SAR TEST REPORT

No. I20Z60999-SEM01

For

TCL Communication Ltd.

Tablet PC

Model name: 9032W

With

Hardware Version: 03

Software Version: 1CS09000

FCC ID: 2ACCJB129

Issued Date: 2020-7-28

Note:

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Test Laboratory:

CTTL, Telecommunication Technology Labs, CAICT

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REPORT HISTORY

Report Number	Revision	Issue Date	Description
I20Z60999-SEM01	Rev.0	2020-7-28	Initial creation of test report

TABLE OF CONTENT

1 Test Laboratory

1.1 Testing Location

Company Name:	CTTL(Shouxiang)
Address:	No. 51 Shouxiang Science Building, Xueyuan Road, Haidian District, Beijing, P. R. China100191

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

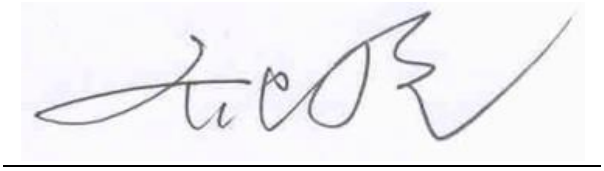
1.3 Project Data

Project Leader:	Qi Dianyuan
Test Engineer:	Lin Xiaojun
Testing Start Date:	July 14, 2020
Testing End Date:	July 25, 2020

1.4 Signature

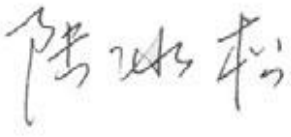
Lin Xiaojun

(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 SAR found during testing for TCL Communication Ltd. Tablet PC 9032W are as follows:

Table 2.1: Highest Reported SAR (1g)

Exposure Configuration	Technology Band	Highest Reported SAR 1g(W/kg)	Equipment Class
Hotspot (Body)	GSM 850	**1.21**	PCE
	PCS 1900	1.05	
	UMTS FDD 5	0.81	
	UMTS FDD 4	1.11	
	UMTS FDD 2	1.20	
	LTE Band 7	1.19	
	LTE Band 12	0.84	
	LTE Band 13	0.91	
	LTE Band 25	1.20	
	LTE Band 26	0.92	
	LTE Band 41 PC2	0.93	
	LTE Band 41 PC3	0.73	
	LTE Band 66	1.11	
	LTE Band 71	0.85	
	WLAN 2.4 GHz	0.43	DTS
	WLAN 5 GHz	0.66	UNII

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 0/8/10/12/15mm 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**: 1.21 W/kg (1g).**

Table 2.2: The sum of reported SAR values for main antenna and WiFi2.4G

	Position	Band	Main antenna	WLAN antenna	Sum	Distance (mm)	Ratio
Maximum reported SAR value for Body	Rear 0mm	GSM850	1.21	0.43	**1.64**	87.44	**0.024**
	Rear 0mm	WCDMA1700	1.11	0.43	**1.54**	/	**/**
	Rear 0mm	WCDMA1900	1.20	0.43	**1.63**	104.02	**0.020**
	Rear 0mm	LTE Band7	1.19	0.43	**1.62**	115.12	**0.018**
	Rear 0mm	LTE Band25	1.20	0.43	**1.63**	103.63	**0.020**
	Rear 0mm	LTE Band66	1.11	0.43	**1.54**	/	**/**

Table 2.2: The sum of reported SAR values for main antenna and WiFi5G

	Position	Band	Main antenna	WLAN antenna	Sum	Distance (mm)	Ratio
Maximum reported SAR value for Body	Rear 0mm	GSM850	1.21	0.66	**1.87**	80.62	**0.032**
	Rear 0mm	GSM1900	1.05	0.66	**1.71**	96.68	**0.023**
	Rear 0mm	WCDMA1700	1.11	0.66	**1.77**	94.87	**0.025**
	Rear 0mm	WCDMA1900	1.20	0.66	**1.86**	97.82	**0.026**
	Rear 0mm	LTE Band7	1.19	0.66	**1.85**	108.67	**0.023**
	Rear 0mm	LTE Band25	1.20	0.66	**1.86**	96.49	**0.026**
	Rear 0mm	LTE Band26	0.92	0.66	**1.58**	/	**/**
	Rear 0mm	LTE Band41 PC2	0.92	0.66	**1.58**	/	**/**
	Rear 0mm	LTE Band66	1.11	0.66	**1.77**	102.29	**0.023**

According to the KDB 447498 D01, when the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR to peak location separation ratio. The ratio is determined by $(SAR1 + SAR2)^{1.5}/Ri$, rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion.

Table 2.3: The sum of reported SAR values for main antenna and BT

	Position	Main antenna	BT	Sum
Maximum reported SAR value for Body	Rear 0mm	1.08	<0.01 [1]	**1.27**

[1] - The head SAR of BT is too low to get it, so the "<0.01" is used to indicate the head SAR of BT.

According to the above tables, the highest sum of reported SAR values is **1.87 W/kg (1g)**. The detail for simultaneous transmission consideration is described in chapter 13.

3 Client Information

3.1 Applicant 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:	Gong Zhizhou
E-mail:	zhizhou.gong@tcl.com
Telephone:	0086-755-36611722
Fax:	0086-75536612000-81722

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:	Gong Zhizhou
E-mail:	zhizhou.gong@tcl.com
Telephone:	0086-755-36611722
Fax:	0086-75536612000-81722

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

4.1 About EUT

Description:	Tablet PC
Model name:	9032W
Operating mode(s):	GSM 850/900/1800/1900, UMTS FDD 2/4/5, BT, Wi-Fi LTE Band 2/4/5/7/12/13/17/25/26/41/66/71
Tested Tx Frequency:	825 – 848.8 MHz (GSM 850)
	1850.2 – 1910 MHz (GSM 1900)
	826.4–846.6 MHz (WCDMA 850 Band V)
	1712.4 – 1752.6 MHz (WCDMA 1700 Band IV)
	1852.4–1907.6 MHz (WCDMA1900 Band II)
	2502.5 – 2567.5 MHz(LTE Band 7)
	699.7 – 715.3 MHz (LTE Band 12)
	777 – 787 MHz (LTE Band 13)
	1850.7 – 1914.3 MHz (LTE Band 25)
	814.7 – 848.3 MHz (LTE Band 26)
	2498.5 – 2687.5 MHz (LTE Band 41)
	1710.7 – 1779.3 MHz (LTE Band 66)
	665.5 – 695.5 MHz (LTE Band 71)
	2412 – 2462 MHz (Wi-Fi 2.4G)
	5.15 – 5.35 GHz 5.725 – 5.825 GHz(Wi-Fi 5G)
GPRS/EGPRS Multislot Class:	12
GPRS capability Class:	B
Test device Production information:	Production unit
Device type:	Portable device
Antenna type:	Integrated antenna
Hotspot mode:	Support
Product Dimension:	Long 209.4mm ;Wide 125.2mm ; Diagonal 243.97mm

4.2 Internal Identification of EUT used during the test

EUT ID*	IMEI	HW	SW Version
EUT1	015773000003876	03	1CS09000
EUT2	015773000003298	03	1CS09000
EUT3	015730000003975	03	1CS09000
EUT4	015773000003744	03	1CS09000
EUT5	015773000002316	03	1CS09000
EUT6	015773000002795	03	1CS09000

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

Note: It is performed to test SAR with the EUT1&2&3 and conducted power with the EUT4&5&6.

4.3 Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	Battery	TLp040M1	CAC4000020C1	BYD

*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

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

KDB865664 D01SAR measurement 100 MHz to 6 GHz v01r04: SAR Measurement Requirements for 100 MHz to 6 GHz.

KDB865664 D02RF 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

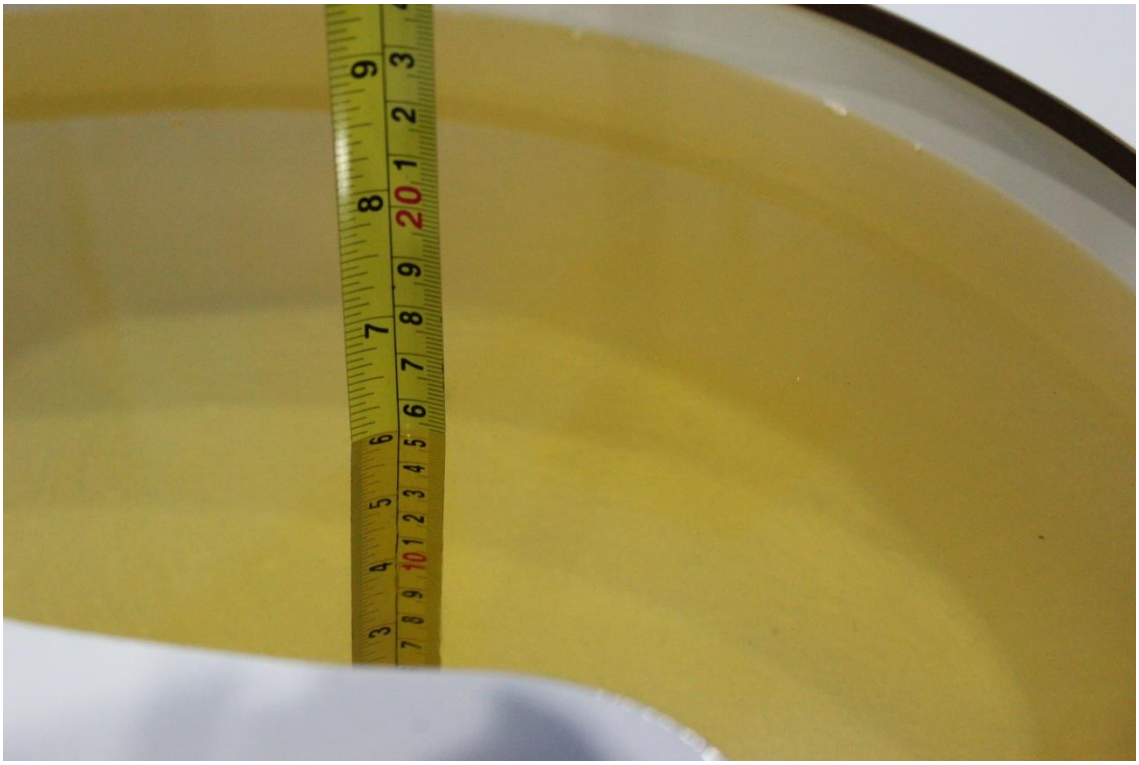
Frequency(MHz)	Liquid Type	Conductivity(σ)	± 5% Range	Permittivity(ε)	± 5% Range
750	Head	0.89	0.85～0.93	41.94	39.8～44.0
835	Head	0.90	0.86～0.95	41.5	39.4～43.6
1750	Head	1.37	1.30～1.44	40.08	38.1～42.1
1900	Head	1.40	1.33～1.47	40.0	38.0～42.0
2450	Head	1.80	1.71～1.89	39.2	37.2～41.2
2600	Head	1.96	1.86～2.06	39.01	37.1～41.0
5200	Head	4.66	4.43～4.89	35.99	34.19～37.79
5800	Head	5.27	5.01～5.53	35.30	33.54～37.07

