional SAR evaluation using a headset cable were required.
8. Per FCC KDB 865664 D01v01, variability SAR tests were not performed since the measured SAR results for all frequency bands were less than 0.8 W/kg. Please see Section 13 for variability analysis information.

GSM/GPRS Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. Justification for reduced test configurations per KDB 941225 D03v01: The source-based time-averaged output power was evaluated for all multi-slot operations. The multi-slot configuration with the highest frame averaged output power was evaluated for SAR.
3. Per FCC KDB 447498 D01v05, 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.

UMTS Test Notes:

1. UMTS mode in Body SAR was tested under RMC 12.2 kbps with HSPA inactive per KDB 941225 D01v02. 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 447498 D01v05, 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). Since the maximum output power variation across the required test channels is ≤ 1/2 dB, middle channel was the default channel used.

WLAN Test Notes:

1. Justification for reduced test configurations for WIFI channels per KDB 248227 D01v01r02 and Oct. 2012 FCC/TCB Meeting Notes for 2.4 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11b. Other IEEE 802.11 modes (including 802.11 g/n) were not investigated since the average output powers over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data rate of IEEE 802.11b mode.
2. Justification for reduced test configurations for WIFI channels per KDB 248227 D01v01r02 and Oct. 2012 FCC/TCB Meeting Notes for 5 GHz WIFI: Highest average RF output power channel for the lowest data rate was selected for SAR evaluation in 802.11a. Other IEEE 802.11n modes were not investigated since the average output power over all channels and data rates were not more than 0.25 dB higher than the tested channel in the lowest data of IEEE 802.11a mode.
3. Since the maximum extrapolated peak SAR of the zoom scan for the maximum output channel was ≤ 1.6 W/kg and the reported 1g averaged SAR was ≤ 0.8 W/kg, SAR testing on other default channels was not required.

14. FCC MULTI-TX CONSIDERATION

14.1. Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v05 are applicable to handsets with built-in unlicensed transmitters such as 802.11a/b/g/n/ac and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

14.2. Simultaneous Transmission Procedures

This device contains transmitter that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v05 IV.C.1.iii, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific physical test configuration is ≤ 1.6 W/kg. When standalone SAR is not required to be measured, per FCC KDB 447498 D01v05 4.3.2 2), the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

$$\text{Estimated SAR} = \frac{\sqrt{f(GHz)}}{7.5} * \frac{(\text{Max Power of channel, mW})}{\text{Min. Separation Distance, mm}}$$

Mode	Frequency	Maximum Allowed Power		Separation Distance (body)	Estimated SAR(body)
	[MHz]	[dBm]	[mW]	[mm]	[W/kg]
Bluetooth	2441	4.00	2.52	15	0.035

Note: Per KDB Publication 447498 D01v05r01, the maximum power of the channel was rounded to the nearest mW before calculation.

14.3. Head & Body SAR Simultaneous Transmission Analysis

Worst Configuration	Mode	2G/3G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
Head Right Touch	GSM850	0.459	0.035	0.494
Head Left Touch	GSM1900	0.202	0.035	0.237
Head Right Touch	WCDMA850	0.564	0.035	0.599
Head Left Touch	WCDMA1900	0.409	0.035	0.444
Body Rear Side	GSM850	0.638	0.035	0.673
Body Rear Side	GSM1900	0.351	0.035	0.386
Body Rear Side	WCDMA850	0.686	0.035	0.721
Body Rear Side	WCDMA1900	0.607	0.035	0.642

Note: Bluetooth SAR was not required to be measured per FCC KDB 447498. Estimated SAR results were used in the above table to determine simultaneous transmission SAR test exclusion

15. SAR MEASUREMENT VARIABILITY

15.1. Measurement Variability

Per FCC KDB Publication 865864 D01v01, SAR measurement variability was assessed when measured 1g SAR is > 0.80 W/kg or when measured 10g SAR is >2.00 W/kg. Since all measured 1g SAR values were <0.8 W/kg SAR measurement variability was not assessed.

15.2. Measurement Uncertainty

The measured SAR was <1.5 W/kg for all frequency bands. Therefore, per KDB Publication 865664 D01v01, the extended measurement uncertainty analysis per IEEE 1528-2003 was not required.

16. CONCLUSION

The SAR evaluation indicates that PM60 complies with the RF radiation exposure limits of the FCC. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

17. EQUIPMENT LIST AND CALIBRATION DETAILS

Equipment Type	Manufacturer	Model Number	Serial Number	Calibration Due	Used For this Test
Robot - Six Axes	Staubli	TX90XL	N/A	N/A	☒
Robot Remote Control	SPEAG	CS7MB	F13/55D0A1 /A/01	N/A	☒
SAM Twin Phantom V5.0	SPEAG	TP-1809	1809	N/A	☒
SAM Twin Phantom V5.0	SPEAG	TP-1810	1810	N/A	☒
ELI Phantom V5.0	SPEAG	TP-1228	1228	N/A	☐
Data Acquisition Electronics	SPEAG	DAE4	1422	2015.01.14	☒
Probe E-Field	SPEAG	ES3DV2	3020	2015.02.25	☒
Probe E-Field	SPEAG	EX3DV4	3905	2015.02.26	☒
Probe E-Field	SPEAG	EX3DV4	3972	2015.01.28	☐
Antenna Dipole 835 MHz	SPEAG	D835V2	481	2015.04.25	☒
Antenna Dipole 900 MHz	SPEAG	D900V2	194	2015.11.20	☐
Antenna Dipole 1800 MHz	SPEAG	D1800V2	2d066	2016.01.23	☐
Antenna Dipole 1900 MHz	SPEAG	D1900V2	5d038	2015.05.29	☒
Antenna Dipole 1950 MHz	SPEAG	D1950V2	1027	2016.01.22	☐
Antenna Dipole 2450 MHz	SPEAG	D2450V2	746	2016.01.21	☒
Antenna Dipole 5000 MHz	SPEAG	D5GHzV2	1147	2016.02.26	☒
High power RF Amplifier	EMPOWER	2057-BBS3Q5KCK	1002D/C0321	2015.03.06	☒
Digital Communication Tester	R&S	CMU200	111356	2015.01.15	☒
Digital Communication Tester	Agilent	E5515C	G44400380	2014.10.28	☐
Signal Generator	Hewlett Packard	8648C	3629U00868	2015.02.18	☒
Signal Generator	R&S	SMBV100A	1407.6004k02-259341-Ez	2014.10.10	☒
RF Power Meter Dual	Hewlett Packard	EPM-442A	GG37170495	2015.03.04	☒
RF Power Sensor 0.01 - 18 GHz	Hewlett Packard	8481A	US37299851	2015.03.14	☒
RF Power Sensor 0.01 - 18 GHz	Hewlett Packard	8481A	3318A92872	2015.03.14	☒
S-Parameter Network Analyzer	Agilent	8753D	3410A07251	2015.03.07	☒
Dual Directional Coupler	Hewlett Packard	778D	1144AO4576	2015.03.04	☒
Directional Coupler	Agilent	773D	MY28390213	2015.03.04	☒

APPENDIX A. SAR PLOTS

Plot No.1

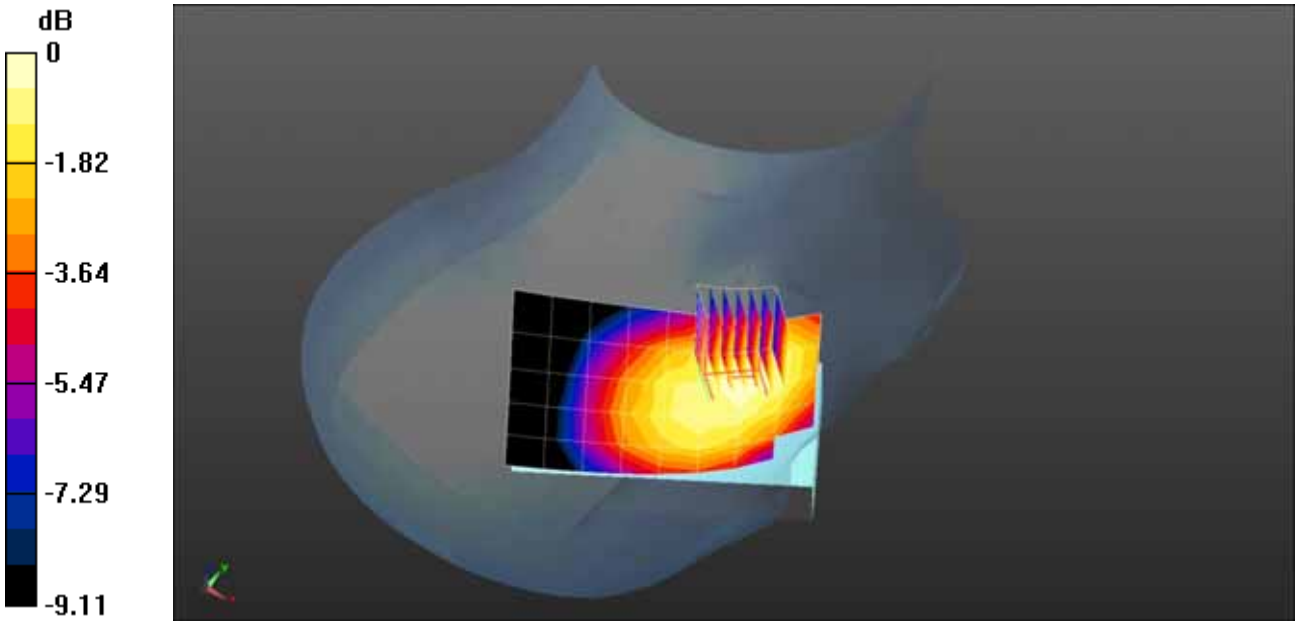
- Test Laboratory: KTL
- Model: PM60
- Position: GSM850 RIGHT CHEEK TOUCH_190CH_1D N4313_NUMERIC
- Test Date: 07/01/2014
- Measured Liquid Temperature: 22.5 ℃, Ambient Temperature: 22.1 ℃

Communication System: UID 0, GSM 850 (0); Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 836.6 MHz;Communication System PAR: 9.191 dB; PMF: 2.88104
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.89 S/m; ε_r = 41.478; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(6.39, 6.39, 6.39); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 2.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.422 W/kg
Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.708 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.497 W/kg
SAR(1 g) = 0.385 W/kg; SAR(10 g) = 0.294 W/kg
Maximum value of SAR (measured) = 0.423 W/kg



