TESTING
NVLAP LAB CODE 600118-0

SAR TEST REPORT

No. I23Z60662-SEM03

For

TCL Communication Ltd.

Tablet PC

Model Name: 8196G

with

Hardware Version: PIO

Software Version: v3SSC

FCC ID: 2ACCJB201

Issued Date: 2023-06-14

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

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Test Laboratory:

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REPORT HISTORY

Report Number	Revision	Issue Date	Description
I23Z60662-SEM03	Rev.0	2023-06-10	Initial creation of test report
I23Z60662-SEM03	Rev.1	2023-06-14	The description of the Equipment Class is changed to PCT on page 2. Changed a clerical error on page 30/31, changing DSI2/DSI4 to DSI1/DSI2.

TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

Company Name:	CTTL
Address:	No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

1.2 Testing Environment

Temperature:	18°C~25°C,
Relative humidity:	30%~ 70%
Ground system resistance:	< 0.5 Ω
Ambient noise & Reflection:	< 0.012 W/kg

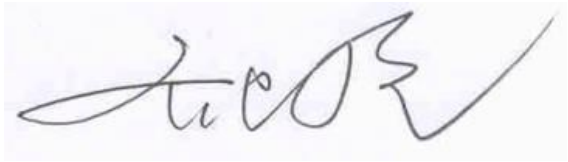
1.3 Project Data

Project Leader:	Qi Dianyuan
Test Engineer:	Yao Juming
Testing Start Date:	May 10, 2023
Testing End Date:	June 6, 2023

1.4 Signature

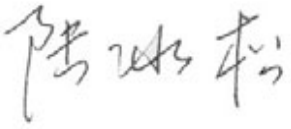
Yao Juming

(Prepared this test report)



Qi Dianyuan

(Reviewed this test report)



Lu Bingsong

Deputy Director of the laboratory

(Approved this test report)

2 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for TCL Communication Ltd. Tablet PC 8196G are as follows:

Table 2.1: Highest Reported SAR (1g)

Technology Band	Body SAR 1g (W/kg)	Equipment Class
GSM850	**0.47**	PCT
GSM1900	**0.80**	
WCDMA1900	**0.84**	
WCDMA1700	**0.31**	
WCDMA 850	**0.46**	
LTE Band2	**0.60**	
LTE Band5	**0.33**	
LTE Band7	**0.79**	
LTE Band12/17	**0.43**	
LTE Band13	**0.31**	
LTE Band41/38	**0.51**	
LTE Band66/4	**0.62**	
WLAN 2.4GHz	**0.76**	DTS
WLAN 5GHz	**0.75**	NII
BT	**0.16**	DSS

The SAR values found for the Mobile Phone are below the maximum recommended levels of 1.6 W/kg as averaged over any 1g tissue according to the ANSI C95.1-1992.

For body operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and which provides a minimum separation distance of 0mm/14mm/15mm/17mm between this device and the body of the user. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output.

The measurement together with the test system set-up is described in annex C of this test report. A detailed description of the equipment under test can be found in chapter 4 of this test report. The highest reported SAR value is obtained at the case of **(Table 2.1),** and the values are**:**

Body: 0.84 W/kg(1g)

Remark：

This device supports both LTE B4/17/B38 and LTE B66/B12/B41.Since the supported frequency span for LTE B4/B17/B38 falls completely within the supports frequency span for LTE B66/B12/B41, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B66/B12/B41.

Table 2.2: The sum of SAR values for Main antenna + WiFi2.4G

Position	LTE Band66	WiFi-2.4G	Sum 1g (W/kg)
Rear 0mm	0.57	0.69	**1.38**

Table 2.3: The sum of SAR values for Main antenna + WiFi-5G + BT

Position	LTE Band66	WiFi-5G	BT	Sum
Rear 0mm	0.62	0.75	0.18	**1.55**

According to the above tables, the highest sum of reported SAR values is **1.55 W/kg (1g)**. The detail for simultaneous transmission consideration is described in chapter 13.

Conclusion:

According to the above tables, the sum of reported SAR values is<1.6W/kg. So the simultaneous transmission SAR with volume scans is not required.

3 Client Information

3.1 Applicant Information

Company Name:	TCL Communication Ltd.
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Contact Person:	Annie Jiang
Contact Email:	nianxiang.jiang@tcl.com
Telephone:	+86 755 3661 1621

3.2 Manufacturer Information

Company Name:	TCL Communication Ltd.
Address/Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact Person:	Annie Jiang
Contact Email:	nianxiang.jiang@tcl.com
Telephone:	+86 755 3661 1621

4 Equipment Under Test (EUT) and Ancillary Equipment (AE)

4.1 About EUT

Description:	Tablet PC
Model name:	8196G
Operating mode(s):	GSM850/1900, WCDMA850/1700/1900 LTEBand2/5/7/12/13/41/66, BT, Wi-Fi(2.4G&5G)
Tested Tx Frequency:	824 – 849 MHz (GSM 850)
	1850 – 1910 MHz (GSM 1900)
	824 – 849 MHz (WCDMA 850 Band V)
	1850 – 1910 MHz (WCDMA1900 Band IV)
	1710-1755 MHz (WCDMA1700 Band II)
	1850 – 1910 MHz (LTE Band 2)
	824 – 849 MHz (LTE Band 5)
	2500 – 2570 MHz (LTE Band 7)
	698 – 716 MHz (LTE Band 12)
	777 –787 MHz (LTE Band 13)
	2496 – 2690 MHz (LTE Band41)
	1710 –1780 MHz (LTE Band 66)
	2412 – 2462 MHz (Wi-Fi 2.4G)
	2400 – 2483.5 MHz (Bluetooth)
	5180 – 5240 MHz (Wi-Fi 5.2G)
	5260 – 5320 MHz (Wi-Fi 5.3G)
	5745 – 5825 MHz (Wi-Fi 5.8G)
GPRS/EGPRS Multislot Class:	12
Test device production information:	Production unit
Device type:	Portable device
Antenna type:	Integrated antenna
Hotspot mode:	Support

4.2 Internal Identification of EUT used during the test

EUT ID*	IMEI/SN	HW Version	SW Version
EUT1	354304830000863	PIO	v3SSC
EUT2	354304830000871	PIO	v3SSC
EUT3	354304830000921	PIO	v3SSC
EUT4	354304830000327	PIO	v3SSC
EUT5	354304830000368	PIO	v3SSC
EUT6	354304830000442	PIO	v3SSC

*EUT ID: is used to identify the test sample in the lab internally.

Note: It is performed to test SAR with the EUT1~3 and conducted power with the EUT4~6.

4.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Battery	TLp058C8	/	Huizhou Ganfeng Lienergy Battery Technology Co.,Ltd.

*AE ID: is used to identify the test sample in the lab internally.

5 TEST METHODOLOGY

5.1 Applicable Limit Regulations

ANSI C95.1–1992:IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

It specifies the maximum exposure limit of **1.6 W/kg** as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

5.2 Applicable Measurement Standards

IEEE 1528–2013: Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.

KDB447498 D01: General RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

KDB616217 D04 SAR for laptop and tablets v01r02 SAR Evaluation Considerations for Laptop, Notebook, Notebook and Tablet Computers.

KDB648474 D04 Handset SAR v01r03: SAR Evaluation Considerations for Wireless Handsets.

KDB941225 D01 SAR test for 3G devices v03r01: SAR Measurement Procedures for 3G Devices

KDB941225 D05 SAR for LTE Devices v02r05: SAR Evaluation Considerations for LTE Devices

KDB941225 D06 Hotspot Mode SAR v02r01: SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities

KDB248227 D01 802.11 Wi-Fi SAR v02r02: SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS

KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04: SAR Measurement Requirements for 100 MHz to 6 GHz.

KDB865664 D02 RF Exposure Reporting v01r02: RF Exposure Compliance Reporting and Documentation Considerations

6 Specific Absorption Rate (SAR)

6.1 Introduction

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

6.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ) . The equation description is as below:

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

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be either related to the temperature elevation in tissue by

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

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

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

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

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

7 Tissue Simulating Liquids

7.1 Targets for tissue simulating liquid

Table 7.1: Targets for tissue simulating liquid

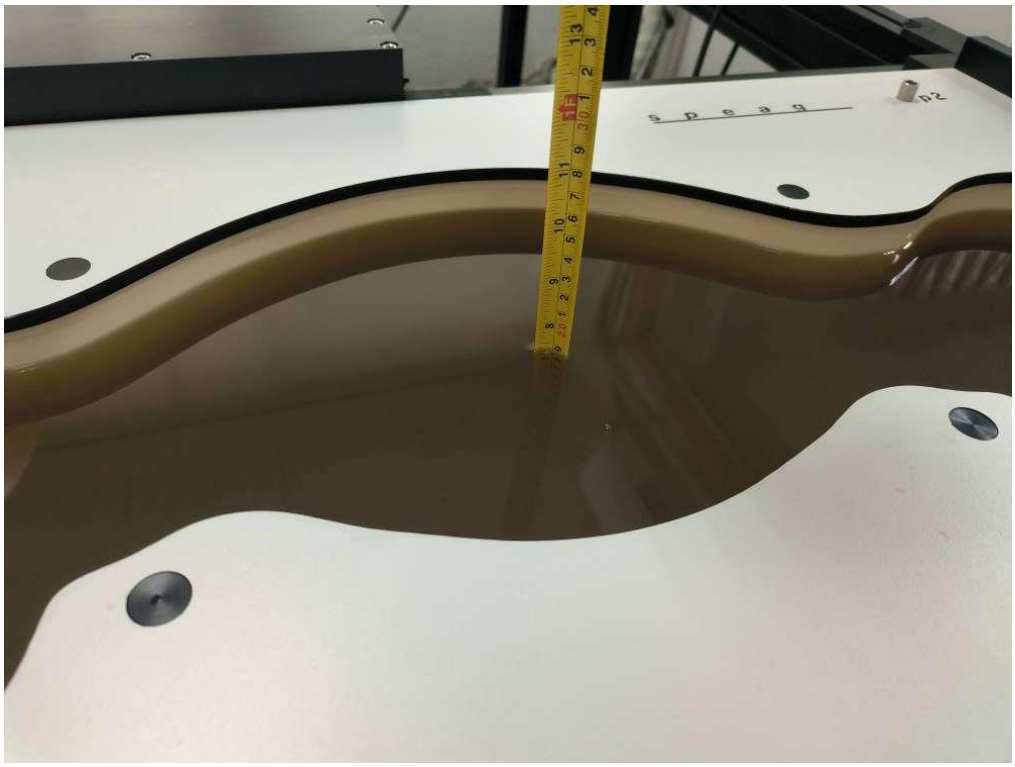
Frequency(MHz)	Liquid Type	Conductivity(σ)	± 5% Range	Permittivity(ε)	± 5% Range
750	Head	0.89	0.85～0.93	41.94	39.8～44.0
835	Head	0.90	0.86～0.95	41.5	39.4～43.6
1750	Head	1.37	1.30～1.44	40.08	38.1～42.1
1900	Head	1.40	1.33～1.47	40.0	38.0～42.0
2450	Head	1.67	1.59～1.75	39.47	37.5～41.4
2600	Head	1.96	1.86～2.06	39.01	37.1～41.0
5250	Head	4.71	4.47～4.95	35.93	34.13～37.73
5600	Head	5.07	4.82～5.32	35.53	33.8～37.3
5750	Head	5.22	4.96～5.48	35.36	33.59～37.13

7.2 Dielectric Performance

Table 7.2: Dielectric Performance of Tissue Simulating Liquid

Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2023/5/10	Head	750 MHz	42.07	0.31	0.897	0.79
2023/5/11	Head	835 MHz	41.45	-0.12	0.884	-1.78
2023/6/7	Head	1750 MHz	39.44	-1.60	1.374	0.29
2023/5/13	Head	1900 MHz	39.33	-1.68	1.382	-1.29
2023/5/14	Head	2450 MHz	39.22	0.05	1.813	0.72
2023/5/15	Head	2600 MHz	38.4	-1.56	1.96	0.00
2023/5/16	Head	5250 MHz	35.43	-1.39	4.701	-0.19
2023/5/17	Head	5600 MHz	35.18	-0.99	5.024	-0.91
2023/5/18	Head	5750 MHz	36.01	1.84	5.248	0.54

Note: The liquid temperature is 22.0℃

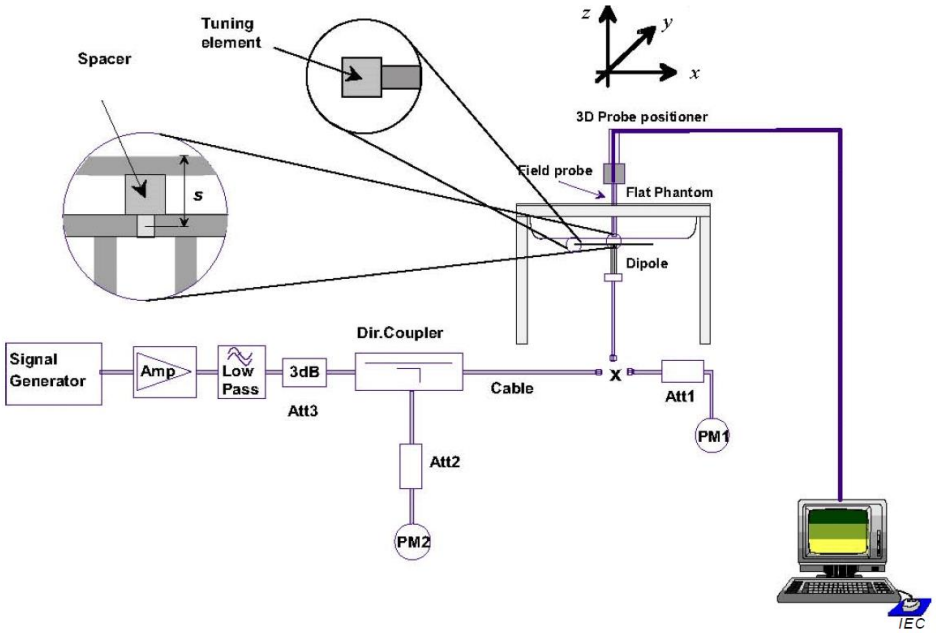


Picture 9-1 Liquid depth in the Flat Phantom

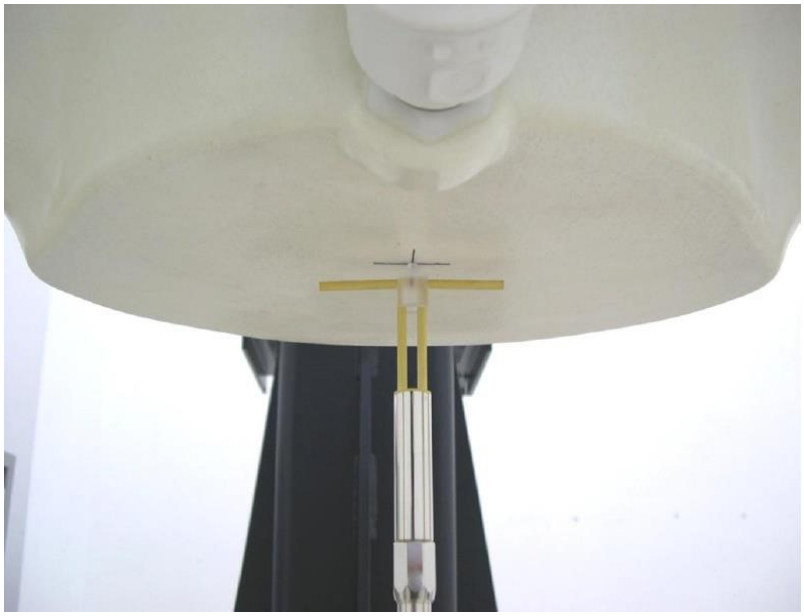
8 System verification

8.1 System Setup

In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:



Picture 8.1 System Setup for System Evaluation



Picture 8.2 Photo of Dipole Setup

8.2 System Verification

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device.

The system verification results are required that the area scan estimated 1-g SAR is within 3% of the zoom scan 1-g SAR. The details are presented in annex B.

Table 8.1: System Verification of Head

Measurement Date (yyyy-mm-dd)	Frequency	Target value (W/kg)		Measured value(W/kg)		Deviation	
		10 g Average	1 g Average	10 g Average	1 g Average	10 g Average	1 g Average
2023/5/10	750 MHz	5.53	8.47	5.6	8.44	1.27%	-0.35%
2023/5/11	835 MHz	6.25	9.60	6.2	9.68	-0.80%	0.83%
2023/6/7	1750 MHz	19.1	36.5	19.04	36	-0.31%	-1.37%
2023/5/13	1900 MHz	20.6	39.6	20.96	39.68	1.75%	0.20%
2023/5/14	2450 MHz	24.5	52.5	24.28	51.76	-0.90%	-1.41%
2023/5/15	2600 MHz	25.3	57.0	25.44	55.88	0.55%	-1.96%
2023/5/16	5250 MHz	22.9	80.5	23.3	80.8	1.66%	0.37%
2023/5/17	5600 MHz	23.6	83.3	23.7	82.3	0.34%	-1.18%
2023/5/18	5750 MHz	22.7	80.4	22.7	80.6	0.09%	0.20%

9 Measurement Procedures

9.1 Tests to be performed

In order to determine the highest value of the peak spatial-average SAR of a handset, all device positions, configurations and operational modes shall be tested for each frequency band according to steps 1 to 3 below. A flowchart of the test process is shown in picture 9.1.

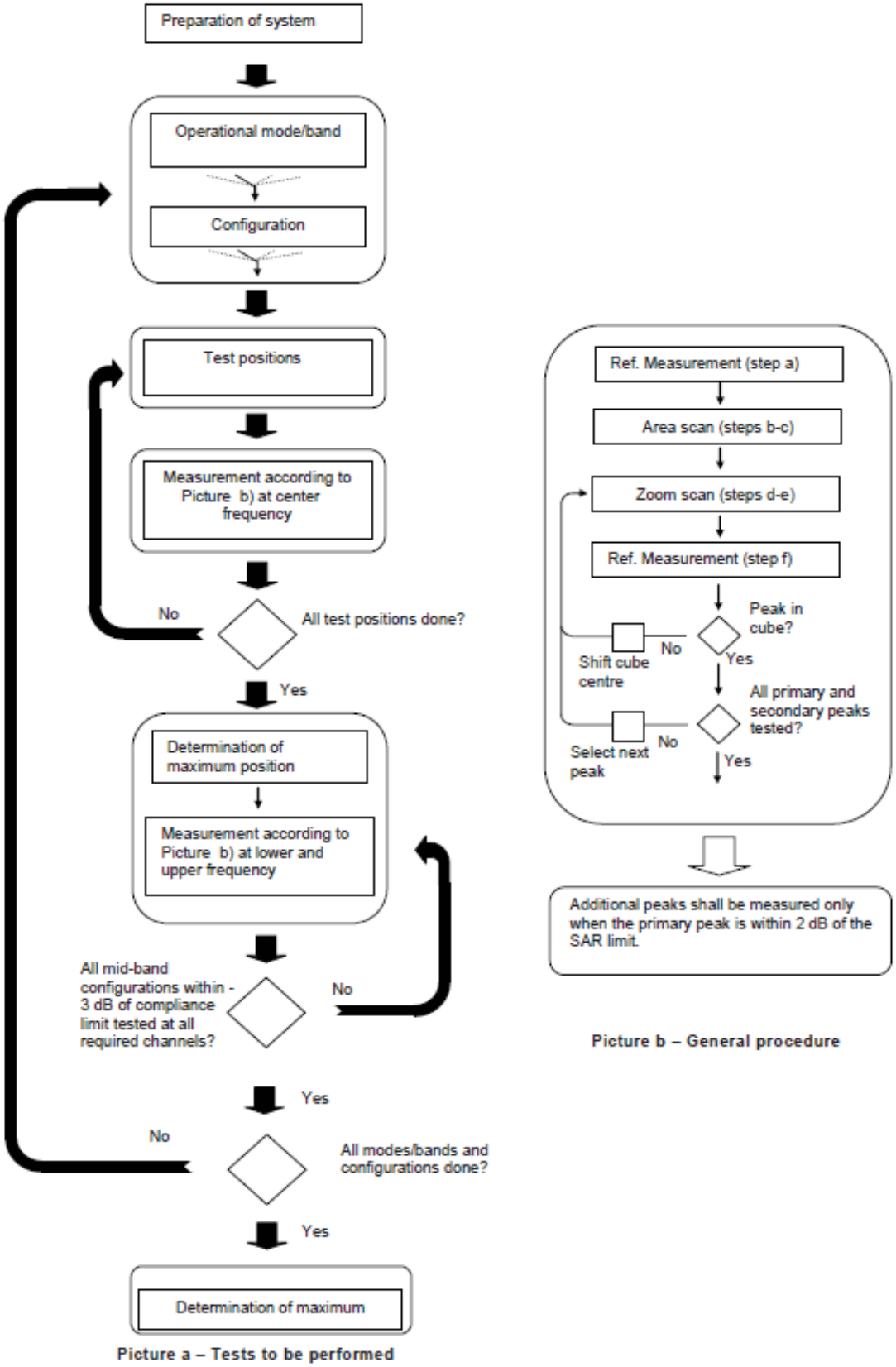
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

a) all device positions (cheek and tilt, for both left and right sides of the SAM phantom, as described in annex D),
b) all configurations for each device position in a), e.g., antenna extended and retracted, and
c) all operational modes, e.g., analogue and digital, for each device position in a) and configuration in b) in each frequency band.

If more than three frequencies need to be tested according to 11.1 (i.e., $N_c > 3$), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

Step 2: For the condition providing highest peak spatial-average SAR determined in Step 1,perform all tests described in 9.2 at all other test frequencies, i.e., lowest and highest frequencies. In addition, for all other conditions (device position, configuration and operational mode) where the peak spatial-average SAR value determined in Step 1 is within3 dB of the applicable SAR limit, it is recommended that all other test frequencies shall be tested as well.

Step 3: Examine all data to determine the highest value of the peak spatial-average SAR found in Steps 1 to 2.



Picture 9.1Block diagram of the tests to be performed

9.2 General Measurement Procedure

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements and fully documented in SAR reports to qualify for TCB approval. Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std 1528-2003. The results should be documented as part of the system validation records and may be requested to support test results when all the measurement parameters in the following table are not satisfied.

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

9.3 WCDMA Measurement Procedures for SAR

The following procedures are applicable to WCDMA handsets operating under 3GPP Release99, Release 5 and Release 6. The default test configuration is to measure SAR with an established radio link between the DUT and a communication test set using a 12.2kbps RMC (reference measurement channel) configured in Test Loop Mode 1. SAR is selectively confirmed for other physical channel configurations (DPCCH & $DPDCH_n$), HSDPA and HSPA (HSUPA/HSDPA) modes according to output power, exposure conditions and device operating capabilities. Both uplink and downlink should be configured with the same RMC or AMR, when required. SAR for Release 5 HSDPA and Release 6 HSPA are measured using the applicable FRC (fixed reference channel) and E-DCH reference channel configurations. Maximum output power is verified according to applicable versions of 3GPP TS 34.121 and SAR must be measured according to these maximum output conditions. When Maximum Power Reduction (MPR) is not implemented according to Cubic Metric (CM) requirements for Release 6 HSPA, the following procedures do not apply.

For Release 5 HSDPA Data Devices:

Sub-test	β_c	β_d	β_d （SF）	β_c/β_d	β_{hs}	CM/dB
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15	15/15	64	12/15	24/25	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

For Release 6 HSPA Data Devices

Sub-test	β_c	β_d	β_d （SF）	β_c/β_d	β_{hs}	β_{ec}	β_{ed}	β_{ed} （SF）	β_{ed} （codes）	CM (dB)	MPR (dB)	AG Index	E-TFCI
1	11/15	15/15	64	11/15	22/15	209/225	1039/225	4	1	1.5	1.5	20	75
2	6/15	15/15	64	6/15	12/15	12/15	12/15	4	1	1.5	1.5	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	1.5	1.5	15	92
4	2/15	15/15	64	2/15	4/15	4/15	56/75	4	1	1.5	1.5	17	71
5	15/15	15/15	64	15/15	24/15	30/15	134/15	4	1	1.5	1.5	21	81

Rel.8 DC-HSDPA (Cat 24)

SAR test exclusion for Rel.8 DC-HSDPA must satisfy the SAR test exclusion requirements of Rel.5 HSDPA. SAR test exclusion for DC-HSDPA devices is determined by power measurements according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to qualify for SAR test exclusion.

9.4 SAR Measurement for LTE

SAR tests for LTE are performed with a base station simulator, Rohde & Rchwarz CMW500. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. All powers were measured with the CMW 500.
It is performed for conducted power and SAR based on the KDB941225 D05.
SAR is evaluated separately according to the following procedures for the different test positions in each exposure condition – head, body, body-worn accessories and other use conditions. The procedures in the following subsections are applied separately to test each LTE frequency band.

1) QPSK with 1 RB allocation
   Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.
2) QPSK with 50% RB allocation
   The procedures required for 1 RB allocation in 1) are applied to measure the SAR for QPSK with 50% RB allocation.
3) QPSK with 100% RB allocation
   For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

TDD test:

TDD testing is performed using guidance from FCC KDB 941225 D05 and the SAR test guidance provided in April 2013 TCB works hop notes. TDD is tested at the highest duty factor using UL-DL configuration 0 with special subframe configuration 6 and applying the FDD LTE procedures in KDB 941225 D05. SAR testing is performed using the extended cyclic prefix listed in 3GPP TS 36.211.

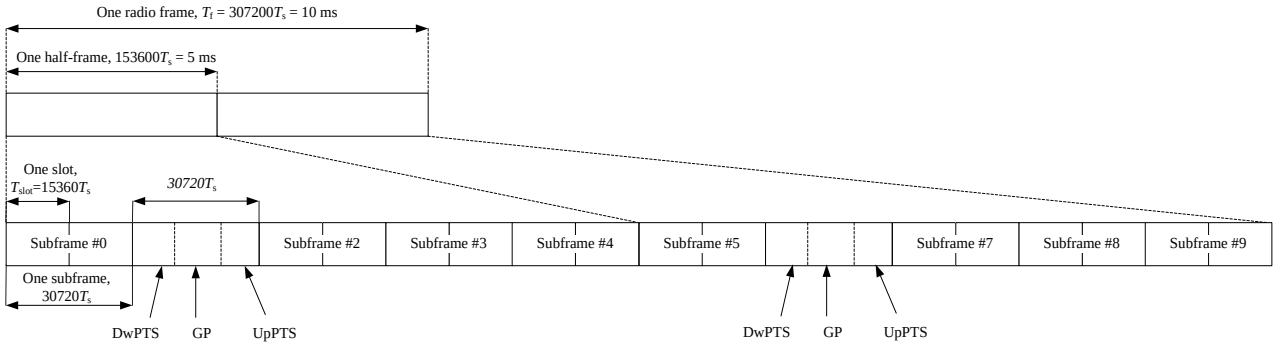


Figure 9.2: Frame structure type 2 (for 5 ms switch-point periodicity)

Table 9.1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Table 9.2: Uplink-downlink configurations

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Duty factor is calculated by:

Duty factor = uplink frame*6+UpPTS*2/one frame length

= (30720.T_s * 6+5120. T_s*2)/307200.T_s

= 0.633

9.5 Bluetooth & Wi-Fi Measurement Procedures for SAR

Normal network operating configurations are not suitable for measuring the SAR of 802.11 transmitters in general. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure that the results are consistent and reliable.

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in a test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

9.6 Power Drift

To control the output power stability during the SAR test, DASY5 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in section14 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

10 Area Scan Based 1-g SAR

10.1 Requirement of KDB

According to the KDB447498 D01, when the implementation is based the specific polynomial fit algorithm as presented at the 29th Bioelectromagnetics Society meeting (2007) and the estimated 1-gSAR is ≤ 1.2 W/kg, a zoom scan measurement is not required provided it is also not needed for any other purpose; for example, if the peak SAR location required for simultaneous transmission SAR test exclusion can be determined accurately by the SAR system or manually to discriminate between distinctive peaks and scattered noisy SAR distributions from area scans.

There must not be any warning or alert messages due to various measurement concerns identified by the SAR system; for example, noise in measurements, peaks too close to scan boundary, peaks are too sharp, spatial resolution and uncertainty issues etc. The SAR system verification must also demonstrate that the area scan estimated 1-g SAR is within 3% of the zoom scan 1-g SAR (See Annex B). When all the SAR results for each exposure condition in a frequency band and wireless mode are based on estimated 1-g SAR, the 1-g SAR for the highest SAR configuration must be determined by a zoom scan.

10.2 Fast SAR Algorithms

The approach is based on the area scan measurement applying a frequency dependent attenuation parameter. This attenuation parameter was empirically determined by analyzing a large number of phones. The MOTOROLA FAST SAR was developed and validated by the MOTOROLA Research Group in Ft. Lauderdale.

In the initial study, an approximation algorithm based on Linear fit was developed. The accuracy of the algorithm has been demonstrated across a broad frequency range (136-2450 MHz)and for both 1- and 10-g averaged SAR using a sample of 264 SAR measurements from 55wireless handsets. For the sample size studied, the root-mean-squared errors of the algorithm mare 1.2% and 5.8% for 1- and 10-g averaged SAR, respectively. The paper describing the algorithm in detail is expected to be published in August 2004 within the Special Issue of Transactions on MTT.

In the second step, the same research group optimized the fitting algorithm to an Polynomial fit whereby the frequency validity was extended to cover the range 30-6000MHz. Details of this study can be found in the BEMS 2007 Proceedings.

Both algorithms are implemented in DASY software.

11 Conducted Output Power

This device uses a power reduction mechanism to reduce output powers in certain use conditions when the device is used close the user's body. When the device's antenna is within a certain distance of the user, the sensor activates and reduces the maximum allowed output power. However, the sensor is not active when the device is moved beyond the sensor triggering distance and the maximum output power is no longer limited. Therefore, it is necessary to test SAR at a distance 1mm less than the smallest distance from the device and SAR phantom to ensure SAR is compliant when the device is allowed to operate at a nonreduced output power level. Sensor triggering distance summary data is included in Annex I. The details of test scenarios categorization in the table below

DSI0 (Senor OFF)	Proximity sensor unactivated (Full power)
DSI1/DSI2 (Senor ON)	Proximity sensor activated

11.1 GSM Measurement result

Table 11.1-1: The conducted power measurement results–GSM850 DSI0

GSM 850 GPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	32.44	32.45	32.33	33.50	-9.03	23.41	23.42	23.30
2 Txslots	**29.83**	**29.88**	**29.82**	**31.00**	**-6.02**	**23.81**	**23.86**	**23.80**
3 Txslots	27.64	27.76	27.79	29.00	-4.26	23.38	23.50	23.53
4 Txslots	26.54	26.51	26.60	28.00	-3.01	23.53	23.50	23.59
GSM 850 EGPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	32.45	32.44	32.33	33.50	-9.03	23.42	23.41	23.30
2 Txslots	**29.83**	**29.88**	**29.83**	**31.00**	**-6.02**	**23.81**	**23.86**	**23.81**
3 Txslots	27.63	27.75	27.77	29.00	-4.26	23.37	23.49	23.51
4 Txslots	26.63	26.52	26.60	28.00	-3.01	23.62	23.51	23.59
GSM 850 EGPRS (8PSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	26.74	26.71	26.85	27.50	-9.03	17.71	17.68	17.82
2 Txslots	23.80	23.87	23.92	25.00	-6.02	17.78	17.85	17.90
3Txslots	21.75	21.78	21.80	23.00	-4.26	17.49	17.52	17.54
4 Txslots	20.59	20.65	20.69	22.00	-3.01	17.58	17.64	17.68

NOTES:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01Db

According to the conducted power as above, the measurements are performed with 2Tx slots for GSM850.

Table 11.1-2: The conducted power measurement results–GSM850 DSI1/DSI2

GSM 850 GPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	**26.58**	**26.80**	**26.90**	**28.00**	**-9.03**	**17.55**	**17.77**	**17.87**
2 Txslots	23.48	23.73	23.87	25.00	-6.02	17.46	17.71	17.85
3 Txslots	21.69	21.99	22.15	23.50	-4.26	17.43	17.73	17.89
4 Txslots	20.21	20.55	20.82	22.00	-3.01	17.20	17.54	17.81
GSM 850 EGPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	**26.56**	**26.81**	**26.91**	**28.00**	**-9.03**	**17.53**	**17.78**	**17.88**
2 Txslots	23.46	23.74	23.88	25.00	-6.02	17.44	17.72	17.86
3 Txslots	21.68	22.01	22.16	23.50	-4.26	17.42	17.75	17.90
4 Txslots	20.21	20.57	20.83	22.00	-3.01	17.20	17.56	17.82
GSM 850 EGPRS (8PSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	251	190	128			251	190	128
1 Txslot	20.83	20.88	20.95	22.00	-9.03	11.80	11.85	11.92
2 Txslots	17.75	17.70	17.77	19.00	-6.02	11.73	11.68	11.75
3Txslots	15.72	15.98	16.03	17.00	-4.26	11.46	11.72	11.77
4 Txslots	14.24	14.47	14.69	16.00	-3.01	11.23	11.46	11.68

NOTES:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

According to the conducted power as above, the measurements are performed with 1Tx slots for GSM850.