7.2 Dielectric Performance

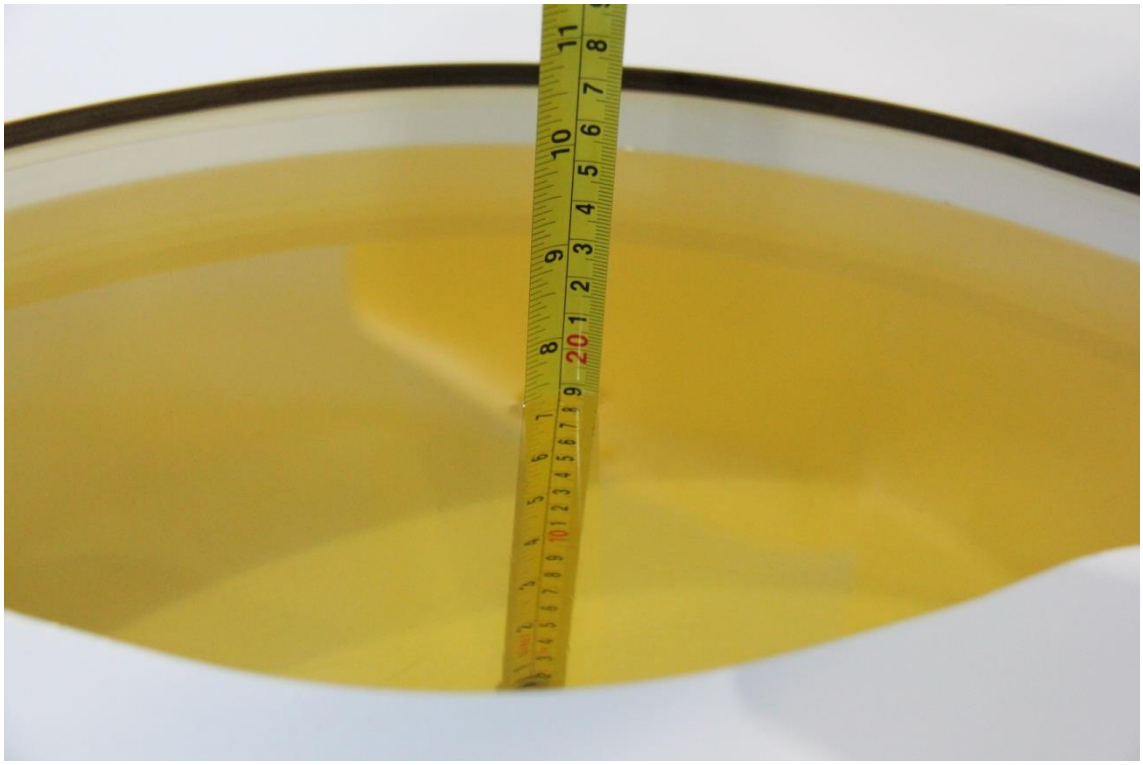
Table 7.2: Dielectric Performance of Tissue Simulating Liquid

Measurement Date (yyyy-mm-dd)	Type	Frequency	Permittivity ε	Drift (%)	Conductivity σ (S/m)	Drift (%)
2020/7/14	Head	750 MHz	42.71	1.84	0.895	0.56
2020/7/15	Head	750 MHz	41.96	0.05	0.896	0.67
2020/7/16	Head	835 MHz	41.49	-0.02	0.918	2.00
2020/7/17	Head	835 MHz	40.85	-1.57	0.9	0.00
2020/7/18	Head	1750 MHz	39.86	-0.55	1.355	-1.09
2020/7/19	Head	1900 MHz	40.05	0.12	1.375	-1.79
2020/7/20	Head	1900 MHz	39.44	-1.40	1.397	-0.21
2020/7/21	Head	2450 MHz	38.98	-0.56	1.817	0.94
2020/7/22	Head	2600 MHz	39.1	0.23	1.961	0.05
2020/7/23	Head	2600 MHz	38.63	-0.97	1.942	-0.92
2020/7/24	Head	5200 MHz	36.53	1.50	4.693	0.71
2020/7/25	Head	5800 MHz	34.9	-1.13	5.233	-0.70

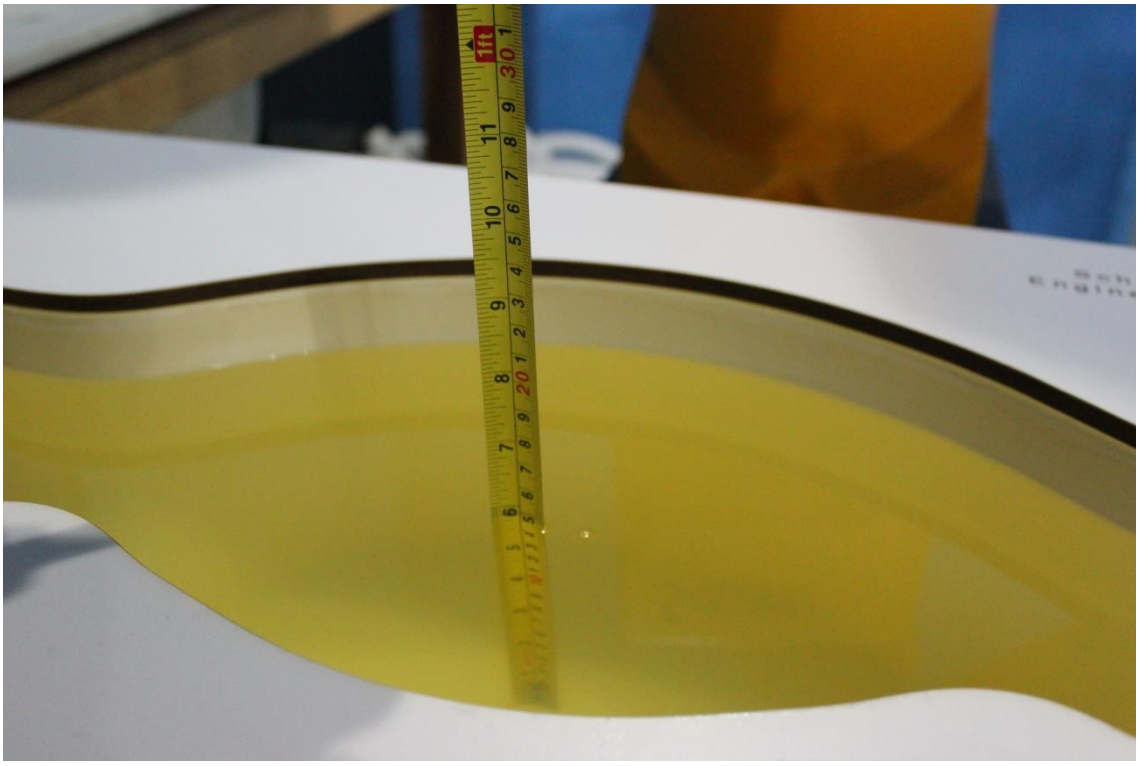
Note: The liquid temperature is 22.0℃



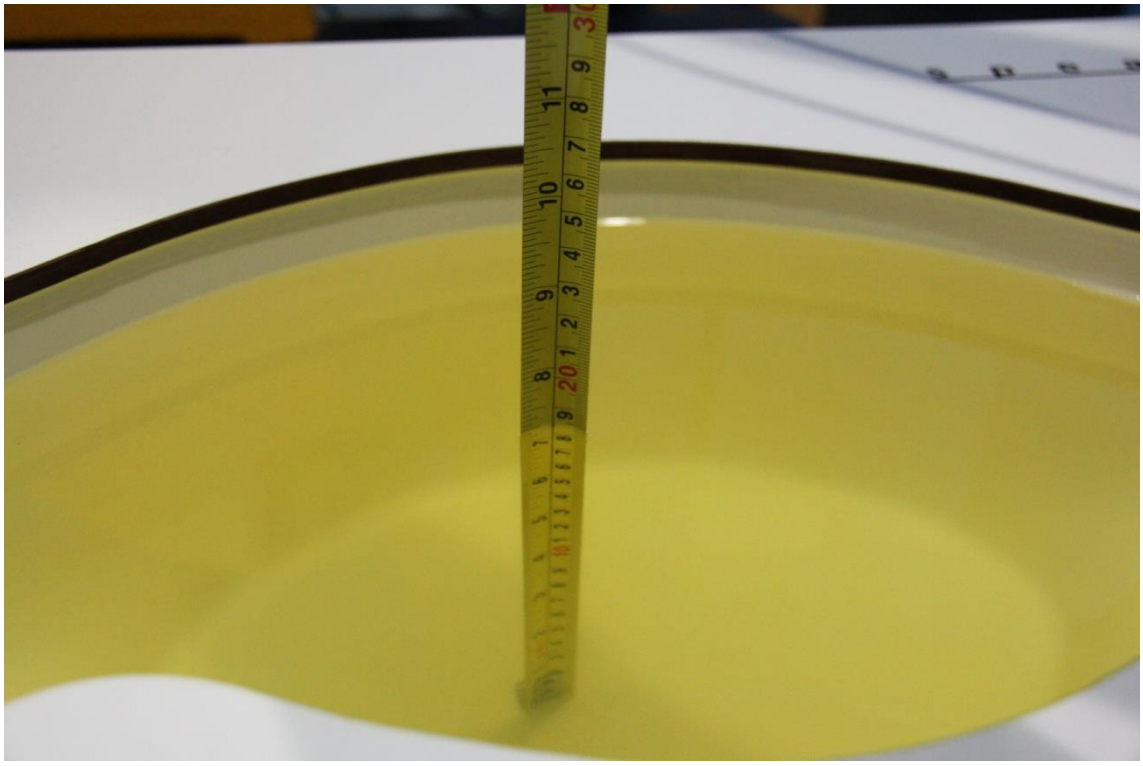
Picture 7-1 Liquid depth in the Flat Phantom (750MHz)