0 dB = 0.423 W/kg = -3.74 dBW/kg

Plot No.2

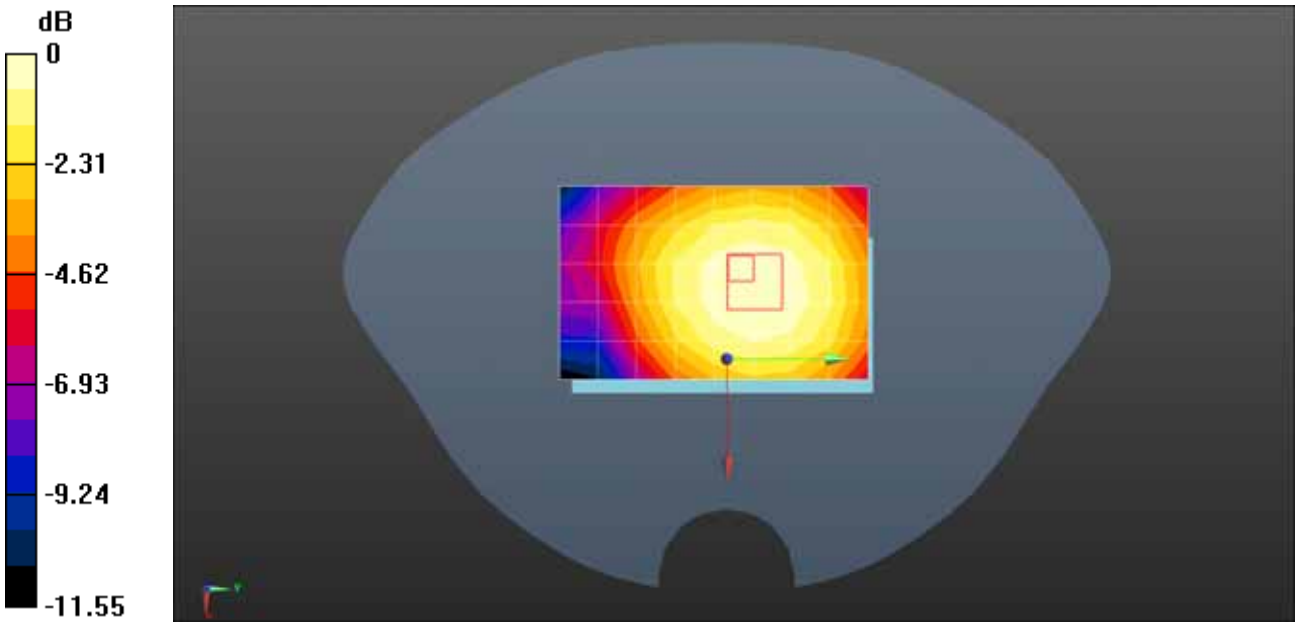
- Test Laboratory: KTL
- Model: PM60
- Position: GSM850 BODY REAR 1.5cm_190CH_1D N4313_NUMERIC
- Test Date: 07/03/2014
- Measured Liquid Temperature: 22.7 ℃, Ambient Temperature: 22.1 ℃

Communication System: UID 0, GSM 850 (0); Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 836.6 MHz;Communication System PAR: 9.191 dB; PMF: 2.88104
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.96 S/m; ε_r = 55.858; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(6.17, 6.17, 6.17); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 2.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.523 W/kg
Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.555 V/m; Power Drift = -0.49 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.535 W/kg; SAR(10 g) = 0.214 W/kg
Maximum value of SAR (measured) = 0.521 W/kg



0 dB = 0.523 W/kg = -2.81 dBW/kg

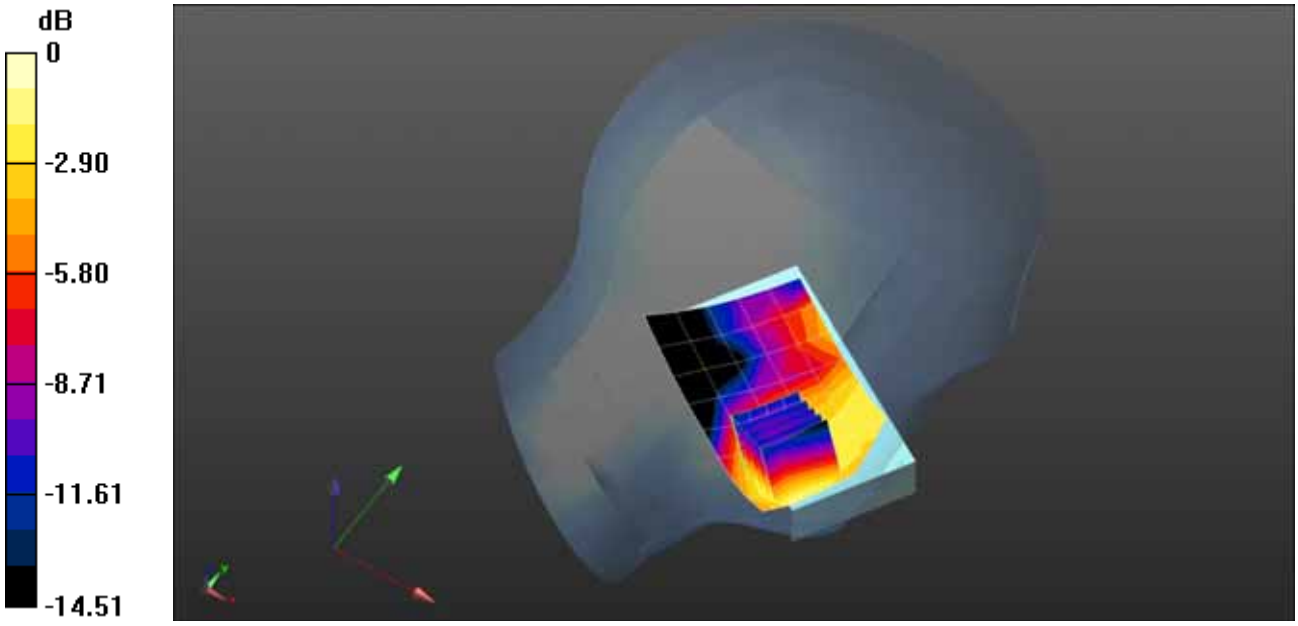
- Test Laboratory: KTL
- Model: PM60
- Position: GSM1900 LEFT CHEEK TOUCH_661CH_1D N4313_NUMERIC
- Test Date: 07/07/2014
- Measured Liquid Temperature: 22.3 ℃, Ambient Temperature: 22.0 ℃

Communication System: UID 0, DCS 1900 (0); Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 1880 MHz;Communication System PAR: 9.191 dB; PMF: 2.88104
Medium parameters used: f = 1880 MHz; σ = 1.45 S/m; ε_r = 39.74; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(4.85, 4.85, 4.85); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 2.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.161 W/kg
Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.437 V/m; Power Drift = 0.25 dB
Peak SAR (extrapolated) = 0.218 W/kg
SAR(1 g) = 0.145 W/kg; SAR(10 g) = 0.091 W/kg
Maximum value of SAR (measured) = 0.170 W/kg



0 dB = 0.170 W/kg = -7.70 dBW/kg

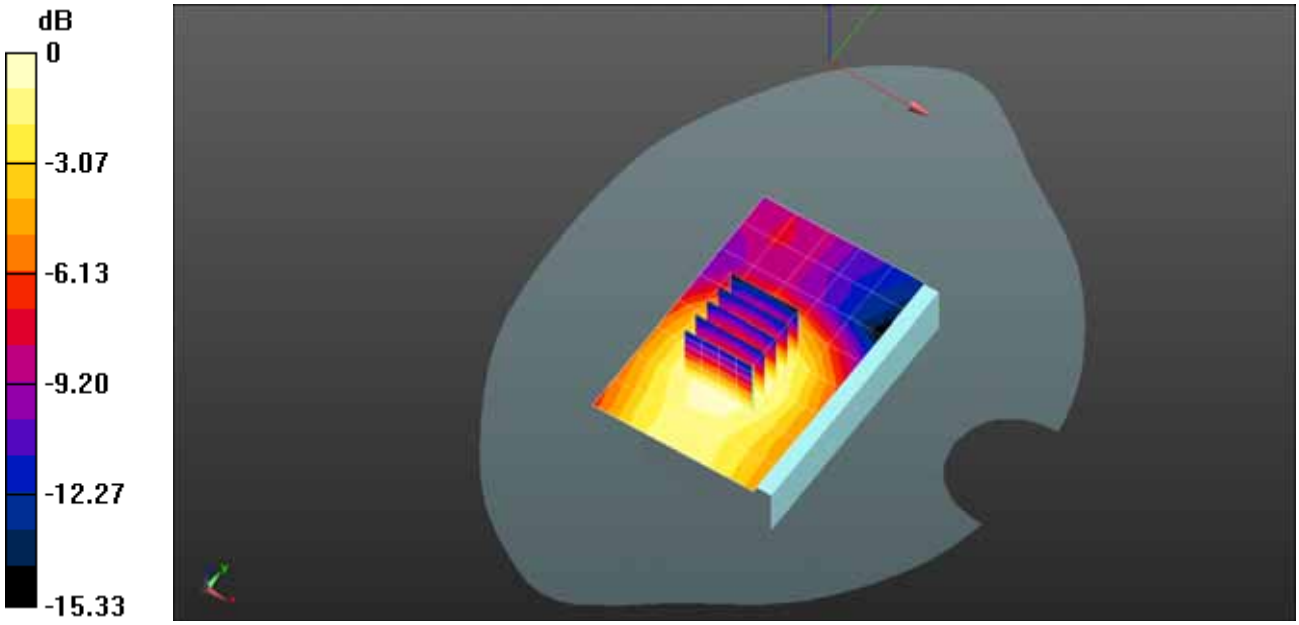
- Test Laboratory: KTL
- Model: PM60
- Position: GSM1900 BODY REAR 1.5cm_661CH_2D N560x_NUMERIC
- Test Date: 07/09/2014
- Measured Liquid Temperature: 22.2 ℃, Ambient Temperature: 22.0 ℃

Communication System: UID 0, GPRS 1900 2tx (0); Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 1880 MHz;Communication System PAR: 6.18 dB; PMF: 2.03704
Medium parameters used: f = 1880 MHz; σ = 1.57 S/m; ε_r = 51.14; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(4.41, 4.41, 4.41); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 2.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.285 W/kg
Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.479 V/m; Power Drift = -0.36 dB
Peak SAR (extrapolated) = 0.365 W/kg
SAR(1 g) = 0.252 W/kg; SAR(10 g) = 0.166 W/kg
Maximum value of SAR (measured) = 0.291 W/kg



0 dB = 0.285 W/kg = -5.45 dBW/kg

Plot No.5

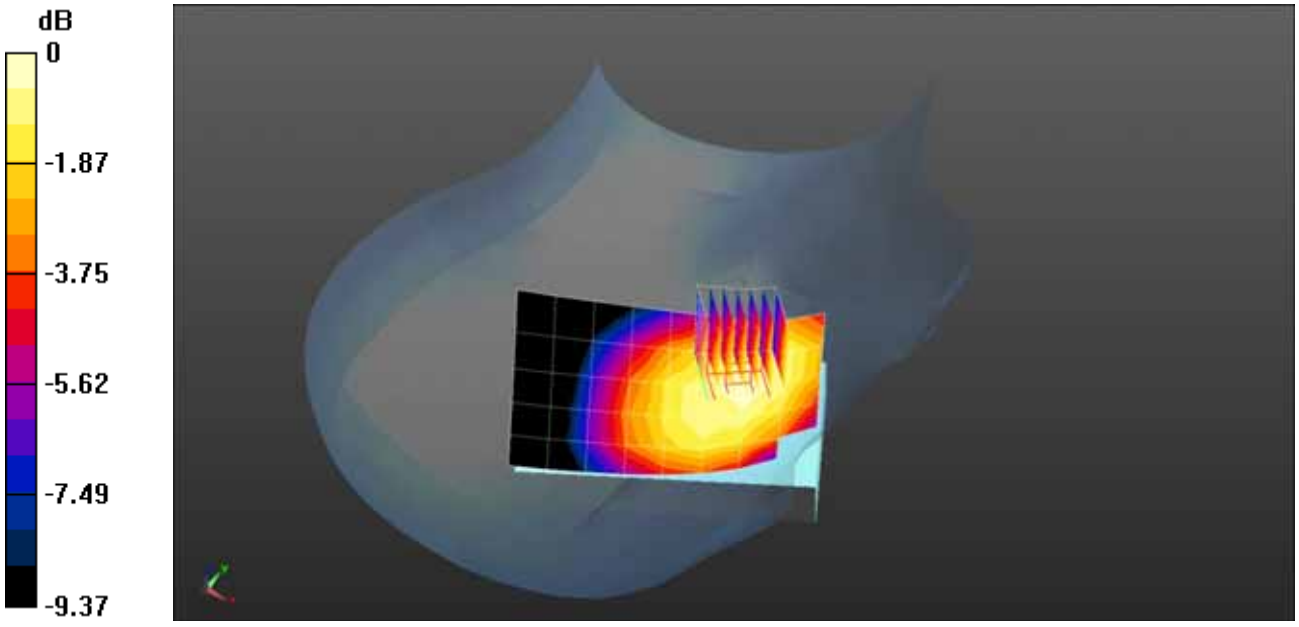
- Test Laboratory: KTL
- Model: PM60
- Position: WCDMA850 RIGHT CHEEK TOUCH_HIGH_1D N4313_NUMERIC
- Test Date: 07/01/2014
- Measured Liquid Temperature: 22.5 ℃, Ambient Temperature: 22.0 ℃