Table 11.1-3: The conducted power measurement results-GSM1900 DSI0

PCS1900 GPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	29.74	29.54	29.57	30.50	-9.03	20.71	20.51	20.54
2 Txslots	**26.95**	**26.68**	**26.64**	**28.00**	**-6.02**	**20.93**	**20.66**	**20.62**
3 Txslots	24.85	24.57	24.42	26.00	-4.26	20.59	20.31	20.16
4 Txslots	23.72	23.39	23.23	24.50	-3.01	20.71	20.38	20.22
PCS1900 EGPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	29.73	29.53	29.57	30.50	-9.03	20.70	20.50	20.54
2 Txslots	**26.94**	**26.67**	**26.64**	**28.00**	**-6.02**	**20.92**	**20.65**	**20.62**
3 Txslots	24.84	24.56	24.42	26.00	-4.26	20.58	20.30	20.16
4 Txslots	23.72	23.40	23.24	24.50	-3.01	20.71	20.39	20.23
PCS1900 EGPRS (8PSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	26.94	25.68	25.62	27.00	-9.03	17.91	16.65	16.59
2 Txslots	23.10	22.81	22.61	24.00	-6.02	17.08	16.79	16.59
3Txslots	21.08	20.81	20.66	22.00	-4.26	16.82	16.55	16.40
4 Txslots	20.04	19.79	19.63	21.00	-3.01	17.03	16.78	16.62

NOTES:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01Db

According to the conducted power as above, the measurements are performed with 2Txslots for GSM1900.

Table 11.1-4: The conducted power measurement results-GSM1900 DSI1/DSI2

PCS1900 GPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	20.99	20.99	20.79	22.00	-9.03	11.96	11.96	11.76
2 Txslots	17.88	17.92	17.67	19.50	-6.02	11.86	11.90	11.65
3 Txslots	16.16	16.17	15.77	17.50	-4.26	11.90	11.91	11.51
4 Txslots	14.58	14.71	14.18	16.50	-3.01	11.57	11.70	11.17
PCS1900 EGPRS (GMSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	20.95	20.96	20.78	22.00	-9.03	11.92	11.93	11.75
2 Txslots	17.53	17.89	17.65	19.50	-6.02	11.51	11.87	11.63
3 Txslots	16.06	16.14	15.76	17.50	-4.26	11.80	11.88	11.50
4 Txslots	14.54	14.69	14.17	16.50	-3.01	11.53	11.68	11.16
PCS1900 EGPRS (8PSK)	Measured timeslot-averaged output power (dBm)				calculation	Source-based time-averaged output power (dBm)		
	810	661	512			810	661	512
1 Txslot	17.62	17.31	17.21	19.00	-9.03	8.59	8.28	8.18
2 Txslots	14.55	14.29	14.03	15.50	-6.02	8.53	8.27	8.01
3Txslots	12.81	12.52	12.36	14.00	-4.26	8.55	8.26	8.10
4 Txslots	11.35	11.09	10.80	12.50	-3.01	8.34	8.08	7.79

NOTES:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

According to the conducted power as above, the measurements are performed with 1Txslots for GSM1900.

11.2 WCDMA Measurement result

Table 11.2-1: The conducted Power for WCDMA B5-DSI0

WCDMA850	FDDV result (dBm)			Tune up
	4233/4458	4183/4408	4132/4357	
	(846.6MHz)	(836.6MHz)	(826.4MHz)	
	23.14	23.12	23.23	24.00
HSUPA	20.28	20.38	20.42	21.00
	20.17	20.47	20.06	21.00
	20.46	20.44	20.75	21.50
	19.95	19.89	19.89	21.00
	20.86	20.65	21.02	21.50
HSPA+	20.83	20.74	21.01	22.00
DC-HSDPA	21.23	21.14	21.41	22.50
	20.6	20.62	20.66	22.00
	20.78	20.87	20.91	22.00
	20.85	20.89	20.90	22.00

Table 11.2-2: The conducted Power for WCDMA B4-DSI0

WCDMA1700	FDDIV result (dBm)			Tune up
	1513/1738	1412/1637	1312/1537	
	(1752.6MHz)	(1732.4MHz)	(1712.4MHz)	
	23.71	23.64	23.66	24.00
HSUPA	19.96	19.99	20.07	21.00
	19.05	19.03	19.00	20.00
	19.69	19.94	20.01	21.00
	19.87	19.86	19.54	21.00
	19.78	19.55	19.67	21.00
HSPA+	21.87	21.85	21.91	22.50
DC-HSDPA	21.47	21.45	21.51	22.00
	20.56	20.48	20.66	22.00
	21.13	21.02	21.15	21.50
	21.-6	21.03	21.01	21.50

Table 11.2-3: The conducted Power for WCDMA B2-DSI0

WCDMA1900	FDDII result (dBm)			Tune up
	9538/9938	9400/9800	9262/9662	
	(1907.6MHz)	(1880MHz)	(1852.4MHz)	
	23.71	23.78	23.72	24.00
HSUPA	20.37	20.53	20.33	21.50
	19.95	20.51	20.34	21.50
	20.35	20.54	20.25	21.50
	19.96	19.89	19.75	21.00
	20.26	20.26	20.52	21.50
HSPA+	21.74	21.86	21.61	22.50
DC-HSDPA	21.43	21.55	21.30	22.00
	20.62	20.70	20.61	22.00
	20.88	21.02	20.43	21.50
	20.82	21.01	20.84	21.50

Table 11.2-4: The conducted Power for WCDMA B5-DSI1/DSI2

WCDMA850	FDDV result (dBm)			Tune up
	4233/4458	4183/4408	4132/4357	
	(846.6MHz)	(836.6MHz)	(826.4MHz)	
	16.80	16.85	16.91	18.00
HSUPA	14.28	14.38	14.42	15.50
	14.17	14.47	14.06	15.50
	14.46	14.44	14.75	15.50
	13.95	13.89	13.89	15.00
	14.86	14.65	15.02	15.50
HSPA+	14.83	14.74	15.01	16.00
DC-HSDPA	15.23	15.14	15.41	16.00
	14.6	14.62	14.66	16.00
	14.78	14.87	14.91	16.00
	14.85	14.89	14.90	16.00

Table 11.2-5: The conducted Power for WCDMA B4-DSI1/DSI2

WCDMA1700	FDDIV result (dBm)			Tune up
	1513/1738	1412/1637	1312/1537	
	(1752.6MHz)	(1732.4MHz)	(1712.4MHz)	
	13.12	13.15	13.24	14.50
HSUPA	9.46	9.49	9.57	10.00
	8.55	8.53	8.50	10.00
	9.19	9.44	9.51	10.00
	9.37	9.36	9.04	10.00
	9.28	9.05	9.17	10.00
HSPA+	11.37	11.35	11.41	12.50
DC-HSDPA	10.97	10.95	11.01	12.00
	10.06	9.98	10.16	11.00
	10.63	10.52	10.65	11.00
	9.61	10.53	10.51	11.00

Table 11.2-6: The conducted Power for WCDMA B2- DSI1/DSI2

WCDMA1900	FDDII result (dBm)			Tune up
	9538/9938	9400/9800	9262/9662	
	(1907.6MHz)	(1880MHz)	(1852.4MHz)	
	14.42	14.27	14.15	15.50
HSUPA	10.37	10.53	10.33	11.00
	9.95	10.51	10.34	11.00
	10.35	10.54	10.25	11.50
	9.96	9.89	9.75	11.00
	10.26	10.26	10.52	11.50
HSPA+	11.74	11.86	11.61	13.00
DC-HSDPA	11.43	11.55	11.30	12.50
	10.62	10.70	10.61	11.50
	10.88	11.02	10.43	12.00
	10.82	11.01	10.84	12.00

11.3 LTE Measurement result

Table 11.3-1: Maximum Power Reduction (MPR) for LTE

Modulation	Channel bandwidth / Transmission bandwidth configuration [RB]						MPR (dB)
	1.4	3	5	10	15	20	
	MHz	MHz	MHz	MHz	MHz	MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	3

Table 11.3-2: The tune up for LTE

Band	**Tune up**	
	Normal power	**Low power**
FDD Band 2	24	14.5
FDD Band 5	24	19
FDD Band 7	24	17
FDD Band 12	24	21
FDD Band 13	24	19
FDD Band 17	24	19
FDD Band 41	24	16
FDD Band 66	24	12

FDD Band 2 DSI0					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
1.4MHz	1RB-High (5)	1909.3 (19193)	23.37	22.24	21.39
		1880 (18900)	23.10	22.60	21.41
		1850.7 (18607)	23.01	22.09	21.34
	1RB-Middle (3)	1909.3 (19193)	23.68	22.59	21.57
		1880 (18900)	23.26	22.71	21.60
		1850.7 (18607)	23.43	22.70	21.47
	1RB-Low (0)	1909.3 (19193)	23.28	22.54	21.53
		1880 (18900)	23.13	22.34	21.09
		1850.7 (18607)	22.68	22.16	21.23
	3RB-High (3)	1909.3 (19193)	22.61	21.51	20.52
		1880 (18900)	22.44	21.31	20.39
		1850.7 (18607)	22.51	21.61	20.41
	3RB-Middle (1)	1909.3 (19193)	22.65	21.67	20.47
		1880 (18900)	22.62	21.49	20.47
		1850.7 (18607)	22.39	21.26	20.54
	3RB-Low (0)	1909.3 (19193)	22.44	21.49	20.29
		1880 (18900)	22.43	21.43	20.58
		1850.7 (18607)	22.58	21.30	20.22
	6RB (0)	1909.3 (19193)	22.54	21.47	20.75
		1880 (18900)	22.36	21.32	20.38
		1850.7 (18607)	22.36	21.35	20.35
3MHz	1RB-High (14)	1908.5 (19185)	23.30	22.55	21.37
		1880 (18900)	23.27	22.45	21.41
		1851.5 (18615)	23.16	22.51	21.32
	1RB-Middle (7)	1908.5 (19185)	23.63	22.80	21.67
		1880 (18900)	23.46	22.98	21.64
		1851.5 (18615)	23.40	22.76	21.61
	1RB-Low (0)	1908.5 (19185)	23.14	22.78	21.47
		1880 (18900)	23.18	22.17	21.30
		1851.5 (18615)	22.76	22.01	21.10
	8RB-High (7)	1908.5 (19185)	22.75	21.43	20.44
		1880 (18900)	22.47	21.59	20.58
		1851.5 (18615)	22.53	21.29	20.58
	8RB-Middle (4)	1908.5 (19185)	22.60	21.52	20.53
		1880 (18900)	22.50	21.48	20.55
		1851.5 (18615)	22.48	21.31	20.23
	8RB-Low (0)	1908.5 (19185)	22.60	21.66	20.66
		1880 (18900)	22.51	21.60	20.34
		1851.5 (18615)	22.40	21.39	20.48
	15RB (0)	1908.5 (19185)	22.60	21.63	20.55
		1880 (18900)	22.62	21.35	20.33
		1851.5 (18615)	22.34	21.30	20.48
5MHz	1RB-High (24)	1907.5 (19175)	23.31	22.25	21.43
		1880 (18900)	23.11	22.56	21.51
		1852.5 (18625)	22.96	22.37	21.17
	1RB-Middle (12)	1907.5 (19175)	23.65	22.62	21.77
		1880 (18900)	23.32	22.67	21.55
		1852.5 (18625)	23.20	22.77	21.64
	1RB-Low (0)	1907.5 (19175)	23.25	22.61	21.52
		1880 (18900)	23.04	22.33	21.03
		1852.5 (18625)	22.88	22.29	21.28
	12RB-High (13)	1907.5 (19175)	22.62	21.48	20.74
		1880 (18900)	22.39	21.34	20.50
		1852.5 (18625)	22.33	21.58	20.43
	12RB-Middle (6)	1907.5 (19175)	22.63	21.77	20.39
		1880 (18900)	22.61	21.75	20.38
		1852.5 (18625)	22.31	21.09	20.52
	12RB-Low (0)	1907.5 (19175)	22.55	21.54	20.40
		1880 (18900)	22.33	21.25	20.34
		1852.5 (18625)	22.47	21.26	20.11
	25RB (0)	1907.5 (19175)	22.40	21.63	20.63
		1880 (18900)	22.41	21.47	20.23
		1852.5 (18625)	22.14	21.17	20.39

10MHz	1RB-High (49)	1905 (19150)	23.31	22.37	21.51
		1880 (18900)	23.32	22.59	21.37
		1855 (18650)	22.88	22.45	21.46
	1RB-Middle (24)	1905 (19150)	23.49	22.92	21.86
		1880 (18900)	23.39	22.74	21.74
		1855 (18650)	23.14	22.60	21.50
	1RB-Low (0)	1905 (19150)	23.18	22.74	21.33
		1880 (18900)	23.10	22.28	21.38
		1855 (18650)	22.80	22.05	21.02
	25RB-High (25)	1905 (19150)	22.49	21.57	20.63
		1880 (18900)	22.67	21.42	20.46
		1855 (18650)	22.49	21.50	20.28
	25RB-Middle (12)	1905 (19150)	22.77	21.48	20.79
		1880 (18900)	22.59	21.50	20.43
		1855 (18650)	22.48	21.37	20.33
	25RB-Low (0)	1905 (19150)	22.68	21.51	20.41
		1880 (18900)	22.40	21.62	20.38
		1855 (18650)	22.34	21.42	20.30
	50RB (0)	1905 (19150)	22.61	21.47	20.52
		1880 (18900)	22.62	21.52	20.45
		1855 (18650)	22.30	21.55	20.52
15MHz	1RB-High (74)	1902.5 (19125)	23.35	22.33	21.50
		1880 (18900)	23.19	22.63	21.52
		1857.5 (18675)	22.95	22.29	21.30
	1RB-Middle (37)	1902.5 (19125)	23.63	22.74	21.71
		1880 (18900)	23.33	22.74	21.55
		1857.5 (18675)	23.37	22.82	21.54
	1RB-Low (0)	1902.5 (19125)	23.22	22.71	21.54
		1880 (18900)	23.14	22.24	21.19
		1857.5 (18675)	22.87	22.25	21.21
	36RB-High (38)	1902.5 (19125)	22.70	21.63	20.67
		1880 (18900)	22.39	21.35	20.44
		1857.5 (18675)	22.43	21.58	20.51
	36RB-Middle (19)	1902.5 (19125)	22.59	21.67	20.51
		1880 (18900)	22.68	21.65	20.43
		1857.5 (18675)	22.35	21.27	20.44
	36RB-Low (0)	1902.5 (19125)	22.59	21.50	20.48
		1880 (18900)	22.53	21.38	20.49
		1857.5 (18675)	22.54	21.38	20.28
	75RB (0)	1902.5 (19125)	22.46	21.62	20.66
		1880 (18900)	22.47	21.37	20.42
		1857.5 (18675)	22.30	21.31	20.37
20MHz	1RB-High (99)	1900 (19100)	23.30	22.52	21.55
		1880 (18900)	23.24	22.62	21.48
		1860 (18700)	23.08	22.41	21.39
	1RB-Middle (50)	1900 (19100)	23.60	22.90	21.85
		1880 (18900)	23.51	22.91	21.71
		1860 (18700)	23.32	22.72	21.62
	1RB-Low (0)	1900 (19100)	23.26	22.68	21.45
		1880 (18900)	23.12	22.35	21.35
		1860 (18700)	22.93	22.21	21.15
	50RB-High (50)	1900 (19100)	22.65	21.61	20.63
		1880 (18900)	22.59	21.55	20.55
		1860 (18700)	22.49	21.48	20.48
	50RB-Middle (25)	1900 (19100)	22.74	21.68	20.71
		1880 (18900)	22.58	21.58	20.57
		1860 (18700)	22.48	21.43	20.43
	50RB-Low (0)	1900 (19100)	22.64	21.62	20.59
		1880 (18900)	22.55	21.52	20.51
		1860 (18700)	22.47	21.45	20.44
	100RB (0)	1900 (19100)	22.65	21.62	20.59
		1880 (18900)	22.54	21.53	20.51
		1860 (18700)	22.46	21.46	20.46

FDD Band 5 DSI0					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
1.4MHz	1RB-High (5)	848.3 (20643)	23.01	22.07	21.00
		836.5 (20525)	22.92	21.91	21.20
		824.7 (20407)	22.84	21.86	20.96
	1RB-Middle (3)	848.3 (20643)	22.95	22.15	21.10
		836.5 (20525)	22.94	21.98	21.20
		824.7 (20407)	22.97	22.25	21.06
	1RB-Low (0)	848.3 (20643)	23.04	22.08	20.96
		836.5 (20525)	23.08	21.99	20.79
		824.7 (20407)	22.88	22.16	20.87
	3RB-High (3)	848.3 (20643)	21.89	21.16	19.92
		836.5 (20525)	22.03	20.74	19.79
		824.7 (20407)	22.32	21.16	20.30
	3RB-Middle (1)	848.3 (20643)	22.23	20.96	19.84
		836.5 (20525)	21.91	20.61	20.05
		824.7 (20407)	21.99	20.85	19.88
	3RB-Low (0)	848.3 (20643)	22.16	20.94	20.05
		836.5 (20525)	21.80	20.97	20.12
		824.7 (20407)	21.79	20.97	19.99
	6RB (0)	848.3 (20643)	22.12	20.99	20.06
		836.5 (20525)	21.88	21.14	19.93
		824.7 (20407)	21.96	21.13	19.83
3MHz	1RB-High (14)	847.5 (20635)	22.85	22.11	21.11
		836.5 (20525)	22.95	22.34	21.02
		825.5 (20415)	22.71	22.04	20.97
	1RB-Middle (7)	847.5 (20635)	23.11	22.35	21.08
		836.5 (20525)	23.10	22.30	21.09
		825.5 (20415)	23.19	22.23	21.23
	1RB-Low (0)	847.5 (20635)	23.00	22.30	20.92
		836.5 (20525)	22.94	22.07	21.07
		825.5 (20415)	22.98	22.21	21.09
	8RB-High (7)	847.5 (20635)	22.06	20.91	20.04
		836.5 (20525)	22.01	20.80	20.04
		825.5 (20415)	22.27	21.12	20.08
	8RB-Middle (4)	847.5 (20635)	22.12	21.08	20.07
		836.5 (20525)	22.02	21.00	20.00
		825.5 (20415)	22.26	21.05	19.93
	8RB-Low (0)	847.5 (20635)	22.07	20.92	20.14
		836.5 (20525)	21.91	20.79	20.05
		825.5 (20415)	21.89	20.91	20.04
	15RB (0)	847.5 (20635)	21.94	21.06	20.03
		836.5 (20525)	21.83	21.06	20.12
		825.5 (20415)	22.14	21.23	20.13

5MHz	1RB-High (24)	846.5 (20625)	23.05	22.19	21.00
		836.5 (20525)	22.94	22.10	21.14
		826.5 (20425)	22.86	22.04	21.07
	1RB-Middle (12)	846.5 (20625)	23.12	22.20	21.09
		836.5 (20525)	23.10	22.17	21.16
		826.5 (20425)	23.09	22.28	21.07
	1RB-Low (0)	846.5 (20625)	23.07	22.21	21.08
		836.5 (20525)	23.00	22.16	20.87
		826.5 (20425)	22.84	22.21	20.99
	12RB-High (13)	846.5 (20625)	22.00	21.13	19.95
		836.5 (20525)	22.01	20.93	19.98
		826.5 (20425)	22.27	21.15	20.25
	12RB-Middle (6)	846.5 (20625)	22.13	20.88	19.89
		836.5 (20525)	21.89	20.81	19.99
		826.5 (20425)	22.11	20.97	20.07
	12RB-Low (0)	846.5 (20625)	22.19	20.91	20.05
		836.5 (20525)	21.96	20.98	20.05
		826.5 (20425)	21.98	20.97	20.15
	25RB (0)	846.5 (20625)	22.07	20.96	20.14
		836.5 (20525)	21.87	21.10	19.90
		826.5 (20425)	22.12	21.04	20.03
10MHz	1RB-High (49)	844 (20600)	22.95	22.14	21.16
		836.5 (20525)	22.91	22.26	21.13
		829 (20450)	22.91	22.11	21.00
	1RB-Middle (24)	844 (20600)	23.04	22.31	21.27
		836.5 (20525)	23.04	22.20	21.15
		829 (20450)	23.14	22.27	21.26
	1RB-Low (0)	844 (20600)	23.00	22.23	21.12
		836.5 (20525)	23.00	22.13	21.03
		829 (20450)	22.98	22.24	21.18
	25RB-High (25)	844 (20600)	22.07	21.07	20.06
		836.5 (20525)	22.00	20.98	20.01
		829 (20450)	22.20	21.18	20.18
	25RB-Middle (12)	844 (20600)	22.08	21.06	20.09
		836.5 (20525)	22.05	21.01	20.04
		829 (20450)	22.28	21.07	20.11
	25RB-Low (0)	844 (20600)	22.12	21.11	20.17
		836.5 (20525)	22.02	20.99	20.02
		829 (20450)	22.06	21.05	20.09
	50RB (0)	844 (20600)	22.08	21.06	20.11
		836.5 (20525)	22.01	21.00	20.03
		829 (20450)	22.13	21.13	20.14

FDD Band 7 DSI0					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
5MHz	1RB-High (24)	2567.5 (21425)	23.39	22.62	21.68
		2535 (21100)	23.56	22.85	21.83
		2502.5 (20775)	23.50	22.69	21.77
	1RB-Middle (12)	2567.5 (21425)	23.62	22.81	21.79
		2535 (21100)	23.80	22.99	21.99
		2502.5 (20775)	23.77	22.89	21.93
	1RB-Low (0)	2567.5 (21425)	23.38	22.68	21.64
		2535 (21100)	23.56	22.80	21.78
		2502.5 (20775)	23.54	22.67	21.75
	12RB-High (13)	2567.5 (21425)	22.55	21.60	20.70
		2535 (21100)	22.74	21.79	20.87
		2502.5 (20775)	22.70	21.73	20.81
	12RB-Middle (6)	2567.5 (21425)	22.58	21.64	20.71
		2535 (21100)	22.79	21.84	20.93
		2502.5 (20775)	22.72	21.74	20.85
	12RB-Low (0)	2567.5 (21425)	22.54	21.56	20.69
		2535 (21100)	22.73	21.74	20.85
		2502.5 (20775)	22.68	21.70	20.81
	25RB (0)	2567.5 (21425)	22.56	21.59	20.64
		2535 (21100)	22.77	21.79	20.85
		2502.5 (20775)	22.72	21.70	20.77
10MHz	1RB-High (49)	2565 (21400)	23.43	22.60	21.67
		2535 (21100)	23.66	22.90	21.81
		2505 (20800)	23.61	22.80	21.81
	1RB-Middle (24)	2565 (21400)	23.56	22.73	21.79
		2535 (21100)	23.80	22.82	21.95
		2505 (20800)	23.69	22.89	21.87
	1RB-Low (0)	2565 (21400)	23.57	22.71	21.78
		2535 (21100)	23.68	22.96	21.90
		2505 (20800)	23.63	22.82	21.82
	25RB-High (25)	2565 (21400)	22.61	21.65	20.72
		2535 (21100)	22.84	21.87	20.92
		2505 (20800)	22.77	21.79	20.83
	25RB-Middle (12)	2565 (21400)	22.64	21.67	20.73
		2535 (21100)	22.81	21.82	20.90
		2505 (20800)	22.80	21.80	20.85
	25RB-Low (0)	2565 (21400)	22.70	21.73	20.79
		2535 (21100)	22.81	21.84	20.89
		2505 (20800)	22.76	21.77	20.85
	50RB (0)	2565 (21400)	22.70	21.72	20.77
		2535 (21100)	22.87	21.87	20.91
		2505 (20800)	22.77	21.76	20.82

15MHz	1RB-High (74)	2562.5 (21375)	23.39	22.63	21.55
		2535 (21100)	23.57	22.78	21.74
		2507.5 (20825)	23.54	22.79	21.79
	1RB-Middle (37)	2562.5 (21375)	23.57	22.74	21.71
		2535 (21100)	23.71	22.93	21.98
		2507.5 (20825)	23.67	22.81	21.84
	1RB-Low (0)	2562.5 (21375)	23.54	22.66	21.73
		2535 (21100)	23.59	22.80	21.86
		2507.5 (20825)	23.58	22.77	21.76
	36RB-High (38)	2562.5 (21375)	22.63	21.62	20.67
		2535 (21100)	22.85	21.81	20.88
		2507.5 (20825)	22.77	21.75	20.80
	36RB-Middle (19)	2562.5 (21375)	22.71	21.70	20.74
		2535 (21100)	22.87	21.87	20.91
		2507.5 (20825)	22.79	21.75	20.87
	36RB-Low (0)	2562.5 (21375)	22.75	21.75	20.83
		2535 (21100)	22.80	21.80	20.86
		2507.5 (20825)	22.78	21.73	20.81
	75RB (0)	2562.5 (21375)	22.69	21.72	20.73
		2535 (21100)	22.80	21.80	20.84
		2507.5 (20825)	22.76	21.75	20.79
20MHz	1RB-High (99)	2560 (21350)	23.20	22.47	21.47
		2535 (21100)	23.39	22.63	21.63
		2510 (20850)	23.37	22.71	21.65
	1RB-Middle (50)	2560 (21350)	23.68	22.90	21.85
		2535 (21100)	23.77	22.94	21.91
		2510 (20850)	23.72	22.86	22.00
	1RB-Low (0)	2560 (21350)	23.40	22.59	21.65
		2535 (21100)	23.43	22.65	21.70
		2510 (20850)	23.36	22.58	21.54
	50RB-High (50)	2560 (21350)	22.62	21.62	20.68
		2535 (21100)	22.83	21.80	20.85
		2510 (20850)	22.72	21.72	20.80
	50RB-Middle (25)	2560 (21350)	22.72	21.74	20.78
		2535 (21100)	22.87	21.87	20.93
		2510 (20850)	22.83	21.84	20.87
	50RB-Low (0)	2560 (21350)	22.78	21.74	20.84
		2535 (21100)	22.78	21.79	20.83
		2510 (20850)	22.76	21.73	20.79
	100RB (0)	2560 (21350)	22.68	21.65	20.73
		2535 (21100)	22.77	21.76	20.80
		2510 (20850)	22.72	21.72	20.74

FDD Band 12 DSI0					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
1.4MHz	1RB-High (5)	715.3 (23173)	22.90	22.08	20.96
		707.5 (23095)	22.96	22.11	21.08
		699.7 (23017)	22.73	22.23	20.92
	1RB-Middle (3)	715.3 (23173)	23.02	22.10	21.25
		707.5 (23095)	23.26	22.22	21.20
		699.7 (23017)	22.98	22.17	21.11
	1RB-Low (0)	715.3 (23173)	22.81	21.84	20.90
		707.5 (23095)	22.97	22.23	21.19
		699.7 (23017)	22.75	22.21	21.11
	3RB-High (3)	715.3 (23173)	21.93	21.02	19.83
		707.5 (23095)	22.17	20.91	20.14
		699.7 (23017)	22.08	20.98	20.03
	3RB-Middle (1)	715.3 (23173)	22.06	20.82	20.04
		707.5 (23095)	22.11	21.07	20.07
		699.7 (23017)	21.98	21.01	20.05
	3RB-Low (0)	715.3 (23173)	22.01	20.99	19.88
		707.5 (23095)	22.18	20.98	20.30
		699.7 (23017)	21.99	21.05	20.04
	6RB (0)	715.3 (23173)	22.02	20.97	20.03
		707.5 (23095)	22.07	21.02	19.99
		699.7 (23017)	21.92	20.98	20.10
3MHz	1RB-High (14)	714.5 (23165)	22.97	22.05	21.00
		707.5 (23095)	22.99	22.06	21.24
		700.5 (23025)	22.96	22.21	21.09
	1RB-Middle (7)	714.5 (23165)	23.07	22.21	21.29
		707.5 (23095)	23.08	22.38	21.32
		700.5 (23025)	23.02	22.19	21.39
	1RB-Low (0)	714.5 (23165)	23.08	22.00	21.12
		707.5 (23095)	23.06	22.24	21.27
		700.5 (23025)	23.09	22.17	21.17
	8RB-High (7)	714.5 (23165)	22.05	20.96	19.87
		707.5 (23095)	21.90	21.05	20.15
		700.5 (23025)	22.08	21.15	20.04
	8RB-Middle (4)	714.5 (23165)	21.90	21.10	20.02
		707.5 (23095)	21.99	20.93	19.96
		700.5 (23025)	22.01	21.06	19.98
	8RB-Low (0)	714.5 (23165)	22.04	21.08	20.19
		707.5 (23095)	22.23	21.17	20.23
		700.5 (23025)	22.22	21.03	20.02
	15RB (0)	714.5 (23165)	21.95	20.91	20.13
		707.5 (23095)	21.97	21.02	20.00
		700.5 (23025)	22.02	21.10	20.16

5MHz	1RB-High (24)	713.5 (23155)	23.00	22.21	20.89
		707.5 (23095)	22.93	22.10	21.13
		701.5 (23035)	22.84	22.14	21.02
	1RB-Middle (12)	713.5 (23155)	23.15	22.25	21.19
		707.5 (23095)	23.21	22.26	21.16
		701.5 (23035)	22.98	22.27	21.14
	1RB-Low (0)	713.5 (23155)	22.89	21.99	21.03
		707.5 (23095)	23.04	22.36	21.13
		701.5 (23035)	22.90	22.18	21.22
	12RB-High (13)	713.5 (23155)	21.83	21.07	19.90
		707.5 (23095)	22.11	21.05	20.13
		701.5 (23035)	22.10	20.99	20.11
	12RB-Middle (6)	713.5 (23155)	22.07	20.88	19.95
		707.5 (23095)	22.13	21.14	20.03
		701.5 (23035)	22.01	21.13	20.10
	12RB-Low (0)	713.5 (23155)	22.03	20.97	20.03
		707.5 (23095)	22.24	21.06	20.26
		701.5 (23035)	22.04	21.00	20.13
	25RB (0)	713.5 (23155)	22.05	21.07	19.97
		707.5 (23095)	22.01	21.09	20.09
		701.5 (23035)	21.92	21.13	20.11
10MHz	1RB-High (49)	711 (23130)	22.90	22.18	21.04
		707.5 (23095)	22.93	22.20	21.15
		704 (23060)	22.94	22.15	21.10
	1RB-Middle (24)	711 (23130)	23.05	22.23	21.25
		707.5 (23095)	23.18	22.31	21.26
		704 (23060)	23.08	22.31	21.29
	1RB-Low (0)	711 (23130)	23.00	22.13	21.17
		707.5 (23095)	23.01	22.30	21.18
		704 (23060)	23.00	22.21	21.19
	25RB-High (25)	711 (23130)	21.96	20.97	19.98
		707.5 (23095)	22.05	21.08	20.09
		704 (23060)	22.05	21.05	20.05
	25RB-Middle (12)	711 (23130)	22.02	21.03	20.04
		707.5 (23095)	22.06	21.07	20.08
		704 (23060)	22.10	21.08	20.13
	25RB-Low (0)	711 (23130)	22.08	21.12	20.11
		707.5 (23095)	22.24	21.15	20.18
		704 (23060)	22.14	21.09	20.11
	50RB (0)	711 (23130)	22.01	21.04	20.05
		707.5 (23095)	22.10	21.14	20.12
		704 (23060)	22.07	21.08	20.10

FDD Band 13 DSI0					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
5MHz	1RB-High (24)	784.5 (23255)	22.71	21.91	21.12
		782 (23230)	22.91	22.10	20.99
		779.5 (23205)	22.89	21.99	21.09
	1RB-Middle (12)	784.5 (23255)	22.72	22.11	21.02
		782 (23230)	22.88	21.98	20.96
		779.5 (23205)	22.81	22.08	21.13
	1RB-Low (0)	784.5 (23255)	22.74	21.90	21.06
		782 (23230)	22.84	22.16	21.12
		779.5 (23205)	22.78	22.02	21.11
	12RB-High (13)	784.5 (23255)	21.89	20.77	19.95
		782 (23230)	21.86	20.91	19.97
		779.5 (23205)	21.69	20.72	19.70
	12RB-Middle (6)	784.5 (23255)	21.92	20.94	19.95
		782 (23230)	21.86	20.85	19.96
		779.5 (23205)	21.72	20.85	19.72
	12RB-Low (0)	784.5 (23255)	21.78	20.93	19.82
		782 (23230)	21.99	20.86	19.93
		779.5 (23205)	21.73	20.78	19.77
	25RB (0)	784.5 (23255)	21.72	20.93	19.83
		782 (23230)	21.92	20.91	19.78
		779.5 (23205)	21.87	20.74	19.81
10MHz	1RB-High (49)	782 (23230)	22.80	22.04	21.03
	1RB-Middle (24)	782 (23230)	22.89	22.07	21.08
	1RB-Low (0)	782 (23230)	22.85	22.09	21.04
	25RB-High (25)	782 (23230)	21.85	20.88	19.85
	25RB-Middle (12)	782 (23230)	21.92	20.93	19.93
	25RB-Low (0)	782 (23230)	21.79	20.76	19.78
	50RB (0)	782 (23230)	21.84	20.85	19.83