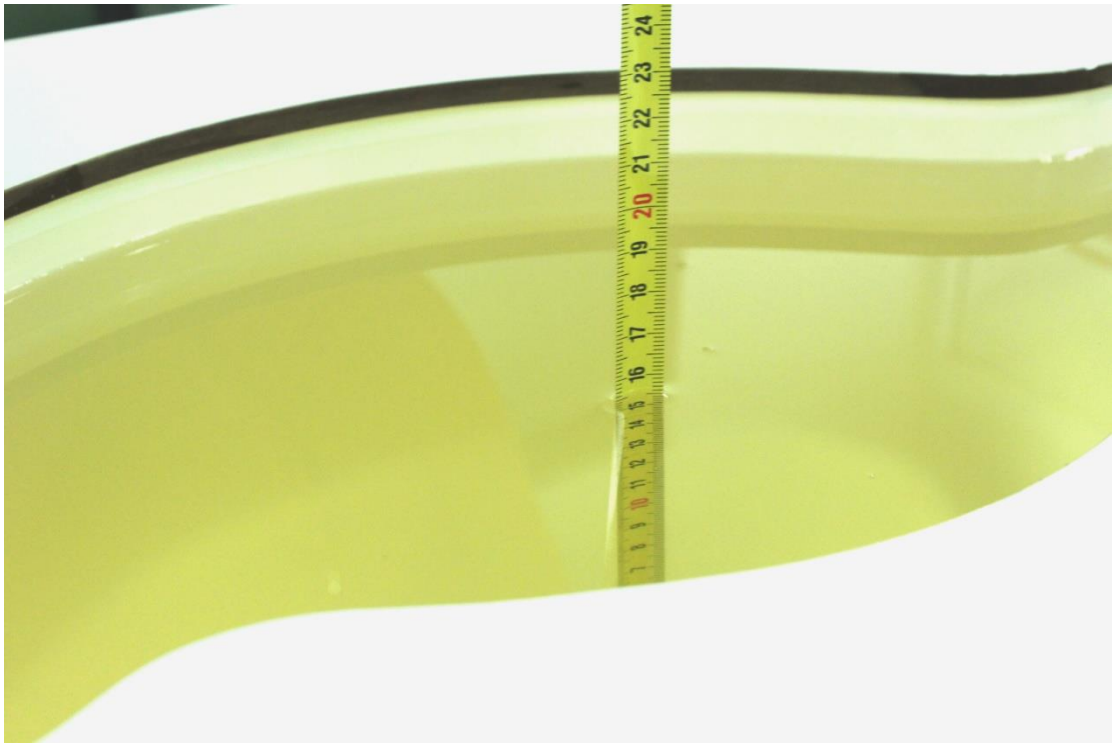
Picture 7-2 Liquid depth in the Flat Phantom (835 MHz)



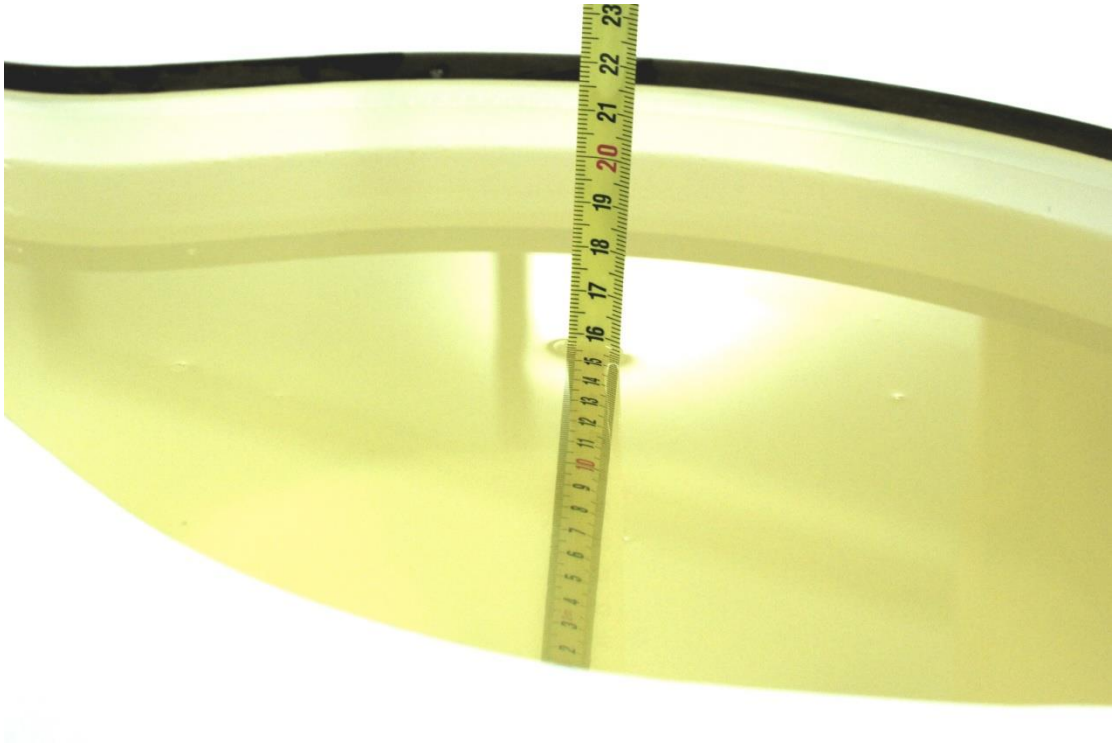
Picture 7-3 Liquid depth in the Flat Phantom (1750MHz)



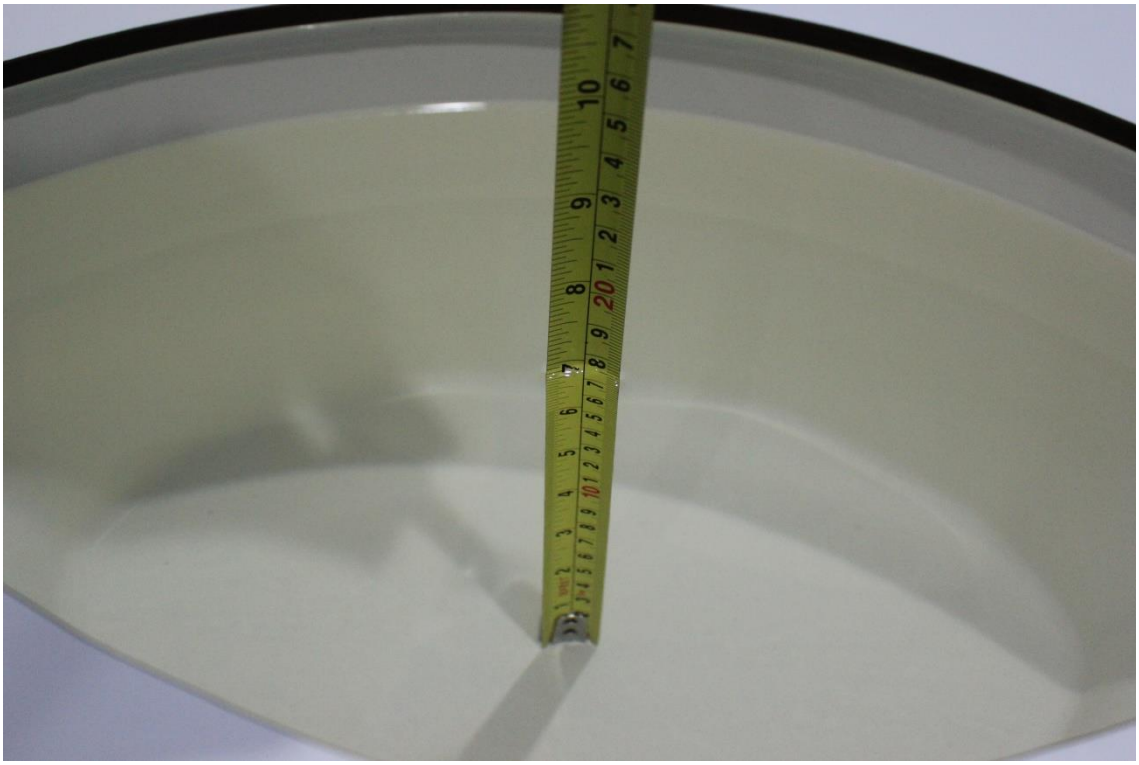
Picture 7-4 Liquid depth in the Flat Phantom (1900MHz)



Picture 7-5 Liquid depth in the Flat Phantom (2450MHz)



Picture 7-6 Liquid depth in the Flat Phantom (2600MHz)