Communication System: UID 0, WCDMA 5 (0); Communication System Band: 4175; Frequency: 835 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 835 MHz; σ = 0.89 S/m; ε_r = 41.5; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(6.39, 6.39, 6.39); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 2.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.474 W/kg
Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.994 V/m; Power Drift = -0.38 dB
Peak SAR (extrapolated) = 0.567 W/kg
SAR(1 g) = 0.435 W/kg; SAR(10 g) = 0.330 W/kg
Maximum value of SAR (measured) = 0.477 W/kg



0 dB = 0.477 W/kg = -3.21 dBW/kg

Plot No.6

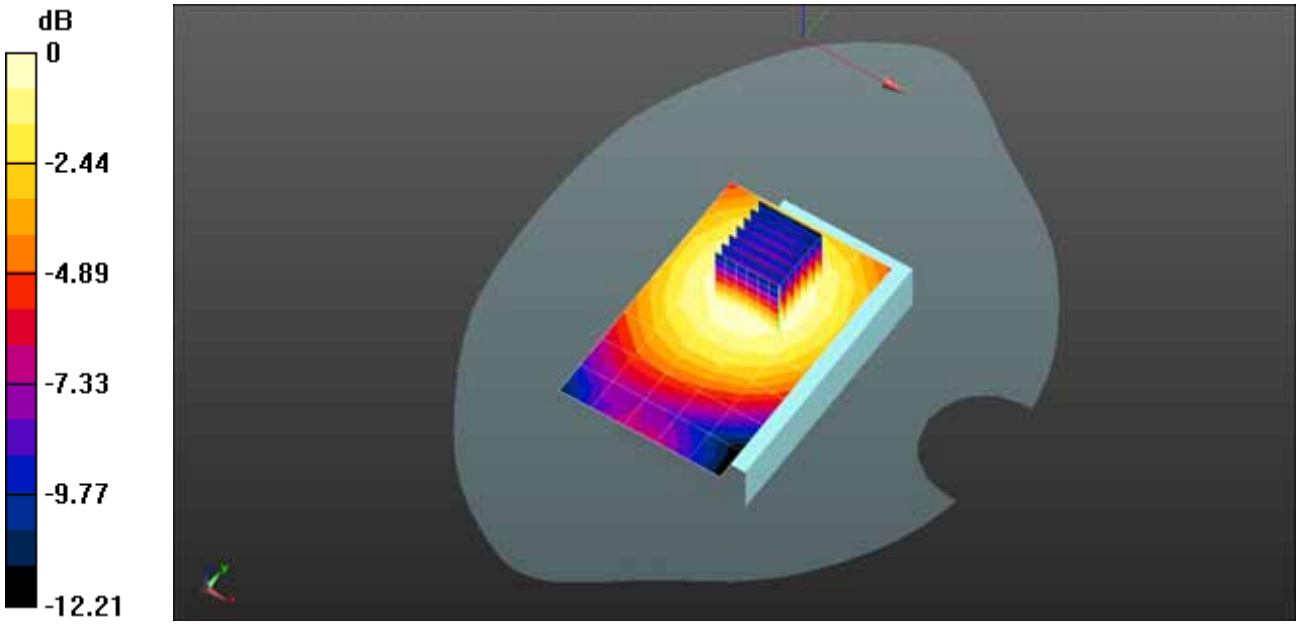
- Test Laboratory: KTL
- Model: PM60
- Position: WCDMA850 BODY REAR 1.5cm_4175CH_1D N4313_NUMERIC
- Test Date: 07/03/2014
- Measured Liquid Temperature: 22.7 ℃, Ambient Temperature: 22.0 ℃

Communication System: UID 0, WCDMA 5 (0); Communication System Band: 4175; Frequency: 835 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 835 MHz; σ = 0.96 S/m; ε_r = 55.87; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(6.17, 6.17, 6.17); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 2.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.574 W/kg
Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.184 V/m; Power Drift = -0.29 dB
Peak SAR (extrapolated) = 0.667 W/kg
SAR(1 g) = 0.529 W/kg; SAR(10 g) = 0.402 W/kg
Maximum value of SAR (measured) = 0.582 W/kg



0 dB = 0.574 W/kg = -2.41 dBW/kg

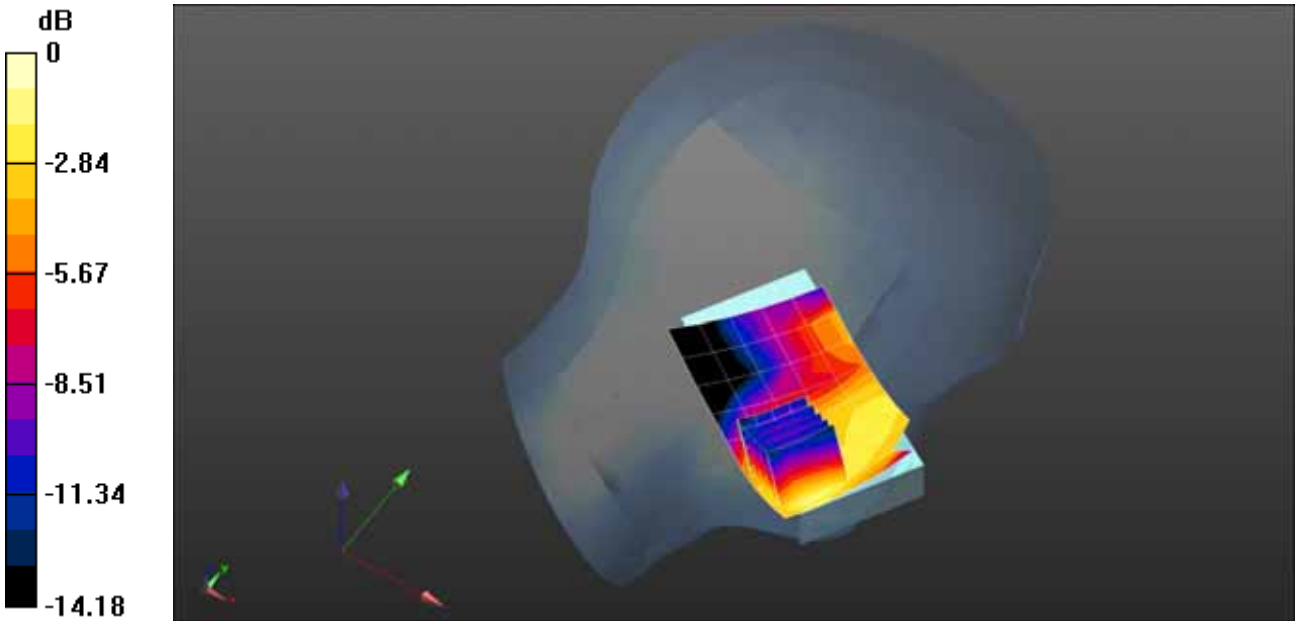
- Test Laboratory: KTL
- Model: PM60
- Position: WCDMA1900 LEFT CHEEK TOUCH_9400CH_1D N4313_NUMERIC
- Test Date: 07/07/2014
- Measured Liquid Temperature: 22.3 ℃, Ambient Temperature: 22.0 ℃

Communication System: UID 0, WCDMA 2 (0); Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 1880 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 1880 MHz; σ = 1.45 S/m; ε_r = 39.74; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(4.85, 4.85, 4.85); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 2.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.318 W/kg
Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.808 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 0.459 W/kg
SAR(1 g) = 0.304 W/kg; SAR(10 g) = 0.190 W/kg
Maximum value of SAR (measured) = 0.355 W/kg



0 dB = 0.355 W/kg = -4.50 dBW/kg

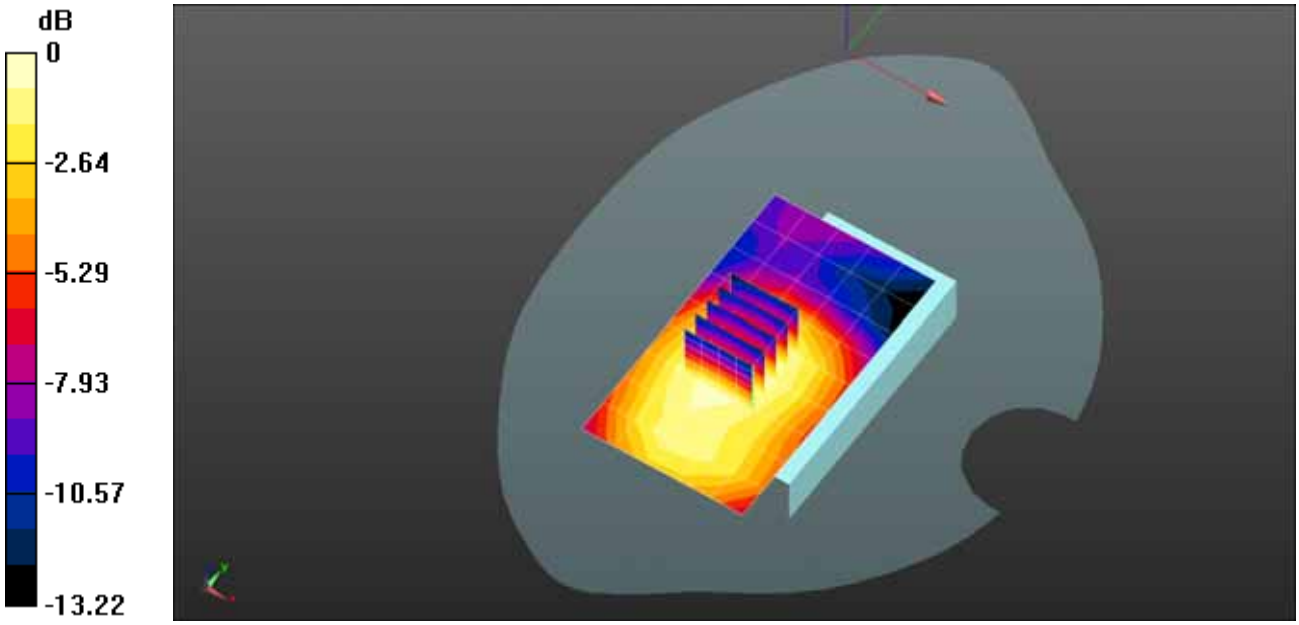
- Test Laboratory: KTL
- Model: PM60
- Position: WCDMA1900 BODY REAR 1.5cm_9400CH_2D N560x_QWERTY
- Test Date: 07/09/2014
- Measured Liquid Temperature: 22.2 ℃, Ambient Temperature: 22.0 ℃