FDD Band 41 DSI0					
BANDWIDTH	Number of RBs	Frequency	QPSK	16QAM	64QAM
5MHz	1RB-High (24)	2687.5 (41565)	23.52	22.51	21.17
		2640.3(41093)	23.46	22.49	21.14
		2593 (40620)	23.43	22.57	21.09
		2545.8(40148)	23.42	22.54	21.11
		2498.5 (39675)	23.43	22.62	21.19
	1RB-Middle (12)	2687.5 (41565)	23.65	22.67	21.28
		2640.3(41093)	23.55	22.66	21.31
		2593 (40620)	23.61	22.79	21.35
		2545.8(40148)	23.59	22.73	21.33
		2498.5 (39675)	23.58	22.79	21.37
	1RB-Low (0)	2687.5 (41565)	23.47	22.56	21.18
		2640.3(41093)	23.49	22.53	21.17
		2593 (40620)	23.47	22.60	21.17
		2545.8(40148)	23.47	22.61	21.18
		2498.5 (39675)	23.43	22.59	21.21
	12RB-High (13)	2687.5 (41565)	22.61	21.49	20.54
		2640.3(41093)	22.56	21.44	20.46
		2593 (40620)	22.51	21.44	20.53
		2545.8(40148)	22.51	21.42	20.46
		2498.5 (39675)	22.51	21.45	20.56
	12RB-Middle (6)	2687.5 (41565)	22.68	21.57	20.65
		2640.3(41093)	22.63	21.49	20.57
		2593 (40620)	22.51	21.50	20.57
		2545.8(40148)	22.50	21.44	20.56
		2498.5 (39675)	22.59	21.55	20.60
	12RB-Low (0)	2687.5 (41565)	22.67	21.54	20.62
		2640.3(41093)	22.57	21.40	20.55
		2593 (40620)	22.48	21.47	20.54
		2545.8(40148)	22.48	21.40	20.51
		2498.5 (39675)	22.56	21.52	20.53
	25RB (0)	2687.5 (41565)	22.55	21.53	20.57
		2640.3(41093)	22.55	21.48	20.56
		2593 (40620)	22.52	21.52	20.55
		2545.8(40148)	22.50	21.45	20.52
		2498.5 (39675)	22.46	21.60	20.61
10MHz	1RB-High (49)	2685 (41540)	23.53	22.63	21.21
		2639(41080)	23.58	22.55	21.19
		2593 (40620)	23.53	22.62	21.23
		2547(40160)	23.50	22.62	21.21
		2501 (39700)	23.52	22.68	21.32
	1RB-Middle (24)	2685 (41540)	23.73	22.67	21.37
		2639(41080)	23.68	22.69	21.26
		2593 (40620)	23.66	22.78	21.26
		2547(40160)	23.67	22.76	21.27
		2501 (39700)	23.65	22.77	21.37
	1RB-Low (0)	2685 (41540)	23.62	22.57	21.27
		2639(41080)	23.62	22.67	21.29
		2593 (40620)	23.56	22.65	21.26
		2547(40160)	23.60	22.74	21.27
		2501 (39700)	23.51	22.66	21.31
	25RB-High (25)	2685 (41540)	22.59	21.58	20.60
		2639(41080)	22.62	21.60	20.61
		2593 (40620)	22.59	21.60	20.60
		2547(40160)	22.58	21.55	20.57
		2501 (39700)	22.65	21.68	20.68
	25RB-Middle (12)	2685 (41540)	22.63	21.64	20.66
		2639(41080)	22.61	21.57	20.62
		2593 (40620)	22.60	21.58	20.62
		2547(40160)	22.62	21.58	20.59
		2501 (39700)	22.66	21.57	20.71
	25RB-Low (0)	2685 (41540)	22.69	21.64	20.70
		2639(41080)	22.62	21.62	20.69
		2593 (40620)	22.59	21.60	20.62
		2547(40160)	22.56	21.55	20.58
		2501 (39700)	22.64	21.65	20.70
	50RB (0)	2685 (41540)	22.57	21.60	20.60
		2639(41080)	22.56	21.62	20.53
		2593 (40620)	22.57	21.65	20.54
		2547(40160)	22.58	21.54	20.52
		2501 (39700)	22.67	21.74	20.62

15MHz	1RB-High (74)	2682.5 (41515)	23.40	22.48	21.09
		2637.8(41068)	23.46	22.45	20.99
		2593 (40620)	23.40	22.51	21.12
		2548.3(40173)	23.37	22.48	21.03
		2503.5 (39725)	23.42	22.58	21.21
	1RB-Middle (37)	2682.5 (41515)	23.59	22.55	21.16
		2637.8(41068)	23.55	22.58	21.22
		2593 (40620)	23.53	22.65	21.23
		2548.3(40173)	23.52	22.64	21.22
		2503.5 (39725)	23.50	22.67	21.22
	1RB-Low (0)	2682.5 (41515)	23.50	22.54	21.16
		2637.8(41068)	23.53	22.61	21.19
		2593 (40620)	23.38	22.56	21.17
		2548.3(40173)	23.50	22.63	21.18
		2503.5 (39725)	23.36	22.55	21.20
	36RB-High (38)	2682.5 (41515)	22.60	21.54	20.50
		2637.8(41068)	22.62	21.45	20.50
		2593 (40620)	22.56	21.43	20.49
		2548.3(40173)	22.47	21.44	20.44
		2503.5 (39725)	22.56	21.52	20.54
	36RB-Middle (19)	2682.5 (41515)	22.67	21.58	20.52
		2637.8(41068)	22.58	21.45	20.54
		2593 (40620)	22.58	21.51	20.53
		2548.3(40173)	22.55	21.48	20.48
		2503.5 (39725)	22.62	21.62	20.57
	36RB-Low (0)	2682.5 (41515)	22.66	21.55	20.49
		2637.8(41068)	22.57	21.53	20.54
		2593 (40620)	22.55	21.40	20.48
		2548.3(40173)	22.52	21.47	20.46
		2503.5 (39725)	22.58	21.56	20.53
	75RB (0)	2682.5 (41515)	22.58	21.51	20.51
		2637.8(41068)	22.57	21.57	20.52
		2593 (40620)	22.54	21.51	20.47
		2548.3(40173)	22.49	21.47	20.45
		2503.5 (39725)	22.66	21.67	20.61
20MHz	1RB-High (99)	2680 (41490)	23.25	22.31	20.93
		2636.5(41055)	23.26	22.27	20.87
		2593 (40620)	23.24	22.37	20.95
		2549.5(40185)	23.19	22.27	20.86
		2506 (39750)	23.24	22.42	21.01
	1RB-Middle (50)	2680 (41490)	23.73	22.63	21.29
		2636.5(41055)	23.83	22.76	21.24
		2593 (40620)	23.63	22.70	21.29
		2549.5(40185)	23.59	22.73	21.33
		2506 (39750)	23.63	22.78	21.40
	1RB-Low (0)	2680 (41490)	23.35	22.39	20.99
		2636.5(41055)	23.34	22.45	20.99
		2593 (40620)	23.29	22.41	21.02
		2549.5(40185)	23.33	22.46	21.05
		2506 (39750)	23.21	22.41	21.02
	50RB-High (50)	2680 (41490)	22.40	21.44	20.46
		2636.5(41055)	22.49	21.55	20.52
		2593 (40620)	22.54	21.58	20.54
		2549.5(40185)	22.49	21.51	20.44
		2506 (39750)	22.64	21.75	20.68
	50RB-Middle (25)	2680 (41490)	22.54	21.51	20.50
		2636.5(41055)	22.76	21.58	20.50
		2593 (40620)	22.53	21.49	20.51
		2549.5(40185)	22.53	21.52	20.49
		2506 (39750)	22.64	21.79	20.70
	50RB-Low (0)	2680 (41490)	22.47	21.46	20.50
		2636.5(41055)	22.48	21.57	20.54
		2593 (40620)	22.53	21.53	20.48
		2549.5(40185)	22.45	21.48	20.43
		2506 (39750)	22.67	21.72	20.67
	100RB (0)	2680 (41490)	22.55	21.55	20.56
		2636.5(41055)	22.60	21.61	20.56
		2593 (40620)	22.58	21.62	20.58
		2549.5(40185)	22.52	21.53	20.47
		2506 (39750)	22.68	21.78	20.67

FDD Band 66 DSI0					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
1.4MHz	1RB-High (5)	1779.3 (132665)	22.82	21.72	20.46
		1745 (132322)	22.57	22.13	21.25
		1710.7 (131979)	22.91	21.79	20.84
	1RB-Middle (3)	1779.3 (132665)	23.07	22.33	21.03
		1745 (132322)	23.48	22.28	21.23
		1710.7 (131979)	23.30	22.67	21.55
	1RB-Low (0)	1779.3 (132665)	22.69	22.05	21.17
		1745 (132322)	22.88	21.98	20.98
		1710.7 (131979)	23.16	22.38	21.35
	3RB-High (3)	1779.3 (132665)	21.97	20.80	19.71
		1745 (132322)	22.15	21.07	20.21
		1710.7 (131979)	22.47	21.27	20.40
	3RB-Middle (1)	1779.3 (132665)	22.28	21.16	20.11
		1745 (132322)	22.06	21.08	20.16
		1710.7 (131979)	22.42	21.39	20.46
	3RB-Low (0)	1779.3 (132665)	21.77	20.92	19.98
		1745 (132322)	22.54	21.55	20.39
		1710.7 (131979)	21.98	21.02	20.24
	6RB (0)	1779.3 (132665)	21.93	20.82	19.64
		1745 (132322)	22.32	21.11	20.14
		1710.7 (131979)	22.20	21.26	20.16
3MHz	1RB-High (14)	1778.5 (132657)	22.75	21.79	20.57
		1745 (132322)	22.91	22.23	21.05
		1711.5 (131987)	23.07	21.90	20.87
	1RB-Middle (7)	1778.5 (132657)	23.05	22.11	21.09
		1745 (132322)	23.37	22.35	21.31
		1711.5 (131987)	23.21	22.62	21.45
	1RB-Low (0)	1778.5 (132657)	22.97	22.13	21.04
		1745 (132322)	23.04	21.91	20.74
		1711.5 (131987)	23.11	22.42	21.22
	8RB-High (7)	1778.5 (132657)	21.79	20.82	19.84
		1745 (132322)	22.27	21.24	20.05
		1711.5 (131987)	22.29	21.40	20.28
	8RB-Middle (4)	1778.5 (132657)	22.10	21.15	20.02
		1745 (132322)	22.34	21.32	20.36
		1711.5 (131987)	22.43	21.30	20.32
	8RB-Low (0)	1778.5 (132657)	22.00	21.04	20.00
		1745 (132322)	22.36	21.43	20.30
		1711.5 (131987)	22.12	21.20	20.15
	15RB (0)	1778.5 (132657)	21.91	20.81	19.78
		1745 (132322)	22.42	21.16	20.28
		1711.5 (131987)	22.18	21.12	20.30
5MHz	1RB-High (24)	1777.5 (132647)	22.70	21.53	20.62
		1745 (132322)	22.58	22.15	21.22
		1712.5 (131997)	22.88	21.94	20.79
	1RB-Middle (12)	1777.5 (132647)	23.12	22.27	21.06
		1745 (132322)	23.46	22.10	21.33
		1712.5 (131997)	23.36	22.60	21.55
	1RB-Low (0)	1777.5 (132647)	22.82	21.96	21.01
		1745 (132322)	22.73	21.86	20.88
		1712.5 (131997)	23.13	22.22	21.32
	12RB-High (13)	1777.5 (132647)	21.85	20.68	19.70
		1745 (132322)	22.31	21.14	20.17
		1712.5 (131997)	22.43	21.40	20.55
	12RB-Middle (6)	1777.5 (132647)	22.28	21.01	20.08
		1745 (132322)	22.19	21.15	20.20
		1712.5 (131997)	22.45	21.34	20.45
	12RB-Low (0)	1777.5 (132647)	21.89	20.90	20.12
		1745 (132322)	22.43	21.46	20.26
		1712.5 (131997)	22.17	20.96	20.24
	25RB (0)	1777.5 (132647)	21.81	20.79	19.65
		1745 (132322)	22.52	21.13	20.13
		1712.5 (131997)	22.39	21.19	20.09

10MHz	1RB-High (49)	1775 (132622)	22.88	21.58	20.63
		1745 (132322)	22.73	22.13	20.96
		1715 (132022)	22.87	22.03	20.87
	1RB-Middle (24)	1775 (132622)	23.02	22.20	21.25
		1745 (132322)	23.39	22.21	21.12
		1715 (132022)	23.30	22.51	21.59
	1RB-Low (0)	1775 (132622)	22.87	22.03	21.07
		1745 (132322)	22.92	21.83	20.95
		1715 (132022)	22.99	22.51	21.25
	25RB-High (25)	1775 (132622)	21.85	20.70	19.71
		1745 (132322)	22.14	21.08	20.08
		1715 (132022)	22.33	21.21	20.49
	25RB-Middle (12)	1775 (132622)	22.18	21.07	20.22
		1745 (132322)	22.27	21.11	20.26
		1715 (132022)	22.35	21.25	20.36
	25RB-Low (0)	1775 (132622)	21.94	20.86	19.93
		1745 (132322)	22.38	21.28	20.37
		1715 (132022)	22.18	21.16	20.29
	50RB (0)	1775 (132622)	21.83	20.76	19.99
		1745 (132322)	22.29	21.25	20.23
		1715 (132022)	22.24	21.16	20.46
15MHz	1RB-High (74)	1772.5 (132597)	22.85	21.64	20.61
		1745 (132322)	22.71	22.19	21.18
		1717.5 (132047)	22.85	21.85	20.93
	1RB-Middle (37)	1772.5 (132597)	23.02	22.24	21.09
		1745 (132322)	23.54	22.19	21.30
		1717.5 (132047)	23.44	22.59	21.47
	1RB-Low (0)	1772.5 (132597)	22.80	22.00	21.14
		1745 (132322)	22.84	21.97	20.95
		1717.5 (132047)	23.14	22.31	21.36
	36RB-High (38)	1772.5 (132597)	21.94	20.83	19.75
		1745 (132322)	22.22	21.07	20.11
		1717.5 (132047)	22.44	21.32	20.48
	36RB-Middle (19)	1772.5 (132597)	22.30	21.06	20.19
		1745 (132322)	22.20	21.18	20.12
		1717.5 (132047)	22.36	21.42	20.52
	36RB-Low (0)	1772.5 (132597)	21.91	21.04	20.10
		1745 (132322)	22.48	21.46	20.39
		1717.5 (132047)	22.13	21.08	20.25
	75RB (0)	1772.5 (132597)	21.95	20.78	19.76
		1745 (132322)	22.47	21.11	20.24
		1717.5 (132047)	22.30	21.31	20.23
20MHz	1RB-High (99)	1770 (132572)	22.79	21.71	20.66
		1745 (132322)	22.86	22.22	21.08
		1720 (132072)	22.98	21.99	20.95
	1RB-Middle (50)	1770 (132572)	23.16	22.19	21.15
		1745 (132322)	23.44	22.30	21.26
		1720 (132072)	23.35	22.56	21.53
	1RB-Low (0)	1770 (132572)	22.91	22.13	21.16
		1745 (132322)	22.99	21.93	20.87
		1720 (132072)	23.10	22.41	21.28
	50RB-High (50)	1770 (132572)	21.85	20.73	19.81
		1745 (132322)	22.21	21.19	20.20
		1720 (132072)	22.35	21.33	20.39
	50RB-Middle (25)	1770 (132572)	22.20	21.07	20.15
		1745 (132322)	22.35	21.25	20.27
		1720 (132072)	22.40	21.34	20.44
	50RB-Low (0)	1770 (132572)	21.96	20.94	20.01
		1745 (132322)	22.49	21.38	20.43
		1720 (132072)	22.18	21.22	20.26
	100RB (0)	1770 (132572)	21.90	20.86	19.91
		1745 (132322)	22.39	21.26	20.31
		1720 (132072)	22.29	21.27	20.37

FDD Band 2 DSI1/DSI2					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
1.4MHz	1RB-High (5)	1909.3 (19193)	13.94	13.81	13.39
		1880 (18900)	13.67	14.17	13.41
		1850.7 (18607)	13.58	13.66	13.34
	1RB-Middle (3)	1909.3 (19193)	14.25	14.16	13.57
		1880 (18900)	13.83	14.28	13.60
		1850.7 (18607)	14.00	14.27	13.47
	1RB-Low (0)	1909.3 (19193)	13.85	14.11	13.53
		1880 (18900)	13.70	13.91	13.09
		1850.7 (18607)	13.25	13.73	13.23
	3RB-High (3)	1909.3 (19193)	13.81	13.88	13.72
		1880 (18900)	13.64	13.68	13.59
		1850.7 (18607)	13.71	13.98	13.61
	3RB-Middle (1)	1909.3 (19193)	13.85	14.04	13.67
		1880 (18900)	13.82	13.86	13.67
		1850.7 (18607)	13.59	13.63	13.74
	3RB-Low (0)	1909.3 (19193)	13.64	13.86	13.49
		1880 (18900)	13.63	13.80	13.78
		1850.7 (18607)	13.78	13.67	13.42
	6RB (0)	1909.3 (19193)	13.74	13.84	13.95
		1880 (18900)	13.56	13.69	13.58
		1850.7 (18607)	13.56	13.72	13.55
3MHz	1RB-High (14)	1908.5 (19185)	13.87	14.12	13.37
		1880 (18900)	13.84	14.02	13.41
		1851.5 (18615)	13.73	14.08	13.32
	1RB-Middle (7)	1908.5 (19185)	14.20	14.37	13.67
		1880 (18900)	14.03	14.55	13.64
		1851.5 (18615)	13.97	14.33	13.61
	1RB-Low (0)	1908.5 (19185)	13.71	14.35	13.47
		1880 (18900)	13.75	13.74	13.30
		1851.5 (18615)	13.33	13.58	13.10
	8RB-High (7)	1908.5 (19185)	13.95	13.80	13.64
		1880 (18900)	13.67	13.96	13.78
		1851.5 (18615)	13.73	13.66	13.78
	8RB-Middle (4)	1908.5 (19185)	13.80	13.89	13.73
		1880 (18900)	13.70	13.85	13.75
		1851.5 (18615)	13.68	13.68	13.43
	8RB-Low (0)	1908.5 (19185)	13.80	14.03	13.86
		1880 (18900)	13.71	13.97	13.54
		1851.5 (18615)	13.60	13.76	13.68
	15RB (0)	1908.5 (19185)	13.80	14.00	13.75
		1880 (18900)	13.82	13.72	13.53
		1851.5 (18615)	13.54	13.67	13.68
5MHz	1RB-High (24)	1907.5 (19175)	13.88	13.82	13.43
		1880 (18900)	13.68	14.13	13.51
		1852.5 (18625)	13.53	13.94	13.17
	1RB-Middle (12)	1907.5 (19175)	14.22	14.19	13.77
		1880 (18900)	13.89	14.24	13.55
		1852.5 (18625)	13.77	14.34	13.64
	1RB-Low (0)	1907.5 (19175)	13.82	14.18	13.52
		1880 (18900)	13.61	13.90	13.03
		1852.5 (18625)	13.45	13.86	13.28
	12RB-High (13)	1907.5 (19175)	13.82	13.85	13.94
		1880 (18900)	13.59	13.71	13.70
		1852.5 (18625)	13.53	13.95	13.63
	12RB-Middle (6)	1907.5 (19175)	13.83	14.14	13.59
		1880 (18900)	13.81	14.12	13.58
		1852.5 (18625)	13.51	13.46	13.72
	12RB-Low (0)	1907.5 (19175)	13.75	13.91	13.60
		1880 (18900)	13.53	13.62	13.54
		1852.5 (18625)	13.67	13.63	13.31
	25RB (0)	1907.5 (19175)	13.60	14.00	13.83
		1880 (18900)	13.61	13.84	13.43
		1852.5 (18625)	13.34	13.54	13.59

10MHz	1RB-High (49)	1905 (19150)	13.88	13.94	13.51
		1880 (18900)	13.89	14.16	13.37
		1855 (18650)	13.45	14.02	13.46
	1RB-Middle (24)	1905 (19150)	14.06	14.49	13.86
		1880 (18900)	13.96	14.31	13.74
		1855 (18650)	13.71	14.17	13.50
	1RB-Low (0)	1905 (19150)	13.75	14.31	13.33
		1880 (18900)	13.67	13.85	13.38
		1855 (18650)	13.37	13.62	13.02
	25RB-High (25)	1905 (19150)	13.69	13.94	13.83
		1880 (18900)	13.87	13.79	13.66
		1855 (18650)	13.69	13.87	13.48
	25RB-Middle (12)	1905 (19150)	13.97	13.85	13.99
		1880 (18900)	13.79	13.87	13.63
		1855 (18650)	13.68	13.74	13.53
	25RB-Low (0)	1905 (19150)	13.88	13.88	13.61
		1880 (18900)	13.60	13.99	13.58
		1855 (18650)	13.54	13.79	13.50
	50RB (0)	1905 (19150)	13.81	13.84	13.72
		1880 (18900)	13.82	13.89	13.65
		1855 (18650)	13.50	13.92	13.72
15MHz	1RB-High (74)	1902.5 (19125)	13.92	13.90	13.50
		1880 (18900)	13.76	14.20	13.52
		1857.5 (18675)	13.52	13.86	13.30
	1RB-Middle (37)	1902.5 (19125)	14.20	14.31	13.71
		1880 (18900)	13.90	14.31	13.55
		1857.5 (18675)	13.94	14.39	13.54
	1RB-Low (0)	1902.5 (19125)	13.79	14.28	13.54
		1880 (18900)	13.71	13.81	13.19
		1857.5 (18675)	13.44	13.82	13.21
	36RB-High (38)	1902.5 (19125)	13.90	14.00	13.87
		1880 (18900)	13.59	13.72	13.64
		1857.5 (18675)	13.63	13.95	13.71
	36RB-Middle (19)	1902.5 (19125)	13.79	14.04	13.71
		1880 (18900)	13.88	14.02	13.63
		1857.5 (18675)	13.55	13.64	13.64
	36RB-Low (0)	1902.5 (19125)	13.79	13.87	13.68
		1880 (18900)	13.73	13.75	13.69
		1857.5 (18675)	13.74	13.75	13.48
	75RB (0)	1902.5 (19125)	13.66	13.99	13.86
		1880 (18900)	13.67	13.74	13.62
		1857.5 (18675)	13.50	13.68	13.57
20MHz	1RB-High (99)	1900 (19100)	13.78	14.44	13.65
		1880 (18900)	13.64	14.21	13.58
		1860 (18700)	13.43	13.97	13.49
	1RB-Middle (50)	1900 (19100)	14.08	13.63	13.95
		1880 (18900)	13.97	13.54	13.81
		1860 (18700)	13.75	14.22	13.72
	1RB-Low (0)	1900 (19100)	13.60	14.20	13.55
		1880 (18900)	13.54	14.06	13.45
		1860 (18700)	13.26	13.84	14.25
	50RB-High (50)	1900 (19100)	14.02	14.04	13.73
		1880 (18900)	13.84	13.91	13.65
		1860 (18700)	13.81	13.83	13.58
	50RB-Middle (25)	1900 (19100)	14.01	14.03	13.81
		1880 (18900)	13.87	13.92	13.67
		1860 (18700)	13.73	13.70	13.53
	50RB-Low (0)	1900 (19100)	13.92	14.00	13.69
		1880 (18900)	13.78	13.88	13.61
		1860 (18700)	13.77	13.79	13.54
	100RB (0)	1900 (19100)	13.99	14.06	13.69
		1880 (18900)	13.88	13.96	13.61
		1860 (18700)	13.81	13.83	13.56

FDD Band 5 DSI1/DSI2					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
1.4MHz	1RB-High (5)	848.3 (20643)	17.95	18.24	18.15
		836.5 (20525)	17.96	18.24	18.12
		824.7 (20407)	17.93	18.17	18.14
	1RB-Middle (3)	848.3 (20643)	18.10	18.43	18.28
		836.5 (20525)	18.05	18.29	18.18
		824.7 (20407)	18.15	18.32	18.35
	1RB-Low (0)	848.3 (20643)	17.99	18.24	18.21
		836.5 (20525)	17.98	18.36	18.11
		824.7 (20407)	18.01	18.32	18.21
	3RB-High (3)	848.3 (20643)	18.04	18.05	18.06
		836.5 (20525)	18.01	17.99	18.00
		824.7 (20407)	18.18	18.17	18.18
	3RB-Middle (1)	848.3 (20643)	18.06	18.08	18.07
		836.5 (20525)	18.05	18.06	18.04
		824.7 (20407)	18.07	18.09	18.08
	3RB-Low (0)	848.3 (20643)	18.12	18.15	18.13
		836.5 (20525)	18.01	18.00	18.01
		824.7 (20407)	18.05	18.04	18.04
	6RB (0)	848.3 (20643)	18.08	18.12	18.08
		836.5 (20525)	18.01	18.00	18.00
		824.7 (20407)	18.13	18.13	18.10
3MHz	1RB-High (14)	847.5 (20635)	17.98	18.27	18.18
		836.5 (20525)	17.99	18.27	18.15
		825.5 (20415)	17.96	18.20	18.17
	1RB-Middle (7)	847.5 (20635)	18.13	18.46	18.31
		836.5 (20525)	18.08	18.32	18.21
		825.5 (20415)	18.18	18.35	18.38
	1RB-Low (0)	847.5 (20635)	18.02	18.27	18.24
		836.5 (20525)	18.01	18.39	18.14
		825.5 (20415)	18.04	18.35	18.24
	8RB-High (7)	847.5 (20635)	18.07	18.08	18.09
		836.5 (20525)	18.04	18.02	18.03
		825.5 (20415)	18.21	18.20	18.21
	8RB-Middle (4)	847.5 (20635)	18.09	18.11	18.10
		836.5 (20525)	18.08	18.09	18.07
		825.5 (20415)	18.10	18.12	18.11
	8RB-Low (0)	847.5 (20635)	18.15	18.18	18.16
		836.5 (20525)	18.04	18.03	18.04
		825.5 (20415)	18.08	18.07	18.07
	15RB (0)	847.5 (20635)	18.11	18.15	18.11
		836.5 (20525)	18.04	18.03	18.03
		825.5 (20415)	18.16	18.16	18.13

5MHz	1RB-High (24)	846.5 (20625)	18.00	18.29	18.20
		836.5 (20525)	18.01	18.29	18.17
		826.5 (20425)	17.98	18.22	18.19
	1RB-Middle (12)	846.5 (20625)	18.15	18.48	18.33
		836.5 (20525)	18.10	18.34	18.23
		826.5 (20425)	18.20	18.37	18.40
	1RB-Low (0)	846.5 (20625)	18.04	18.29	18.26
		836.5 (20525)	18.03	18.41	18.16
		826.5 (20425)	18.06	18.37	18.26
	12RB-High (13)	846.5 (20625)	18.09	18.10	18.11
		836.5 (20525)	18.06	18.04	18.05
		826.5 (20425)	18.23	18.22	18.23
	12RB-Middle (6)	846.5 (20625)	18.11	18.13	18.12
		836.5 (20525)	18.10	18.11	18.09
		826.5 (20425)	18.12	18.14	18.13
	12RB-Low (0)	846.5 (20625)	18.17	18.20	18.18
		836.5 (20525)	18.06	18.05	18.06
		826.5 (20425)	18.10	18.09	18.09
	25RB (0)	846.5 (20625)	18.13	18.17	18.13
		836.5 (20525)	18.06	18.05	18.05
		826.5 (20425)	18.18	18.18	18.15
10MHz	1RB-High (49)	844 (20600)	18.04	18.33	18.24
		836.5 (20525)	18.05	18.33	18.21
		829 (20450)	18.02	18.26	18.23
	1RB-Middle (24)	844 (20600)	18.19	18.52	18.37
		836.5 (20525)	18.14	18.38	18.27
		829 (20450)	18.24	18.41	18.44
	1RB-Low (0)	844 (20600)	18.08	18.33	18.30
		836.5 (20525)	18.07	18.45	18.20
		829 (20450)	18.10	18.41	18.30
	25RB-High (25)	844 (20600)	18.13	18.14	18.15
		836.5 (20525)	18.10	18.08	18.09
		829 (20450)	18.27	18.26	18.27
	25RB-Middle (12)	844 (20600)	18.15	18.17	18.16
		836.5 (20525)	18.14	18.15	18.13
		829 (20450)	18.16	18.18	18.17
	25RB-Low (0)	844 (20600)	18.21	18.24	18.22
		836.5 (20525)	18.10	18.09	18.10
		829 (20450)	18.14	18.13	18.13
	50RB (0)	844 (20600)	18.17	18.21	18.17
		836.5 (20525)	18.10	18.09	18.09
		829 (20450)	18.22	18.22	18.19

FDD Band 7 DSI1/DSI2					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
5MHz	1RB-High (24)	2567.5 (21425)	16.12	15.97	15.98
		2535 (21100)	16.26	16.00	16.05
		2502.5 (20775)	16.19	16.20	16.18
	1RB-Middle (12)	2567.5 (21425)	16.60	16.32	16.35
		2535 (21100)	16.66	16.37	16.44
		2502.5 (20775)	16.55	16.38	16.42
	1RB-Low (0)	2567.5 (21425)	16.38	16.08	16.11
		2535 (21100)	16.49	16.24	16.24
		2502.5 (20775)	16.21	16.02	16.06
	12RB-High (13)	2567.5 (21425)	16.48	15.99	15.99
		2535 (21100)	16.23	16.08	16.23
		2502.5 (20775)	16.20	16.09	16.20
	12RB-Middle (6)	2567.5 (21425)	16.13	16.06	16.20
		2535 (21100)	16.31	16.18	16.29
		2502.5 (20775)	16.25	16.11	16.25
	12RB-Low (0)	2567.5 (21425)	16.18	16.09	16.22
		2535 (21100)	16.24	16.12	16.26
		2502.5 (20775)	16.18	16.04	16.16
	25RB (0)	2567.5 (21425)	16.16	16.03	16.15
		2535 (21100)	16.25	16.09	16.24
		2502.5 (20775)	16.18	16.03	16.20
10MHz	1RB-High (49)	2565 (21400)	16.18	16.02	16.03
		2535 (21100)	16.32	16.06	16.11
		2505 (20800)	16.25	16.26	16.24
	1RB-Middle (24)	2565 (21400)	16.66	16.38	16.41
		2535 (21100)	16.72	16.43	16.50
		2505 (20800)	16.61	16.44	16.48
	1RB-Low (0)	2565 (21400)	16.44	16.14	16.17
		2535 (21100)	16.55	16.30	16.30
		2505 (20800)	16.27	16.08	16.12
	25RB-High (25)	2565 (21400)	16.54	16.04	16.04
		2535 (21100)	16.29	16.14	16.29
		2505 (20800)	16.26	16.15	16.26
	25RB-Middle (12)	2565 (21400)	16.19	16.12	16.26
		2535 (21100)	16.37	16.24	16.35
		2505 (20800)	16.31	16.17	16.31
	25RB-Low (0)	2565 (21400)	16.24	16.15	16.28
		2535 (21100)	16.30	16.18	16.32
		2505 (20800)	16.24	16.10	16.22
	50RB (0)	2565 (21400)	16.22	16.09	16.21
		2535 (21100)	16.31	16.15	16.30
		2505 (20800)	16.24	16.09	16.26