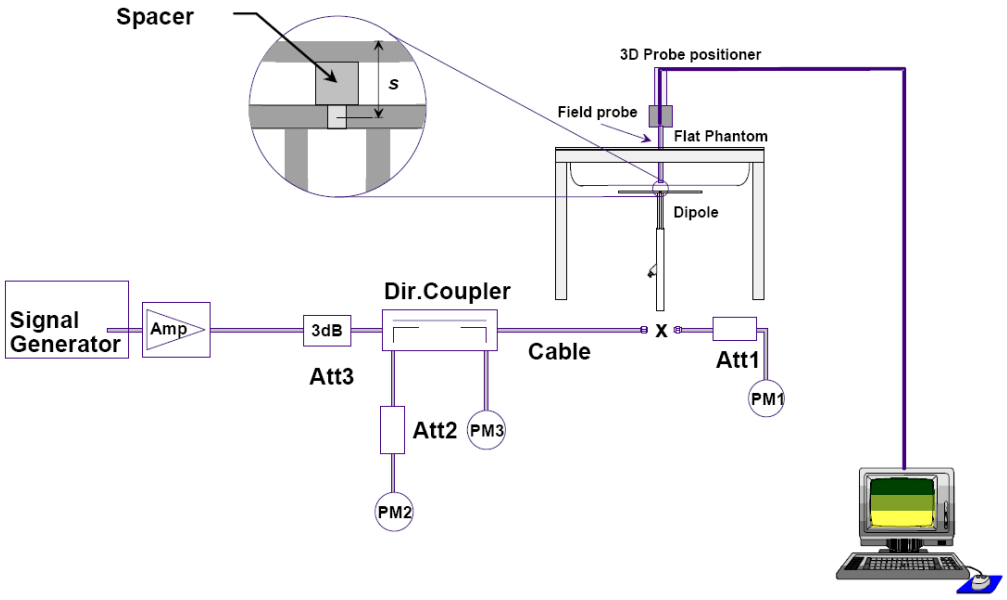


Picture 7-7 Liquid depth in the Flat Phantom (5GHz)

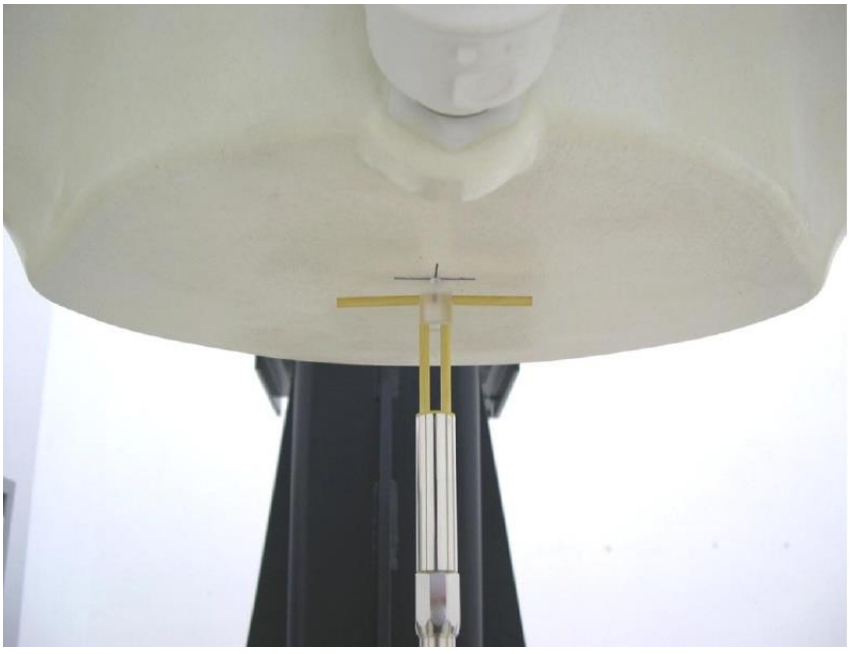
8 System verification

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 Body

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
2020/7/14	750 MHz	5.55	8.44	5.56	8.44	0.18%	0.00%
2020/7/15	750 MHz	5.55	8.44	5.48	8.32	-1.26%	-1.42%
2020/7/16	835 MHz	6.20	9.49	6.28	9.48	1.29%	-0.11%
2020/7/17	835 MHz	6.20	9.49	6.24	9.32	0.65%	-1.79%
2020/7/18	1750 MHz	18.7	35.5	18.92	34.88	1.18%	-1.75%
2020/7/19	1900 MHz	20.8	40.1	20.72	39.32	-0.38%	-1.95%
2020/7/20	1900 MHz	20.8	40.1	21.16	40.24	1.73%	0.35%
2020/7/21	2450 MHz	24.0	52.7	23.72	52.68	-1.17%	-0.04%
2020/7/22	2600 MHz	25.3	57.2	25.32	57.84	0.08%	1.12%
2020/7/23	2600 MHz	25.3	57.2	25.4	56.52	0.40%	-1.19%
2020/7/24	5200 MHz	21.7	75.9	21.8	74.7	0.65%	-1.55%
2020/7/25	5800 MHz	22.8	79.3	22.6	80.5	-0.88%	1.49%

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.

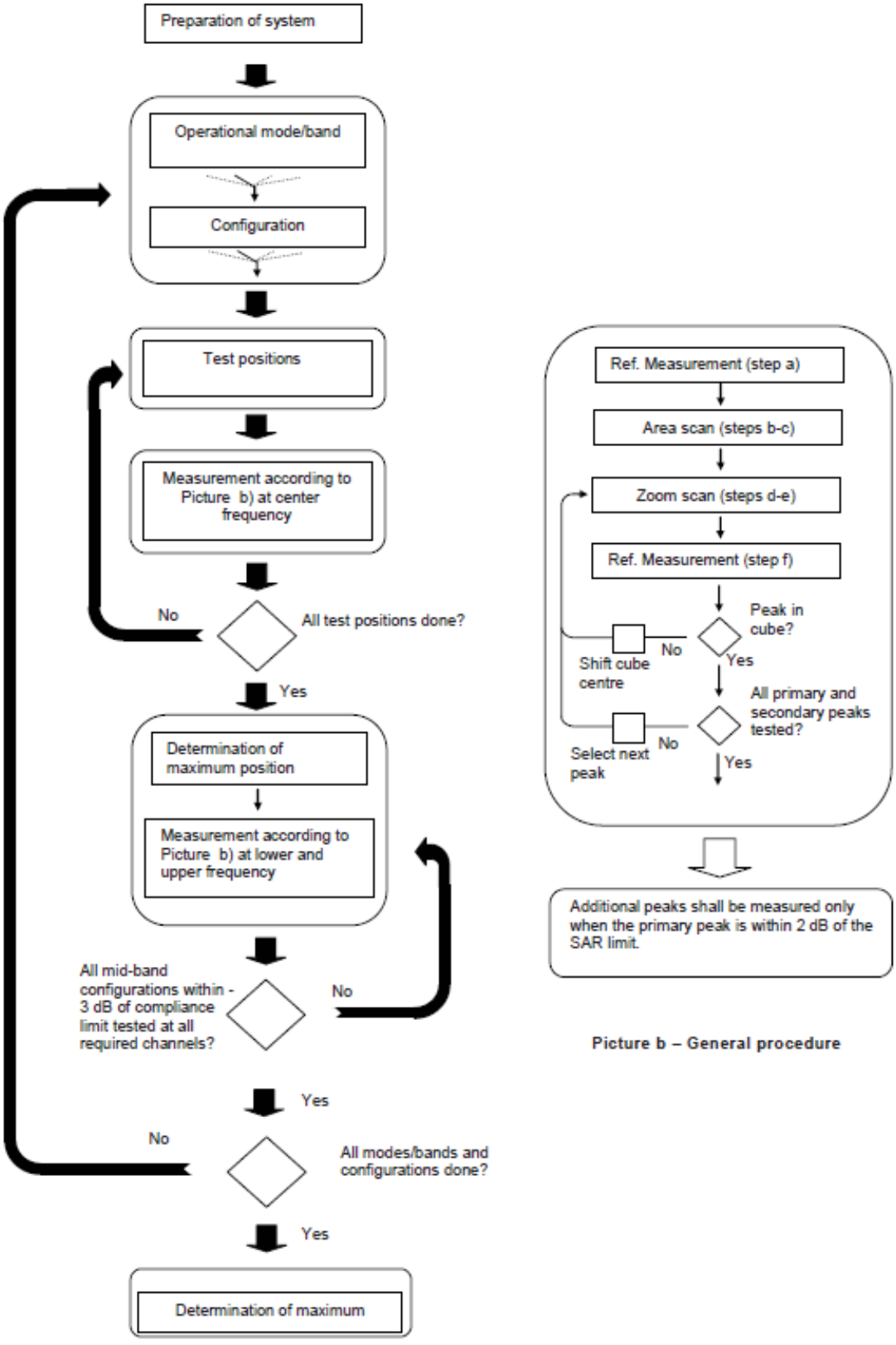
Step 1: The tests described in 9.2 shall be performed at the channel that is closest to the centre of the transmit frequency band (f_c) for:

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 v02r05 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 v02r05. SAR testing is performed using the extended cyclic prefix listed in 3GPP TS 36.211.