Communication System: UID 0, WCDMA 2 (0); Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 1880 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 1880 MHz; σ = 1.57 S/m; ε_r = 51.14; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(4.41, 4.41, 4.41); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 2.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.520 W/kg
Zoom Scan (7x7x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.847 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.650 W/kg
SAR(1 g) = 0.451 W/kg; SAR(10 g) = 0.301 W/kg



0 dB = 0.520 W/kg = -2.84 dBW/kg

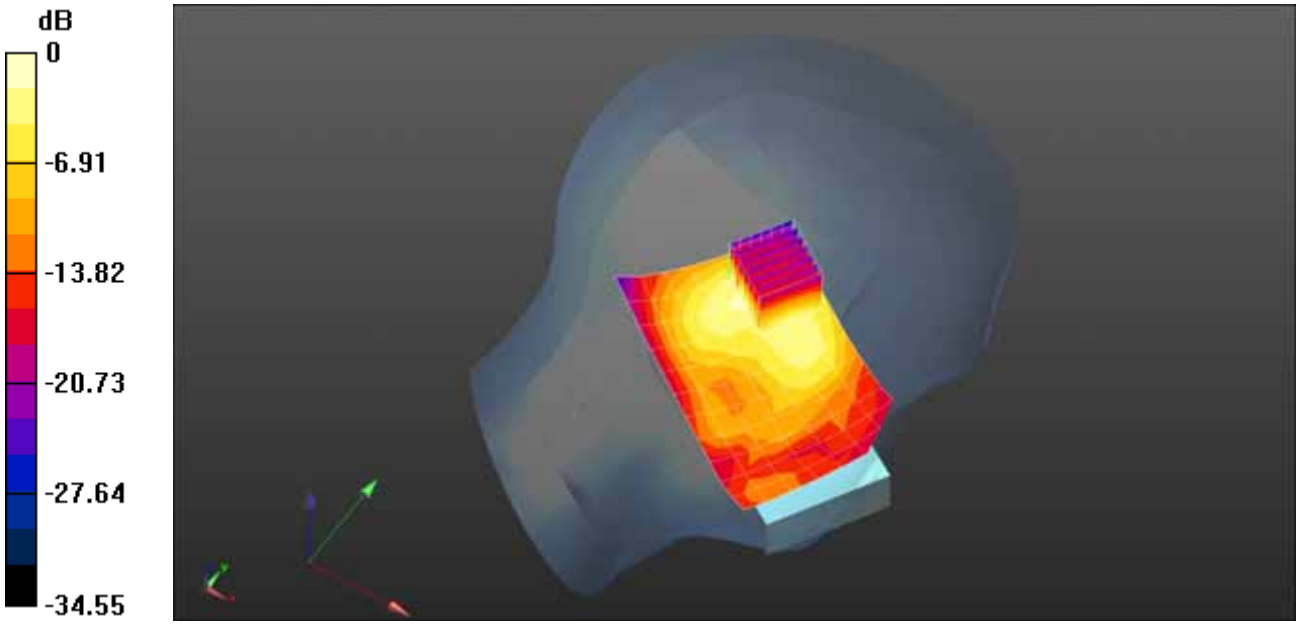
- Test Laboratory: KTL
- Model: PM60
- Position: 802.11b 2437 LEFT CHEEK TOUCH_6CH_2D N560x_QWERTY
- Test Date: 07/11/2014
- Measured Liquid Temperature: 22.6 ℃, Ambient Temperature: 21.0 ℃

Communication System: UID 0, WLAN (0); Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 2437 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 2437 MHz; σ = 1.823 S/m; ε_r = 37.59; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(4.18, 4.18, 4.18); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 2.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Area Scan (8x12x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.284 W/kg
Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.154 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.512 W/kg
SAR(1 g) = 0.224 W/kg; SAR(10 g) = 0.104 W/kg
Maximum value of SAR (measured) = 0.299 W/kg



0 dB = 0.299 W/kg = -5.24 dBW/kg

Plot No.10

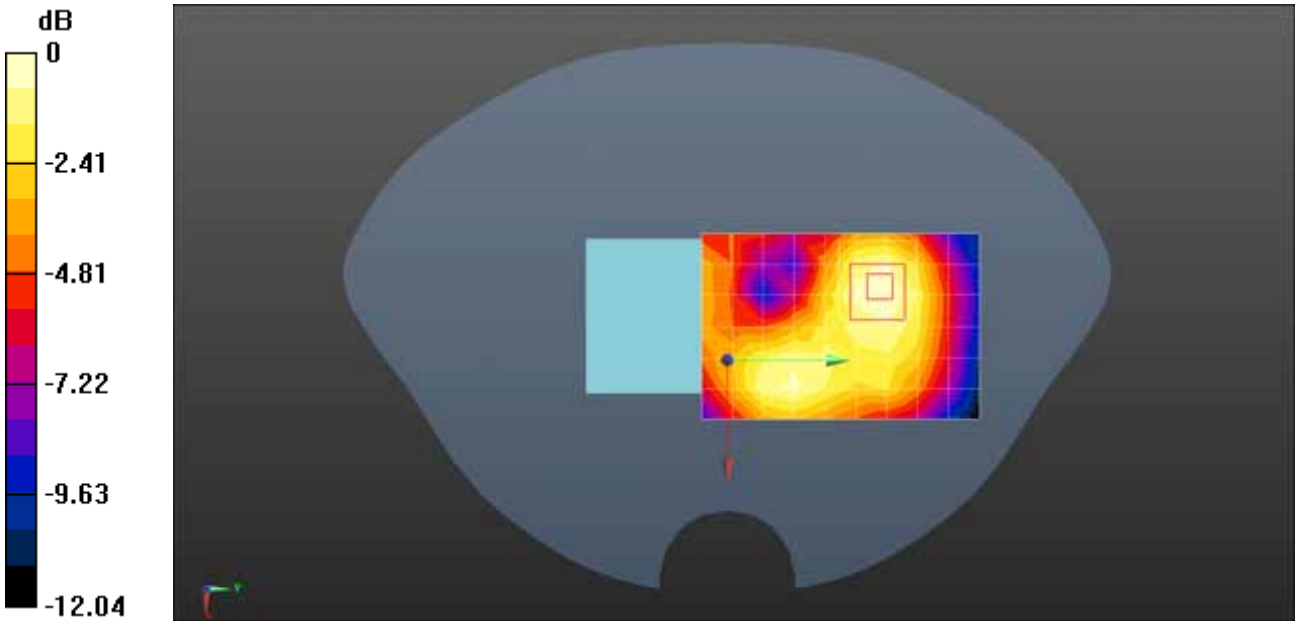
- Test Laboratory: KTL
- Model: PM60
- Position: 802.11b 2437 BODY FRONT 1.5cm_6CH_2D N560x_QWERTY
- Test Date: 07/14/2014
- Measured Liquid Temperature: 22.8 ℃, Ambient Temperature: 23.0 ℃

Communication System: UID 0, WLAN (0); Communication System Band: Exported from older format (data unavailable - please correct).; Frequency: 2437 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.881 S/m; ε_r = 50.548; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(3.78, 3.78, 3.78); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 2.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Left)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Area Scan (7x10x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.0500 W/kg
Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.151 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.0750 W/kg
SAR(1 g) = 0.042 W/kg; SAR(10 g) = 0.024 W/kg
Maximum value of SAR (measured) = 0.0501 W/kg



0 dB = 0.0500 W/kg = -13.01 dBW/kg

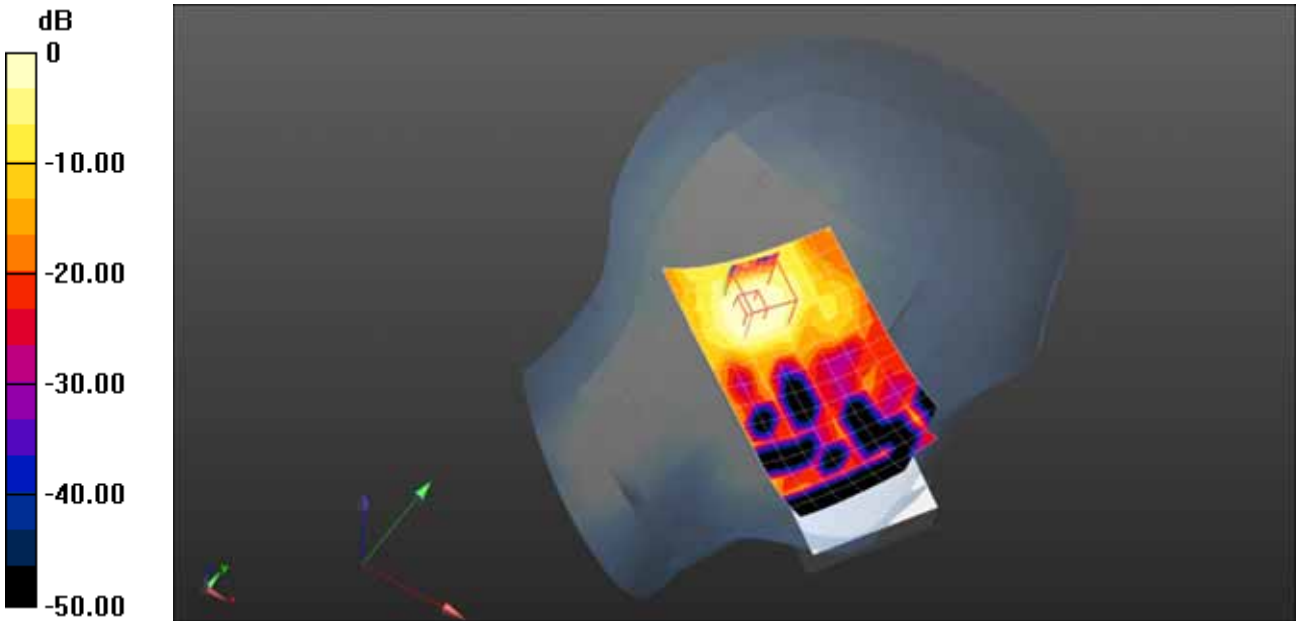
- Test Laboratory: KTL
- Model: PM60
- Position: 802.11a 5240 LEFT TILT_48CH_2D N560x_QWERTY
- Test Date: 07/16/2014
- Measured Liquid Temperature: 22.4 ℃, Ambient Temperature: 23.0 ℃

Communication System: UID 0, 5G FCC (0); Communication System Band: 5G FCC; Frequency: 5240 MHz;Communication System PAR: 0 dB; PMF: 1.12202e-005
Medium parameters used: f = 5240 MHz; σ = 4.777 S/m; ε_r = 36.735; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3905; ConvF(4.82, 4.82, 4.82); Calibrated: 26.02.2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -3.0, 23.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Area Scan (9x15x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.405 W/kg
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.620 V/m; Power Drift = 0.30 dB
Peak SAR (extrapolated) = 0.833 W/kg
SAR(1 g) = 0.246 W/kg; SAR(10 g) = 0.098 W/kg
Maximum value of SAR (measured) = 0.443 W/kg