15MHz	1RB-High (74)	2562.5 (21375)	15.92	15.76	15.77
		2535 (21100)	16.06	15.80	15.85
		2507.5 (20825)	15.99	16.00	15.98
	1RB-Middle (37)	2562.5 (21375)	16.39	16.11	16.14
		2535 (21100)	16.45	16.16	16.23
		2507.5 (20825)	16.34	16.17	16.21
	1RB-Low (0)	2562.5 (21375)	16.17	15.88	15.91
		2535 (21100)	16.28	16.04	16.04
		2507.5 (20825)	16.01	15.82	15.86
	36RB-High (38)	2562.5 (21375)	16.27	15.78	15.78
		2535 (21100)	16.03	15.88	16.03
		2507.5 (20825)	16.00	15.89	16.00
	36RB-Middle (19)	2562.5 (21375)	15.93	15.86	16.00
		2535 (21100)	16.11	15.98	16.09
		2507.5 (20825)	16.05	15.91	16.05
	36RB-Low (0)	2562.5 (21375)	15.98	15.89	16.02
		2535 (21100)	16.04	15.92	16.06
		2507.5 (20825)	15.98	15.84	15.96
	75RB (0)	2562.5 (21375)	15.96	15.83	15.95
		2535 (21100)	16.05	15.89	16.04
		2507.5 (20825)	15.98	15.83	16.00
20MHz	1RB-High (99)	2560 (21350)	16.27	16.11	16.12
		2535 (21100)	16.41	16.15	16.20
		2510 (20850)	16.34	16.35	16.33
	1RB-Middle (50)	2560 (21350)	16.85	16.47	16.50
		2535 (21100)	16.81	16.52	16.59
		2510 (20850)	16.70	16.53	16.57
	1RB-Low (0)	2560 (21350)	16.53	16.23	16.26
		2535 (21100)	16.64	16.39	16.39
		2510 (20850)	16.36	16.17	16.21
	50RB-High (50)	2560 (21350)	16.63	16.13	16.13
		2535 (21100)	16.38	16.23	16.38
		2510 (20850)	16.35	16.24	16.35
	50RB-Middle (25)	2560 (21350)	16.28	16.21	16.35
		2535 (21100)	16.46	16.33	16.44
		2510 (20850)	16.40	16.26	16.40
	50RB-Low (0)	2560 (21350)	16.33	16.24	16.37
		2535 (21100)	16.39	16.27	16.41
		2510 (20850)	16.33	16.19	16.31
	100RB (0)	2560 (21350)	16.31	16.18	16.30
		2535 (21100)	16.40	16.24	16.39
		2510 (20850)	16.33	16.18	16.35

FDD Band 12 DSI1/DSI2					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
1.4MHz	1RB-High (5)	715.3	19.99	20.20	20.13
		707.5	20.01	20.28	20.20
		699.7	19.99	20.22	20.22
	1RB-Middle (3)	715.3	20.10	20.37	20.31
		707.5	20.15	20.48	20.43
		699.7	20.19	20.45	20.42
	1RB-Low (0)	715.3	20.10	20.39	20.27
		707.5	20.09	20.46	20.30
		699.7	20.08	20.38	20.27
	3RB-High (3)	715.3	20.02	20.02	20.02
		707.5	20.14	20.16	20.13
		699.7	20.12	20.11	20.14
	3RB-Middle (1)	715.3	20.09	20.09	20.11
		707.5	20.12	20.13	20.13
		699.7	20.16	20.13	20.15
	3RB-Low (0)	715.3	20.16	20.18	20.16
		707.5	20.22	20.21	20.21
		699.7	20.16	20.15	20.13
	6RB (0)	715.3	20.08	20.09	20.07
		707.5	20.15	20.19	20.16
		699.7	20.12	20.15	20.13
3MHz	1RB-High (14)	714.5	20.03	20.24	20.17
		707.5	20.05	20.32	20.24
		700.5	20.03	20.26	20.26
	1RB-Middle (7)	714.5	20.14	20.41	20.35
		707.5	20.19	20.52	20.47
		700.5	20.23	20.49	20.46
	1RB-Low (0)	714.5	20.14	20.43	20.31
		707.5	20.13	20.50	20.34
		700.5	20.12	20.42	20.31
	8RB-High (7)	714.5	20.06	20.06	20.06
		707.5	20.18	20.20	20.17
		700.5	20.16	20.15	20.18
	8RB-Middle (4)	714.5	20.13	20.13	20.15
		707.5	20.16	20.17	20.17
		700.5	20.20	20.17	20.19
	8RB-Low (0)	714.5	20.20	20.22	20.20
		707.5	20.26	20.25	20.25
		700.5	20.20	20.19	20.17
	15RB (0)	714.5	20.12	20.13	20.11
		707.5	20.19	20.23	20.20
		700.5	20.16	20.19	20.17

5MHz	1RB-High (24)	713.5	19.96	20.17	20.10
		707.5	19.98	20.25	20.17
		701.5	19.96	20.19	20.19
	1RB-Middle (12)	713.5	20.07	20.34	20.28
		707.5	20.12	20.45	20.40
		701.5	20.16	20.42	20.39
	1RB-Low (0)	713.5	20.07	20.36	20.24
		707.5	20.06	20.43	20.27
		701.5	20.05	20.35	20.24
	12RB-High (13)	713.5	19.99	19.99	19.99
		707.5	20.11	20.13	20.10
		701.5	20.09	20.08	20.11
	12RB-Middle (6)	713.5	20.06	20.06	20.08
		707.5	20.09	20.10	20.10
		701.5	20.13	20.10	20.12
	12RB-Low (0)	713.5	20.13	20.15	20.13
		707.5	20.19	20.18	20.18
		701.5	20.13	20.12	20.10
	25RB (0)	713.5	20.05	20.06	20.04
		707.5	20.12	20.16	20.13
		701.5	20.09	20.12	20.10
10MHz	1RB-High (49)	711	20.05	20.26	20.19
		707.5	20.07	20.34	20.26
		704	20.05	20.28	20.28
	1RB-Middle (24)	711	20.16	20.43	20.37
		707.5	20.21	20.54	20.49
		704	20.25	20.51	20.48
	1RB-Low (0)	711	20.16	20.45	20.33
		707.5	20.15	20.52	20.36
		704	20.14	20.44	20.33
	25RB-High (25)	711	20.08	20.08	20.08
		707.5	20.20	20.22	20.19
		704	20.18	20.17	20.20
	25RB-Middle (12)	711	20.15	20.15	20.17
		707.5	20.18	20.19	20.19
		704	20.22	20.19	20.21
	25RB-Low (0)	711	20.22	20.24	20.22
		707.5	20.28	20.27	20.27
		704	20.22	20.21	20.19
	50RB (0)	711	20.14	20.15	20.13
		707.5	20.21	20.25	20.22
		704	20.18	20.21	20.19

FDD Band 13 DSI1/DSI2					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
5MHz	1RB-High (24)	784.5 (23255)	17.89	18.17	18.05
		782 (23230)	17.84	18.14	18.09
		779.5 (23205)	17.86	18.17	17.98
	1RB-Middle (12)	784.5 (23255)	18.14	18.43	18.41
		782 (23230)	18.09	18.45	18.26
		779.5 (23205)	18.15	18.42	18.26
	1RB-Low (0)	784.5 (23255)	17.90	18.17	18.01
		782 (23230)	17.91	18.21	18.06
		779.5 (23205)	17.89	18.22	17.99
	12RB-High (13)	784.5 (23255)	17.99	17.99	18.00
		782 (23230)	17.93	17.91	17.92
		779.5 (23205)	18.01	17.98	18.00
	12RB-Middle (6)	784.5 (23255)	18.05	18.05	18.08
		782 (23230)	18.06	18.03	18.03
		779.5 (23205)	18.01	18.00	18.02
	12RB-Low (0)	784.5 (23255)	18.04	18.03	18.04
		782 (23230)	17.97	17.93	17.94
		779.5 (23205)	17.85	17.82	17.85
	25RB (0)	784.5 (23255)	18.01	18.01	18.00
		782 (23230)	17.97	17.96	17.96
		779.5 (23205)	17.98	17.96	17.94
10MHz	1RB-High (49)	782 (23230)	17.96	18.29	18.13
	1RB-Middle (24)	782 (23230)	18.06	18.35	18.28
	1RB-Low (0)	782 (23230)	18.02	18.29	18.24
	25RB-High (25)	782 (23230)	17.96	17.98	17.98
	25RB-Middle (12)	782 (23230)	18.07	18.04	18.02
	25RB-Low (0)	782 (23230)	17.89	17.85	17.85
	50RB (0)	782 (23230)	17.94	17.95	17.93

FDD Band 41 DSI1/DSI2					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
5MHz	1RB-High (24)	2687.5 (41565)	14.84	15.12	14.79
		2640.3(41093)	14.81	14.96	14.76
		2593 (40620)	14.68	15.14	14.63
		2545.8(40148)	14.63	14.91	14.58
		2498.5 (39675)	14.65	14.89	14.6
	1RB-Middle (12)	2687.5 (41565)	15.30	15.61	15.25
		2640.3(41093)	15.29	15.42	15.24
		2593 (40620)	15.13	15.57	15.08
		2545.8(40148)	15.10	15.33	15.05
		2498.5 (39675)	15.23	15.43	15.18
	1RB-Low (0)	2687.5 (41565)	14.79	15.10	14.73
		2640.3(41093)	14.80	14.98	14.75
		2593 (40620)	14.61	15.05	14.56
		2545.8(40148)	14.56	14.85	14.51
		2498.5 (39675)	14.73	15.00	14.68
	12RB-High (13)	2687.5 (41565)	15.00	15.02	14.95
		2640.3(41093)	15.01	15.04	14.95
		2593 (40620)	14.97	15.01	14.92
		2545.8(40148)	14.84	14.90	14.79
		2498.5 (39675)	14.94	14.99	14.89
	12RB-Middle (6)	2687.5 (41565)	15.06	15.08	15.01
		2640.3(41093)	15.04	15.06	14.99
		2593 (40620)	14.95	14.99	14.9
		2545.8(40148)	14.82	14.83	14.77
		2498.5 (39675)	14.92	14.97	14.87
	12RB-Low (0)	2687.5 (41565)	15.07	15.09	15.02
		2640.3(41093)	14.99	15.01	14.94
		2593 (40620)	14.86	14.97	14.81
		2545.8(40148)	14.77	14.75	14.72
		2498.5 (39675)	14.91	14.97	14.86
	25RB (0)	2687.5 (41565)	15.04	15.03	14.99
		2640.3(41093)	14.98	15.04	14.93
		2593 (40620)	14.92	14.97	14.87
		2545.8(40148)	14.84	14.79	14.79
		2498.5 (39675)	14.95	14.99	14.89
10MHz	1RB-High (49)	2685 (41540)	14.95	15.23	14.9
		2639(41080)	14.92	15.06	14.87
		2593 (40620)	14.78	15.25	14.74
		2547(40160)	14.73	15.02	14.69
		2501 (39700)	14.76	14.99	14.71
	1RB-Middle (24)	2685 (41540)	15.41	15.72	15.36
		2639(41080)	15.40	15.53	15.35
		2593 (40620)	15.24	15.68	15.19
		2547(40160)	15.20	15.44	15.16
		2501 (39700)	15.34	15.54	15.29
	1RB-Low (0)	2685 (41540)	14.89	15.21	14.84
		2639(41080)	14.91	15.08	14.86
		2593 (40620)	14.72	15.16	14.67
		2547(40160)	14.66	14.95	14.62
		2501 (39700)	14.83	15.11	14.79
	25RB-High (25)	2685 (41540)	15.11	15.13	15.06
		2639(41080)	15.11	15.14	15.06
		2593 (40620)	15.08	15.12	15.03
		2547(40160)	14.95	15.00	14.9
		2501 (39700)	15.05	15.09	15
	25RB-Middle (12)	2685 (41540)	15.17	15.19	15.12
		2639(41080)	15.15	15.16	15.1
		2593 (40620)	15.06	15.09	15.01
		2547(40160)	14.93	14.93	14.88
		2501 (39700)	15.03	15.07	14.98
	25RB-Low (0)	2685 (41540)	15.17	15.20	15.13
		2639(41080)	15.10	15.12	15.05
		2593 (40620)	14.96	15.08	14.92
		2547(40160)	14.88	14.85	14.83
		2501 (39700)	15.01	15.08	14.97
	50RB (0)	2685 (41540)	15.14	15.14	15.1
		2639(41080)	15.09	15.15	15.04
		2593 (40620)	15.02	15.07	14.98
		2547(40160)	14.94	14.90	14.9
		2501 (39700)	15.05	15.10	15

15MHz	1RB-High (74)	2682.5 (41515)	14.94	15.22	14.89
		2637.8(41068)	14.91	15.05	14.86
		2593 (40620)	14.77	15.24	14.73
		2548.3(40173)	14.72	15.01	14.68
		2503.5 (39725)	14.75	14.98	14.7
	1RB-Middle (37)	2682.5 (41515)	15.40	15.71	15.35
		2637.8(41068)	15.39	15.52	15.34
		2593 (40620)	15.23	15.67	15.18
		2548.3(40173)	15.19	15.43	15.15
		2503.5 (39725)	15.33	15.53	15.28
	1RB-Low (0)	2682.5 (41515)	14.88	15.20	14.83
		2637.8(41068)	14.90	15.07	14.85
		2593 (40620)	14.71	15.15	14.66
		2548.3(40173)	14.65	14.95	14.61
		2503.5 (39725)	14.82	15.10	14.78
	36RB-High (38)	2682.5 (41515)	15.10	15.12	15.05
		2637.8(41068)	15.10	15.13	15.05
		2593 (40620)	15.07	15.11	15.02
		2548.3(40173)	14.94	14.99	14.89
		2503.5 (39725)	15.04	15.08	14.99
	36RB-Middle (19)	2682.5 (41515)	15.16	15.18	15.11
		2637.8(41068)	15.14	15.15	15.09
		2593 (40620)	15.05	15.08	15
		2548.3(40173)	14.92	14.92	14.87
		2503.5 (39725)	15.02	15.06	14.97
	36RB-Low (0)	2682.5 (41515)	15.16	15.19	15.12
		2637.8(41068)	15.09	15.11	15.04
		2593 (40620)	14.95	15.07	14.91
		2548.3(40173)	14.87	14.84	14.82
		2503.5 (39725)	15.00	15.07	14.96
	75RB (0)	2682.5 (41515)	15.14	15.13	15.09
		2637.8(41068)	15.08	15.14	15.03
		2593 (40620)	15.01	15.06	14.97
		2548.3(40173)	14.93	14.89	14.89
		2503.5 (39725)	15.04	15.09	14.99
20MHz	1RB-High (99)	2680 (41490)	14.90	15.18	14.85
		2636.5(41055)	14.87	15.01	14.82
		2593 (40620)	14.74	15.20	14.69
		2549.5(40185)	14.68	14.97	14.64
		2506 (39750)	14.71	14.94	14.66
	1RB-Middle (50)	2680 (41490)	15.36	15.67	15.31
		2636.5(41055)	15.37	15.48	15.3
		2593 (40620)	15.19	15.63	15.14
		2549.5(40185)	15.15	15.39	15.11
		2506 (39750)	15.29	15.49	15.24
	1RB-Low (0)	2680 (41490)	14.84	15.16	14.79
		2636.5(41055)	14.86	15.03	14.81
		2593 (40620)	14.67	15.11	14.62
		2549.5(40185)	14.61	14.91	14.57
		2506 (39750)	14.78	15.06	14.74
	50RB-High (50)	2680 (41490)	15.06	15.08	15.01
		2636.5(41055)	15.06	15.10	15.01
		2593 (40620)	15.03	15.07	14.98
		2549.5(40185)	14.90	14.96	14.85
		2506 (39750)	15.00	15.04	14.95
	50RB-Middle (25)	2680 (41490)	15.12	15.14	15.07
		2636.5(41055)	15.13	15.11	15.05
		2593 (40620)	15.01	15.04	14.96
		2549.5(40185)	14.88	14.89	14.83
		2506 (39750)	14.98	15.03	14.93
	50RB-Low (0)	2680 (41490)	15.12	15.15	15.08
		2636.5(41055)	15.05	15.07	15
		2593 (40620)	14.91	15.03	14.87
		2549.5(40185)	14.83	14.80	14.78
		2506 (39750)	14.96	15.03	14.92
	100RB (0)	2680 (41490)	15.10	15.09	15.05
		2636.5(41055)	15.04	15.10	14.99
		2593 (40620)	14.98	15.02	14.93
		2549.5(40185)	14.89	14.85	14.85
		2506 (39750)	15.00	15.05	14.95

FDD Band 66 DSI1/DSI2					
BANDWIDTH	**Number of RBs**	**Frequency**	**QPSK**	**16QAM**	**64QAM**
1.4MHz	1RB-High (5)	1779.3 (132665)	10.17	10.58	10.06
		1745 (132322)	10.30	10.64	10.19
		1710.7 (131979)	10.40	10.71	10.27
	1RB-Middle (3)	1779.3 (132665)	10.45	10.97	10.33
		1745 (132322)	10.64	10.88	10.52
		1710.7 (131979)	10.80	11.10	10.68
	1RB-Low (0)	1779.3 (132665)	10.21	10.67	10.09
		1745 (132322)	10.32	10.59	10.2
		1710.7 (131979)	10.52	10.84	10.4
	3RB-High (3)	1779.3 (132665)	10.28	10.24	10.15
		1745 (132322)	10.49	10.45	10.38
		1710.7 (131979)	10.70	10.69	10.58
	3RB-Middle (1)	1779.3 (132665)	10.43	10.44	10.3
		1745 (132322)	10.54	10.49	10.42
		1710.7 (131979)	10.75	10.72	10.63
	3RB-Low (0)	1779.3 (132665)	10.34	10.37	10.22
		1745 (132322)	10.71	10.63	10.59
		1710.7 (131979)	10.67	10.65	10.54
	6RB (0)	1779.3 (132665)	10.33	10.33	10.2
		1745 (132322)	10.65	10.56	10.53
		1710.7 (131979)	10.69	10.71	10.57
3MHz	1RB-High (14)	1778.5 (132657)	10.26	10.68	10.15
		1745 (132322)	10.40	10.74	10.29
		1711.5 (131987)	10.49	10.81	10.37
	1RB-Middle (7)	1778.5 (132657)	10.55	11.07	10.43
		1745 (132322)	10.74	10.98	10.62
		1711.5 (131987)	10.90	11.20	10.78
	1RB-Low (0)	1778.5 (132657)	10.30	10.77	10.19
		1745 (132322)	10.42	10.69	10.3
		1711.5 (131987)	10.62	10.94	10.49
	8RB-High (7)	1778.5 (132657)	10.37	10.33	10.25
		1745 (132322)	10.59	10.55	10.48
		1711.5 (131987)	10.80	10.79	10.68
	8RB-Middle (4)	1778.5 (132657)	10.53	10.54	10.4
		1745 (132322)	10.64	10.58	10.52
		1711.5 (131987)	10.85	10.82	10.73
	8RB-Low (0)	1778.5 (132657)	10.44	10.46	10.32
		1745 (132322)	10.81	10.72	10.69
		1711.5 (131987)	10.77	10.75	10.64
	15RB (0)	1778.5 (132657)	10.42	10.42	10.3
		1745 (132322)	10.74	10.66	10.63
		1711.5 (131987)	10.79	10.81	10.67
5MHz	1RB-High (24)	1777.5 (132647)	10.25	10.66	10.14
		1745 (132322)	10.39	10.72	10.27
		1712.5 (131997)	10.47	10.79	10.35
	1RB-Middle (12)	1777.5 (132647)	10.54	11.05	10.41
		1745 (132322)	10.72	10.96	10.6
		1712.5 (131997)	10.88	11.18	10.76
	1RB-Low (0)	1777.5 (132647)	10.29	10.75	10.17
		1745 (132322)	10.40	10.67	10.29
		1712.5 (131997)	10.60	10.93	10.48
	12RB-High (13)	1777.5 (132647)	10.35	10.31	10.24
		1745 (132322)	10.58	10.54	10.46
		1712.5 (131997)	10.79	10.77	10.66
	12RB-Middle (6)	1777.5 (132647)	10.51	10.53	10.39
		1745 (132322)	10.63	10.56	10.5
		1712.5 (131997)	10.84	10.80	10.71
	12RB-Low (0)	1777.5 (132647)	10.42	10.44	10.3
		1745 (132322)	10.79	10.71	10.68
		1712.5 (131997)	10.75	10.74	10.63
	25RB (0)	1777.5 (132647)	10.40	10.40	10.29
		1745 (132322)	10.74	10.64	10.61
		1712.5 (131997)	10.78	10.79	10.65

10MHz	1RB-High (49)	1775 (132622)	10.25	10.66	10.14
		1745 (132322)	10.39	10.72	10.27
		1715 (132022)	10.47	10.79	10.35
	1RB-Middle (24)	1775 (132622)	10.54	11.05	10.41
		1745 (132322)	10.72	10.96	10.6
		1715 (132022)	10.88	11.18	10.76
	1RB-Low (0)	1775 (132622)	10.29	10.75	10.17
		1745 (132322)	10.40	10.67	10.29
		1715 (132022)	10.60	10.93	10.48
	25RB-High (25)	1775 (132622)	10.35	10.31	10.24
		1745 (132322)	10.58	10.54	10.46
		1715 (132022)	10.79	10.77	10.66
	25RB-Middle (12)	1775 (132622)	10.51	10.53	10.39
		1745 (132322)	10.63	10.56	10.5
		1715 (132022)	10.84	10.80	10.71
	25RB-Low (0)	1775 (132622)	10.42	10.44	10.3
		1745 (132322)	10.79	10.71	10.68
		1715 (132022)	10.75	10.74	10.63
	50RB (0)	1775 (132622)	10.40	10.40	10.29
		1745 (132322)	10.74	10.64	10.61
		1715 (132022)	10.78	10.79	10.65
15MHz	1RB-High (74)	1772.5 (132597)	10.21	10.62	10.1
		1745 (132322)	10.35	10.68	10.23
		1717.5 (132047)	10.44	10.75	10.31
	1RB-Middle (37)	1772.5 (132597)	10.49	11.01	10.37
		1745 (132322)	10.68	10.92	10.56
		1717.5 (132047)	10.84	11.14	10.72
	1RB-Low (0)	1772.5 (132597)	10.25	10.71	10.13
		1745 (132322)	10.36	10.63	10.25
		1717.5 (132047)	10.56	10.88	10.44
	36RB-High (38)	1772.5 (132597)	10.32	10.27	10.2
		1745 (132322)	10.54	10.49	10.42
		1717.5 (132047)	10.74	10.73	10.62
	36RB-Middle (19)	1772.5 (132597)	10.47	10.49	10.35
		1745 (132322)	10.59	10.53	10.46
		1717.5 (132047)	10.79	10.76	10.67
	36RB-Low (0)	1772.5 (132597)	10.38	10.40	10.26
		1745 (132322)	10.75	10.67	10.64
		1717.5 (132047)	10.71	10.69	10.59
	75RB (0)	1772.5 (132597)	10.37	10.37	10.25
		1745 (132322)	10.69	10.60	10.57
		1717.5 (132047)	10.74	10.75	10.61
20MHz	1RB-High (99)	1770 (132572)	10.23	10.64	10.11
		1745 (132322)	10.36	10.69	10.25
		1720 (132072)	10.45	10.77	10.33
	1RB-Middle (50)	1770 (132572)	10.51	11.03	10.39
		1745 (132322)	10.70	10.94	10.58
		1720 (132072)	10.86	11.16	10.74
	1RB-Low (0)	1770 (132572)	10.26	10.73	10.15
		1745 (132322)	10.38	10.65	10.26
		1720 (132072)	10.58	10.90	10.45
	50RB-High (50)	1770 (132572)	10.33	10.29	10.21
		1745 (132322)	10.55	10.51	10.44
		1720 (132072)	10.76	10.75	10.64
	50RB-Middle (25)	1770 (132572)	10.48	10.50	10.36
		1745 (132322)	10.60	10.54	10.48
		1720 (132072)	10.81	10.78	10.69
	50RB-Low (0)	1770 (132572)	10.40	10.42	10.28
		1745 (132322)	10.77	10.68	10.65
		1720 (132072)	10.73	10.71	10.6
	100RB (0)	1770 (132572)	10.38	10.38	10.26
		1745 (132322)	10.71	10.62	10.59
		1720 (132072)	10.75	10.77	10.63

11.4 Wi-Fi and BT Measurement result

The maximum output power of BT antenna is 9.95dBm.
The maximum tune up of BT antenna is 10.5dBm.

The average conducted power for Wi-Fi 2.4G DSI0

802.11b	
Channel\data rate	1Mbps
1(2412MHz)	20.30
6(2437MHz)	20.30
11(2462MHz)	20.63
Tune up	21.00
802.11g	
Channel\data rate	6Mbps
1(2412MHz)	17.73
6(2437MHz)	17.73
11(2462MHz)	17.77
Tune up	18.5
802.11n-20MHz	
Channel\data rate	MCS0
1(2412MHz)	16.33
6(2437MHz)	16.21
11(2462MHz)	15.99
Tune up	17.5
802.11n-40MHz	
Channel\data rate	MCS0
3(2422MHz)	17.54
6(2437MHz)	17.01
9(2452MHz)	16.90
Tune up	18.00

The average conducted power for Wi-Fi 2.4G DSI1/DSI2

802.11b	
Channel\data rate	1Mbps
1(2412MHz)	14.98
6(2437MHz)	15.23
11(2462MHz)	15.36
Tune up	16.00
802.11g	
Channel\data rate	6Mbps
1(2412MHz)	11.61
6(2437MHz)	12.02
11(2462MHz)	11.86
Tune up	13.00
802.11n-20MHz	
Channel\data rate	MCS0
1(2412MHz)	11.64
6(2437MHz)	12.02
11(2462MHz)	11.88
Tune up	13.00
802.11n-40MHz	
Channel\data rate	MCS0
3(2422MHz)	8.98
6(2437MHz)	8.71
9(2452MHz)	8.59
Tune up	10.00

The average conducted power for Wi-Fi 5G DSI0

802.11a(dBm)	
Channel\data rate	6Mbps
36(5180 MHz)	16.54
40(5200 MHz)	16.52
44(5220 MHz)	16.55
48(5240 MHz)	16.45
52(5260 MHz)	16.58
56(5280 MHz)	16.53
60(5300 MHz)	16.45
64(5320 MHz)	16.61
Tune up	18.00
802.11ac(dBm)-80MHz	
155(5775 MHz)	12.04
Tune up	13.50

The average conducted power for Wi-Fi 5G DSI1/DSI2

802.11a(dBm)	
Channel\data rate	6Mbps
36(5180 MHz)	10.72
40(5200 MHz)	10.71
44(5220 MHz)	10.58
48(5240 MHz)	10.73
52(5260 MHz)	10.85
56(5280 MHz)	10.85
60(5300 MHz)	10.52
64(5320 MHz)	10.89
Tune up	11.50
802.11ac(dBm)-80MHz	
155(5775 MHz)	6.18
Tune up	7.50

12 Simultaneous TX SAR Considerations

12.1 Introduction

The following procedures adopted from “FCC SAR Considerations for Cell Phones with Multiple Transmitters” are applicable to handsets with built-in unlicensed transmitters such as 802.11 a/b/g and Bluetooth devices which may simultaneously transmit with the licensed transmitter.
For this device, the BT and Wi-Fi can transmit simultaneous with other transmitters.

12.2SAR Measurement Positions

According to the KDB941225 D06 Hot Spot SAR, the edges with less than 2.5 cm distance to the antennas need to be tested for SAR.

SAR measurement positions						
Mode	Front	Rear	Left edge	Right edge	Top edge	Bottom edge
WWAN-Main	Yes	Yes	Yes	No	Yes	No
WIFI ANT	Yes	Yes	Yes	No	Yes	No

13 Evaluation of Simultaneous

Table 13.1: The sum of SAR values for Main antenna + WiFi-2.4G

Position	LTE Band66	WiFi-2.4G	Sum 1g (W/kg)
Rear 0mm	0.57	0.69	**1.38**

Table 13.2: The sum of SAR values for Main antenna + WiFi-5G + BT

Position	LTE Band66	WiFi-5G	BT	Sum
Rear 0mm	0.62	0.75	0.18	**1.55**

Conclusion:
According to the above tables, the sum of reported SAR values is<1.6W/kg. So the simultaneous transmission SAR with volume scans is not required.

14 SAR Test Result

It is determined by user manual for the distance between the EUT and the phantom bottom.
The distance is 10 mm and just applied to the condition of body worn accessory.
It is performed for all SAR measurements with area scan based 1-g SAR estimation (Fast SAR). A zoom scan measurement is added when the estimated 1-g SAR is the highest measured SAR in each exposure configuration, wireless mode and frequency band combination or more than 1.2W/kg.
The calculated SAR is obtained by the following formula:

$$\text{Reported SAR} = \text{Measured SAR} \times 10^{(P_{Target}-P_{Measured})/10}$$

Where P_{Target} is the power of manufacturing upper limit;
$P_{Measured}$ is the measured power in chapter 11.