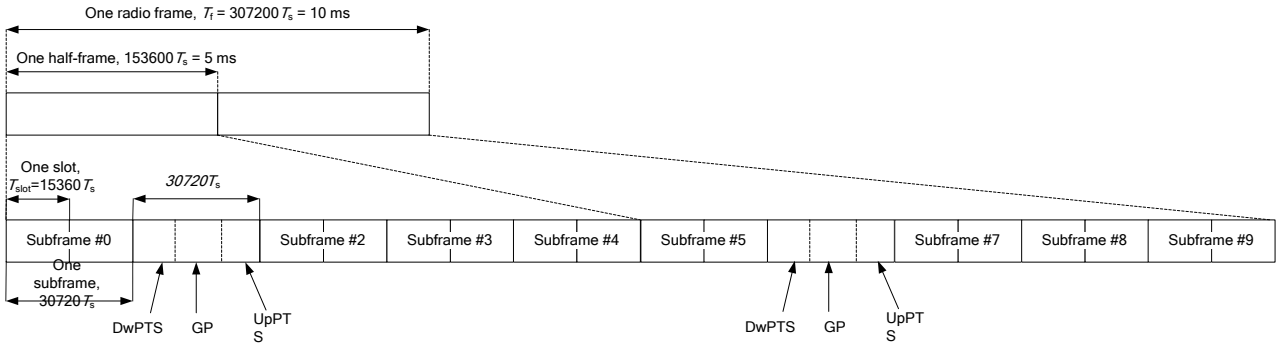


Figure 9.2: Frame structure type 2 (for 5 ms switch-point periodicity)

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

According to the KDB 447498 D01, SAR should be evaluated at more than 3 frequencies for devices supporting transmit bands wider than 100MHz. Oct.2014 FCC-TCB conference notes (Dec. 2014 rev.) specifies the 5 test channels to use for 3GPP band 41 SAR evaluation.

This device supports uplink-downlink configurations 0-6. The configuration with highest duty cycle was used for SAR Testing: configuration 0 at 63.3% (Power Class 3) and configuration 1 at 43.3% (Power Class 2) duty cycle.

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, DASY4 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 v05, 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

There are two sets of tune-up power, Normal power and Low power, for all bands by proximity sensor. The detail of proximity sensor is presented in annex I.

11.1 GSM Measurement result

During the process of testing, the EUT was controlled via Agilent Digital Radio Communication tester (E5515C) to ensure the maximum power transmission and proper modulation. This result contains conducted output power for the EUT. In all cases, the measured peak output power should be greater and within 5% than EMI measurement.

Normal Power

Table 11.1-1: The conducted power measurement results for GPRS and EGPRS

GSM 850	Measured Power (dBm)				calculation	Averaged Power (dBm)		
GPRS (GMSK)	251	190	128			251	190	128
1 Txslot	31.99	32.01	31.95	33.50	-9.03	22.96	22.98	22.92
2 Txslots	**30.78**	**30.80**	**30.75**	**32.00**	**-6.02**	**24.76**	**24.78**	**24.73**
3Txslots	28.79	28.82	28.77	30.00	-4.26	24.53	24.56	24.51
4 Txslots	27.36	27.36	27.33	28.50	-3.01	24.35	24.35	24.32
GSM 850	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (GMSK)	251	190	128			251	190	128
1 Txslot	31.98	31.99	31.94	33.50	-9.03	22.95	22.96	22.91
2 Txslots	30.77	30.78	30.75	**32.00**	-6.02	24.75	24.76	24.73
3Txslots	28.78	28.80	28.77	30.00	-4.26	24.52	24.54	24.51
4 Txslots	27.35	27.35	27.33	28.50	-3.01	24.34	24.34	24.32
GSM 850	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (8PSK)	251	190	128			251	190	128
1 Txslot	26.90	26.96	26.98	28.00	-9.03	17.87	17.93	17.95
2 Txslots	25.78	25.84	25.86	27.00	-6.02	19.76	19.82	19.84
3Txslots	23.57	23.62	23.62	25.00	-4.26	19.31	19.36	19.36
4 Txslots	22.42	22.47	22.46	23.50	-3.01	19.41	19.46	19.45
PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
GPRS (GMSK)	810	661	512			810	661	512
1 Txslot	29.31	29.12	29.00	30.50	-9.03	20.28	20.09	19.97
2 Txslots	**28.03**	**27.84**	**27.70**	**29.00**	**-6.02**	**22.01**	**21.82**	**21.68**
3Txslots	26.21	25.91	25.76	27.00	-4.26	21.95	21.65	21.50
4 Txslots	24.86	24.54	24.28	25.50	-3.01	21.85	21.53	21.27
PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (GMSK)	810	661	512			810	661	512
1 Txslot	29.30	29.11	28.97	30.50	-9.03	20.27	20.08	19.94
2 Txslots	28.02	27.82	27.66	29.00	-6.02	22.00	21.80	21.64
3Txslots	26.20	25.91	25.72	27.00	-4.26	21.94	21.65	21.46
4 Txslots	24.85	24.54	24.26	25.50	-3.01	21.84	21.53	21.25

PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (8PSK)	810	661	512			810	661	512
1 Txslot	25.91	25.90	25.80	27.00	-9.03	16.88	16.87	16.77
2 Txslots	24.81	24.78	24.46	26.00	-6.02	18.79	18.76	18.44
3Txslots	22.57	22.44	22.23	24.00	-4.26	18.31	18.18	17.97
4 Txslots	21.31	21.29	20.97	22.50	-3.01	18.30	18.28	17.96

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 body measurements are performed with 2Txslots for GSM850 and GSM1900.

Low Power

Table 11.1-2: The conducted power measurement results for GPRS and EGPRS

GSM 850	Measured Power (dBm)				calculation	Averaged Power (dBm)		
GPRS (GMSK)	251	190	128			251	190	128
1 Txslot	25.85	25.87	25.91	27.00	-9.03	16.82	16.84	16.88
2 Txslots	**24.49**	**24.51**	**24.62**	**25.50**	**-6.02**	**18.47**	**18.49**	**18.60**
3Txslots	22.52	22.53	22.60	23.50	-4.26	18.26	18.27	18.34
4 Txslots	20.95	20.94	21.02	22.00	-3.01	17.94	17.93	18.01
GSM 850	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (GMSK)	251	190	128			251	190	128
1 Txslot	25.82	25.86	25.89	27.00	-9.03	16.79	16.83	16.86
2 Txslots	24.47	24.50	24.60	25.50	-6.02	18.45	18.48	18.58
3Txslots	22.50	22.52	22.58	23.50	-4.26	18.24	18.26	18.32
4 Txslots	20.93	20.94	21.00	22.00	-3.01	17.92	17.93	17.99
GSM 850	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (8PSK)	251	190	128			251	190	128
1 Txslot	25.76	25.79	25.82	26.50	-9.03	16.73	16.76	16.79
2 Txslots	24.55	24.58	24.60	25.50	-6.02	18.53	18.56	18.58
3Txslots	22.39	22.43	22.46	23.50	-4.26	18.13	18.17	18.20
4 Txslots	21.28	21.31	21.30	22.00	-3.01	18.27	18.30	18.29
PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
GPRS (GMSK)	810	661	512			810	661	512
1 Txslot	20.61	20.52	20.73	21.50	-9.03	11.58	11.49	11.70
2 Txslots	**19.71**	**19.59**	**19.83**	**20.00**	**-6.02**	**13.69**	**13.57**	**13.81**

3Txslots	17.80	17.62	17.93	18.50	-4.26	13.54	13.36	13.67
4 Txslots	16.46	16.23	16.50	17.00	-3.01	13.45	13.22	13.49
PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (GMSK)	810	661	512			810	661	512
1 Txslot	20.61	20.52	20.73	21.50	-9.03	11.58	11.49	11.70
2 Txslots	19.71	19.59	19.82	20.00	-6.02	13.69	13.57	13.80
3Txslots	17.80	17.62	17.92	18.50	-4.26	13.54	13.36	13.66
4 Txslots	16.46	16.23	16.50	17.00	-3.01	13.45	13.22	13.49
PCS1900	Measured Power (dBm)				calculation	Averaged Power (dBm)		
EGPRS (8PSK)	810	661	512			810	661	512
1 Txslot	20.84	20.80	20.79	21.00	-9.03	11.81	11.77	11.76
2 Txslots	19.71	19.71	19.72	20.00	-6.02	13.69	13.69	13.70
3Txslots	17.52	17.44	17.38	18.50	-4.26	13.26	13.18	13.12
4 Txslots	16.16	16.14	16.11	17.00	-3.01	13.15	13.13	13.10

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 body measurements are performed with 2Txslots for GSM850 and GSM1900.

11.2 WCDMA Measurement result

Normal power

Table 11.2-1: The conducted Power for WCDMA

Item	band	FDDV result			
	ARFCN	4132 (826.4MHz)	4182 (836.4MHz)	4233 (846.6MHz)	Tune up
WCDMA	\	23.09	23.01	23.05	24.00
HSUPA	1	20.07	19.97	19.91	21.00
	2	20.06	19.99	19.97	21.00
	3	21.02	20.94	20.92	22.00
	4	19.54	19.55	19.58	21.00
	5	20.99	20.89	20.91	22.00
HSPA+(16QAM)	1	21.58	21.48	21.50	22.50
DC-HSDPA	1	21.97	21.92	21.95	22.50
	2	21.83	21.66	21.78	22.50
	3	21.46	21.41	21.44	22.50
	4	21.45	21.40	21.43	22.50
Item	band	FDDIV result			
	ARFCN	1312 (1712.4MHz)	1412 (1732.4MHz)	1513 (1752.6MHz)	
WCDMA	\	22.98	22.99	22.92	24.00
HSUPA	1	19.83	19.84	19.85	21.00
	2	19.76	19.72	19.74	21.00
	3	20.78	20.73	20.76	22.00
	4	19.58	19.52	19.55	21.00
	5	20.72	20.74	20.71	22.00
HSPA+(16QAM)	1	21.29	21.31	21.28	22.50
DC-HSDPA	1	21.73	21.72	21.73	22.50
	2	21.32	21.22	21.26	22.50
	3	21.2	21.21	21.23	22.50
	4	21.2	21.21	21.21	22.50
Item	band	FDDII result			
	ARFCN	9262 (1852.4MHz)	9400 (1880MHz)	9538 (1907.6MHz)	
WCDMA	\	23.01	23.03	23.07	24.00
HSUPA	1	19.84	19.91	19.98	21.00
	2	19.73	19.79	19.86	21.00
	3	20.72	20.81	20.88	22.00
	4	19.54	19.57	19.58	21.00
	5	20.72	20.77	20.84	22.00
HSPA+(16QAM)	1	21.35	21.38	21.45	22.50
DC-HSDPA	1	21.7	21.72	21.80	22.50
	2	21.29	21.36	21.30	22.50
	3	21.2	21.28	21.33	22.50
	4	21.18	21.22	21.31	22.50