0 dB = 0.405 W/kg = -3.93 dBW/kg

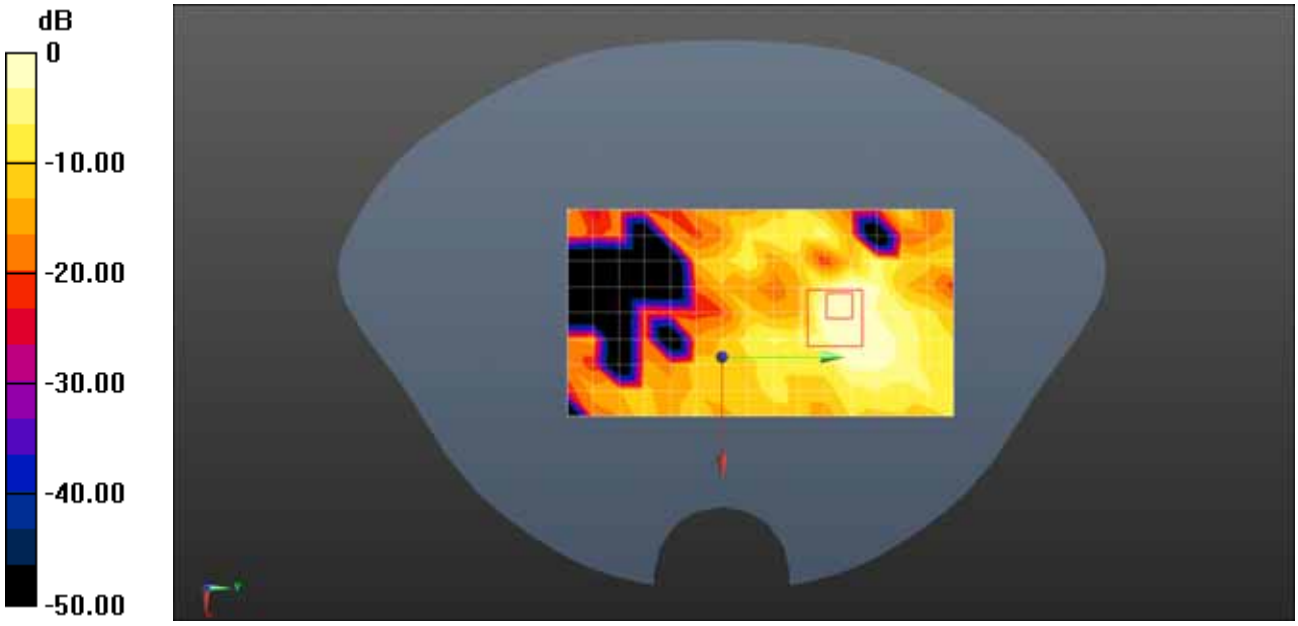
- Test Laboratory: KTL
- Model: PM60
- Position: 802.11a 5745 BODY REAR 1.5cm_149CH_2D N560x_QWERTY
- Test Date: 12/11/2014
- Measured Liquid Temperature: 22.3 ℃, Ambient Temperature: 23.0 ℃

Communication System: UID 0, 5G FCC (0); Frequency: 5745 MHz
Medium parameters used: f = 5745 MHz; σ = 5.94 S/m; ε_r = 47.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3905; ConvF(4.04, 4.04, 4.04); Calibrated: 26.02.2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = -3.0, 23.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Left)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Area Scan (9x16x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.107 W/kg
Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.755 V/m; Power Drift = 0.65 dB
Peak SAR (extrapolated) = 0.352 W/kg
SAR(1 g) = 0.060 W/kg; SAR(10 g) = 0.017 W/kg
Maximum value of SAR (measured) = 0.152 W/kg



0 dB = 0.107 W/kg = -9.71 dBW/kg

835 MHz Head – Verification DATA (D835V2 – 481)

- Test Date: 07/01/2014

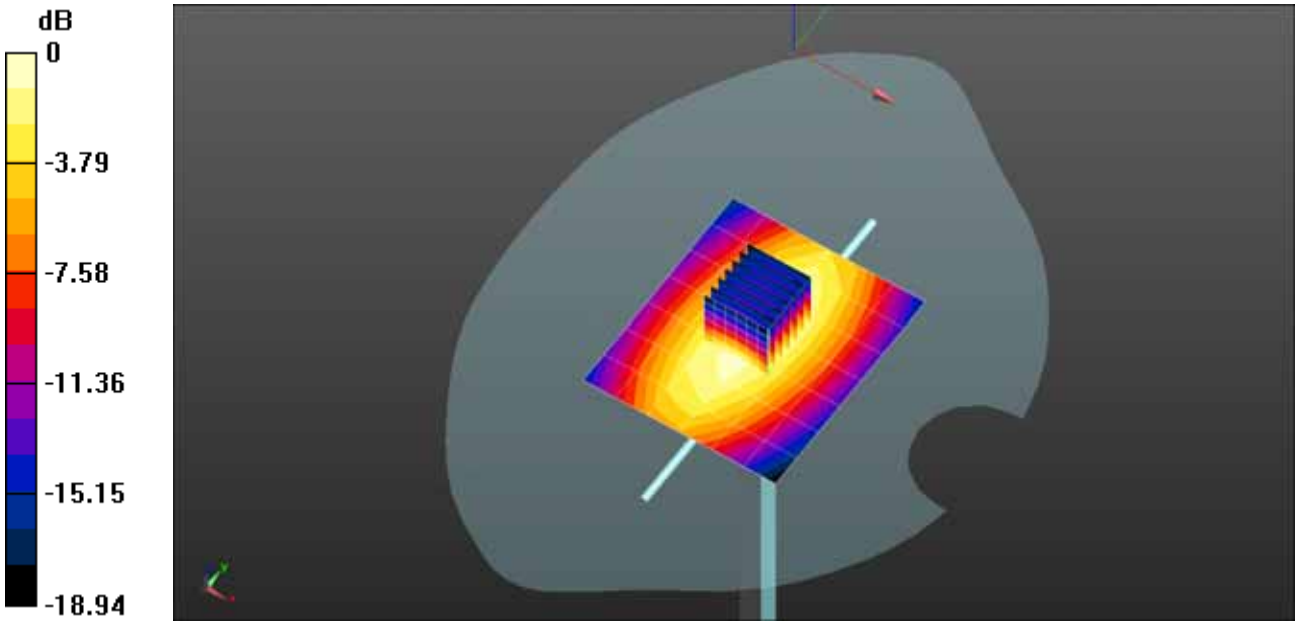
- Measured Liquid Temperature: 22.5 ℃, Ambient Temperature: 22.1 ℃

Communication System: UID 0, CW (0); Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 835 MHz; σ = 0.89 S/m; ε_r = 41.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(6.39, 6.39, 6.39); Calibrated: 25.02.2014;
  - Modulation Compensation:
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

835MHz/d=10mm, Pin=xx mW, dist=3.0mm (ES-Probe) 2/Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.90 W/kg
835MHz/d=10mm, Pin=xx mW, dist=3.0mm (ES-Probe) 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.621 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.69 W/kg
SAR(1 g) = 2.51 W/kg; SAR(10 g) = 1.65 W/kg
Maximum value of SAR (measured) = 2.92 W/kg



0 dB = 2.90 W/kg = 4.62 dBW/kg

835 MHz Body – Verification DATA (D835V2 – 481)

- Test Date: 07/03/2014

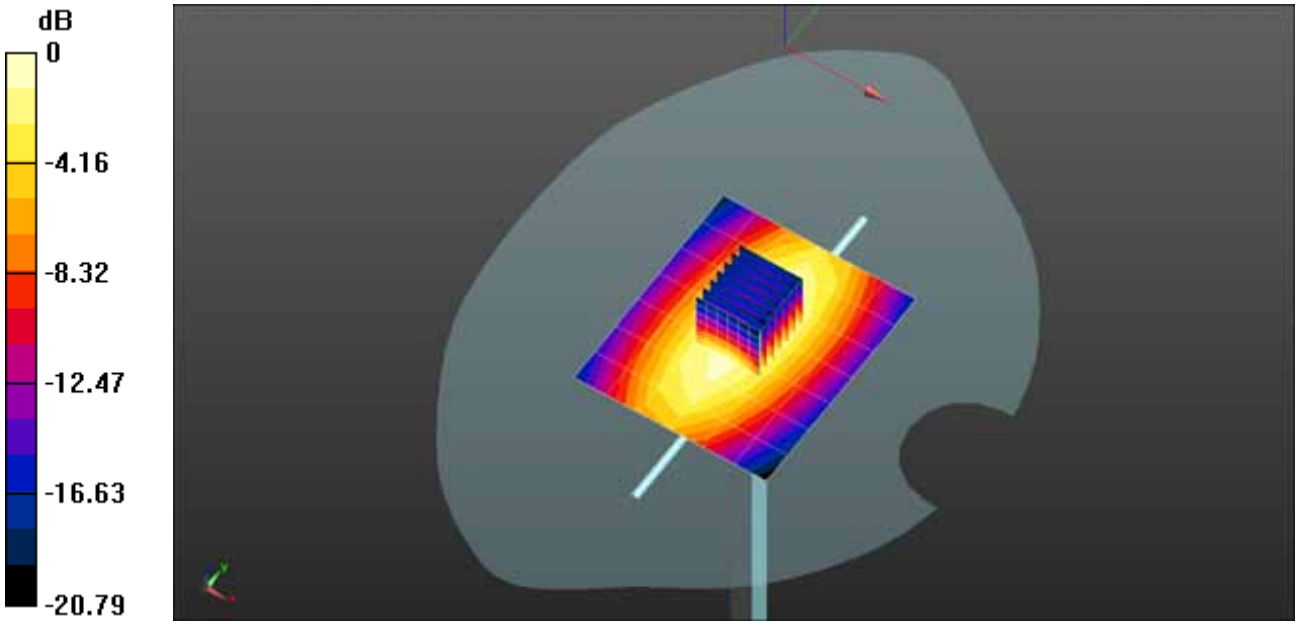
- Measured Liquid Temperature: 22.7 ℃, Ambient Temperature: 22.1 ℃

Communication System: UID 0, CW (0); Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 835 MHz; σ = 0.96 S/m; ε_r = 55.87; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(6.17, 6.17, 6.17); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

835MHz/d=10mm, Pin=xx mW, dist=3.0mm (ES-Probe) 2/Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.01 W/kg
835MHz/d=10mm, Pin=xx mW, dist=3.0mm (ES-Probe) 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.277 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.82 W/kg
SAR(1 g) = 2.6 W/kg; SAR(10 g) = 1.72 W/kg
Maximum value of SAR (measured) = 3.02 W/kg