Table 14.1: Duty Cycle

Mode	Duty Cycle
GPRS/EGPRS 850/1900	1:4 or 1:8.3
WCDMA&LTE FDD	1:1
LTE TDD	1:1.58

14.1 SAR results for 2G/3G/4G

Test Position	Frequency Band	Channel Number	Frequency (MHz)	Test setup	Figure No./Note	EUT Measured Power (dBm)	Tune up (dBm)	Measured SAR 1g (W/kg)	Calculated SAR 1g (W/kg)	Measured SAR 10g (W/kg)	Calculated SAR 10g (W/kg)	Power Drift
Body	GSM 850	190	836.6	GPRS 1TX Front 0mm	/	26.80	27.00	0.164	**0.17**	0.096	**0.10**	-0.11
Body	GSM 850	190	836.6	GPRS 1TX Rear 0mm	/	26.80	27.00	0.201	**0.21**	0.122	**0.13**	0.18
Body	GSM 850	190	836.6	GPRS 1TX Left Edge 0mm	Fig.A1	26.80	27.00	0.355	**0.37**	0.168	**0.18**	0.14
Body	GSM 850	190	836.6	GPRS 1TX Top Edge 0mm	/	26.80	27.00	0.150	**0.16**	0.074	**0.08**	0.07
Body	GSM 850	190	836.6	GPRS 2TX Front 12mm	/	29.88	31.00	0.124	**0.16**	0.084	**0.11**	0.09
Body	GSM 850	190	836.6	GPRS 2TX Rear 14mm	/	29.88	31.00	0.131	**0.17**	0.087	**0.11**	0.25
Body	GSM 850	190	836.6	GPRS 2TX Left Edge 14mm	/	29.88	31.00	0.107	**0.14**	0.076	**0.10**	0.21
Body	GSM 850	190	836.6	GPRS 2TX Top Edge 14mm	/	29.88	31.00	0.078	**0.10**	0.053	**0.07**	0.26
Body	GSM 850	190	836.6	EGPRS 1TX Left Edge 0mm		26.81	27.00	0.345	**0.36**	0.154	**0.16**	0.25
Test Position	**Frequency Band**	**Channel Number**	**Frequency (MHz)**	**Test setup**	Figure No./Note	EUT Measured Power (dBm)	Tune up (dBm)	**Measured SAR 1g (W/kg)**	**Calculated SAR 1g (W/kg)**	**Measured SAR 10g (W/kg)**	**Calculated SAR 10g (W/kg)**	**Power Drift**
Body	GSM1900	661	1880	GPRS 1TX Front 0mm	/	20.99	22.00	0.216	**0.27**	0.112	**0.14**	0.02
Body	GSM1900	661	1880	GPRS 1TX Rear 0mm	/	20.99	22.00	0.360	**0.45**	0.182	**0.23**	0.26
Body	GSM1900	661	1880	GPRS 1TX Left Edge 0mm	Fig.A2	20.99	22.00	0.635	**0.80**	0.262	**0.33**	0.18
Body	GSM1900	661	1880	GPRS 1TX Top Edge 0mm	/	20.99	22.00	0.283	**0.36**	0.117	**0.15**	-0.15
Body	GSM1900	661	1880	GPRS 1TX Front 12mm	/	26.68	28.00	0.215	**0.29**	0.117	**0.16**	0.15
Body	GSM1900	661	1880	GPRS 1TX Rear 14mm	/	26.68	28.00	0.210	**0.29**	0.120	**0.16**	-0.15
Body	GSM1900	661	1880	GPRS 1TX Left Edge 14mm	/	26.68	28.00	0.208	**0.28**	0.122	**0.16**	-0.07
Body	GSM1900	661	1880	GPRS 1TX Top Edge 14mm	/	26.68	28.00	0.195	**0.26**	0.103	**0.14**	-0.27
Body	GSM1900	661	1880	GPRS 1TX Left Edge 0mm	/	20.96	22.00	0.619	**0.79**	0.243	**0.31**	0.20
Test Position	**Frequency Band**	**Channel Number**	**Frequency (MHz)**	**Test setup**	Figure No./Note	EUT Measured Power (dBm)	Tune up (dBm)	**Measured SAR 1g (W/kg)**	**Calculated SAR 1g (W/kg)**	**Measured SAR 10g (W/kg)**	**Calculated SAR 10g (W/kg)**	**Power Drift**
Body	WCDMA1900	9400	1880	Front 0mm	/	14.27	15.50	0.216	**0.29**	0.112	**0.15**	0.15
Body	WCDMA1900	9400	1880	Rear 0mm	/	14.27	15.50	0.360	**0.48**	0.182	**0.24**	-0.22
Body	WCDMA1900	9400	1880	Left Edge 0mm	Fig.A3	14.27	15.50	0.635	**0.84**	0.262	**0.35**	0.18
Body	WCDMA1900	9400	1880	Top Edge 0mm	/	14.27	15.50	0.283	**0.38**	0.117	**0.16**	0.24
Body	WCDMA1900	9400	1880	Front 12mm	/	23.78	24.00	0.215	**0.23**	0.117	**0.12**	0.06
Body	WCDMA1900	9400	1880	Rear 14mm	/	23.78	24.00	0.210	**0.22**	0.120	**0.13**	0.14
Body	WCDMA1900	9400	1880	Left Edge 14mm	/	23.78	24.00	0.208	**0.22**	0.122	**0.13**	-0.09
Body	WCDMA1900	9400	1880	Top Edge 14mm	/	23.78	24.00	0.195	**0.21**	0.103	**0.11**	0.04
Test Position	**Frequency Band**	**Channel Number**	**Frequency (MHz)**	**Test setup**	Figure No./Note	EUT Measured Power (dBm)	Tune up (dBm)	**Measured SAR 1g (W/kg)**	**Calculated SAR 1g (W/kg)**	**Measured SAR 10g (W/kg)**	**Calculated SAR 10g (W/kg)**	**Power Drift**
Body	WCDMA1700	1412	1732.4	Front 0mm	/	13.15	14.50	0.145	**0.20**	0.061	**0.08**	0.16
Body	WCDMA1700	1412	1732.4	Rear 0mm	Fig.A4	13.15	14.50	0.228	**0.31**	0.093	**0.13**	0.26
Body	WCDMA1700	1412	1732.4	Left Edge 0mm	/	13.15	14.50	0.171	**0.23**	0.060	**0.08**	0.17
Body	WCDMA1700	1412	1732.4	Top Edge 0mm	/	13.15	14.50	0.170	**0.23**	0.072	**0.10**	-0.22
Body	WCDMA1700	1412	1732.4	Front 12mm	/	23.64	24.00	0.194	**0.21**	0.097	**0.11**	0.06
Body	WCDMA1700	1412	1732.4	Rear 14mm	/	23.64	24.00	0.219	**0.24**	0.114	**0.12**	-0.13
Body	WCDMA1700	1412	1732.4	Left Edge 14mm	/	23.64	24.00	0.052	**0.06**	0.030	**0.03**	0.28
Body	WCDMA1700	1412	1732.4	Top Edge 14mm	/	23.64	24.00	0.242	**0.26**	0.125	**0.14**	0.20
Test Position	**Frequency Band**	**Channel Number**	**Frequency (MHz)**	**Test setup**	Figure No./Note	EUT Measured Power (dBm)	Tune up (dBm)	**Measured SAR 1g (W/kg)**	**Calculated SAR 1g (W/kg)**	**Measured SAR 10g (W/kg)**	**Calculated SAR 10g (W/kg)**	**Power Drift**
Body	WCDMA 850	4183	836.6	Front 0mm	/	16.85	18.00	0.164	**0.21**	0.096	**0.12**	-0.10
Body	WCDMA 850	4183	836.6	Rear 0mm	/	16.85	18.00	0.201	**0.26**	0.122	**0.16**	0.16
Body	WCDMA 850	4183	836.6	Left Edge 0mm	Fig.A5	16.85	18.00	0.355	**0.46**	0.168	**0.22**	-0.05
Body	WCDMA 850	4183	836.6	Top Edge 0mm	/	16.85	18.00	0.150	**0.20**	0.074	**0.10**	-0.29
Body	WCDMA 850	4183	836.6	Front 12mm	/	23.12	24.00	0.124	**0.15**	0.084	**0.10**	-0.27
Body	WCDMA 850	4183	836.6	Rear 14mm	/	23.12	24.00	0.131	**0.16**	0.087	**0.11**	-0.23
Body	WCDMA 850	4183	836.6	Left Edge 14mm	/	23.12	24.00	0.107	**0.13**	0.076	**0.09**	-0.13
Body	WCDMA 850	4183	836.6	Top Edge 14mm	/	23.12	24.00	0.078	**0.10**	0.053	**0.06**	0.08

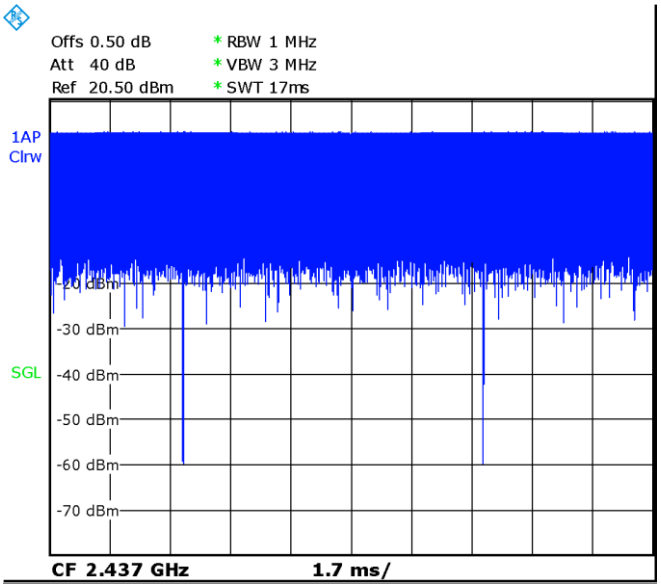
Test Position	Frequency Band	Channel Number	Frequency (MHz)	Test setup	Figure No./Note	EUT Measured Power (dBm)	Tune up (dBm)	Measured SAR 1g (W/kg)	Calculated SAR 1g (W/kg)	Measured SAR 10g (W/kg)	Calculated SAR 10g (W/kg)	Power Drift
Body	LTE Band2	19100	1900	1RB-middle Front 0mm	/	14.08	14.50	0.164	**0.18**	0.103	**0.11**	0.17
Body	LTE Band2	19100	1900	1RB-middle Rear 0mm	/	14.08	14.50	0.205	**0.23**	0.121	**0.13**	0.11
Body	LTE Band2	19100	1900	1RB-middle Left Edge 0mm	Fig.A6	14.08	14.50	0.541	**0.60**	0.232	**0.26**	-0.25
Body	LTE Band2	19100	1900	1RB-middle Top Edge 0mm	/	14.08	14.50	0.169	**0.19**	0.082	**0.09**	0.22
Body	LTE Band2	19100	1900	50RB-High Front 0mm	/	14.02	14.50	0.154	**0.17**	0.093	**0.10**	-0.03
Body	LTE Band2	19100	1900	50RB-High Rear 0mm	/	14.02	14.50	0.296	**0.33**	0.150	**0.17**	-0.12
Body	LTE Band2	19100	1900	50RB-High Left Edge 0mm	/	14.02	14.50	0.449	**0.50**	0.215	**0.24**	-0.10
Body	LTE Band2	19100	1900	50RB-High Top Edge 0mm	/	14.02	14.50	0.173	**0.19**	0.084	**0.09**	-0.12
Body	LTE Band2	19100	1900	1RB-middle Front 12mm	/	23.60	24.00	0.129	**0.14**	0.087	**0.10**	-0.04
Body	LTE Band2	19100	1900	1RB-middle Rear 14mm	/	23.60	24.00	0.138	**0.15**	0.085	**0.09**	0.04
Body	LTE Band2	19100	1900	1RB-middle Left Edge 14mm	/	23.60	24.00	0.141	**0.15**	0.099	**0.11**	0.19
Body	LTE Band2	19100	1900	1RB-middle Top Edge 14mm	/	23.60	24.00	0.133	**0.15**	0.083	**0.09**	0.10
Body	LTE Band2	19100	1900	50RB-middle Front 12mm	/	22.74	23.00	0.097	**0.10**	0.065	**0.07**	-0.14
Body	LTE Band2	19100	1900	50RB-middle Rear 14mm	/	22.74	23.00	0.086	**0.09**	0.059	**0.06**	0.15
Body	LTE Band2	19100	1900	50RB-middle Left Edge 14mm	/	22.74	23.00	0.118	**0.12**	0.082	**0.09**	-0.12
Body	LTE Band2	19100	1900	50RB-middle Top Edge 14mm	/	22.74	23.00	0.122	**0.13**	0.077	**0.08**	-0.04
Test Position	**Frequency Band**	**Channel Number**	**Frequency (MHz)**	**Test setup**	**Figure No./Note**	**EUT Measured Power (dBm)**	**Tune up (dBm)**	**Measured SAR 1g (W/kg)**	**Calculated SAR 1g (W/kg)**	**Measured SAR 10g (W/kg)**	**Calculated SAR 10g (W/kg)**	**Power Drift**
Body	LTE Band5	20450	829	1RB-Middle Front 0mm	/	18.24	19.00	0.128	**0.15**	0.096	**0.11**	0.23
Body	LTE Band5	20450	829	1RB-MiddleRear 0mm	/	18.24	19.00	0.099	**0.12**	0.085	**0.10**	0.01
Body	LTE Band5	20450	829	1RB-Middle Left Edge 0mm	Fig.A7	18.24	19.00	0.279	**0.33**	0.135	**0.16**	0.09
Body	LTE Band5	20450	829	1RB-Middle Top Edge 0mm	/	18.24	19.00	0.066	**0.08**	0.050	**0.06**	0.08
Body	LTE Band5	20450	829	25RB-High Front 0mm	/	18.27	19.00	0.117	**0.14**	0.089	**0.11**	-0.22
Body	LTE Band5	20450	829	25RB-High Rear 0mm	/	18.27	19.00	0.103	**0.12**	0.085	**0.10**	-0.18
Body	LTE Band5	20450	829	25RB-High Left Edge 0mm	/	18.27	19.00	0.268	**0.32**	0.145	**0.17**	-0.10
Body	LTE Band5	20450	829	25RB-High Top Edge 0mm	/	18.27	19.00	0.068	**0.08**	0.051	**0.06**	0.18
Body	LTE Band5	20450	829	1RB-Middle Front 12mm	/	23.14	24.00	0.059	**0.07**	0.060	**0.07**	-0.21
Body	LTE Band5	20450	829	1RB-Middle Rear 14mm	/	23.14	24.00	0.064	**0.08**	0.064	**0.08**	-0.21
Body	LTE Band5	20450	829	1RB-Middle Left Edge 14mm	/	23.14	24.00	0.035	**0.04**	0.036	**0.04**	-0.16
Body	LTE Band5	20450	829	1RB-Middle Top Edge 14mm	/	23.14	24.00	0.030	**0.04**	0.029	**0.03**	0.21
Body	LTE Band5	20450	829	25RB-Middle Front 12mm	/	22.28	23.00	0.041	**0.05**	0.041	**0.05**	0.03
Body	LTE Band5	20450	829	25RB-Middle Rear 14mm	/	22.28	23.00	0.052	**0.06**	0.052	**0.06**	0.00
Body	LTE Band5	20450	829	25RB-Middle Left Edge 14mm	/	22.28	23.00	0.030	**0.04**	0.030	**0.04**	0.27
Body	LTE Band5	20450	829	25RB-Middle Top Edge 14mm	/	22.28	23.00	0.024	**0.03**	0.025	**0.03**	-0.29
Test Position	**Frequency Band**	**Channel Number**	**Frequency (MHz)**	**Test setup**	**Figure No./Note**	**EUT Measured Power (dBm)**	**Tune up (dBm)**	**Measured SAR 1g (W/kg)**	**Calculated SAR 1g (W/kg)**	**Measured SAR 10g (W/kg)**	**Calculated SAR 10g (W/kg)**	**Power Drift**
Body	LTE Band7	21350	2560	1RB-Middle Front 0mm	/	16.85	17.00	0.201	**0.21**	0.108	**0.11**	0.08
Body	LTE Band7	21350	2560	1RB-Middle Rear 0mm	/	16.85	17.00	0.307	**0.32**	0.149	**0.15**	-0.17
Body	LTE Band7	21350	2560	1RB-Middle Left Edge 0mm	/	16.85	17.00	0.601	**0.62**	0.253	**0.26**	-0.29
Body	LTE Band7	21350	2560	1RB-Middle Top Edge 0mm	/	16.85	17.00	0.221	**0.23**	0.102	**0.11**	0.23
Body	LTE Band7	21350	2560	50RB-High Front 0mm	/	16.63	17.00	0.229	**0.25**	0.117	**0.13**	-0.30
Body	LTE Band7	21350	2560	50RB-High Rear 0mm	/	16.63	17.00	0.308	**0.34**	0.149	**0.16**	0.09
Body	LTE Band7	21350	2560	50RB-High Left Edge 0mm	Fig.A8	16.63	17.00	0.723	**0.79**	0.271	**0.30**	-0.06
Body	LTE Band7	21350	2560	50RB-High Top Edge 0mm	/	16.63	17.00	0.316	**0.34**	0.116	**0.13**	0.14
Body	LTE Band7	21100	2535	1RB-Middle Front 12mm	/	23.77	24.00	0.175	**0.18**	0.106	**0.11**	0.08
Body	LTE Band7	21100	2535	1RB-Middle Rear 14mm	/	23.77	24.00	0.191	**0.20**	0.114	**0.12**	-0.25
Body	LTE Band7	21100	2535	1RB-Middle Left Edge 14mm	/	23.77	24.00	0.349	**0.37**	0.200	**0.21**	-0.23
Body	LTE Band7	21100	2535	1RB-Middle Top Edge 14mm	/	23.77	24.00	0.143	**0.15**	0.080	**0.08**	0.03
Body	LTE Band7	21100	2535	50RB-Middle Front 12mm	/	22.87	23.00	0.120	**0.12**	0.076	**0.08**	-0.21
Body	LTE Band7	21100	2535	50RB-Middle Rear 14mm	/	22.87	23.00	0.171	**0.18**	0.100	**0.10**	0.24
Body	LTE Band7	21100	2535	50RB-Middle Left Edge 14mm	/	22.87	23.00	0.284	**0.29**	0.162	**0.17**	0.25
Body	LTE Band7	21100	2535	50RB-Middle Top Edge 14mm	/	22.87	23.00	0.113	**0.12**	0.064	**0.07**	-0.18
Test Position	**Frequency Band**	**Channel Number**	**Frequency (MHz)**	**Test setup**	**Figure No./Note**	**EUT Measured Power (dBm)**	**Tune up (dBm)**	**Measured SAR 1g (W/kg)**	**Calculated SAR 1g (W/kg)**	**Measured SAR 10g (W/kg)**	**Calculated SAR 10g (W/kg)**	**Power Drift**
Body	LTE Band12	23060	704	1RB-Middle Front 0mm	/	20.25	21.00	0.192	**0.23**	0.147	**0.17**	0.18
Body	LTE Band12	23060	704	1RB-Middle Rear 0mm	/	20.25	21.00	0.174	**0.21**	0.136	**0.16**	-0.25
Body	LTE Band12	23060	704	1RB-Middle Left Edge 0mm	Fig.A9	20.25	21.00	0.360	**0.43**	0.171	**0.20**	0.13
Body	LTE Band12	23060	704	1RB-Middle Top Edge 0mm	/	20.25	21.00	0.159	**0.19**	0.114	**0.14**	-0.27
Body	LTE Band12	23095	707.5	25RB-Low Front 0mm	/	20.28	21.00	0.205	**0.24**	0.158	**0.19**	-0.27
Body	LTE Band12	23095	707.5	25RB-Low Rear 0mm	/	20.28	21.00	0.165	**0.19**	0.139	**0.16**	-0.09
Body	LTE Band12	23095	707.5	25RB-Low Left Edge 0mm	/	20.28	21.00	0.315	**0.37**	0.160	**0.19**	0.25
Body	LTE Band12	23095	707.5	25RB-Low Top Edge 0mm	/	20.28	21.00	0.219	**0.26**	0.125	**0.15**	-0.13
Body	LTE Band12	23095	707.5	1RB-Middle Front 12mm	/	23.18	24.00	0.041	**0.05**	0.040	**0.05**	-0.01
Body	LTE Band12	23095	707.5	1RB-Middle Rear 14mm	/	23.18	24.00	0.046	**0.06**	0.045	**0.05**	-0.24
Body	LTE Band12	23095	707.5	1RB-Middle Left Edge 14mm	/	23.18	24.00	0.038	**0.05**	0.038	**0.05**	0.25
Body	LTE Band12	23095	707.5	1RB-Middle Top Edge 14mm	/	23.18	24.00	0.017	**0.02**	0.018	**0.02**	-0.24
Body	LTE Band12	23095	707.5	25RB-Low Front 12mm	/	22.24	23.00	0.035	**0.04**	0.034	**0.04**	-0.18
Body	LTE Band12	23095	707.5	25RB-Low Rear 14mm	/	22.24	23.00	0.038	**0.05**	0.037	**0.04**	0.30
Body	LTE Band12	23095	707.5	25RB-Low Left Edge 14mm	/	22.24	23.00	0.030	**0.04**	0.030	**0.04**	0.11
Body	LTE Band12	23095	707.5	25RB-Low Top Edge 14mm	/	22.24	23.00	0.015	**0.02**	0.015	**0.02**	-0.24

Test Position	Frequency Band	Channel Number	Frequency (MHz)	Test setup	Figure No./Note	EUT Measured Power (dBm)	Tune up (dBm)	Measured SAR 1g (W/kg)	Calculated SAR 1g (W/kg)	Measured SAR 10g (W/kg)	Calculated SAR 10g (W/kg)	Power Drift
Body	LTE Band13	23230	782	1RB-Middle Front 0mm	/	18.06	19.00	0.157	**0.20**	0.117	**0.15**	0.18
Body	LTE Band13	23230	782	1RB-Middle Rear 0mm	/	18.06	19.00	0.158	**0.20**	0.115	**0.14**	0.26
Body	LTE Band13	23230	782	1RB-Middle Left Edge 0mm	Fig.A10	18.06	19.00	0.252	**0.31**	0.123	**0.15**	0.12
Body	LTE Band13	23230	782	1RB-Middle Top Edge 0mm	/	18.06	19.00	0.143	**0.18**	0.075	**0.09**	-0.30
Body	LTE Band13	23230	782	25RB-Middle Front 0mm	/	18.07	19.00	0.149	**0.18**	0.111	**0.14**	0.10
Body	LTE Band13	23230	782	25RB-Middle Rear 0mm	/	18.07	19.00	0.133	**0.16**	0.104	**0.13**	-0.09
Body	LTE Band13	23230	782	25RB-Middle Left Edge 0mm	/	18.07	19.00	0.244	**0.30**	0.129	**0.16**	-0.12
Body	LTE Band13	23230	782	25RB-Middle Top Edge 0mm	/	18.07	19.00	0.133	**0.16**	0.073	**0.09**	0.05
Body	LTE Band13	23230	782	1RB-Middle Front 12mm	/	22.89	24.00	0.071	**0.09**	0.063	**0.08**	0.06
Body	LTE Band13	23230	782	1RB-Middle Rear 14mm	/	22.89	24.00	0.023	**0.03**	0.023	**0.03**	-0.20
Body	LTE Band13	23230	782	1RB-Middle Left Edge 14mm	/	22.89	24.00	0.015	**0.02**	0.014	**0.02**	-0.27
Body	LTE Band13	23230	782	1RB-Middle Top Edge 14mm	/	22.89	24.00	0.000	**0.00**	0.000	**0.00**	-0.01
Body	LTE Band13	23230	782	25RB-Middle Front 12mm	/	21.92	23.00	0.025	**0.03**	0.023	**0.03**	0.05
Body	LTE Band13	23230	782	25RB-Middle Rear 14mm	/	21.92	23.00	0.022	**0.03**	0.019	**0.02**	0.04
Body	LTE Band13	23230	782	25RB-Middle Left Edge 14mm	/	21.92	23.00	0.000	**0.00**	0.000	**0.00**	-0.02
Body	LTE Band13	23230	782	25RB-Middle Top Edge 14mm	/	21.92	23.00	0.000	**0.00**	0.000	**0.00**	0.26
Test Position	**Frequency Band**	**Channel Number**	**Frequency (MHz)**	**Test setup**	**Figure No./Note**	**EUT Measured Power (dBm)**	**Tune up (dBm)**	**Measured SAR 1g (W/kg)**	**Calculated SAR 1g (W/kg)**	**Measured SAR 10g (W/kg)**	**Calculated SAR 10g (W/kg)**	**Power Drift**
Body	LTE Band41	41055	2636.5	1RB-Middle Front 0mm	/	15.37	16.00	0.098	**0.11**	0.049	**0.06**	0.10
Body	LTE Band41	41055	2636.5	1RB-Middle Rear 0mm	/	15.37	16.00	0.163	**0.19**	0.076	**0.09**	0.24
Body	LTE Band41	41055	2636.5	1RB-Middle Left Edge 0mm	/	15.37	16.00	0.321	**0.37**	0.141	**0.16**	-0.03
Body	LTE Band41	41055	2636.5	1RB-Middle Top Edge 0mm	/	15.37	16.00	0.078	**0.09**	0.032	**0.04**	-0.08
Body	LTE Band41	41055	2636.5	50RB-Middle Front 0mm	/	15.13	16.00	0.122	**0.15**	0.058	**0.07**	-0.27
Body	LTE Band41	41055	2636.5	50RB-Middle Rear 0mm	/	15.13	16.00	0.199	**0.24**	0.085	**0.10**	-0.20
Body	LTE Band41	41055	2636.5	50RB-Middle Left Edge 0mm	Fig.A11	15.13	16.00	0.421	**0.51**	0.156	**0.19**	-0.11
Body	LTE Band41	41055	2636.5	50RB-Middle Top Edge 0mm	/	15.13	16.00	0.089	**0.11**	0.035	**0.04**	0.09
Body	LTE Band41	41055	2636.5	1RB-Middle Front 12mm	/	23.83	24.00	0.043	**0.04**	0.026	**0.03**	-0.02
Body	LTE Band41	41055	2636.5	1RB-Middle Rear 14mm	/	23.83	24.00	0.063	**0.07**	0.037	**0.04**	-0.20
Body	LTE Band41	41055	2636.5	1RB-Middle Left Edge 14mm	/	23.83	24.00	0.121	**0.13**	0.070	**0.07**	-0.04
Body	LTE Band41	41055	2636.5	1RB-Middle Top Edge 14mm	/	23.83	24.00	＜0.01	＜0.01	＜0.01	＜0.01	/
Body	LTE Band41	41055	2636.5	50RB-Middle Front 12mm	/	22.76	23.00	0.042	**0.04**	0.025	**0.03**	0.19
Body	LTE Band41	41055	2636.5	50RB-Middle Rear 14mm	/	22.76	23.00	0.062	**0.07**	0.037	**0.04**	-0.05
Body	LTE Band41	41055	2636.5	50RB-Middle Left Edge 14mm	/	22.76	23.00	0.097	**0.10**	0.057	**0.06**	0.02
Body	LTE Band41	41055	2636.5	50RB-Middle Top Edge 14mm	/	22.76	23.00	0.033	**0.03**	0.018	**0.02**	0.13
Test Position	**Frequency Band**	**Channel Number**	**Frequency (MHz)**	**Test setup**	**Figure No./Note**	**EUT Measured Power (dBm)**	**Tune up (dBm)**	**Measured SAR 1g (W/kg)**	**Calculated SAR 1g (W/kg)**	**Measured SAR 10g (W/kg)**	**Calculated SAR 10g (W/kg)**	**Power Drift**
Body	LTE Band66	132072	1720	1RB-Middle Front 0mm	/	10.86	12.00	0.383	**0.50**	0.173	**0.22**	-0.18
Body	LTE Band66	132072	1720	1RB-Middle Rear 0mm	Fig.A12	10.86	12.00	0.479	**0.62**	0.208	**0.27**	0.08
Body	LTE Band66	132072	1720	1RB-Middle Left Edge 0mm	/	10.86	12.00	0.329	**0.43**	0.125	**0.16**	0.13
Body	LTE Band66	132072	1720	1RB-Middle Top Edge 0mm	/	10.86	12.00	0.418	**0.54**	0.169	**0.22**	-0.29
Body	LTE Band66	132072	1720	50RB-High Front 0mm	/	10.81	12.00	0.437	**0.57**	0.177	**0.23**	-0.11
Body	LTE Band66	132072	1720	50RB-High Rear 0mm	/	10.81	12.00	0.471	**0.62**	0.211	**0.28**	-0.26
Body	LTE Band66	132072	1720	50RB-High Left Edge 0mm	/	10.81	12.00	0.308	**0.41**	0.125	**0.16**	0.10
Body	LTE Band66	132072	1720	50RB-High Top Edge 0mm	/	10.81	12.00	0.378	**0.50**	0.160	**0.21**	-0.05
Body	LTE Band66	132322	1745	1RB-Middle Front 12mm	/	23.44	24.00	0.066	**0.08**	0.033	**0.04**	-0.19
Body	LTE Band66	132322	1745	1RB-Middle Rear 14mm	/	23.44	24.00	0.070	**0.08**	0.036	**0.04**	-0.15
Body	LTE Band66	132322	1745	1RB-Middle Left Edge 14mm	/	23.44	24.00	＜0.01	＜0.01	＜0.01	＜0.01	/
Body	LTE Band66	132322	1745	1RB-Middle Top Edge 14mm	/	23.44	24.00	0.080	**0.09**	0.041	**0.05**	0.30
Body	LTE Band66	132322	1745	50RB-Low Front 12mm	/	22.49	23.00	0.069	**0.08**	0.034	**0.04**	-0.14
Body	LTE Band66	132322	1745	50RB-Low Rear 14mm	/	22.49	23.00	0.056	**0.06**	0.028	**0.03**	0.01
Body	LTE Band66	132322	1745	50RB-Low Left Edge 14mm	/	22.49	23.00	＜0.01	＜0.01	＜0.01	＜0.01	/
Body	LTE Band66	132322	1745	50RB-Low Top Edge 14mm	/	22.49	23.00	0.084	**0.09**	0.043	**0.05**	-0.05

14.2 WLAN Evaluation for 2.4G

Table 14.2-1: SAR Values (WiFi 2.4G – Body)

Test Position	Frequency Band	Channel Number	Frequency (MHz)	Test setup	Figure No./Note	EUT Measured Power (dBm)	Tune up (dBm)	Measured SAR 1g (W/kg)	Calculated SAR 1g (W/kg)	Measured SAR 10g (W/kg)	Calculated SAR 10g (W/kg)	Power Drift
Body	WLAN2.4G 11b 20db	6	2437	Front 0mm	/	20.30	21.00	0.587	**0.69**	0.224	**0.26**	-0.17
Body	WLAN2.4G 11b 20db	6	2437	Rear 14mm	/	20.30	21.00	0.467	**0.55**	0.202	**0.24**	-0.22
Body	WLAN2.4G 11b 20db	6	2437	Left Edge 14mm	/	20.30	21.00	<0.01	<0.01	<0.01	<0.01	/
Body	WLAN2.4G 11b 20db	6	2437	Top Edge 14mm	/	20.30	21.00	0.07	**0.08**	0.037	**0.04**	0.3
Body	WLAN2.4G 11b 13db	6	2437	Rear 0mm	Fig.A13	15.23	16.00	0.637	**0.76**	0.26	**0.31**	-0.24
Body	WLAN2.4G 11b 13db	6	2437	Left Edge 0mm	/	15.23	16.00	0.114	**0.14**	0.025	**0.03**	0.22
Body	WLAN2.4G 11b 13db	6	2437	Top Edge 0mm	/	15.23	16.00	<0.01	<0.01	<0.01	<0.01	/

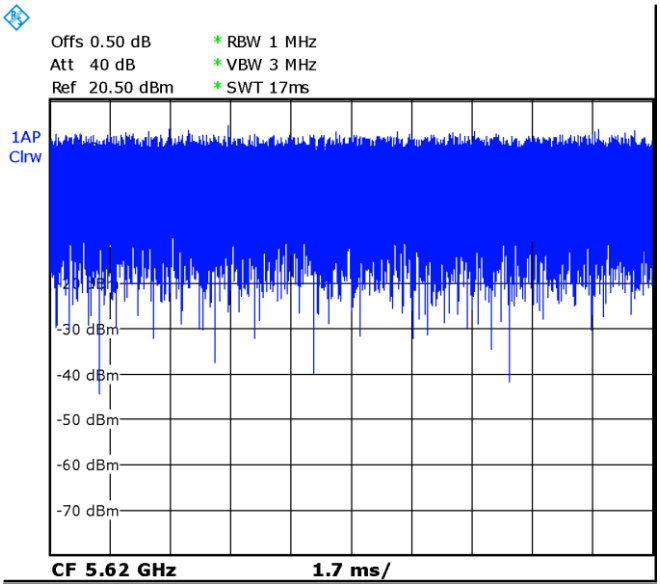


Picture 14.2-1 Duty factor plot

14.3 WLAN Evaluation For 5G

Table 14.3-1: SAR Values (WiFi 5G - Body)

Test Position	Frequency Band	Channel Number	Frequency (MHz)	Test setup	Figure No./Note	EUT Measured Power (dBm)	Tune up (dBm)	Measured SAR 1g (W/kg)	Calculated SAR 1g (W/kg)	Measured SAR 10g (W/kg)	Calculated SAR 10g (W/kg)	Power Drift
Body	WLAN5G 802.11a 15.5db	64	5320	Front 0mm	/	16.61	18.00	0.143	**0.20**	0.047	**0.06**	-0.22
Body	WLAN5G 802.11a 15.5db	64	5320	Rear 14mm	/	16.61	18.00	0.506	**0.70**	0.182	**0.25**	0.14
Body	WLAN5G 802.11a 15.5db	64	5320	Left Edge 14mm	/	16.61	18.00	0.038	**0.05**	0.017	**0.02**	-0.05
Body	WLAN5G 802.11a 15.5db	64	5320	Top Edge 14mm	/	16.61	18.00	0.056	**0.08**	0.024	**0.03**	0.27
Body	WLAN5G 802.11a 11.5db	64	5320	Rear 0mm	Fig.A14	10.89	11.50	0.654	**0.75**	0.229	**0.26**	0.12
Body	WLAN5G 802.11a 11.5db	64	5320	Left Edge 0mm	/	10.89	11.50	0.196	**0.23**	0.031	**0.04**	-0.11
Body	WLAN5G 802.11a 11.5db	64	5320	Top Edge 0mm	/	10.89	11.50	0.172	**0.20**	0.048	**0.06**	0.05
Test Position	**Frequency Band**	**Channel Number**	**Frequency (MHz)**	**Test setup**	**Figure No./Note**	**EUT Measured Power (dBm)**	**Tune up (dBm)**	**Measured SAR 1g (W/kg)**	**Calculated SAR 1g (W/kg)**	**Measured SAR 10g (W/kg)**	**Calculated SAR 10g (W/kg)**	**Power Drift**
Body	WLAN5G 802.11a 13.5db	155	5775	Front 0mm	/	12.04	13.50	0.488	**0.68**	0.13	**0.18**	0.05
Body	WLAN5G 802.11a 13.5db	155	5775	Rear 14mm	/	12.04	13.50	0.405	**0.57**	0.141	**0.20**	0.1
Body	WLAN5G 802.11a 13.5db	155	5775	Left Edge 14mm	/	12.04	13.50	0.087	**0.12**	0.028	**0.04**	0.1
Body	WLAN5G 802.11a 13.5db	155	5775	Top Edge 14mm	/	12.04	13.50	0.118	**0.17**	0.04	**0.06**	0.26
Body	WLAN5G 802.11ac 80M 7.5db	155	5775	Rear 0mm	/	6.18	7.50	0.522	**0.71**	0.178	**0.24**	0.28
Body	WLAN5G 802.11ac 80M 7.5db	155	5775	Left Edge 0mm	/	6.18	7.50	0.163	**0.22**	0.034	**0.05**	0.08
Body	WLAN5G 802.11ac 80M 7.5db	155	5775	Top Edge 0mm	/	6.18	7.50	0.187	**0.25**	0.048	**0.07**	0.21



Picture 14.3-1 Duty factor plot

14.4 WLAN Evaluation For BT

Table 14.4-1: SAR Values (BT - Body)

Test Position	Frequency Band	Channel Number	Test setup	EUT Measured Power (dBm)	Tune up (dBm)	Measured SAR 1g (W/kg)	Calculated SAR 1g (W/kg)	Measured SAR 10g (W/kg)	Calculated SAR 10g (W/kg)	Power Drift
Body	BT	39	Front 0mm	9.95	10.50	0.144	**0.16**	0.051	**0.06**	0.13
Body	BT	39	Rear 14mm	9.95	10.50	0.114	**0.13**	0.046	**0.05**	0.02
Body	BT	39	Left Edge 14mm	9.95	10.50	≤0.01	≤0.01	≤0.01	≤0.01	/
Body	BT	39	Top Edge 14mm	9.95	10.50	0.017	**0.02**	0.008	**0.01**	0.03
Body	BT	39	Rear 0mm	9.95	10.50	0.156	**0.18**	0.059	**0.07**	-0.28
Body	BT	39	Left Edge 0mm	9.95	10.50	0.028	**0.03**	0.006	**0.01**	0.11
Body	BT	39	Top Edge 0mm	9.95	10.50	≤0.01	≤0.01	≤0.01	≤0.01	/