Low power

Table 11.2-2: The conducted Power for WCDMA

Item	band	FDDV result			
	ARFCN	4132 (826.4MHz)	4182 (836.4MHz)	4233 (846.6MHz)	Tune up
WCDMA	\	18.16	18.11	18.16	19.00
HSUPA	1	16.1	16.11	16.14	17.00
	2	16.07	16.08	16.12	17.00
	3	17.07	17.07	17.14	18.00
	4	15.58	15.56	15.63	17.00
	5	17.04	17.03	17.07	18.00
HSPA+(16QAM)	1	17.56	17.58	17.65	18.50
DC-HSDPA	1	17.97	17.95	17.98	18.50
	2	17.95	17.95	17.98	18.50
	3	17.6	17.58	17.63	18.50
	4	17.55	17.56	17.61	18.50
Item	band	FDDIV result			
	ARFCN	1312 (1712.4MHz)	1412 (1732.4MHz)	1513 (1752.6MHz)	
WCDMA	\	15.79	15.89	15.77	16.50
HSUPA	1	13.8	13.84	13.79	15.00
	2	13.79	13.82	13.76	15.00
	3	14.73	14.74	14.73	16.00
	4	13.23	13.28	13.25	15.00
	5	14.67	14.72	14.68	16.00
HSPA+(16QAM)	1	15.22	15.28	15.25	16.50
DC-HSDPA	1	15.74	15.76	15.73	16.50
	2	15.7	15.74	15.72	16.50
	3	15.25	15.30	15.23	16.50
	4	15.22	15.28	15.20	16.50
Item	band	FDDII result			
	ARFCN	9262 (1852.4MHz)	9400 (1880MHz)	9538 (1907.6MHz)	
WCDMA	\	15.92	15.90	15.81	16.50
HSUPA	1	13.8	13.81	13.89	15.00
	2	13.76	13.79	13.83	15.00
	3	14.75	14.76	14.83	16.00
	4	13.25	13.29	13.33	15.00
	5	14.71	14.73	14.77	16.00
HSPA+(16QAM)	1	15.3	15.22	15.38	16.50
DC-HSDPA	1	15.71	15.80	15.90	16.50
	2	15.7	15.75	15.84	16.50
	3	15.2	15.27	15.34	16.50
	4	15.19	15.24	15.32	16.50

11.3 LTE Measurement result

Table 13.3-1: 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

Table 13.3-2: Maximum Power Reduction (MPR) for LTE Band7/41 on Low power

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

Table 13.3-3: The tune up for LTE – Normal Power

Band	Tune up
LTE Band 7	23.5
LTE Band 12	24
LTE Band 13	24
LTE Band 25	24
LTE Band 26	24
LTE Band 41 – PC2	27
LTE Band 41 – PC3	24
LTE Band 66	24
LTE Band 71	24

Table 13.3-4: The tune up for LTE – Low Power

Band	Tune up
LTE Band 7	14
LTE Band 12	19
LTE Band 13	19
LTE Band 25	16.5
LTE Band 26	19
LTE Band 41 – PC2	17
LTE Band 41 – PC3	14
LTE Band 66	16.5
LTE Band 71	19

Normal power

Table 11.3-4: The conducted Power for LTE

Band 7				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
5 MHz	1RB High (24)	2567.5	22.35	21.44
		2535	22.42	21.52
		2502.5	22.30	21.81
	1RB Middle (12)	2567.5	22.62	21.71
		2535	22.71	21.82
		2502.5	22.62	22.10
	1RB Low (0)	2567.5	22.34	21.44
		2535	22.39	21.49
		2502.5	22.33	21.81
	12RB High (13)	2567.5	21.46	20.53
		2535	21.49	20.54
		2502.5	21.46	20.55
	12RB Middle (6)	2567.5	21.50	20.58
		2535	21.51	20.61
		2502.5	21.52	20.65
	12RB Low (0)	2567.5	21.42	20.51
		2535	21.48	20.56
		2502.5	21.50	20.62
	25RB (0)	2567.5	21.45	20.44
		2535	21.47	20.53
		2502.5	21.44	20.53
10 MHz	1RB High (49)	2565	22.35	21.35
		2535	22.46	21.81
		2505	22.33	21.41
	1RB Middle (24)	2565	22.48	21.45
		2535	22.57	21.91
		2505	22.45	21.48
	1RB Low (0)	2565	22.38	21.30
		2535	22.43	21.74
		2505	22.35	21.37
	25RB High (25)	2565	21.46	20.52
		2535	21.51	20.58
		2505	21.50	20.60
	25RB Middle (12)	2565	21.46	20.54
		2535	21.50	20.60
		2505	21.48	20.62
	25RB Low (0)	2565	21.52	20.57
		2535	21.47	20.55
		2505	21.46	20.54
	50RB (0)	2565	21.51	20.52
		2535	21.52	20.55
		2505	21.48	20.53

15 MHz	1RB High (74)	2562.5	22.24	21.23
		2535	22.33	21.72
		2507.5	22.28	21.72
	1RB Middle (37)	2562.5	22.41	21.31
		2535	22.41	21.81
		2507.5	22.40	21.77
	1RB Low (0)	2562.5	22.27	21.22
		2535	22.30	21.68
		2507.5	22.37	21.68
	36RB High (38)	2562.5	21.45	20.37
		2535	21.49	20.55
		2507.5	21.53	20.47
	36RB Middle (19)	2562.5	21.54	20.45
		2535	21.47	20.51
		2507.5	21.49	20.39
	36RB Low (0)	2562.5	21.56	20.49
		2535	21.43	20.49
		2507.5	21.50	20.38
	75RB (0)	2562.5	21.56	20.49
		2535	21.49	20.53
		2507.5	21.48	20.45
20 MHz	1RB High (99)	2560	22.23	21.71
		2535	22.26	21.68
		2510	22.27	21.81
	1RB Middle (50)	2560	22.61	22.01
		2535	22.60	21.97
		2510	22.52	22.08
	1RB Low (0)	2560	22.26	21.73
		2535	22.26	21.63
		2510	22.28	21.80
	50RB High (50)	2560	21.37	20.40
		2535	21.48	20.49
		2510	21.49	20.52
	50RB Middle (25)	2560	21.41	20.50
		2535	21.50	20.50
		2510	21.46	20.51
	50RB Low (0)	2560	21.57	20.59
		2535	21.46	20.47
		2510	21.35	20.38
	100RB (0)	2560	21.49	20.49
		2535	21.47	20.50
		2510	21.48	20.49

Band 12				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
1.4 MHz	1RB High (5)	715.3	22.76	21.77
		707.5	22.68	21.68
		699.7	22.79	21.79
	1RB Middle (3)	715.3	22.93	21.85
		707.5	22.89	21.86
		699.7	22.98	21.93
	1RB Low (0)	715.3	22.64	21.67
		707.5	22.67	22.02
		699.7	22.74	22.05
	3RB High (3)	715.3	22.84	21.91
		707.5	22.82	21.91
		699.7	22.85	21.98
	3RB Middle (1)	715.3	22.85	21.82
		707.5	22.89	21.81
		699.7	22.91	21.85
	3RB Low (0)	715.3	22.87	21.72
		707.5	22.85	21.88
		699.7	22.82	21.94
	6RB (0)	715.3	21.86	20.94
		707.5	21.81	20.93
		699.7	21.81	20.99
3 MHz	1RB High (14)	714.5	22.72	21.65
		707.5	22.80	22.09
		700.5	22.81	21.71
	1RB Middle (7)	714.5	22.87	21.78
		707.5	22.97	22.22
		700.5	22.97	21.87
	1RB Low (0)	714.5	22.74	21.67
		707.5	22.83	22.07
		700.5	22.75	21.81
	8RB High (7)	714.5	21.79	20.82
		707.5	21.79	20.80
		700.5	21.80	20.89
	8RB Middle (4)	714.5	21.83	20.91
		707.5	21.84	20.88
		700.5	21.88	20.98
	8RB Low (0)	714.5	21.77	20.87
		707.5	21.81	20.88
		700.5	21.79	20.90
	15RB (0)	714.5	21.79	20.81
		707.5	21.79	20.72
		700.5	21.83	20.86

5 MHz	1RB High (24)	713.5	22.75	21.81
		707.5	22.70	21.76
		701.5	22.75	22.16
	1RB Middle (12)	713.5	22.97	22.03
		707.5	22.96	22.00
		701.5	22.98	22.44
	1RB Low (0)	713.5	22.74	21.75
		707.5	22.69	21.72
		701.5	22.70	22.18
	12RB High (13)	713.5	21.73	20.75
		707.5	21.74	20.83
		701.5	21.83	20.81
	12RB Middle (6)	713.5	21.80	20.82
		707.5	21.85	20.90
		701.5	21.87	20.90
	12RB Low (0)	713.5	21.78	20.81
		707.5	21.77	20.77
		701.5	21.76	20.84
	25RB (0)	713.5	21.77	20.81
		707.5	21.74	20.76
		701.5	21.81	20.77
10 MHz	1RB High (49)	711	22.71	21.65
		707.5	22.76	21.55
		704	22.75	21.96
	1RB Middle (24)	711	22.82	21.70
		707.5	22.87	21.62
		704	22.86	22.13
	1RB Low (0)	711	22.72	21.60
		707.5	22.66	21.53
		704	22.57	21.94
	25RB High (25)	711	21.60	20.70
		707.5	21.66	20.70
		704	21.68	20.75
	25RB Middle (12)	711	21.69	20.79
		707.5	21.70	20.75
		704	21.72	20.77
	25RB Low (0)	711	21.74	20.81
		707.5	21.75	20.77
		704	21.68	20.75
	50RB (0)	711	21.65	20.71
		707.5	21.70	20.75
		704	21.73	20.74