0 dB = 3.01 W/kg = 4.78 dBW/kg

1900 MHz Head- Verification DATA (D1900V2 – 5d038)

- Test Date: 07/07/2014

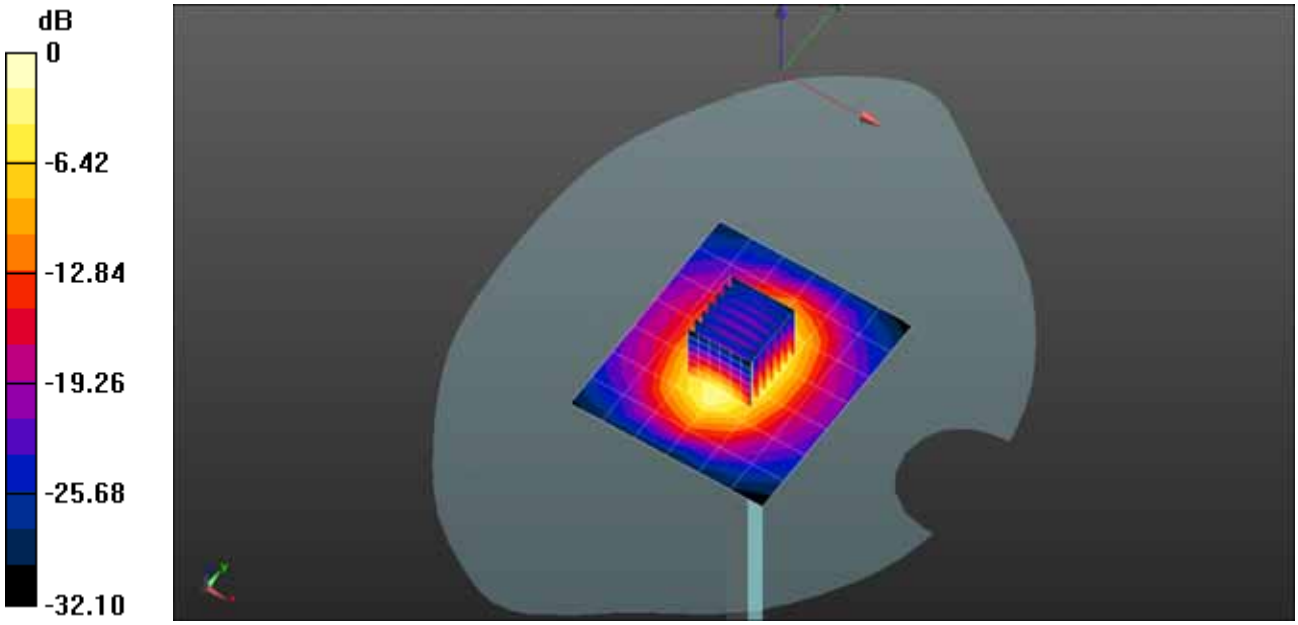
- Measured Liquid Temperature: 22.3 ℃, Ambient Temperature: 22.0 ℃

Communication System: UID 0, CW (0); Communication System Band: D1900 (1900.0 MHz);
Frequency: 1900 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 1900 MHz; σ = 1.45 S/m; ε_r = 39.75; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(4.85, 4.85, 4.85); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1900MHz/d=10mm, Pin=xx mW, dist=3.0mm (ES-Probe) 2/Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 12.3 W/kg
1900MHz/d=10mm, Pin=xx mW, dist=3.0mm (ES-Probe) 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.124 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 18.9 W/kg
SAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.56 W/kg
Maximum value of SAR (measured) = 13.3 W/kg



0 dB = 12.3 W/kg = 10.89 dBW/kg

1900 MHz Body- Verification DATA (D1900V2 – 5d038)

- Test Date: 07/09/2014

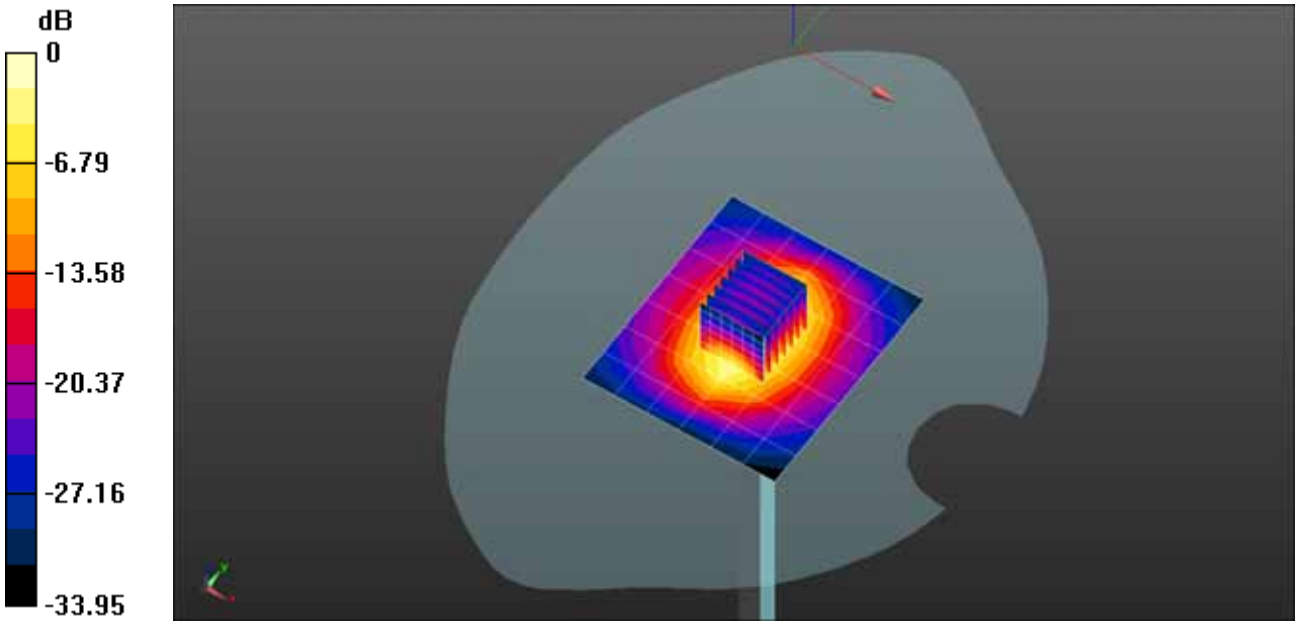
- Measured Liquid Temperature: 22.2 ℃, Ambient Temperature: 22.0 ℃

Communication System: UID 0, CW (0); Communication System Band: D1900 (1900.0 MHz);
Frequency: 1900 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 1900 MHz; σ = 1.57 S/m; ε_r = 51.05; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(4.41, 4.41, 4.41); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

1900MHz/d=10mm, Pin=xx mW, dist=3.0mm (ES-Probe) 2/Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 12.9 W/kg
1900MHz/d=10mm, Pin=xx mW, dist=3.0mm (ES-Probe) 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.271 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 18.6 W/kg
SAR(1 g) = 10.6 W/kg; SAR(10 g) = 5.63 W/kg
Maximum value of SAR (measured) = 13.4 W/kg



0 dB = 12.9 W/kg = 11.10 dBW/kg

2450 MHz Head- Verification DATA (D2450V2– 746)

- Test Date: 07/11/2014

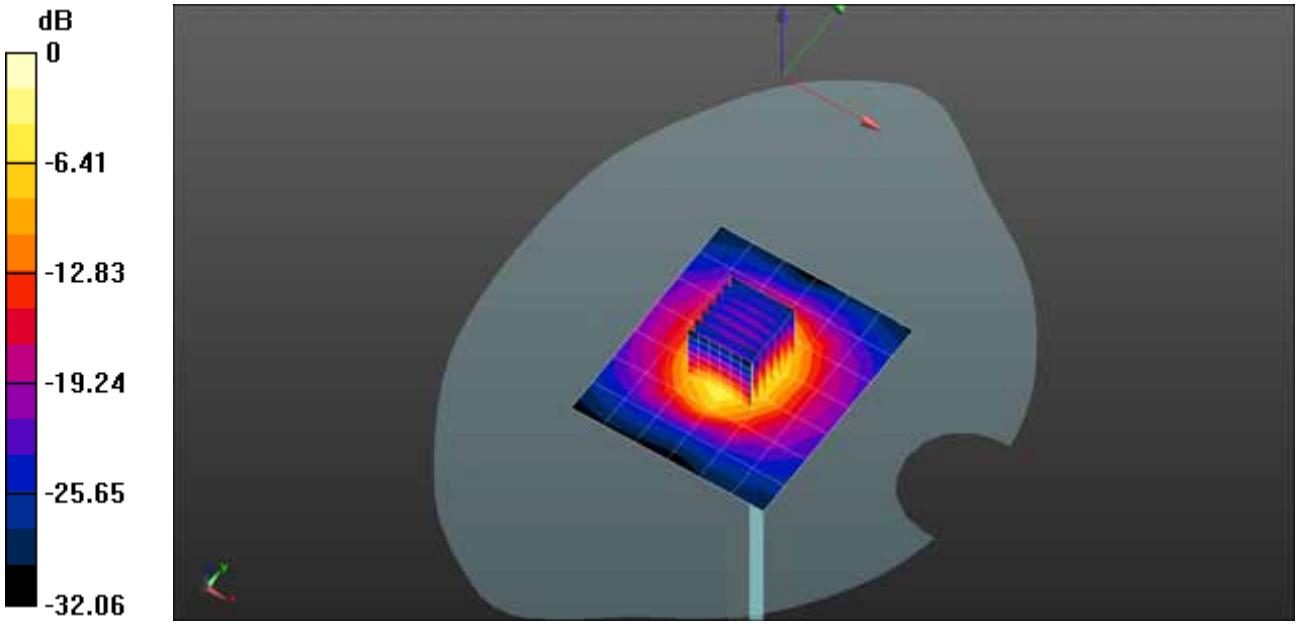
- Measured Liquid Temperature: 22.6 ℃, Ambient Temperature: 22.0 ℃

Communication System: UID 0, CW (0); Communication System Band: D2450 (2450.0 MHz);
Frequency: 2450 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 2450 MHz; σ = 1.84 S/m; ε_r = 37.547; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(4.18, 4.18, 4.18); Calibrated: 25.02.2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

2450MHz/d=10mm, Pin=xx mW, dist=3.0mm (ES-Probe) 2/Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 17.1 W/kg
2450MHz/d=10mm, Pin=xx mW, dist=3.0mm (ES-Probe) 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 101.9 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 28.2 W/kg
SAR(1 g) = 13.7 W/kg; SAR(10 g) = 6.39 W/kg
Maximum value of SAR (measured) = 18.0 W/kg



0 dB = 17.1 W/kg = 12.32 dBW/kg

2450 MHz Body- Verification DATA (D2450V2– 746)

- Test Date: 07/14/2014

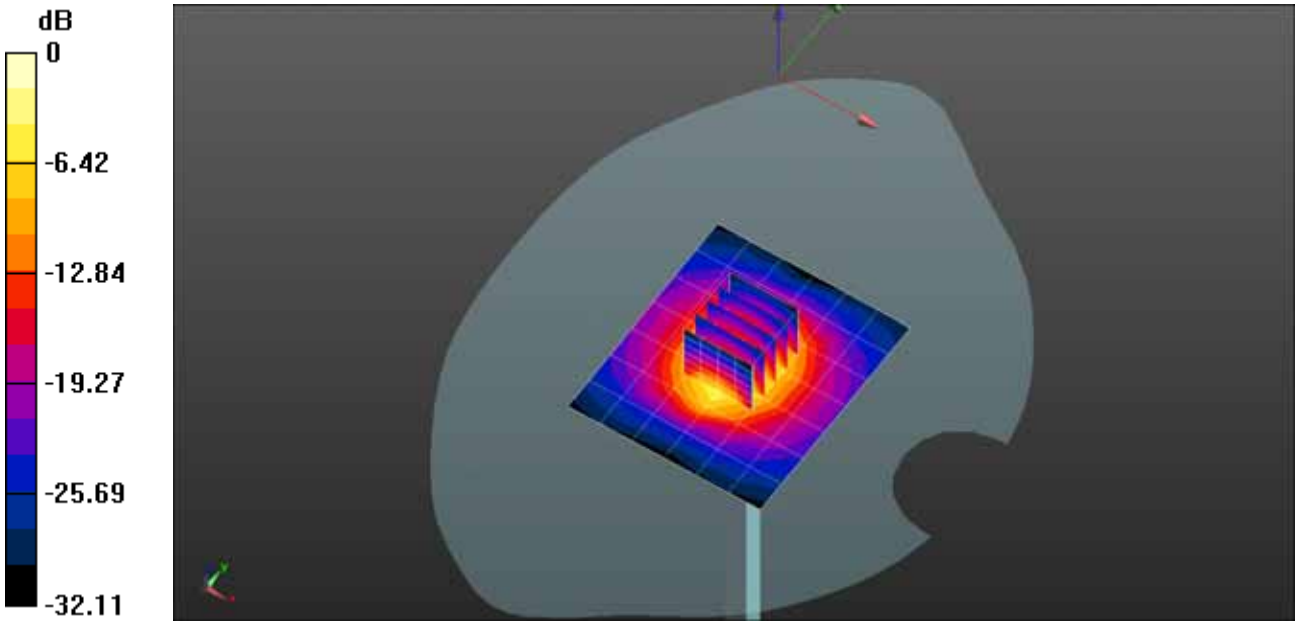
- Measured Liquid Temperature: 22.8 ℃, Ambient Temperature: 23.0 ℃