15 SAR Measurement Variability

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

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

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

16 Measurement Uncertainty

16.1 Measurement Uncertainty for Normal SAR Tests (300MHz~3GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.0	N	1	1	1	6.0	6.0	∞
2	Isotropy	B	4.7	R	√3	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	√3	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	√3	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	N	1	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	√3	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	√3	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	√3	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	√3	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	√3	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.4	R	√3	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	√3	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	√3	1	1	0.6	0.6	∞
Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	√3	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	√3	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	√3	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	√3	0.6	0.49	1.7	1.4	∞
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521

Combined standard uncertainty	$u_c^{'} = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$					9.55	9.43	257
Expanded uncertainty (confidence interval of 95 %)	$u_e = 2u_c$					19.1	18.9	

16.2 Measurement Uncertainty for Normal SAR Tests (3~6GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.55	N	1	1	1	6.55	6.55	∞
2	Isotropy	B	4.7	R	√3	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	√3	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	√3	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	√3	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	√3	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	√3	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	√3	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	√3	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	√3	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.8	R	√3	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	√3	1	1	3.9	3.9	∞
13	Post-processing	B	4.0	R	√3	1	1	2.3	2.3	∞
Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	√3	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	√3	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	√3	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	√3	0.6	0.49	1.7	1.4	∞

21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						10.7	10.6	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						21.4	21.1	

16.3 Measurement Uncertainty for Fast SAR Tests (300MHz~3GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.0	N	1	1	1	6.0	6.0	∞
2	Isotropy	B	4.7	R	√3	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	√3	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	√3	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	√3	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	√3	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	√3	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	√3	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	√3	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	√3	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.4	R	√3	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	√3	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	√3	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	7.0	R	√3	1	1	4.0	4.0	∞
Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
17	Drift of output power	B	5.0	R	√3	1	1	2.9	2.9	∞
Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	√3	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	B	5.0	R	√3	0.64	0.43	1.8	1.2	∞

20	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
21	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
22	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						10.4	10.3	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						20.8	20.6	

16.4 Measurement Uncertainty for Fast SAR Tests (3~6GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.55	N	1	1	1	6.55	6.55	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	14.0	R	$\sqrt{3}$	1	1	8.1	8.1	∞
Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5

17	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
20	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
21	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
22	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						13.5	13.4	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						27.0	26.8	

17 MAIN TEST INSTRUMENTS

Table 17.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46110673	January 10, 2023	One year
02	Power sensor	NRP110T	101139	January 13, 2023	One year
03	Power sensor	NRP110T	101159	January 13, 2023	One year
04	Signal Generator	E4438C	MY49071430	January 19, 2023	One year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	CMW500	159890	January 12, 2023	One year
07	E-field Probe	SPEAG EX3DV4	7548	August 1, 2022	One year
08	DAE	SPEAG DAE4	1331	September 15, 2022	One year
09	Dipole Validation Kit	SPEAG D750V3	1017	July 20,,2022	One year
10	Dipole Validation Kit	SPEAG D835V2	4d069	July 20,,2022	One year
11	Dipole Validation Kit	SPEAG D1750V2	1003	July 18,,2022	One year
12	Dipole Validation Kit	SPEAG D1900V2	5d101	July 26,2022	One year
13	Dipole Validation Kit	SPEAG D2450V2	853	July 20,2022	One year
14	Dipole Validation Kit	SPEAG D2600V2	1012	July 20,2022	One year
15	Dipole Validation Kit	SPEAG D5GHzV2	1060	July 5,2022	One year

END OF REPORT BODY

ANNEX A Graph Results

GSM850_CH190 GPRS 1TX Left Edge 0mm
Date: 5/11/2023
Electronics: DAE4 Sn1331
Medium: body 835 MHz
Medium parameters used: f = 836.6; σ = 0.905 mho/m; εr = 41.16; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: GSM850 836.6 Duty Cycle: 1:8.3
Probe: EX3DV4 – SN7548 ConvF(9.81,9.81,9.81)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.494 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.76 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.355 W/kg; SAR(10 g) = 0.168 W/kg
Maximum value of SAR (measured) = 0.14 W/kg

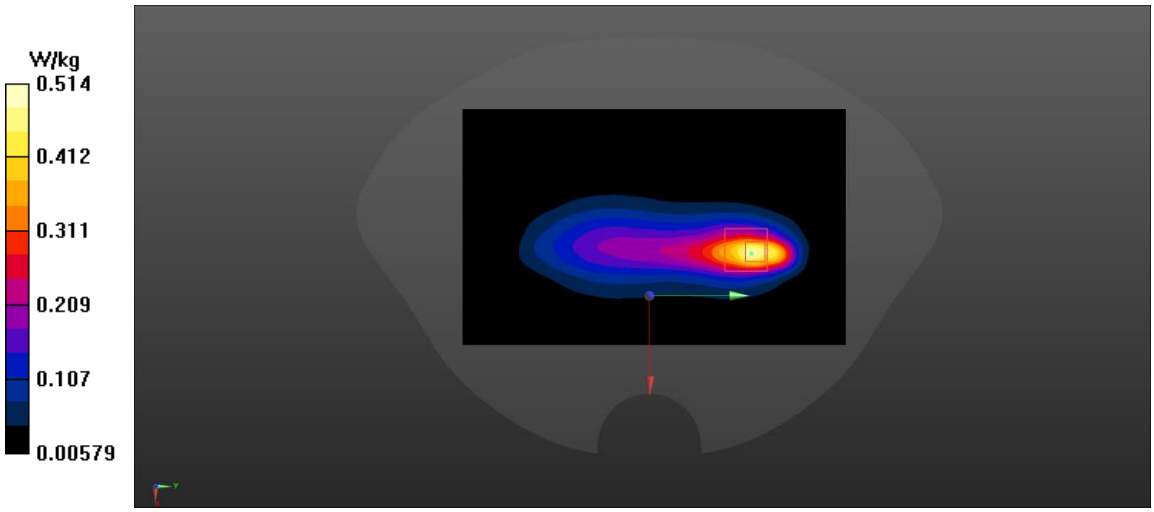


Fig A.1

PCS1900_CH661 GPRS 1TX Left Edge 0mm
Date: 5/13/2023
Electronics: DAE4 Sn1331
Medium: body 1900 MHz
Medium parameters used: f = 1880; σ = 1.386 mho/m; εr = 39.95; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: PCS1900 1880 Duty Cycle: 1:8.3
Probe: EX3DV4 – SN7548 ConvF(7.80,7.80,7.80)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.846 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.31 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 1.89 W/kg
SAR(1 g) = 0.635 W/kg; SAR(10 g) = 0.262 W/kg
Maximum value of SAR (measured) = 0.18 W/kg

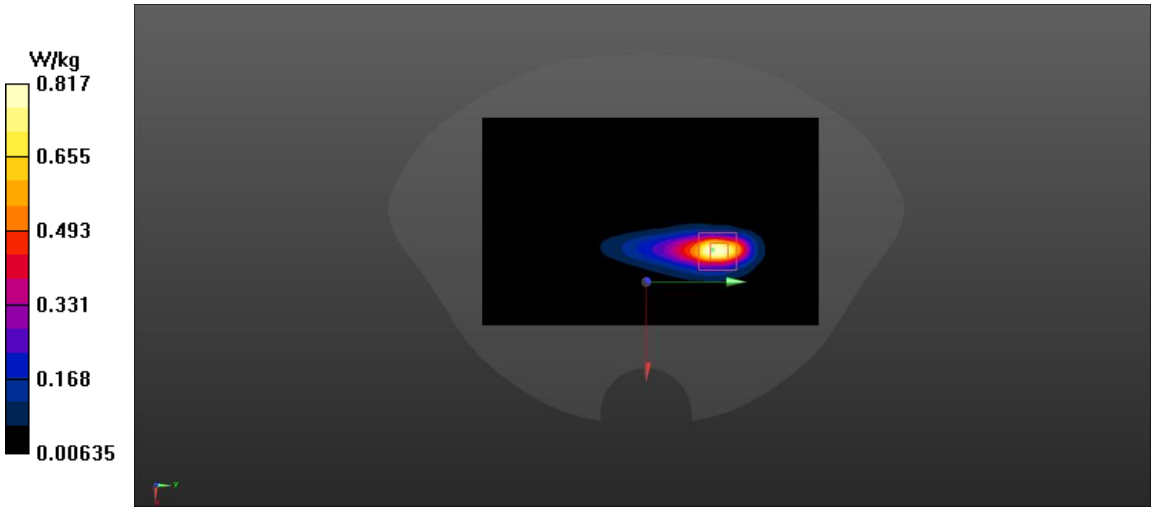


Fig A.2

WCDMA1900-BII_CH9400 Left Edge 0mm
Date: 5/13/2023
Electronics: DAE4 Sn1331
Medium: body 1900 MHz
Medium parameters used: f = 1880; σ = 1.386 mho/m; εr = 39.95; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA1900-BII 1880 Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.80,7.80,7.80)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.702 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.25 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 1.6 W/kg
SAR(1 g) = 0.635 W/kg; SAR(10 g) = 0.262 W/kg
Maximum value of SAR (measured) = 0.18 W/kg

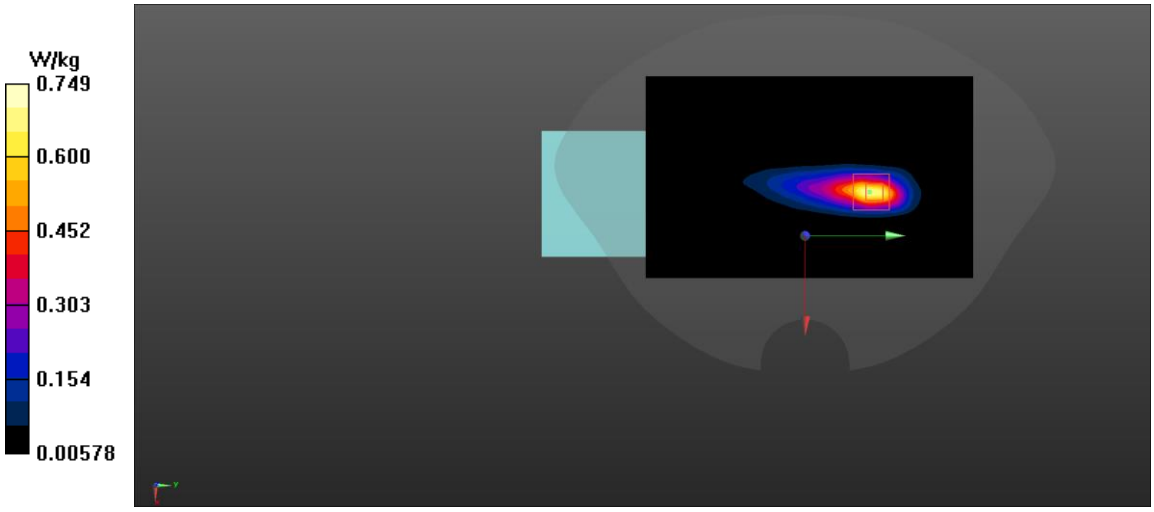


Fig A.3

WCDMA1700-BIV_CH1412 Top Edge 14mm
Date: 6/7/2023
Electronics: DAE4 Sn1331
Medium: body 1750 MHz
Medium parameters used: f = 1732.4; σ = 1.331 mho/m; εr = 40.58; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA1700-BIV 1732.4 Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(8.13,8.13,8.13)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.224 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.193 V/m; Power Drift = 0.2 dB
Peak SAR (extrapolated) = 0.606 W/kg
SAR(1 g) = 0.242 W/kg; SAR(10 g) = 0.125 W/kg
Maximum value of SAR (measured) = 0.2 W/kg

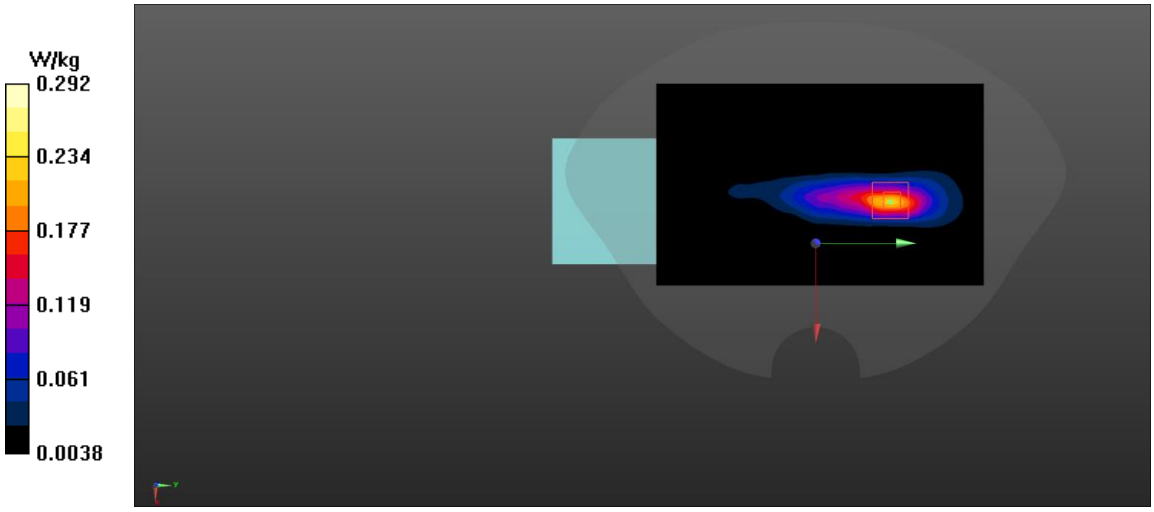


Fig A.4

WCDMA850-BV_CH4183 Left Edge 0mm
Date: 5/11/2023
Electronics: DAE4 Sn1331
Medium: body 835 MHz
Medium parameters used: f = 836.6; σ = 0.905 mho/m; εr = 41.16; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA850-BV 836.6 Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(9.81,9.81,9.81)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.396 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.81 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.889 W/kg
SAR(1 g) = 0.355 W/kg; SAR(10 g) = 0.168 W/kg
Maximum value of SAR (measured) = -0.05 W/kg

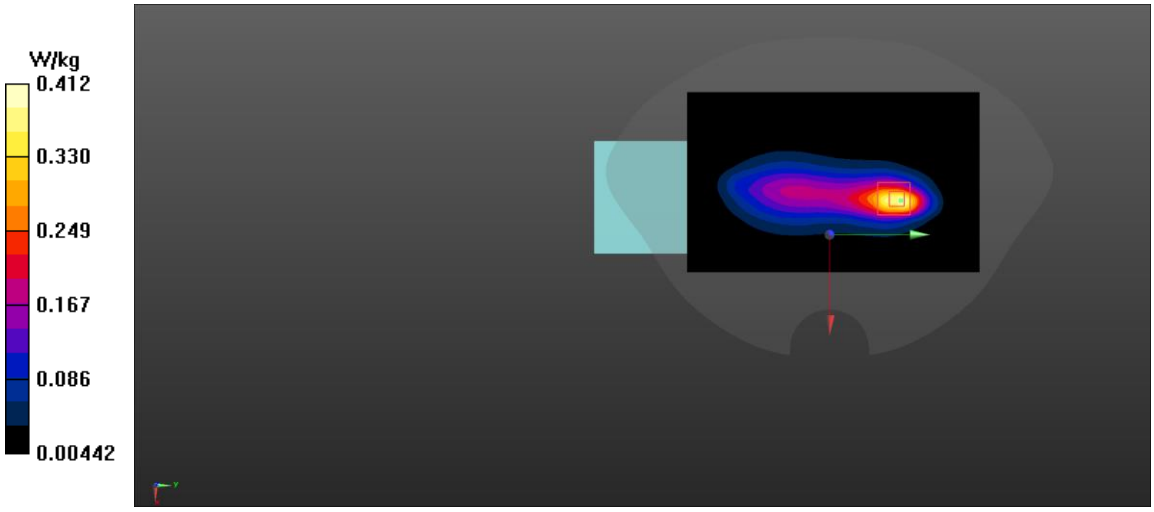


Fig A.5

LTE1900-FDD2_CH19100 1RB-middle Left Edge 0mm
Date: 5/13/2023
Electronics: DAE4 Sn1331
Medium: body 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.405 mho/m; εr = 39.93; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE1900-FDD2 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.80,7.80,7.80)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.605 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.85 V/m; Power Drift = -0.25 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.541 W/kg; SAR(10 g) = 0.232 W/kg
Maximum value of SAR (measured) = -0.25 W/kg

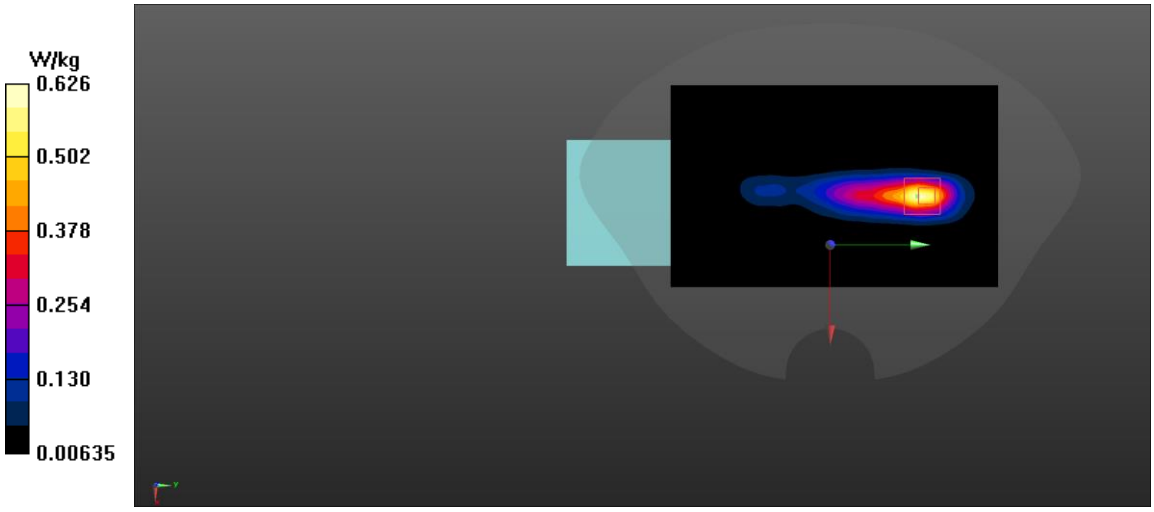


Fig A.6

LTE850-FDD5_CH20450 1RB-Middle Left Edge 0mm
Date: 5/11/2023
Electronics: DAE4 Sn1331
Medium: body 835 MHz
Medium parameters used: f = 829 MHz; σ = 0.897 mho/m; εr = 41.17; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE850-FDD5 829 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(9.81,9.81,9.81)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.304 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.46 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.647 W/kg
SAR(1 g) = 0.279 W/kg; SAR(10 g) = 0.135 W/kg
Maximum value of SAR (measured) = 0.09 W/kg

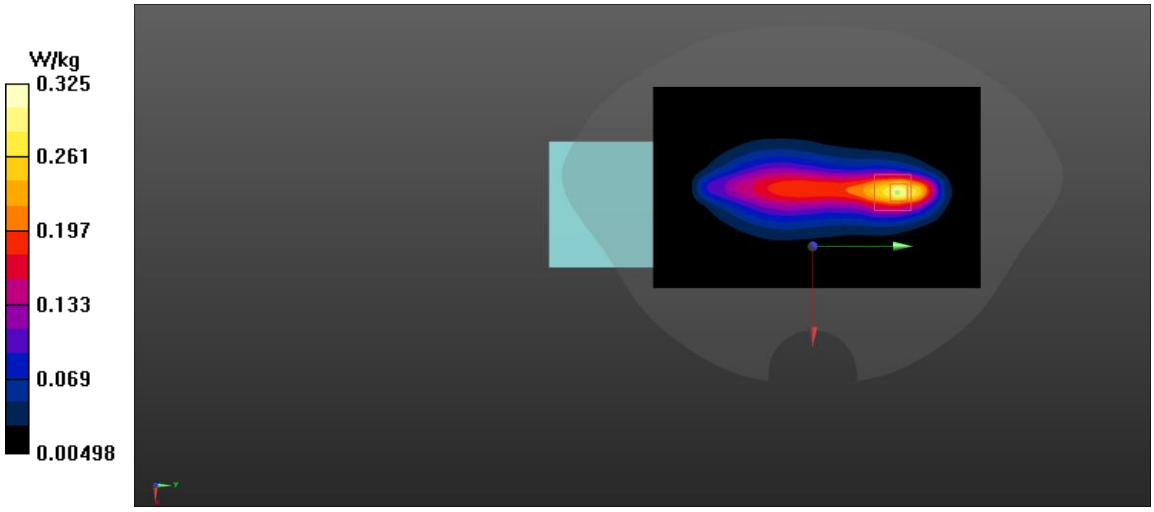


Fig A.7

LTE2500-FDD7_CH21350 50RB-High Left Edge 0mm
Date: 5/15/2023
Electronics: DAE4 Sn1331
Medium: body 2600 MHz
Medium parameters used: f = 2560 MHz; σ = 1.913 mho/m; εr = 39.5; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE2500-FDD7 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.12,7.12,7.12)

Area Scan (71x121x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.943 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.052 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 2.02 W/kg
SAR(1 g) = 0.723 W/kg; SAR(10 g) = 0.271 W/kg
Maximum value of SAR (measured) = -0.06 W/kg

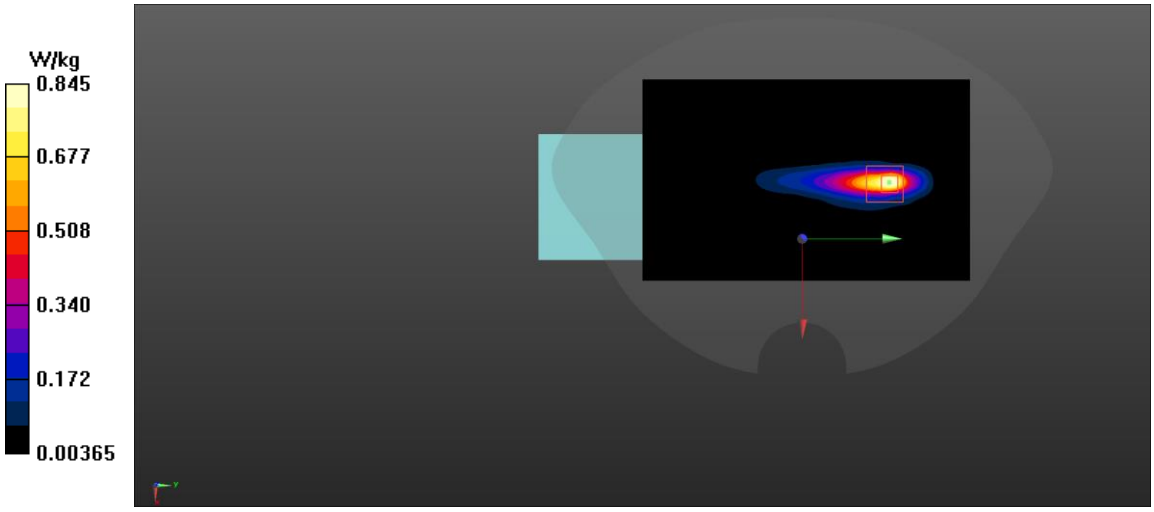


Fig A.8

LTE700-FDD12_CH23060 1RB-Middle Left Edge 0mm
Date: 5/10/2023
Electronics: DAE4 Sn1331
Medium: body 750 MHz
Medium parameters used: f = 704 MHz; σ = 0.847 mho/m; εr = 41.65; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE700-FDD12 704 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(10.30,10.30,10.30)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.387 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.74 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.982 W/kg
SAR(1 g) = 0.36 W/kg; SAR(10 g) = 0.171 W/kg
Maximum value of SAR (measured) = 0.13 W/kg

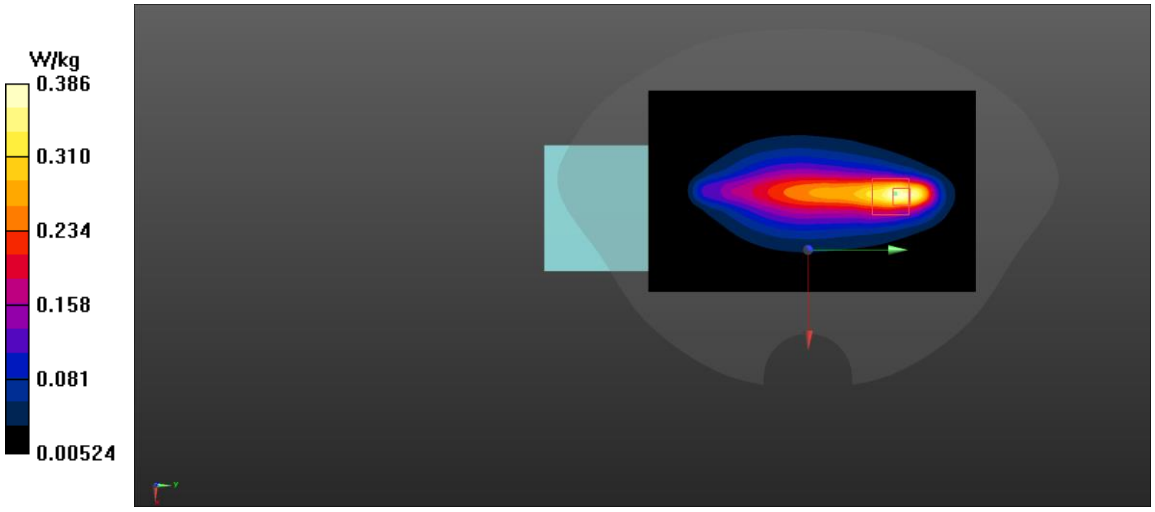


Fig A.9

LTE750-FDD13_CH23230 1RB-Middle Left Edge 0mm
Date: 5/10/2023
Electronics: DAE4 Sn1331
Medium: body 750 MHz
Medium parameters used: f = 782 MHz; σ = 0.921 mho/m; εr = 41.55; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE750-FDD13 782 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(10.30,10.30,10.30)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.275 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.38 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.608 W/kg
SAR(1 g) = 0.252 W/kg; SAR(10 g) = 0.123 W/kg
Maximum value of SAR (measured) = 0.12 W/kg

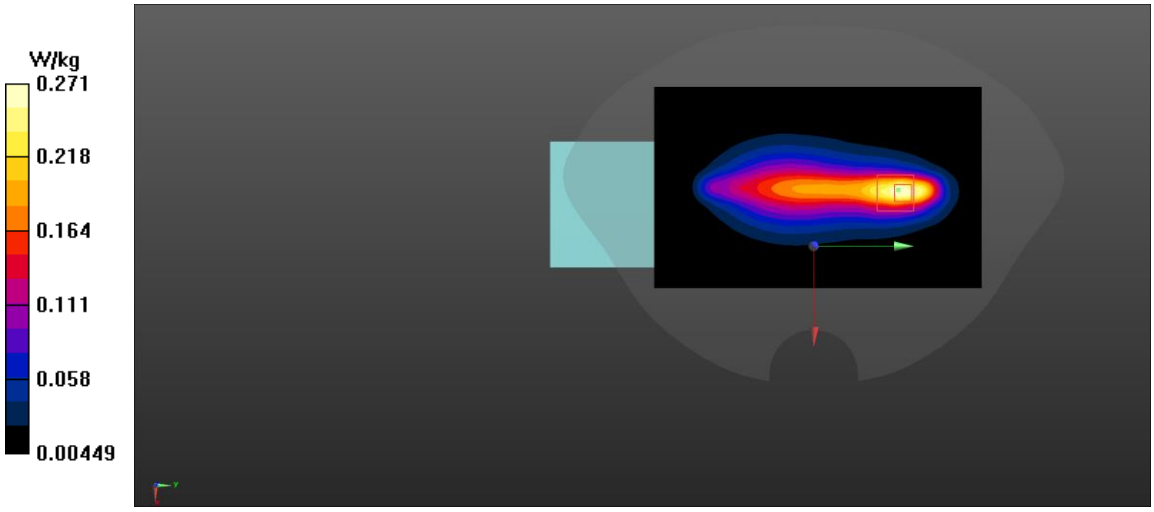


Fig A.10

LTE2600-TDD41_CH41055 50RB-Middle Left Edge 0mm
Date: 5/15/2023
Electronics: DAE4 Sn1331
Medium: body 2600 MHz
Medium parameters used: f = 2636.5 MHz; σ = 0.224 mho/m; εr = 41.63; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE2600-TDD41 2636.5 MHz Duty Cycle: 1:1.5787
Probe: EX3DV4 – SN7548 ConvF(7.12,7.12,7.12)

Area Scan (71x121x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.416 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.274 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.421 W/kg; SAR(10 g) = 0.156 W/kg
Maximum value of SAR (measured) = -0.11 W/kg

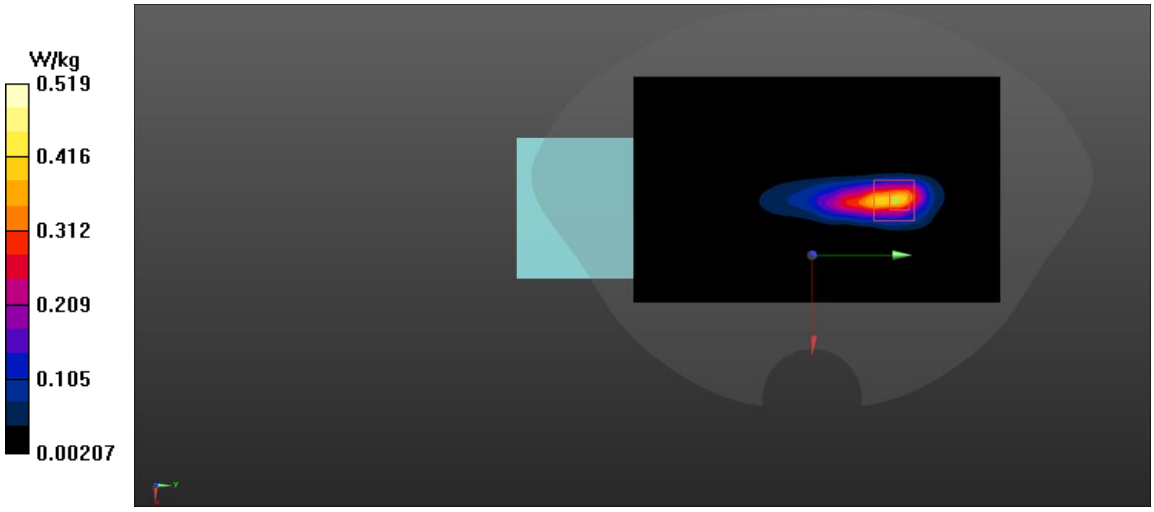


Fig A.11

LTE1700-FDD66_CH132072 1RB-Middle Rear 0mm
Date: 6/7/2023
Electronics: DAE4 Sn1331
Medium: body 1750 MHz
Medium parameters used: f = 1720 MHz; σ = 0.428 mho/m; εr = 41.72; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: LTE1700-FDD66 1720 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(8.13,8.13,8.13)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.792 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.179 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.68 W/kg
SAR(1 g) = 0.479 W/kg; SAR(10 g) = 0.208 W/kg
Maximum value of SAR (measured) = 0.08 W/kg

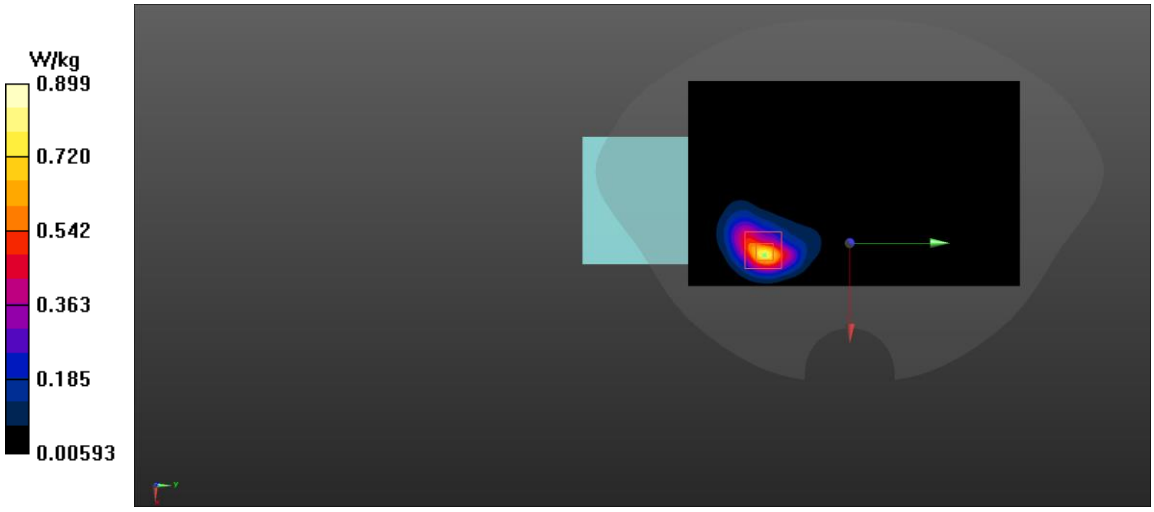


Fig A.12

WLAN2450_CH6 Rear 0mm
Date: 5/14/2023
Electronics: DAE4 Sn1331
Medium: body 2450 MHz
Medium parameters used: f = 2437; σ = 1.788 mho/m; εr = 39.16; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WLAN2450 2437 Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.32,7.32,7.32)