Band 13				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
5 MHz	1RB High (24)	784.5	22.60	21.64
		782	22.56	21.67
		779.5	22.60	22.08
	1RB Middle (12)	784.5	22.84	21.83
		782	22.79	21.92
		779.5	22.84	22.36
	1RB Low (0)	784.5	22.55	21.63
		782	22.60	21.77
		779.5	22.60	22.14
	12RB High (13)	784.5	21.62	20.63
		782	21.59	20.63
		779.5	21.66	20.79
	12RB Middle (6)	784.5	21.76	20.73
		782	21.71	20.77
		779.5	21.74	20.88
	12RB Low (0)	784.5	21.65	20.69
		782	21.66	20.71
		779.5	21.67	20.79
	25RB (0)	784.5	21.66	20.62
		782	21.63	20.65
		779.5	21.68	20.74
10 MHz	1RB High (49)	782	22.73	21.57
	1RB Middle (24)	782	22.76	21.65
	1RB Low (0)	782	22.61	21.62
	25RB High (25)	782	21.61	20.64
	25RB Middle (12)	782	21.75	20.76
	25RB Low (0)	782	21.72	20.73
	50RB (0)	782	21.69	20.68

Band 25				
Bandwidth (MHz)	RB allocation	Frequency (MHz)	QPSK	16QAM
	RB offset (Start RB)		Actual output power (dBm)	Actual output power (dBm)
1.4 MHz	1RB High (5)	1914.3	22.63	21.65
		1882.5	22.63	21.80
		1850.7	22.62	21.74
	1RB Middle (3)	1914.3	22.73	22.17
		1882.5	22.68	21.80
		1850.7	22.86	21.63
	1RB Low (0)	1914.3	22.63	21.73
		1882.5	22.60	22.02
		1850.7	22.71	21.85
	3RB High (3)	1914.3	22.70	21.91
		1882.5	22.75	21.80
		1850.7	22.81	21.98
	3RB Middle (1)	1914.3	22.61	21.95
		1882.5	22.80	21.95
		1850.7	22.84	22.00
	3RB Low (0)	1914.3	22.72	21.79
		1882.5	22.68	21.94
		1850.7	22.76	21.81
	6RB (0)	1914.3	21.72	20.88
		1882.5	21.63	20.81
		1850.7	21.79	20.90
3 MHz	1RB High (14)	1913.5	22.70	21.61
		1882.5	22.68	22.11
		1851.5	22.71	21.70
	1RB Middle (7)	1913.5	22.81	21.92
		1882.5	22.78	21.77
		1851.5	22.94	21.81
	1RB Low (0)	1913.5	22.73	21.83
		1882.5	22.71	21.67
		1851.5	22.76	22.19
	8RB High (7)	1913.5	21.73	20.83
		1882.5	21.64	20.75
		1851.5	21.71	20.83
	8RB Middle (4)	1913.5	21.81	20.89
		1882.5	21.72	20.81
		1851.5	21.79	20.94
	8RB Low (0)	1913.5	21.74	20.88
		1882.5	21.72	20.83
		1851.5	21.77	20.82
	15RB (0)	1913.5	21.72	20.79
		1882.5	21.70	20.68
		1851.5	21.76	20.82

5 MHz	1RB High (24)	1912.5	22.62	22.12
		1882.5	22.63	21.75
		1852.5	22.64	21.80
	1RB Middle (12)	1912.5	22.86	22.38
		1882.5	22.89	22.02
		1852.5	22.90	22.01
	1RB Low (0)	1912.5	22.63	22.15
		1882.5	22.66	22.13
		1852.5	22.65	22.17
	12RB High (13)	1912.5	21.68	20.80
		1882.5	21.66	20.87
		1852.5	21.70	20.85
	12RB Middle (6)	1912.5	21.75	20.86
		1882.5	21.74	20.84
		1852.5	21.79	20.88
	12RB Low (0)	1912.5	21.72	20.79
		1882.5	21.72	20.79
		1852.5	21.78	20.88
	25RB (0)	1912.5	21.72	20.68
		1882.5	21.70	20.66
		1852.5	21.67	20.73
10 MHz	1RB High (49)	1910	22.71	21.60
		1882.5	22.64	21.71
		1855	22.66	21.69
	1RB Middle (24)	1910	22.46	21.84
		1882.5	22.55	21.89
		1855	22.54	21.86
	1RB Low (0)	1910	22.60	21.62
		1882.5	22.66	22.06
		1855	22.69	21.69
	25RB High (25)	1910	21.65	20.83
		1882.5	21.67	20.79
		1855	21.80	20.87
	25RB Middle (12)	1910	22.56	20.93
		1882.5	21.71	20.82
		1855	21.77	20.94
	25RB Low (0)	1910	21.79	20.87
		1882.5	21.77	20.82
		1855	21.84	20.97
	50RB (0)	1910	21.80	20.81
		1882.5	21.74	20.80
		1855	21.80	20.27
15 MHz	1RB High (74)	1907.5	22.68	22.11
		1882.5	22.69	22.17
		1857.5	22.67	21.71
	1RB Middle (37)	1907.5	22.71	22.24
		1882.5	22.73	22.22
		1857.5	22.74	21.74

	1RB Low (0)	1907.5	22.77	22.23
		1882.5	22.71	22.13
		1857.5	22.72	21.68
	36RB High (38)	1907.5	21.74	20.73
		1882.5	21.66	20.74
		1857.5	21.76	20.77
	36RB Middle (19)	1907.5	21.80	20.73
		1882.5	21.77	20.82
		1857.5	21.80	20.79
	36RB Low (0)	1907.5	21.73	20.76
		1882.5	21.72	20.77
		1857.5	21.88	20.83
	75RB (0)	1907.5	21.68	20.79
		1882.5	21.69	20.74
		1857.5	21.77	20.83
20 MHz	1RB High (99)	1905	22.43	21.99
		1882.5	22.43	21.98
		1860	22.46	22.11
	1RB Middle (50)	1905	22.74	22.24
		1882.5	22.68	22.19
		1860	22.76	22.36
	1RB Low (0)	1905	22.49	22.03
		1882.5	22.46	21.98
		1860	22.51	22.09
	50RB High (50)	1905	21.47	20.53
		1882.5	21.51	20.53
		1860	21.73	20.82
	50RB Middle (25)	1905	21.61	20.72
		1882.5	21.64	20.69
		1860	21.72	20.82
	50RB Low (0)	1905	21.55	20.66
		1882.5	21.61	20.64
		1860	21.88	20.93
	100RB (0)	1905	21.55	20.60
		1882.5	21.55	20.60
		1860	21.79	20.86

Band 26				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
1.4 MHz	1RB High (5)	848.3	22.53	21.74
		831.5	22.56	21.63
		814.7	22.53	21.98
	1RB Middle (3)	848.3	22.82	21.83
		831.5	22.75	21.80
		814.7	22.74	22.14
	1RB Low (0)	848.3	22.67	21.70
		831.5	22.65	21.98
		814.7	22.62	21.69
	3RB High (3)	848.3	22.69	21.89
		831.5	22.69	21.68
		814.7	22.71	21.82
	3RB Middle (1)	848.3	22.74	21.80
		831.5	22.71	21.87
		814.7	22.65	21.88
	3RB Low (0)	848.3	22.70	21.88
		831.5	22.65	21.85
		814.7	22.64	21.86
	6RB (0)	848.3	21.71	20.94
		831.5	21.70	20.59
		814.7	21.64	20.78
3 MHz	1RB High (14)	847.5	22.60	21.66
		831.5	22.70	21.61
		815.5	22.65	21.67
	1RB Middle (7)	847.5	22.84	21.90
		831.5	22.78	21.73
		815.5	22.76	21.82
	1RB Low (0)	847.5	22.70	21.75
		831.5	22.66	21.59
		815.5	22.70	21.98
	8RB High (7)	847.5	21.64	20.75
		831.5	21.69	20.73
		815.5	21.67	20.76
	8RB Middle (4)	847.5	21.76	20.82
		831.5	21.67	20.77
		815.5	21.71	20.77
	8RB Low (0)	847.5	21.72	20.81
		831.5	21.70	20.74
		815.5	21.71	20.68
	15RB (0)	847.5	21.68	20.74
		831.5	21.65	20.67
		815.5	21.67	20.68

5 MHz	1RB High (24)	846.5	22.59	21.70
		831.5	22.59	22.06
		816.5	22.63	21.69
	1RB Middle (12)	846.5	22.86	21.96
		831.5	22.84	22.26
		816.5	22.87	21.95
	1RB Low (0)	846.5	22.60	21.68
		831.5	22.54	21.67
		816.5	22.57	21.67
	12RB High (13)	846.5	21.63	20.75
		831.5	21.67	20.69
		816.5	21.65	20.74
	12RB Middle (6)	846.5	21.71	20.84
		831.5	21.74	20.72
		816.5	21.70	20.82
	12RB Low (0)	846.5	21.72	20.76
		831.5	21.63	20.62
		816.5	21.63	20.65
	25RB (0)	846.5	21.67	20.72
		831.5	21.65	20.70
		816.5	21.62	20.64
10 MHz	1RB High (49)	844	22.62	22.01
		831.5	22.64	21.61
		820	22.63	21.63
	1RB Middle (24)	844	22.76	22.12
		831.5	22.69	21.64
		820	22.70	21.74
	1RB Low (0)	844	22.57	21.95
		831.5	22.56	21.49
		820	22.58	21.61
	25RB High (25)	844	21.60	20.63
		831.5	21.65	20.70
		820	21.67	20.74
	25RB Middle (12)	844	21.62	20.66
		831.5	21.65	20.76
		820	21.67	20.73
	25RB Low (0)	844	21.72	20.73
		831.5	21.66	20.74
		820	21.62	20.65
	50RB (0)	844	21.67	20.70
		831.5	21.66	20.69
		820	21.63	20.63
15 MHz	1RB High (74)	841.5	22.54	21.99
		831.5	22.57	21.49
		822.5	22.59	21.89
	1RB Middle (37)	841.5	22.68	22.04
		831.5	22.62	21.53
		822.5	22.71	21.99