Communication System: UID 0, CW (0); Communication System Band: D2450 (2450.0 MHz);
Frequency: 2450 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 2450 MHz; σ = 1.897 S/m; ε_r = 50.545; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: ES3DV2 - SN3020; ConvF(3.78, 3.78, 3.78); Calibrated: 25.02.2014;
  - Modulation Compensation:
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0, 32.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Left)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

2450MHz/d=10mm, Pin=xx mW, dist=3.0mm (ES-Probe) 2/Area Scan (7x8x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 16.0 W/kg
2450MHz/d=10mm, Pin=xx mW, dist=3.0mm (ES-Probe) 2/Zoom Scan (7x7x7) (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 96.914 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 27.3 W/kg
SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.12 W/kg
Maximum value of SAR (measured) = 17.2 W/kg



0 dB = 16.0 W/kg = 12.03 dBW/kg

5200 MHz Head- Verification DATA (D5GHzV2– 1147)

- Test Date: 07/16/2014

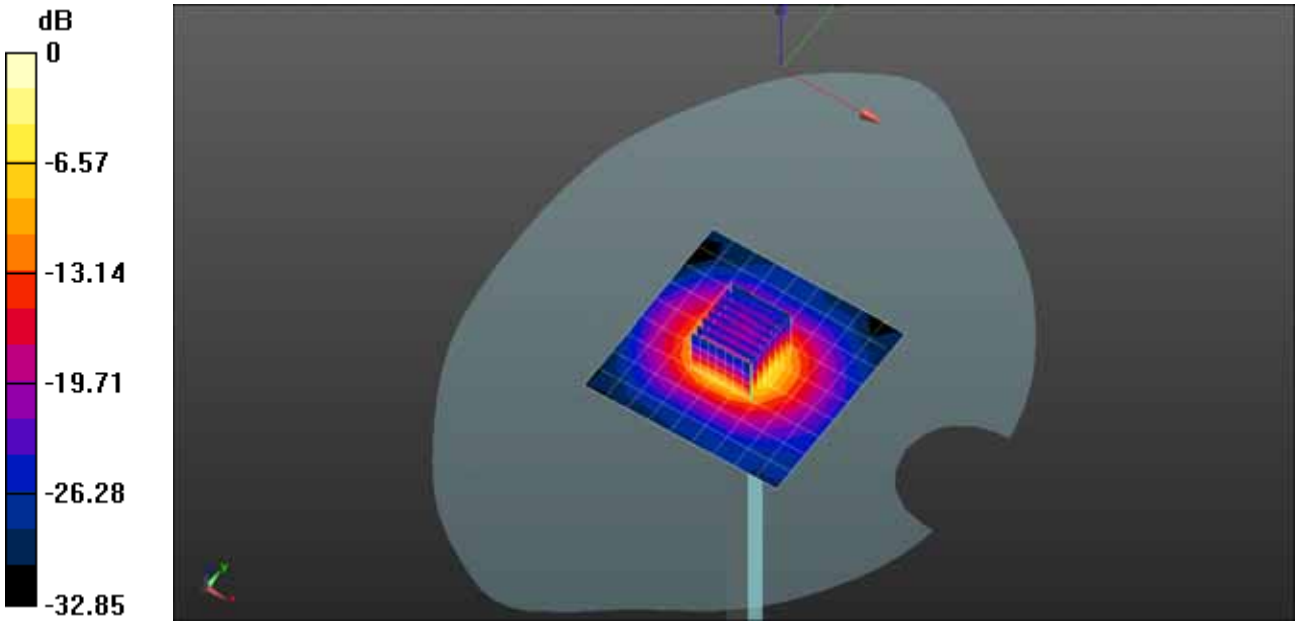
- Measured Liquid Temperature: 22.4 ℃, Ambient Temperature: 23.0 ℃

Communication System: UID 0, CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz);
Frequency: 5200 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 5200 MHz; σ = 4.727 S/m; ε_r = 36.596; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3905; ConvF(4.82, 4.82, 4.82); Calibrated: 26.02.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5200 MHz/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 13.6 W/kg
System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 69.960 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 32.7 W/kg
SAR(1 g) = 8.12 W/kg; SAR(10 g) = 2.37 W/kg
Maximum value of SAR (measured) = 18.8 W/kg



0 dB = 13.6 W/kg = 11.34 dBW/kg

5200 MHz Body- Verification DATA (D5GHzV2– 1147)

- Test Date: 12/11/2014

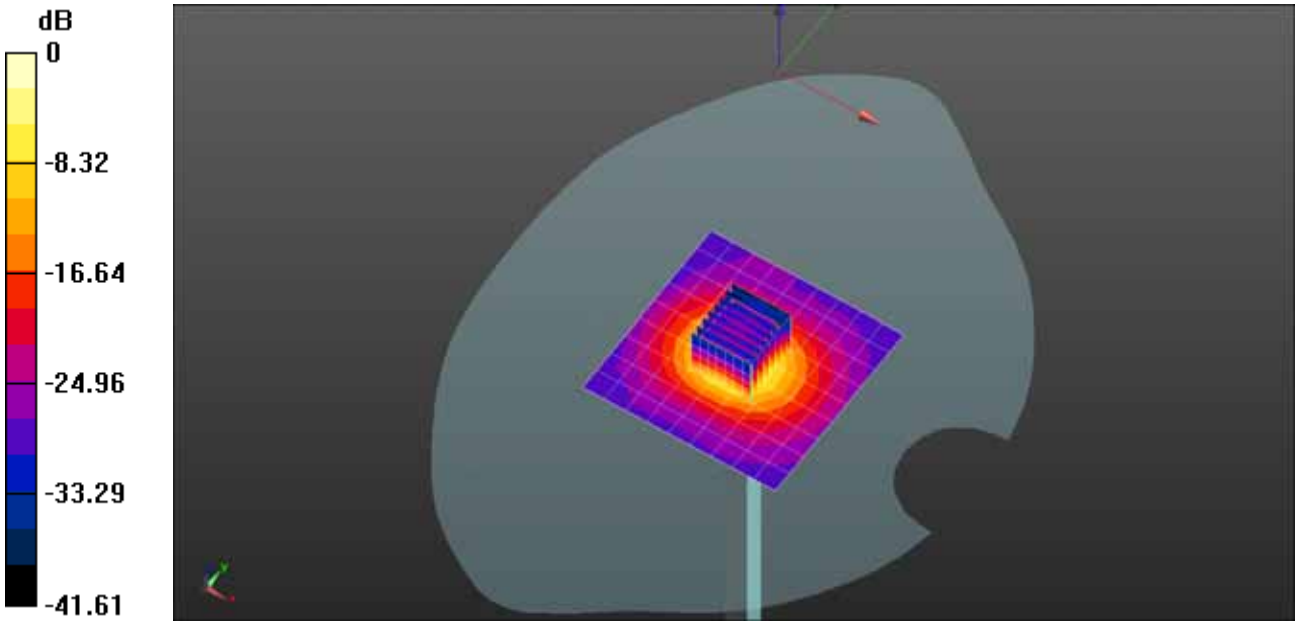
- Measured Liquid Temperature: 21.5 ℃, Ambient Temperature: 23.0 ℃

Communication System: UID 0, CW (0); Frequency: 5200 MHz
Medium parameters used: f = 5200 MHz; σ = 5.43 S/m; ε_r = 46.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3905; ConvF(4.08, 4.08, 4.08); Calibrated: 26.02.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Left)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5200 MHz/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 31.5 W/kg
System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 106.3 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 78.3 W/kg
SAR(1 g) = 20.7 W/kg; SAR(10 g) = 6.02 W/kg
Maximum value of SAR (measured) = 47.1 W/kg



0 dB = 47.1 W/kg = 16.73 dBW/kg

5500 MHz Head- Verification DATA (D5GHzV2– 1147)

- Test Date: 07/18/2014

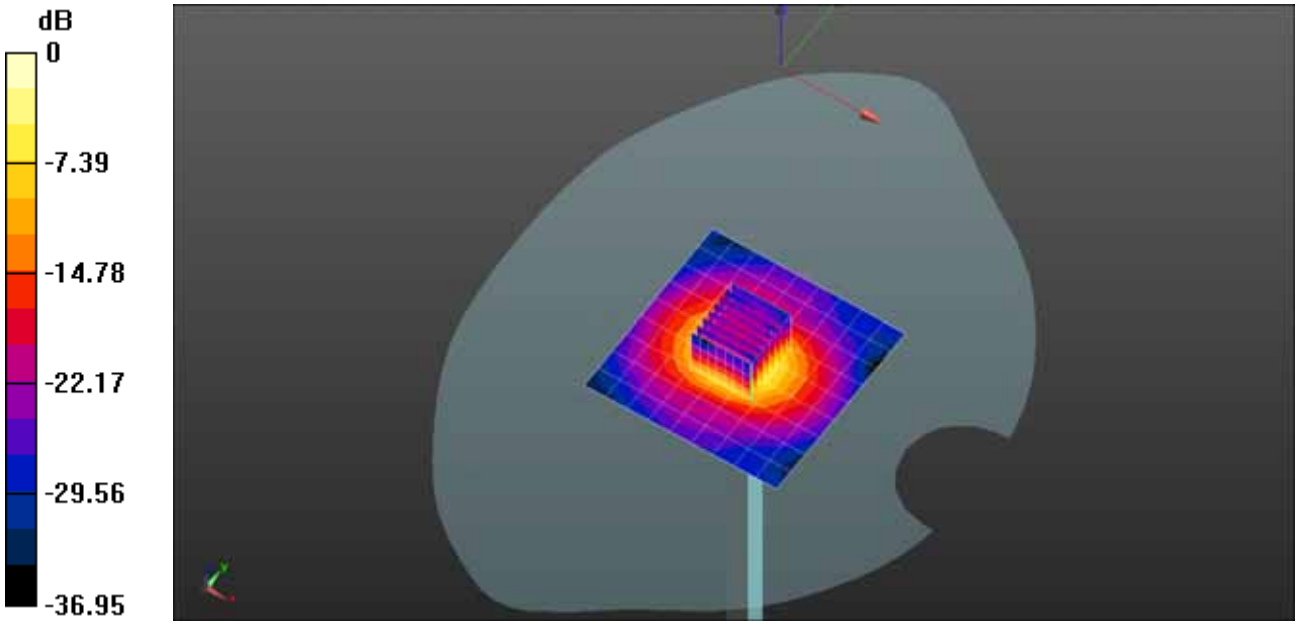
- Measured Liquid Temperature: 22.2 ℃, Ambient Temperature: 23.0 ℃