Area Scan (71x121x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.657 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.02 V/m; Power Drift = -0.24 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.637 W/kg; SAR(10 g) = 0.26 W/kg
Maximum value of SAR (measured) = -0.24 W/kg

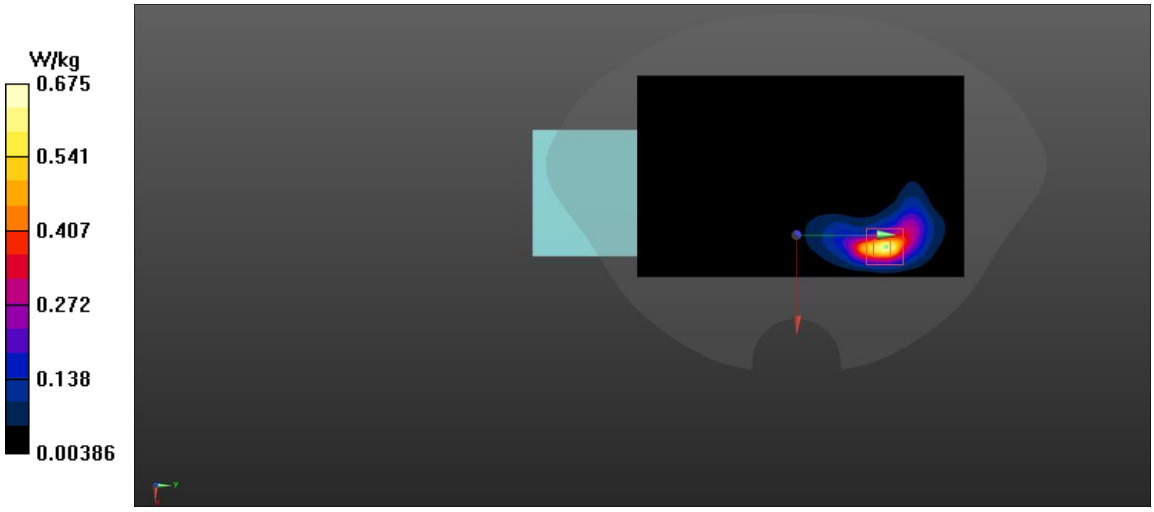


Fig A.13

WLAN_CH64 Rear 0mm
Date: 5/14/2023
Electronics: DAE4 Sn1331
Medium: body 2450 MHz
Medium parameters used: f = 5320; σ = 4.579 mho/m; εr = 34.256; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WLAN 5320 Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(4.98,4.98,4.98)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.504 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 0 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 2.28 W/kg
SAR(1 g) = 0.654 W/kg; SAR(10 g) = 0.229 W/kg
Maximum value of SAR (measured) = 0.12 W/kg

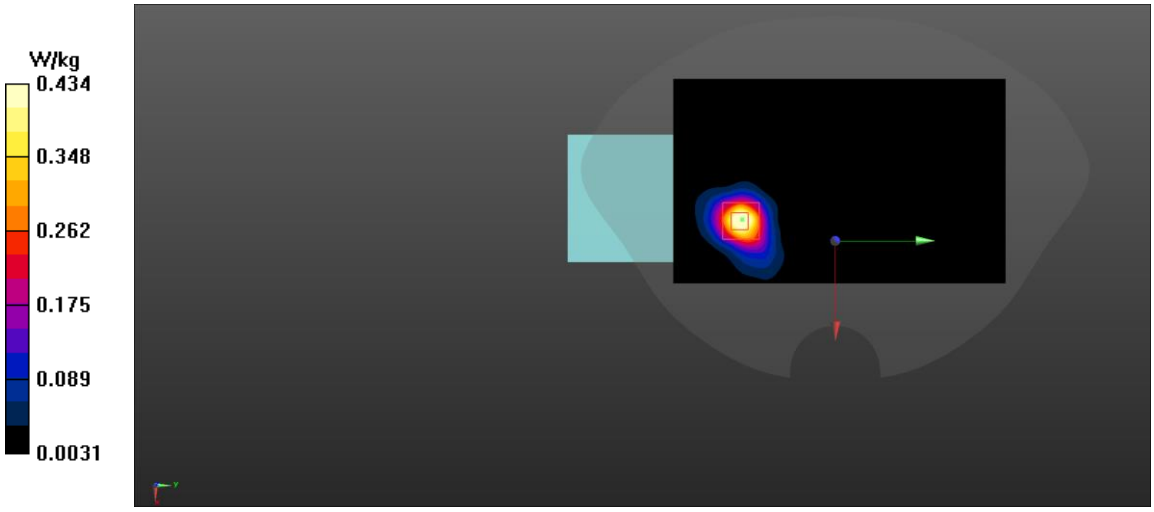


Fig A.14

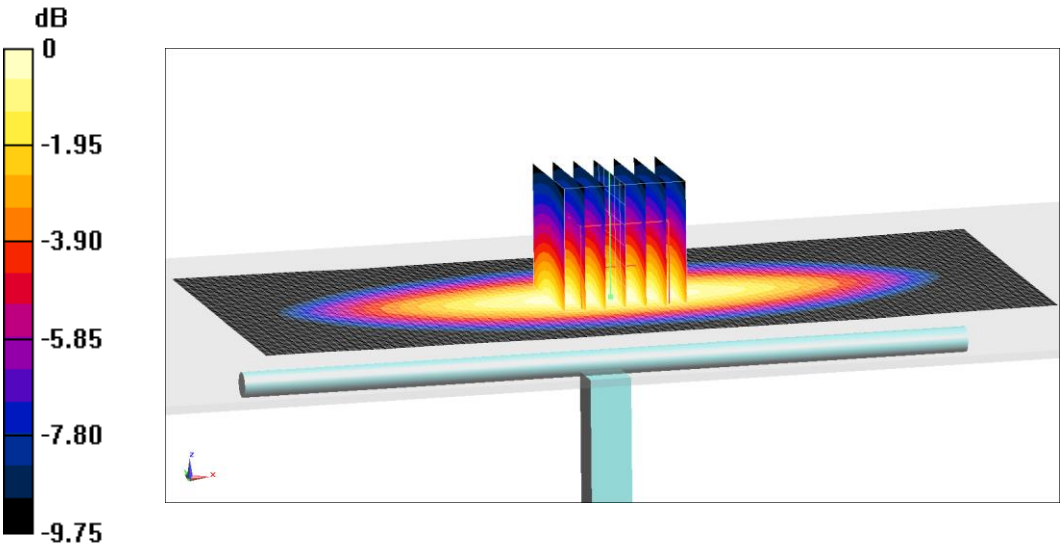
ANNEX B System Verification Results

750 MHz

Date: 5/10/2023
Electronics: DAE4 Sn1331
Medium: Head 750 MHz
Medium parameters used: f = 750 MHz; σ =0.897 mho/m; ε_r = 42.07; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C
Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(10.30,10.30,10.30)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 58.99 V/m; Power Drift = -0.1
Fast SAR: SAR(1 g) = 2.08 W/kg; SAR(10 g) = 1.4 W/kg
Maximum value of SAR (interpolated) = 2.81 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value =58.99 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.3 W/kg
SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.4 W/kg
Maximum value of SAR (measured) = 2.92 W/kg



0 dB = 2.92 W/kg = 4.65 dB W/kg

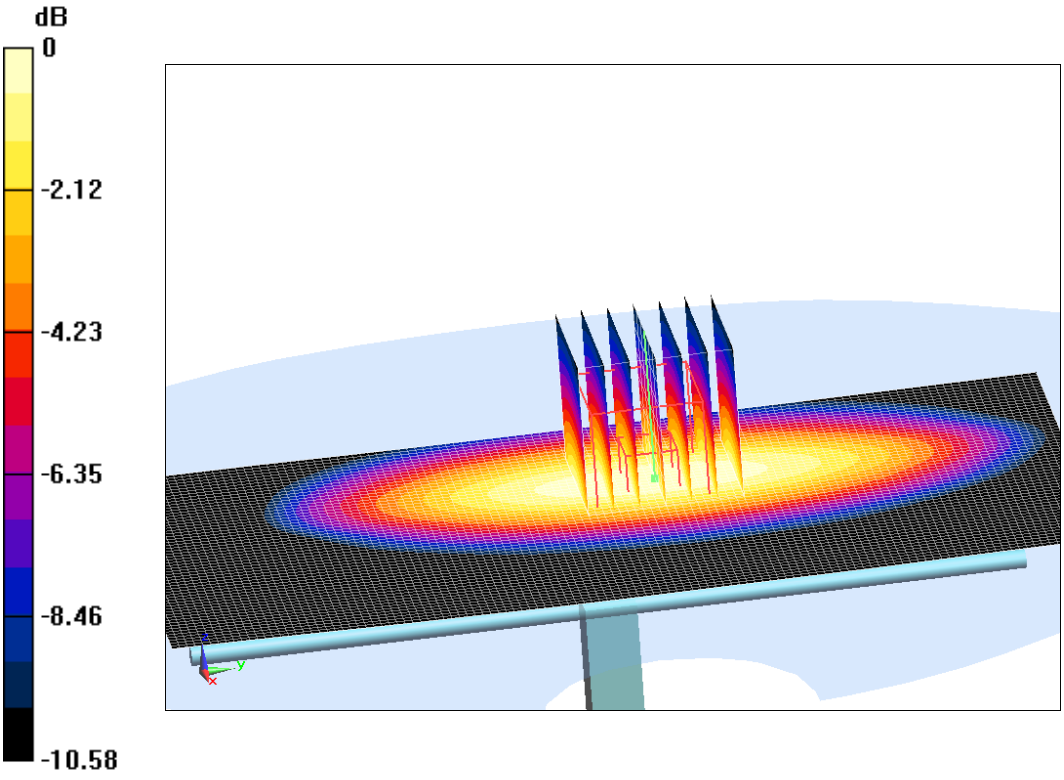
Fig.B.1 validation 750 MHz 250mW

835 MHz

Date: 5/11/2023
Electronics: DAE4 Sn1331
Medium: Head 835 MHz
Medium parameters used: f = 835 MHz; σ =0.884 mho/m; ε_r = 41.45; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(9.81,9.81,9.81)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 63.45 V/m; Power Drift = -0.05
Fast SAR: SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.59 W/kg
Maximum value of SAR (interpolated) = 3.2 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value =63.45 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.7 W/kg
SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (measured) = 3.21 W/kg



0 dB = 3.21 W/kg = 5.07 dB W/kg

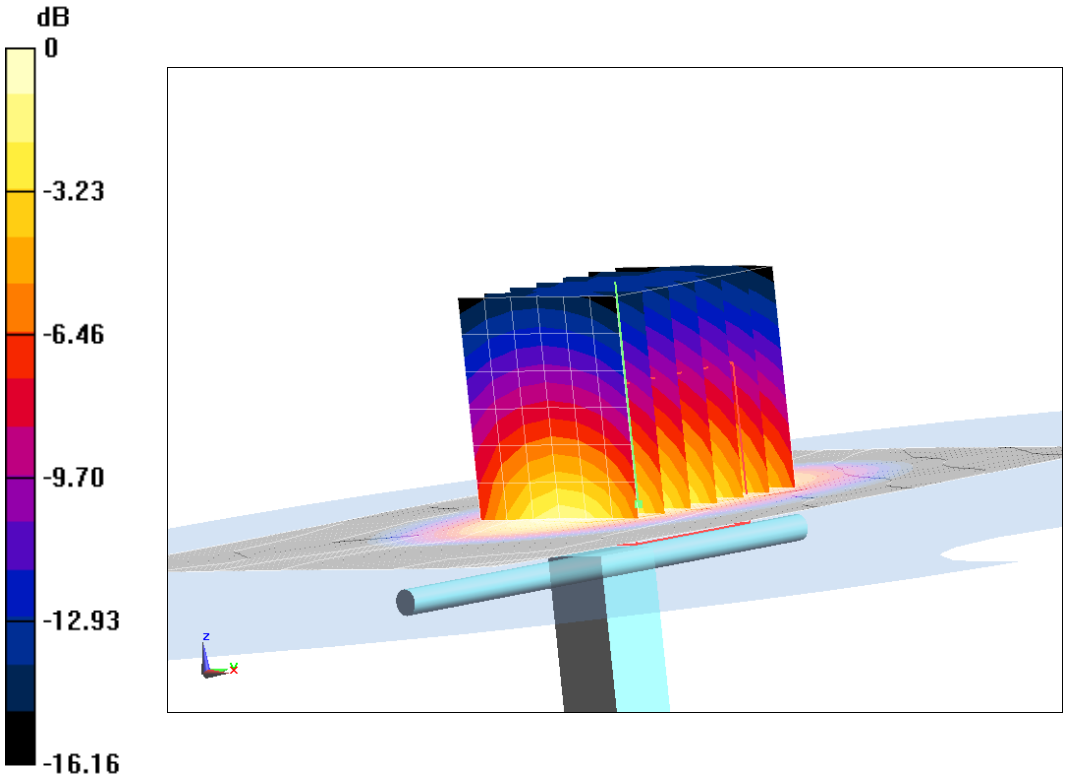
Fig.B.2 validation 835 MHz 250mW

1750 MHz

Date: 6/7/2023
Electronics: DAE4 Sn1331
Medium: Head 1750 MHz
Medium parameters used: f = 1750 MHz; σ =1.374 mho/m; ε_r = 39.44; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C
Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(8.13,8.13,8.13)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 105.19 V/m; Power Drift = -0.04
Fast SAR: SAR(1 g) = 9.3 W/kg; SAR(10 g) = 4.73 W/kg
Maximum value of SAR (interpolated) = 14.12 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value =105.19 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 16.67 W/kg
SAR(1 g) = 9 W/kg; SAR(10 g) = 4.76 W/kg
Maximum value of SAR (measured) = 14.22 W/kg



0 dB = 14.22 W/kg = 11.53 dB W/kg

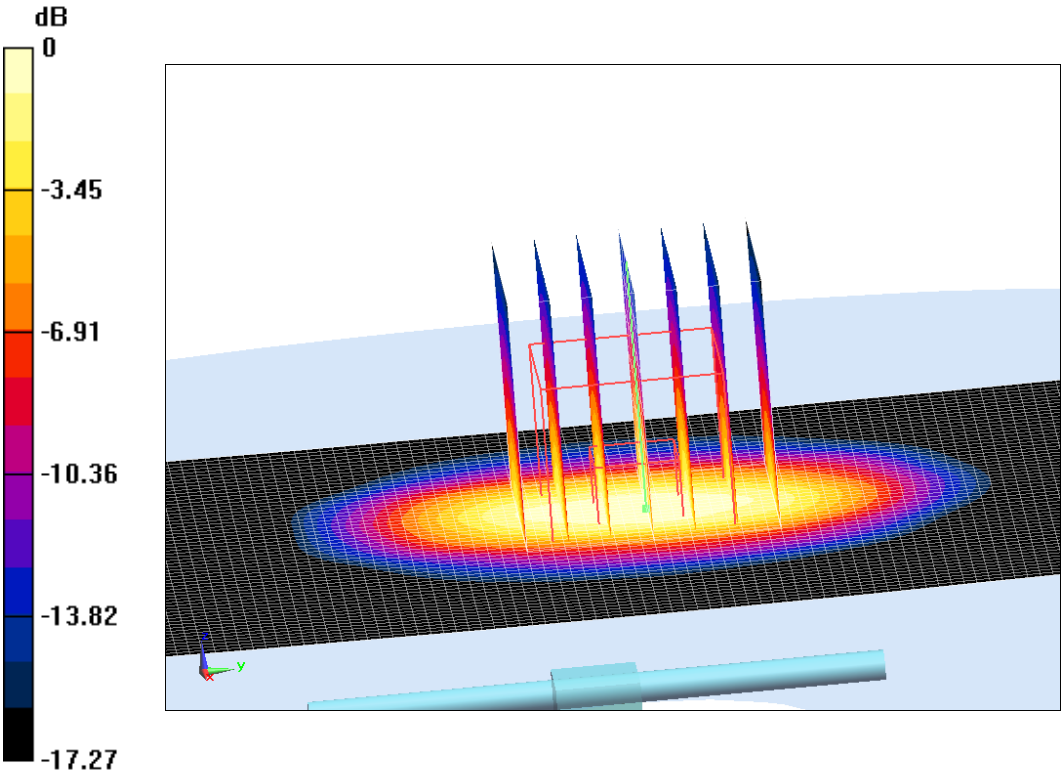
Fig.B.3 validation 1750 MHz 250mW

1900 MHz

Date: 5/13/2023
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.382 mho/m; ε_r = 39.33; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.80,7.80,7.80)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 110.67 V/m; Power Drift = 0.06
Fast SAR: SAR(1 g) = 9.95 W/kg; SAR(10 g) = 5.14 W/kg
Maximum value of SAR (interpolated) = 15.41 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value =110.67 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 18.05 W/kg
SAR(1 g) = 9.92 W/kg; SAR(10 g) = 5.24 W/kg
Maximum value of SAR (measured) = 14.91 W/kg



0 dB = 14.91 W/kg = 11.73 dB W/kg

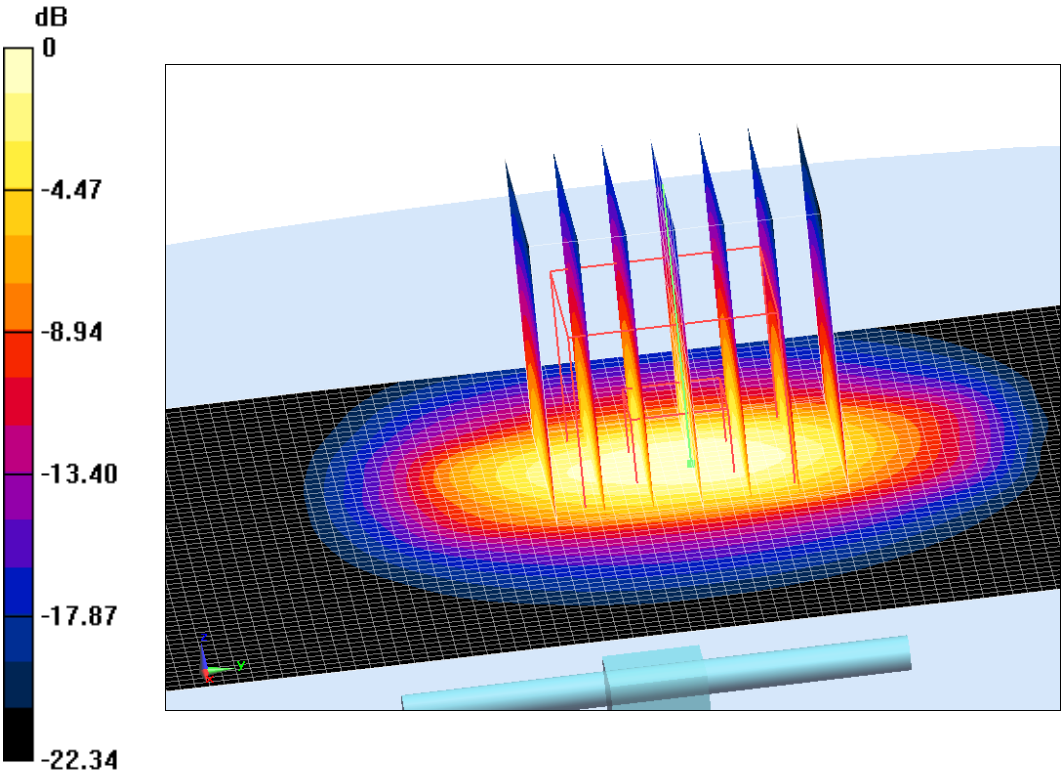
Fig.B.4 validation 1900 MHz 250mW

2450 MHz

Date: 5/14/2023
Electronics: DAE4 Sn1331
Medium: Head 2450 MHz
Medium parameters used: f = 2450 MHz; σ =1.813 mho/m; ε_r = 39.22; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C
Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.32,7.32,7.32)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Reference Value = 117.51 V/m; Power Drift = -0.05
Fast SAR: SAR(1 g) = 12.89 W/kg; SAR(10 g) = 6.09 W/kg
Maximum value of SAR (interpolated) = 22.09 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =117.51 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 25.93 W/kg
SAR(1 g) = 12.94 W/kg; SAR(10 g) = 6.07 W/kg
Maximum value of SAR (measured) = 21.84 W/kg



0 dB = 21.84 W/kg = 13.39 dB W/kg

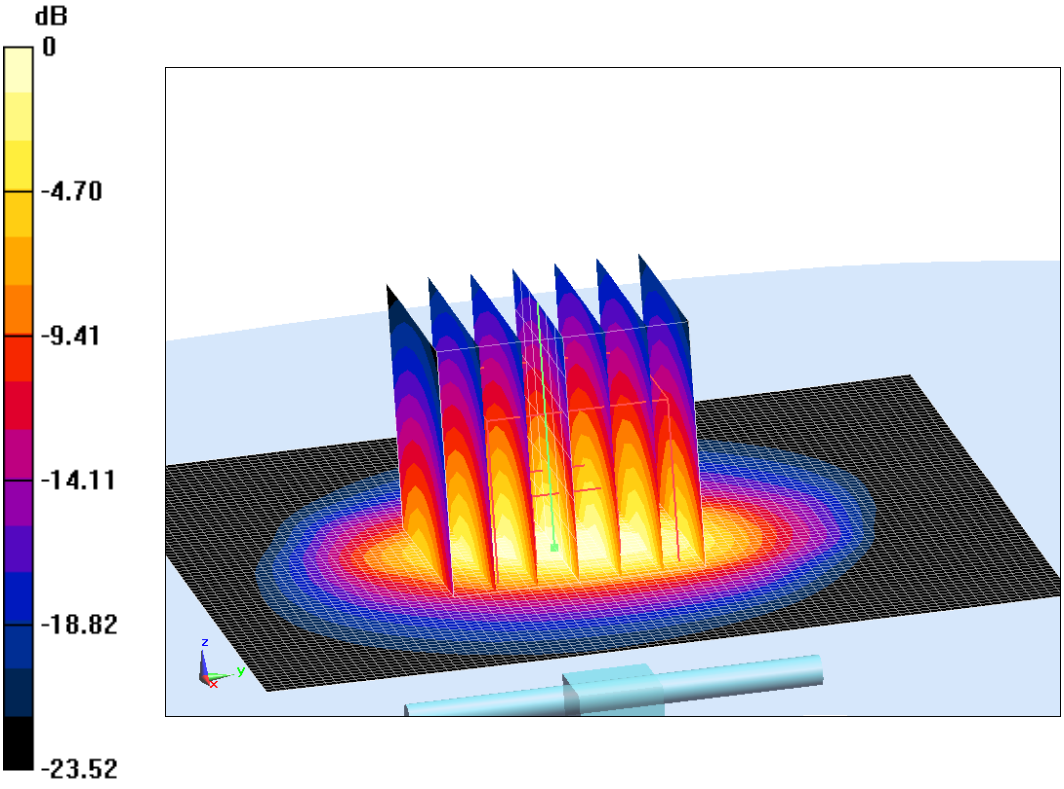
Fig.B.5 validation 2450 MHz 250mW

2600 MHz

Date: 5/15/2023
Electronics: DAE4 Sn1331
Medium: Head 2600 MHz
Medium parameters used: f = 2600 MHz; σ =1.96 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C
Communication System: CW Frequency: 2600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(7.12,7.12,7.12)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Reference Value = 121 V/m; Power Drift = 0.02
Fast SAR: SAR(1 g) = 14.01 W/kg; SAR(10 g) = 6.28 W/kg
Maximum value of SAR (interpolated) = 24.01 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =121 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 28.74 W/kg
SAR(1 g) = 13.97 W/kg; SAR(10 g) = 6.36 W/kg
Maximum value of SAR (measured) = 24.72 W/kg



0 dB = 24.72 W/kg = 13.93 dB W/kg

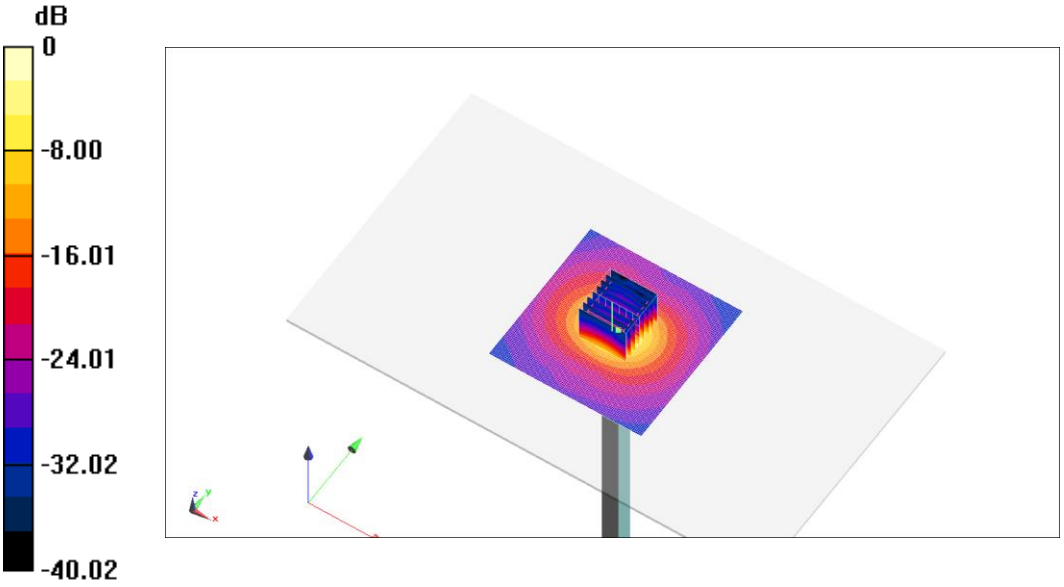
Fig.B.6 validation 2600 MHz 250mW

5250 MHz

Date: 5/16/2023
Electronics: DAE4 Sn1331
Medium: Head 5250 MHz
Medium parameters used: f = 5250 MHz; σ =4.701 mho/m; ε_r = 35.43; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C
Communication System: CW Frequency: 5250 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(4.98,4.98,4.98)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 18.54 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value =80.43 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 28.09 W/kg
SAR(1 g) = 20.2 W/kg; SAR(10 g) = 5.82 W/kg
Maximum value of SAR (measured) = 18.36 W/kg



0 dB = 18.36 W/kg = 12.64 dB W/kg

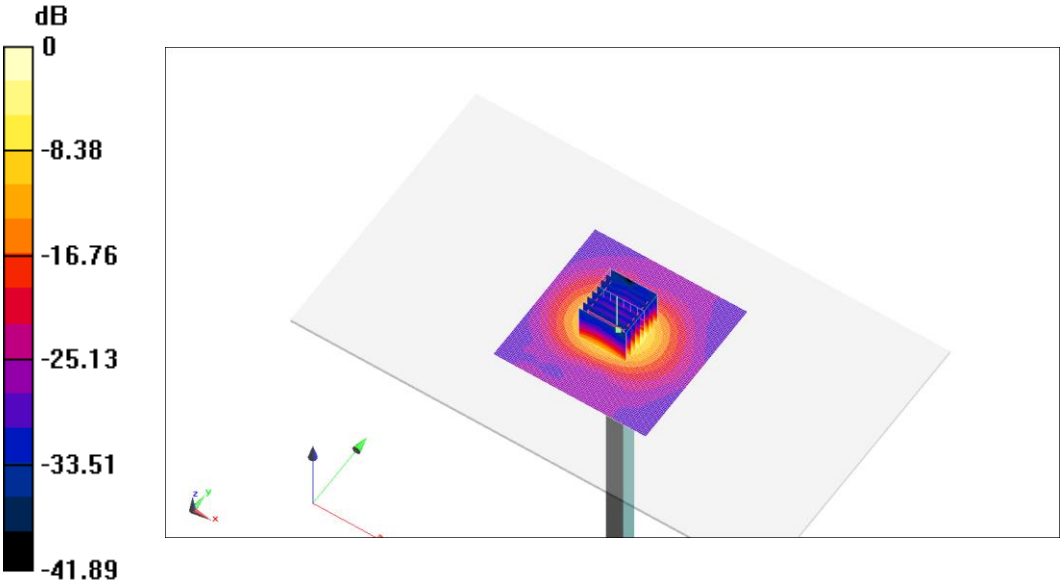
Fig.B.7 validation 5250 MHz 100mW

5600 MHz

Date: 5/17/2023
Electronics: DAE4 Sn1331
Medium: Head 5600 MHz
Medium parameters used: f = 5600 MHz; σ =5.024 mho/m; ε_r = 35.18; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C
Communication System: CW Frequency: 5600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(4.574.57,4.57)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 20.01 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value =77.41 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 31.27 W/kg
SAR(1 g) = 20.58 W/kg; SAR(10 g) = 5.92 W/kg
Maximum value of SAR (measured) = 20.55 W/kg



0 dB = 20.55 W/kg = 13.13 dB W/kg

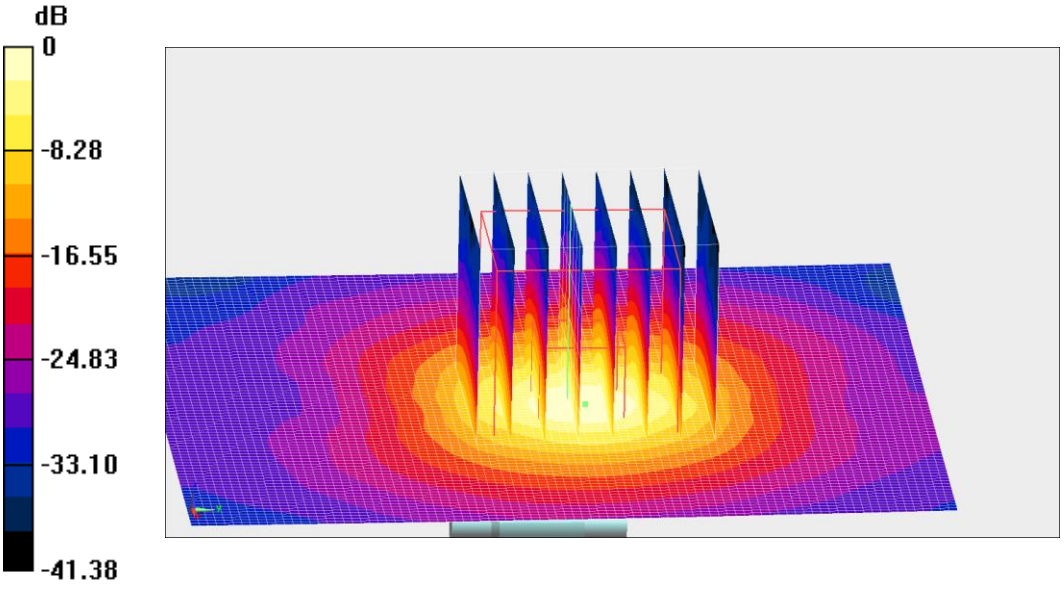
Fig.B.8 validation 5600 MHz 100mW

5750 MHz

Date: 5/18/2023
Electronics: DAE4 Sn1331
Medium: Head 5750 MHz
Medium parameters used: f = 5750 MHz; σ =5.248 mho/m; ε_r = 36.01; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C
Communication System: CW Frequency: 5750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7548 ConvF(4.64,4.64,4.64)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 19.96 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value =76.97 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 32.07 W/kg
SAR(1 g) = 20.14 W/kg; SAR(10 g) = 5.68 W/kg
Maximum value of SAR (measured) = 20.18 W/kg



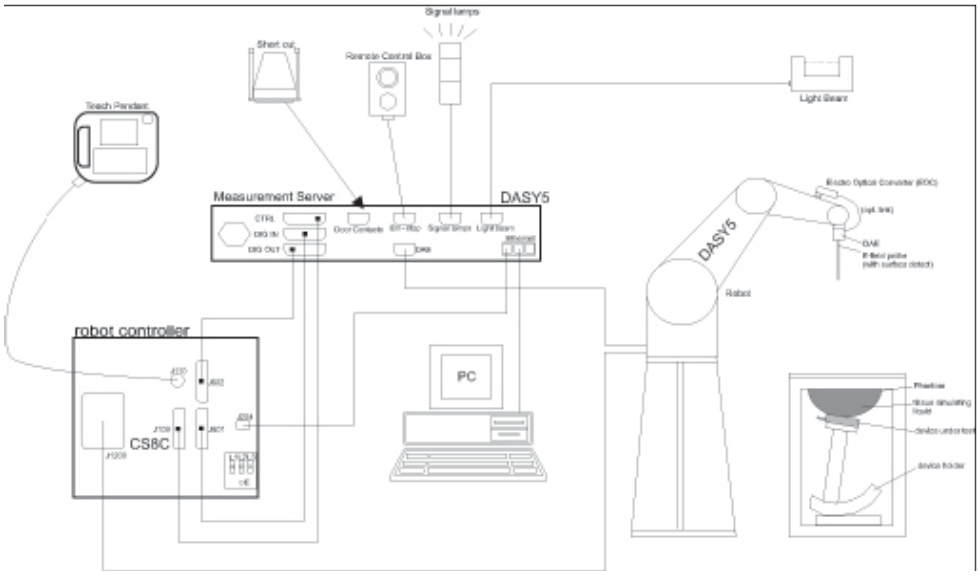
0 dB = 20.18 W/kg = 13.05 dB W/kg

Fig.B.9 validation 5750 MHz 100mW

ANNEX C SAR Measurement Setup

C.1 Measurement Set-up

The Dasy4 or DASY5 system for performing compliance tests is illustrated above graphically. This system consists of the following items:



Picture C.1SAR Lab Test Measurement Set-up

- A standard high precision 6-axis robot (StäubliTX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY4 or DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as
- warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

C.2 Dasy4 or DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY4 or DASY5 software reads the reflection durning a software approach and looks for the maximum using 2nd ord curve fitting. The approach is stopped at reaching the maximum.

Probe Specifications:

Model: ES3DV3, EX3DV4
Frequency 10MHz — 6.0GHz(EX3DV4)
Range: 10MHz — 4GHz(ES3DV3)
Calibration: In head and body simulating tissue at Frequencies from 835 up to 5800MHz
Linearity: ± 0.2 dB(30 MHz to 6 GHz) for EX3DV4
± 0.2 dB(30 MHz to 4 GHz) for ES3DV3
DynamicRange: 10 mW/kg — 100W/kg
Probe Length: 330 mm
Probe Tip
Length: 20 mm
Body Diameter: 12 mm
Tip Diameter: 2.5 mm (3.9 mm for ES3DV3)
Tip-Center: 1 mm (2.0mm for ES3DV3)
Application: SAR Dosimetry Testing
Compliance tests ofmobile phones
Dosimetry in strong gradient fields

Picture C.2Near-field Probe

Picture C.3E-field Probe

C.3 E-field Probe Calibration

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

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and inn a waveguide or

other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm^2.

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

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

Where:

Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

C.4 Other Test Equipment

C.4.1 Data Acquisition Electronics(DAE)

The data acquisition electronics consist 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 with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

PictureC.4: DAE

C.4.2 Robot

The SPEAG DASY system uses the high precision robots (DASY4: RX90XL; DASY5: RX160L) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchron motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

Picture C.5DASY 4

Picture C.6DASY 5

C.4.3 Measurement Server

The Measurement server is based on a PC/104 CPU broad with CPU (dasy4: 166 MHz, Intel Pentium; DASY5: 400 MHz, Intel Celeron), chipdisk (DASY4: 32 MB; DASY5: 128MB), RAM (DASY4: 64 MB, DASY5: 128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O broad, which is directly connected to the PC/104 bus of the CPU broad.

The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.

Picture C.7 Server for DASY 4

Picture C.8 Server for DASY 5

C.4.4 Device Holder for Phantom

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

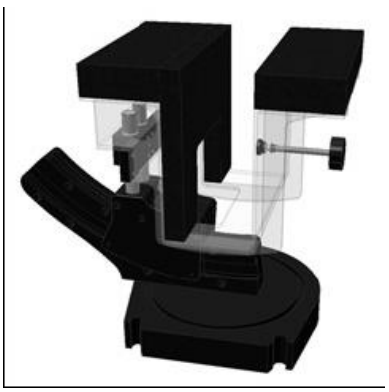
The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

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

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM and ELI phantoms.

Picture C.9-1: Device Holder



Picture C.9-2: Laptop Extension Kit

C.4.5 Phantom

The SAM Twin Phantom V4.0 is constructed of a fiberglass shell integrated in a table. The shape of the shell is based on data from an anatomical study designed to
Represent the 90th percentile of the population. The phantom enables the dissymmetric evaluation of SAR for both left and right handed handset usage, as well as body-worn usage using the flat phantom region. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. The shell phantom has a 2mm shell thickness (except the ear region where shell thickness increases to 6 mm).

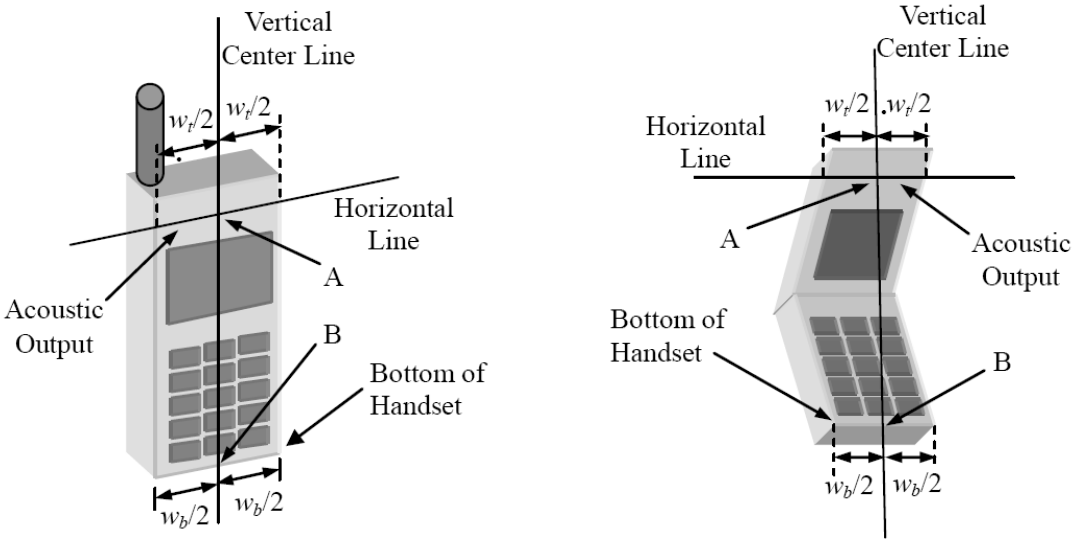
Shell Thickness: 2±0. 2 mm
Filling Volume: Approx. 25 liters
Dimensions: 810 x l000 x 500 mm (H x L x W)
Available: Special

Picture C.10: SAM Twin Phantom

ANNEX D Position of the wireless device in relation to the phantom

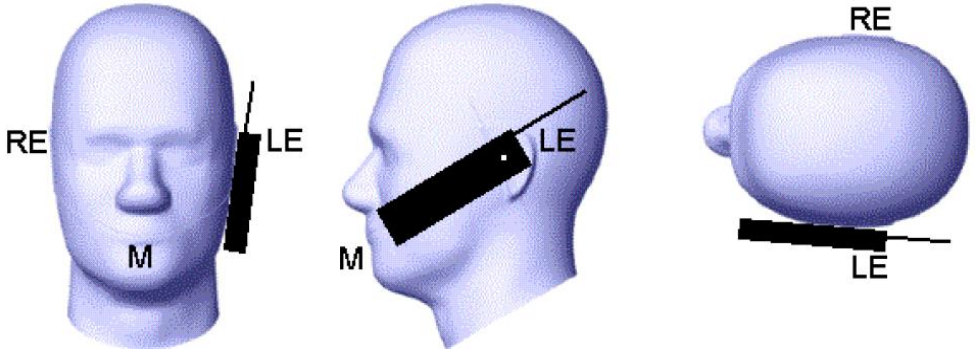
D.1 General considerations

This standard specifies two handset test positions against the head phantom – the “cheek” position and the “tilt” position.

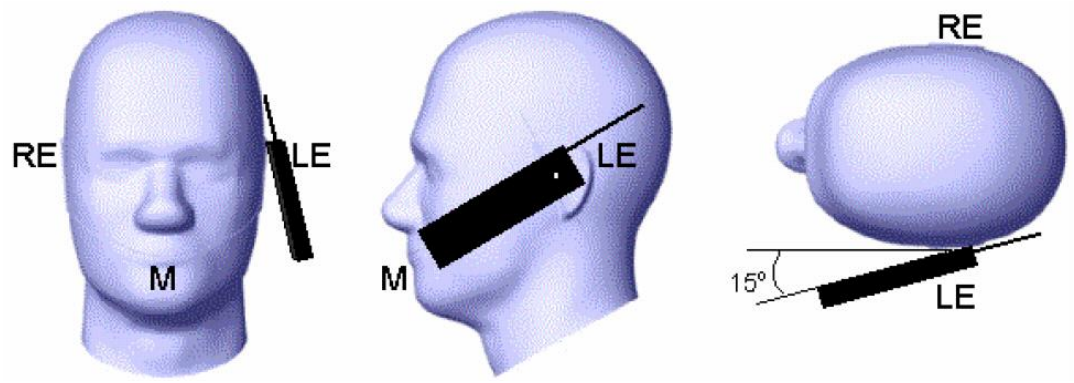


W_t	Width of the handset at the level of the acoustic
W_b	Width of the bottom of the handset
A	Midpoint of the width W_t of the handset at the level of the acoustic output
B	Midpoint of the width W_b of the bottom of the handset

Picture D.1-a Typical “fixed” case handset **Picture D.1-b Typical “clam-shell” case handset**



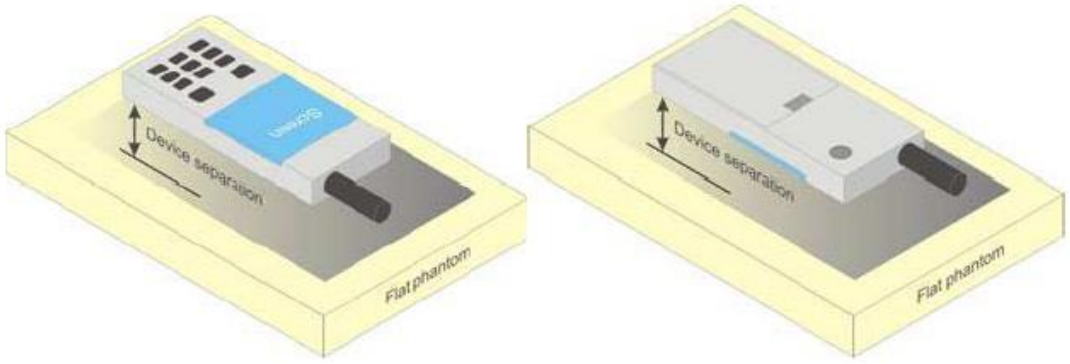
Picture D.2 Cheek position of the wireless device on the left side of SAM



Picture D.3 Tilt position of the wireless device on the left side of SAM

D.2 Body-worn device

A typical example of a body-worn device is a mobile phone, wireless enabled PDA or other battery operated wireless device with the ability to transmit while mounted on a person's body using a carry accessory approved by the wireless device manufacturer.

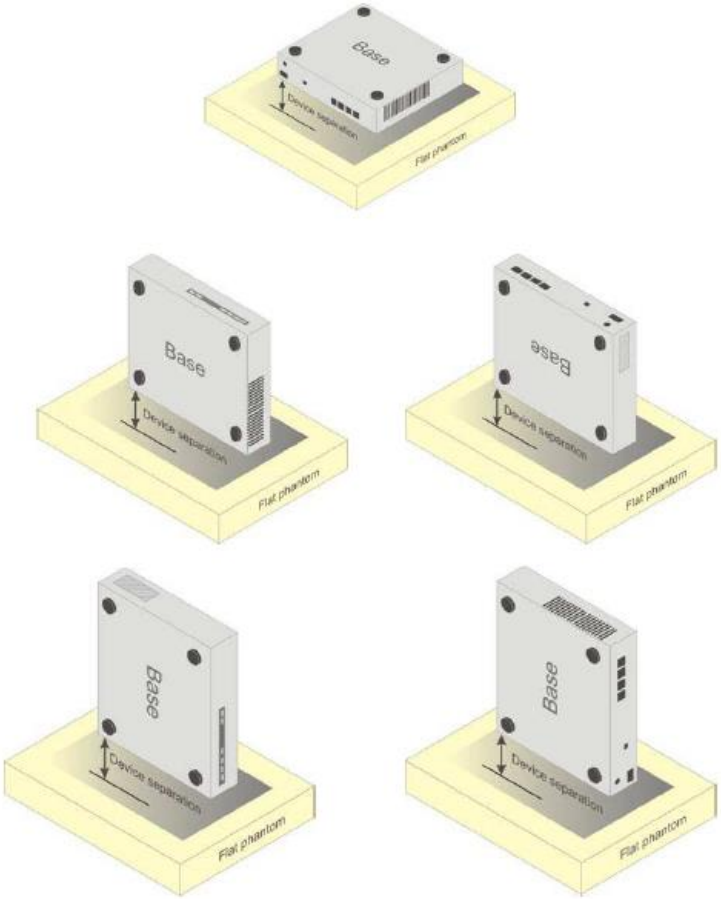


Picture D.4Test positions for body-worn devices

D.3 Desktop device

A typical example of a desktop device is a wireless enabled desktop computer placed on a table or desk when used.

The DUT shall be positioned at the distance and in the orientation to the phantom that corresponds to the intended use as specified by the manufacturer in the user instructions. For devices that employ an external antenna with variable positions, tests shall be performed for all antenna positions specified. Picture8.5 show positions for desktop device SAR tests. If the intended use is not specified, the device shall be tested directly against the flat phantom.



Picture D.5 Test positions for desktop devices

D.4 DUT Setup Photos

Picture D.6

ANNEX E Equivalent Media Recipes

The liquid used for the frequency range of 800-3000 MHz consisted of water, sugar, salt, preventol, glycol monobutyl and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table E.1 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528 and IEC 62209.

TableE.1: Composition of the Tissue Equivalent Matter

Frequency (MHz)	835Head	835Body	1900 Head	1900 Body	2450 Head	2450 Body	5800 Head	5800 Body
Ingredients (% by weight)								
Water	41.45	52.5	55.242	69.91	58.79	72.60	65.53	65.53
Sugar	56.0	45.0	\	\	\	\	\	\
Salt	1.45	1.4	0.306	0.13	0.06	0.18	\	\
Preventol	0.1	0.1	\	\	\	\	\	\
Cellulose	1.0	1.0	\	\	\	\	\	\
Glycol Monobutyl	\	\	44.452	29.96	41.15	27.22	\	\
Diethylenglycol monohexylether	\	\	\	\	\	\	17.24	17.24
Triton X-100	\	\	\	\	\	\	17.24	17.24
Dielectric Parameters Target Value	ε=41.5 σ=0.90	ε=55.2 σ=0.97	ε=40.0 σ=1.40	ε=53.3 σ=1.52	ε=39.2 σ=1.80	ε=52.7 σ=1.95	ε=35.3 σ=5.27	ε=48.2 σ=6.00

Note: There are a little adjustment respectively for 750, 1750, 2600, 5200, 5300 and 5600 based on the recipe of closest frequency in table E.1.

ANNEX F System Validation

The SAR system must be validated against its performance specifications before it is deployed. When SAR probes, system components or software are changed, upgraded or recalibrated, these must be validated with the SAR system(s) that operates with such components.

Table F.1: System Validation for 7464

Probe SN.	Liquid name	Validation date	Frequency point	Status (OK or Not)
7548	Head 750MHz	March.2,2021	750 MHz	OK
7548	Head 835MHz	March.2,2021	835 MHz	OK
7548	Head 900MHz	March.2,2021	900 MHz	OK
7548	Head 1450MHz	March.2,2021	1450 MHz	OK
7548	Head 1750MHz	March.3,2021	1750 MHz	OK
7548	Head 1880MHz	March.3,2021	1880 MHz	OK
7548	Head 1900MHz	March.3,2021	1900 MHz	OK
7548	Head 2000MHz	March.3,2021	2000 MHz	OK
7548	Head 2300MHz	March.3,2021	2300 MHz	OK
7548	Head 2450MHz	March.4,2021	2450 MHz	OK
7548	Head 2600MHz	March.4,2021	2600 MHz	OK
7548	Head 3300MHz	March.4,2021	3300 MHz	OK
7548	Head 3500MHz	March.4,2021	3500 MHz	OK
7548	Head 3700MHz	March.4,2021	3700 MHz	OK
7548	Head 3900MHz	March.4,2021	3900 MHz	OK
7548	Head 4100MHz	March.4,2021	4100 MHz	OK
7548	Head 5250MHz	March.5,2021	5250 MHz	OK
7548	Head 5600MHz	March.5,2021	5600 MHz	OK
7548	Head 5750MHz	March.5,2021	5750 MHz	OK
7548	Head 5800MHz	March.5,2021	5800 MHz	OK

ANNEX G Probe Calibration Certificate

Probe 7548 Calibration Certificate

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CALIBRATION
CNAS L0570

Client CTTL Certificate No: Z22-60260

CALIBRATION CERTIFICATE

Object EX3DV4 - SN : 7548

Calibration Procedure(s) FF-Z11-004-02
Calibration Procedures for Dosimetric E-field Probes

Calibration date: August 01, 2022

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	14-Jun-22(CTTL, No.J22X04181)	Jun-23
Power sensor NRP-Z91	101547	14-Jun-22(CTTL, No.J22X04181)	Jun-23
Power sensor NRP-Z91	101548	14-Jun-22(CTTL, No.J22X04181)	Jun-23
Reference 10dBAttenuator	18N50W-10dB	20-Jan-21(CTTL, No.J21X00486)	Jan-23
Reference 20dBAttenuator	18N50W-20dB	20-Jan-21(CTTL, No.J21X00485)	Jan-23
Reference Probe EX3DV4	SN 3846	20-May-22(SPEAG, No.EX3-3846_May22)	May-23
DAE4	SN 771	20-Jan-22(SPEAG, No.DAE4-771_Jan22)	Jan-23
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
SignalGenerator MG3700A	6201052605	14-Jun-22(CTTL, No.J22X04182)	Jun-23
Network Analyzer E5071C	MY46110673	14-Jan-22(CTTL, No.J22X00406)	Jan-23

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: August 08, 2022

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Glossary:

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

Calibration is Performed According to the Following Standards:

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

b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016

c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010

d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

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

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DASY/EASY – Parameters of Probe: EX3DV4 – SN:7548

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (*k*=2)
Norm(μV/(V/m)²)[A]	0.62	0.70	0.63	±10.0%
DCP(mV)[B]	101.7	102.0	102.0	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (*k*=2)
0	CW	X	0.0	0.0	1.0	0.00	193.2	±2.2%
		Y	0.0	0.0	1.0		208.5	
		Z	0.0	0.0	1.0		192.2	

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor *k*=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of Norm X, Y, Z do not affect the E²-field uncertainty inside TSL (see Page 4).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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DASY/EASY – Parameters of Probe: EX3DV4 – SN:7548

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (k=2)
750	41.9	0.89	10.30	10.30	10.30	0.16	1.29	±12.1%
900	41.5	0.97	9.81	9.81	9.81	0.16	1.32	±12.1%
1450	40.5	1.20	8.56	8.56	8.56	0.20	0.91	±12.1%
1750	40.1	1.37	8.13	8.13	8.13	0.22	1.00	±12.1%
1900	40.0	1.40	7.80	7.80	7.80	0.25	1.00	±12.1%
2100	39.8	1.49	7.95	7.95	7.95	0.19	1.24	±12.1%
2300	39.5	1.67	7.61	7.61	7.61	0.46	0.72	±12.1%
2450	39.2	1.80	7.32	7.32	7.32	0.50	0.72	±12.1%
2600	39.0	1.96	7.12	7.12	7.12	0.56	0.68	±12.1%
3300	38.2	2.71	6.75	6.75	6.75	0.40	0.90	±13.3%
3500	37.9	2.91	6.61	6.61	6.61	0.38	1.02	±13.3%
3700	37.7	3.12	6.41	6.41	6.41	0.35	1.07	±13.3%
3900	37.5	3.32	6.30	6.30	6.30	0.30	1.50	±13.3%
4100	37.2	3.53	6.22	6.22	6.22	0.30	1.38	±13.3%
4200	37.1	3.63	6.10	6.10	6.10	0.35	1.35	±13.3%
4400	36.9	3.84	6.00	6.00	6.00	0.35	1.35	±13.3%
4600	36.7	4.04	5.92	5.92	5.92	0.40	1.30	±13.3%
4800	36.4	4.25	5.88	5.88	5.88	0.40	1.38	±13.3%
4950	36.3	4.40	5.68	5.68	5.68	0.40	1.40	±13.3%
5250	35.9	4.71	4.98	4.98	4.98	0.45	1.35	±13.3%
5600	35.5	5.07	4.57	4.57	4.57	0.45	1.40	±13.3%
5750	35.4	5.22	4.64	4.64	4.64	0.40	1.60	±13.3%

[C] Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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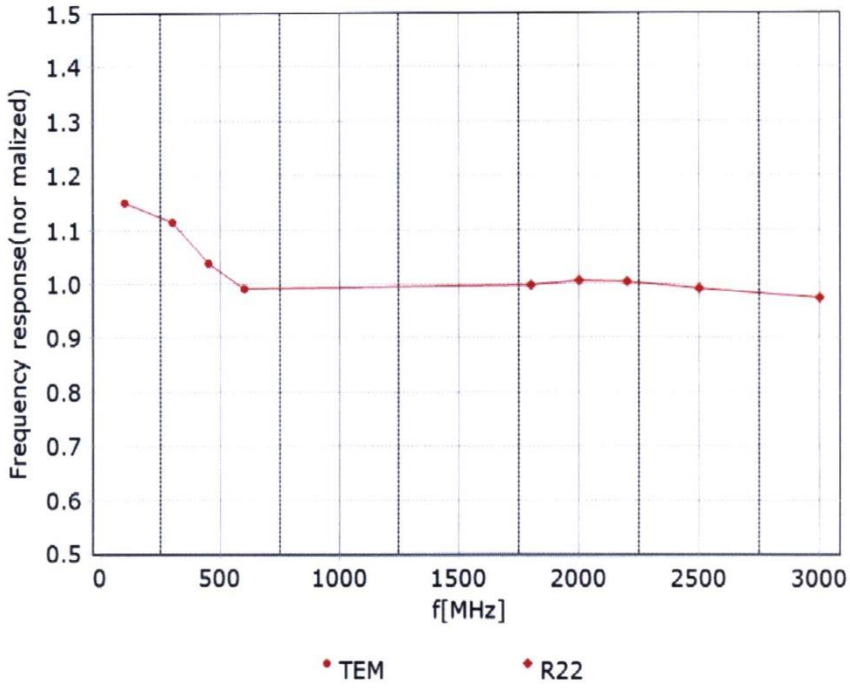
Frequency Response of E-Field
(TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ±7.4% (*k*=2)

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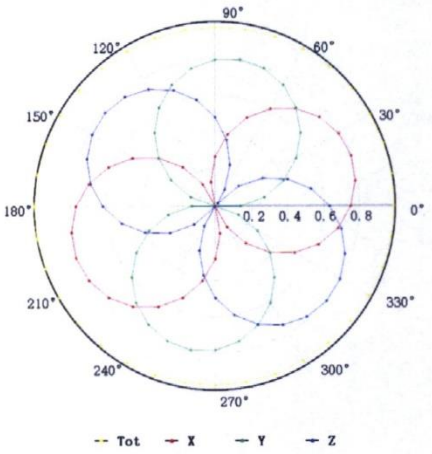
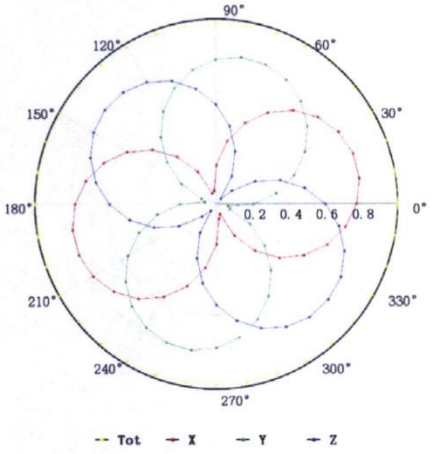
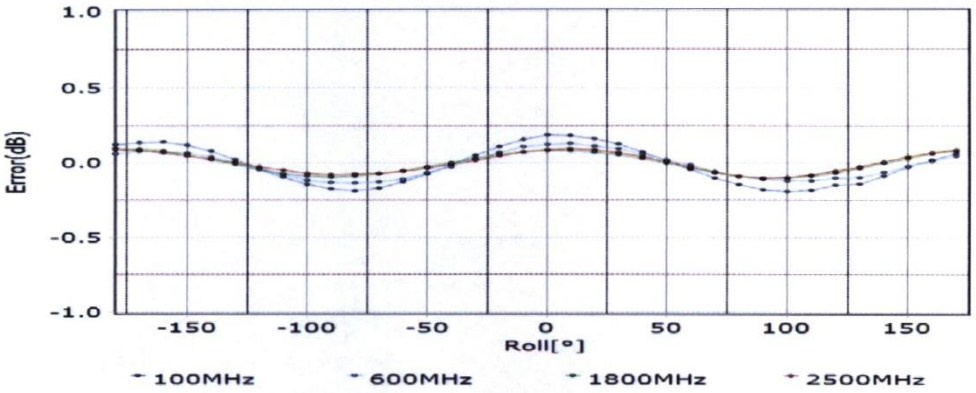
Receiving Pattern (Φ), θ=0°

f=600 MHz, TEM



f=1800 MHz, R22





Uncertainty of Axial Isotropy Assessment: ±1.2% (*k*=2)

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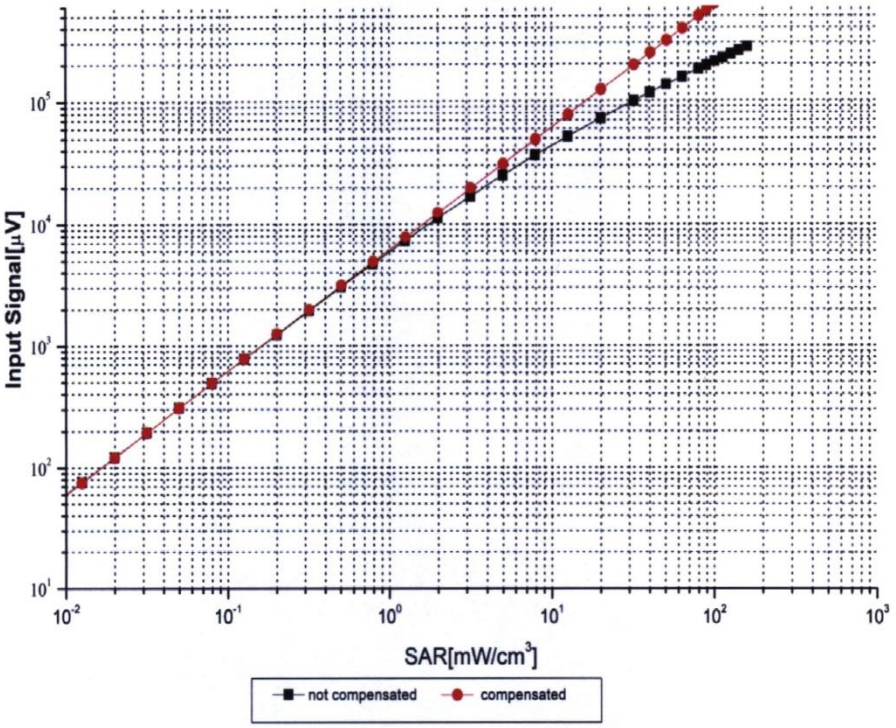
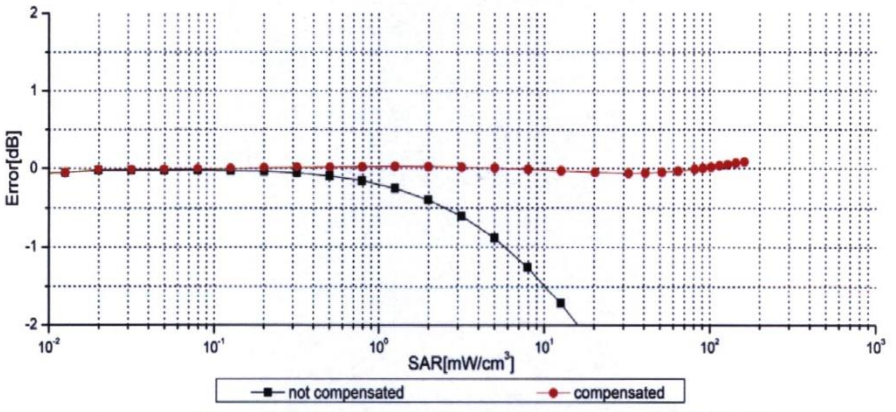
Dynamic Range f(SAR$_{head}$)
(TEM cell, f = 900 MHz)





Uncertainty of Linearity Assessment: ±0.9% (*k*=2)

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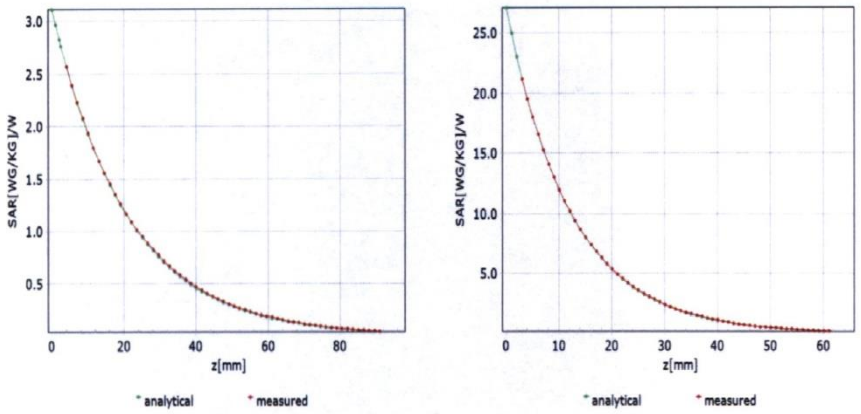
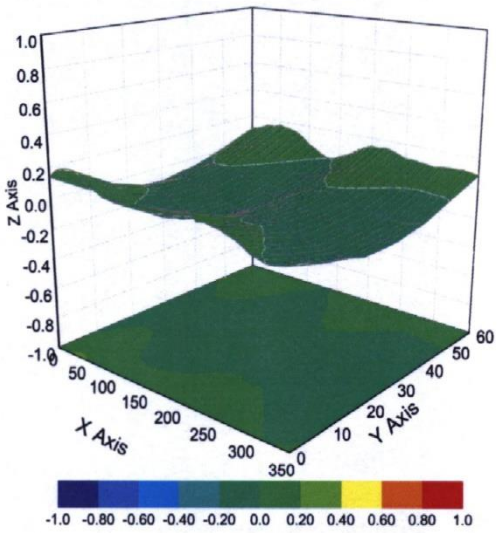
Conversion Factor Assessment

f=750 MHz,WGLS R9(H_convF) **f=1750 MHz,WGLS R22(H_convF)**



Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: ±3.2% (*k*=2)

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DASY/EASY – Parameters of Probe: EX3DV4 – SN:7548

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	146.7
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	9mm
Tip Diameter	2.5mm
Probe Tip to Sensor X Calibration Point	1mm
Probe Tip to Sensor Y Calibration Point	1mm
Probe Tip to Sensor Z Calibration Point	1mm
Recommended Measurement Distance from Surface	1.4mm

ANNEX H Dipole Calibration Certificate

750 MHz Dipole Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client CTTL (Auden) **Certificate No: D750V3-1017_Jul22**

CALIBRATION CERTIFICATE

Object	D750V3 - SN:1017
Calibration procedure(s)	QA CAL-05.v11 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz
Calibration date:	July 20, 2022

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
Power sensor NRP-Z91	SN: 103245	04-Apr-22 (No. 217-03525)	Apr-23
Reference 20 dB Attenuator	SN: BH9394 (20k)	04-Apr-22 (No. 217-03527)	Apr-23
Type-N mismatch combination	SN: 310982 / 06327	04-Apr-22 (No. 217-03528)	Apr-23
Reference Probe EX3DV4	SN: 7349	31-Dec-21 (No. EX3-7349_Dec21)	Dec-22
DAE4	SN: 601	02-May-22 (No. DAE4-601_May22)	May-23

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: MY41093315	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-20)	In house check: Oct-22
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-22

	Name	Function	Signature
Calibrated by:	Aidonia Georgiadou	Laboratory Technician	
Approved by:	Sven Kühn	Technical Manager	

Issued: July 22, 2022

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

Certificate No: D750V3-1017_Jul22 Page 1 of 6

Calibration Laboratory of
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S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.5 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.19 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.63 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.43 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.64 W/kg ± 16.5 % (k=2)**