Communication System: UID 0, CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5500 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 5500 MHz; σ = 5.053 S/m; ε_r = 35.827; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3905; ConvF(4.52, 4.52, 4.52); Calibrated: 26.02.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5500 MHz/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 15.2 W/kg
System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5500 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 73.160 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 37.6 W/kg
SAR(1 g) = 8.96 W/kg; SAR(10 g) = 2.56 W/kg
Maximum value of SAR (measured) = 21.2 W/kg



0 dB = 15.2 W/kg = 11.83 dBW/kg

5500 MHz Body- Verification DATA (D5GHzV2– 1147)

- Test Date: 07/21/2014

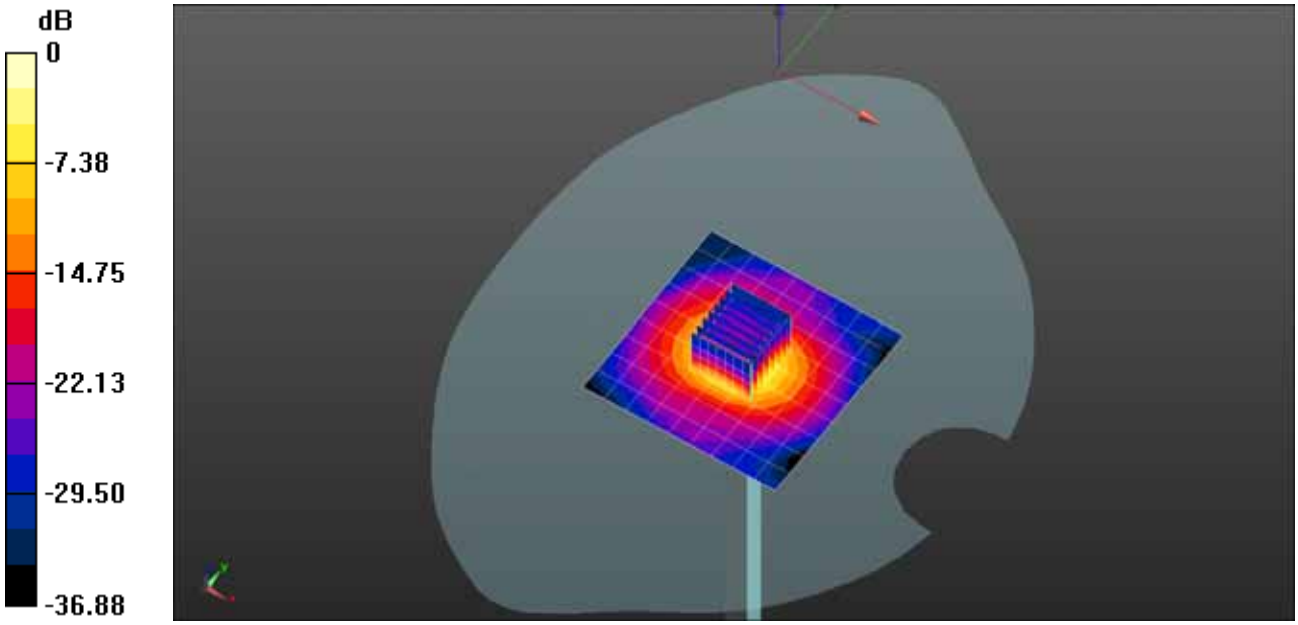
- Measured Liquid Temperature: 22.3 ℃, Ambient Temperature: 23.0 ℃

Communication System: UID 0, CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz);
Frequency: 5500 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 5500 MHz; σ = 5.78 S/m; ε_r = 47.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3905; ConvF(3.74, 3.74, 3.74); Calibrated: 26.02.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5500 MHz/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 13.3 W/kg
System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5500 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 68.829 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 34.2 W/kg
SAR(1 g) = 8.5 W/kg; SAR(10 g) = 2.39 W/kg
Maximum value of SAR (measured) = 19.6 W/kg



0 dB = 13.3 W/kg = 11.23 dBW/kg

5800 MHz Head- Verification DATA (D5GHzV2– 1147)

- Test Date: 07/23/2014

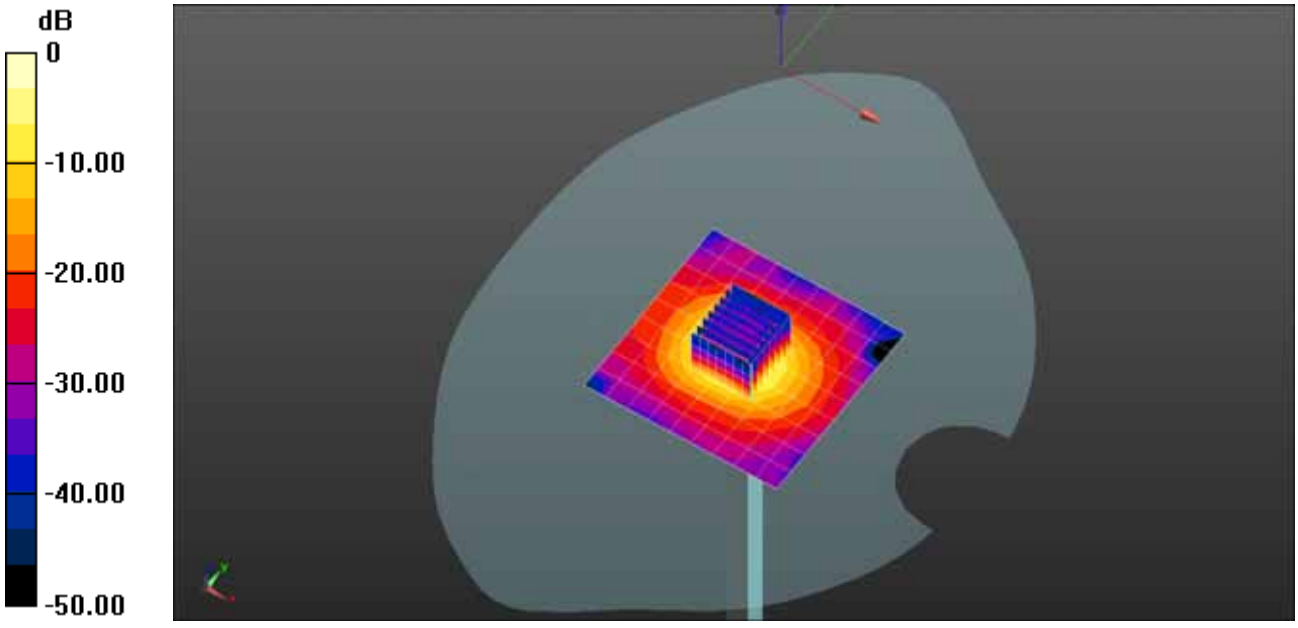
- Measured Liquid Temperature: 22.5 ℃, Ambient Temperature: 23.0 ℃

Communication System: UID 0, CW; Communication System Band: D5GHz (5000.0 - 6000.0 MHz);
Frequency: 5800 MHz;Communication System PAR: 0 dB; PMF: 1
Medium parameters used: f = 5800 MHz; σ = 5.464 S/m; ε_r = 35.218; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3905; ConvF(5.2, 5.2, 5.2); Calibrated: 26.02.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Right)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5800 MHz/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 14.6 W/kg
System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 68.354 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 37.9 W/kg
SAR(1 g) = 8.23 W/kg; SAR(10 g) = 2.34 W/kg
Maximum value of SAR (measured) = 20.3 W/kg



0 dB = 14.6 W/kg = 11.65 dBW/kg

5800 MHz Body- Verification DATA (D5GHzV2– 1147)

- Test Date: 12/11/2014

- Measured Liquid Temperature: 21.0 ℃, Ambient Temperature: 23.0 ℃

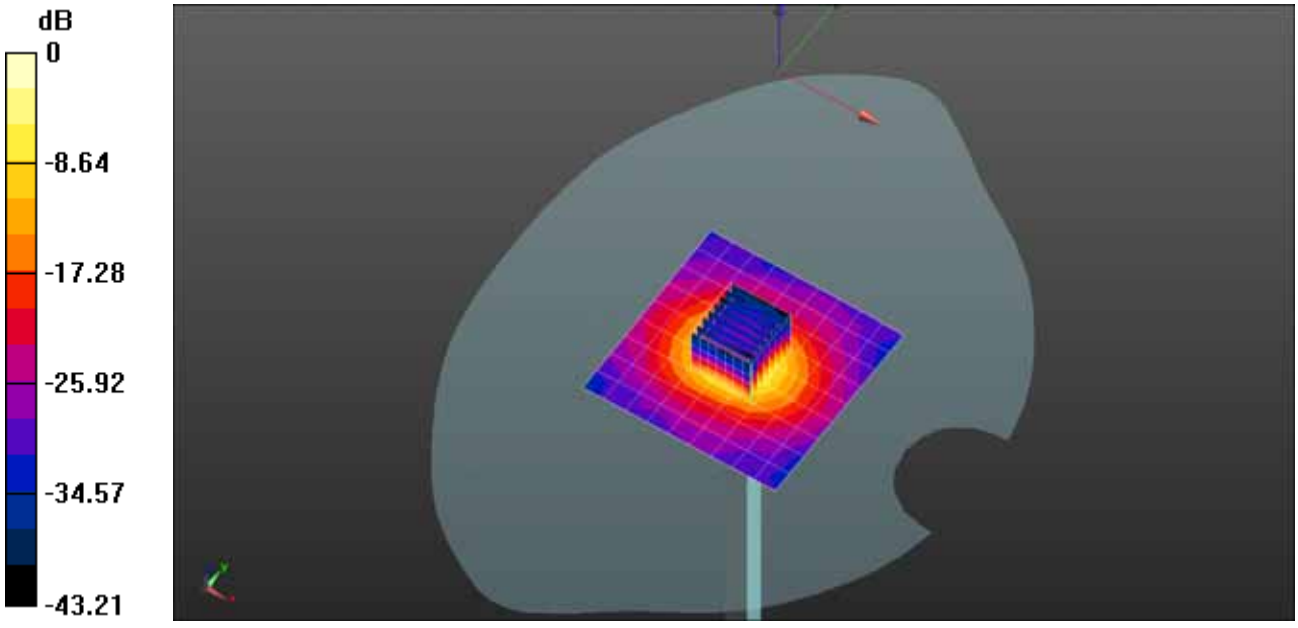
Communication System: UID 0, CW (0); Frequency: 5800 MHz
Medium parameters used: f = 5800 MHz; σ = 5.94 S/m; ε_r = 47.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

- Probe: EX3DV4 - SN3905; ConvF(4.04, 4.04, 4.04); Calibrated: 26.02.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0
- Electronics: DAE4 Sn1422; Calibrated: 13.01.2014
- Phantom: SAM with CRP v5.0(Left)_2014_03_05; Type: QD000P40CD; Serial: TP:xxxx
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5800 MHz 2/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 29.2 W/kg

System Performance Check with D5GHzV2 Dipole (graded grid)/d=10mm, Pin=100mW, f=5800 MHz 2/Zoom Scan (4x4x1.4mm, graded), dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 102.2 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 83.0 W/kg
SAR(1 g) = 18.8 W/kg; SAR(10 g) = 5.29 W/kg
Maximum value of SAR (measured) = 45.6 W/kg



0 dB = 45.6 W/kg = 16.59 dBW/kg