	1RB Low (0)	841.5	22.59	21.96
		831.5	22.52	21.45
		822.5	22.65	21.90
	36RB High (38)	841.5	21.60	20.56
		831.5	21.68	20.63
		822.5	21.65	20.64
	36RB Middle (19)	841.5	21.65	20.58
		831.5	21.67	20.61
		822.5	21.65	20.66
	36RB Low (0)	841.5	21.65	20.58
		831.5	21.64	20.56
		822.5	21.64	20.64
	75RB (0)	841.5	21.61	20.61
		831.5	21.64	20.62
		822.5	21.64	20.63

Band 41 – PC2				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
5 MHz	1RB High (24)	2687.5	25.80	25.19
		2640.3	25.75	25.25
		2593	25.75	24.99
		2545.8	25.64	25.02
		2498.5	25.64	25.13
	1RB Middle (12)	2687.5	26.06	25.39
		2640.3	26.01	25.39
		2593	25.88	25.13
		2545.8	25.84	25.22
		2498.5	25.81	25.34
	1RB Low (0)	2687.5	25.83	25.16
		2640.3	25.78	25.22
		2593	25.72	25.03
		2545.8	25.63	24.98
		2498.5	25.65	25.16
	12RB High (13)	2687.5	24.96	23.91
		2640.3	24.85	23.95
		2593	24.77	23.78
		2545.8	24.74	23.79
		2498.5	24.77	23.88
	12RB Middle (6)	2687.5	24.97	23.91
		2640.3	24.88	24.00
		2593	24.81	23.82
		2545.8	24.81	23.84
		2498.5	24.72	23.87
	12RB Low (0)	2687.5	24.90	23.87
		2640.3	24.87	23.97
		2593	24.77	23.87
		2545.8	24.80	23.83
		2498.5	24.74	23.85
	25RB (0)	2687.5	24.93	23.92
		2640.3	24.85	23.86
		2593	24.78	23.81
		2545.8	24.80	23.92
		2498.5	24.72	23.80
10 MHz	1RB High (49)	2685	25.95	25.36
		2639	25.73	25.26

		2593	25.85	25.06
		2547	25.66	25.19
		2501	25.64	25.16
	1RB Middle (24)	2685	25.87	25.39
		2639	25.78	25.29
		2593	25.82	25.05
		2547	25.64	25.18
		2501	25.68	25.14
	1RB Low (0)	2685	25.79	25.30
		2639	25.74	25.25
		2593	25.77	24.99
		2547	25.66	25.17
		2501	25.60	25.14
	25RB High (25)	2685	24.95	23.91
		2639	24.83	23.86
		2593	24.74	23.82
		2547	24.76	23.85
		2501	24.80	23.87
	25RB Middle (12)	2685	24.92	23.89
		2639	24.87	23.93
		2593	24.77	23.82
		2547	24.79	23.85
		2501	24.77	23.78
	25RB Low (0)	2685	24.89	23.86
		2639	24.86	23.89
		2593	24.78	23.81
		2547	24.79	23.89
		2501	24.73	23.79
	50RB (0)	2685	24.87	23.90
		2639	24.83	23.86
		2593	24.77	23.76
		2547	24.81	23.90
		2501	24.71	23.85
15 MHz	1RB High (74)	2682.5	25.86	25.12
		2637.8	25.80	25.25
		2593	25.62	25.10
		2548.3	25.73	24.95
		2503.5	25.65	25.18
	1RB Middle (37)	2682.5	25.89	25.13
		2637.8	25.81	25.30
		2593	25.66	25.06
		2548.3	25.72	24.97

		2503.5	25.64	25.15
	1RB Low (0)	2682.5	25.90	25.07
		2637.8	25.77	25.30
		2593	25.55	25.12
		2548.3	25.72	24.99
		2503.5	25.71	25.17
	36RB High (38)	2682.5	24.87	23.84
		2637.8	24.84	23.77
		2593	24.81	23.74
		2548.3	24.58	23.69
		2503.5	24.74	23.68
	36RB Middle (19)	2682.5	24.85	23.77
		2637.8	24.86	23.84
		2593	24.78	23.76
		2548.3	24.62	23.69
		2503.5	24.77	23.73
	36RB Low (0)	2682.5	24.81	23.74
		2637.8	24.86	23.81
		2593	24.74	23.73
		2548.3	24.65	23.70
		2503.5	24.71	23.67
	75RB (0)	2682.5	24.84	23.82
		2637.8	24.85	23.83
		2593	24.77	23.71
		2548.3	24.66	23.75
		2503.5	24.75	23.75
20 MHz	1RB High (99)	2680	25.85	25.20
		2636.5	25.88	25.04
		2593	25.76	25.22
		2549.5	25.69	25.03
		2506	25.75	24.95
	1RB Middle (50)	2680	26.09	25.38
		2636.5	26.10	25.28
		2593	25.94	25.37
		2549.5	25.95	25.24
		2506	25.99	25.17
	1RB Low (0)	2680	25.84	25.15
		2636.5	25.78	25.02
		2593	25.66	25.19
		2549.5	25.69	25.02
		2506	25.76	24.93
	50RB	2680	24.86	23.82

	High (50)	2636.5	24.74	23.78
		2593	24.71	23.78
		2549.5	24.71	23.80
		2506	24.74	23.76
	50RB Middle (25)	2680	24.85	23.79
		2636.5	24.87	23.87
		2593	24.78	23.82
		2549.5	24.77	23.80
		2506	24.72	23.77
	50RB Low (0)	2680	24.84	23.71
		2636.5	24.85	23.88
		2593	24.77	23.86
		2549.5	24.78	23.82
		2506	24.68	23.67
	100RB (0)	2680	24.84	23.79
		2636.5	24.82	23.84
		2593	24.78	23.80
		2549.5	24.78	23.80
		2506	24.71	23.76

Band 41 – PC3				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
5 MHz	1RB High (24)	2687.5	22.84	21.87
		2640.3	22.80	21.97
		2593	22.84	21.71
		2545.8	22.69	21.70
		2498.5	22.70	21.85
	1RB Middle (12)	2687.5	22.81	21.85
		2640.3	22.77	21.97
		2593	22.77	21.64
		2545.8	22.64	21.62
		2498.5	22.61	21.81
	1RB Low (0)	2687.5	22.83	21.87
		2640.3	22.81	21.98
		2593	22.83	21.69
		2545.8	22.72	21.72
		2498.5	22.65	21.83
	12RB High (13)	2687.5	21.93	20.81
		2640.3	21.87	20.86
		2593	21.77	20.74
		2545.8	21.75	20.70
		2498.5	21.74	20.79
	12RB Middle (6)	2687.5	21.95	20.88
		2640.3	21.95	21.01
		2593	21.83	20.79
		2545.8	21.83	20.79
		2498.5	21.81	20.83
	12RB Low (0)	2687.5	21.86	20.77
		2640.3	21.83	20.88
		2593	21.76	20.76
		2545.8	21.77	20.72
		2498.5	21.69	20.72
	25RB (0)	2687.5	21.89	20.89
		2640.3	21.83	20.85
		2593	21.74	20.73
		2545.8	21.81	20.81
		2498.5	21.72	20.74
10 MHz	1RB	2685	22.77	21.90

	High (49)	2639	22.82	22.02
		2593	22.85	21.81
		2547	22.66	21.75
		2501	22.69	21.90
	1RB Middle (24)	2685	23.04	22.12
		2639	23.10	22.25
		2593	23.10	22.00
		2547	22.88	21.94
		2501	22.95	22.13
	1RB Low (0)	2685	22.76	21.85
		2639	22.84	22.04
		2593	22.82	21.73
		2547	22.66	21.71
		2501	22.67	21.88
	25RB High (25)	2685	21.89	20.88
		2639	21.80	20.82
		2593	21.74	20.73
		2547	21.72	20.75
		2501	21.70	20.75
	25RB Middle (12)	2685	21.83	20.81
		2639	21.85	20.82
		2593	21.76	20.74
		2547	21.75	20.75
		2501	21.66	20.69
	25RB Low (0)	2685	21.86	20.81
		2639	21.87	20.90
		2593	21.77	20.77
		2547	21.80	20.83
		2501	21.70	20.75
	50RB (0)	2685	21.84	20.83
		2639	21.81	20.86
		2593	21.74	20.72
		2547	21.75	20.82
		2501	21.71	20.75
15 MHz	1RB High (74)	2682.5	22.81	21.83
		2637.8	22.76	21.94
		2593	22.80	21.80
		2548.3	22.66	21.73
		2503.5	22.62	21.79
	1RB Middle (37)	2682.5	22.80	21.87
		2637.8	22.81	21.93
		2593	22.80	21.78

		2548.3	22.70	21.71
		2503.5	22.66	21.77
	1RB Low (0)	2682.5	22.80	21.84
		2637.8	22.76	21.92
		2593	22.79	21.75
		2548.3	22.70	21.72
		2503.5	22.66	21.81
	36RB High (38)	2682.5	21.84	20.78
		2637.8	21.81	20.79
		2593	21.74	20.71
		2548.3	21.65	20.65
		2503.5	21.71	20.68
	36RB Middle (19)	2682.5	21.79	20.77
		2637.8	21.86	20.84
		2593	21.76	20.70
		2548.3	21.67	20.66
		2503.5	21.72	20.71
	36RB Low (0)	2682.5	21.77	20.70
		2637.8	21.85	20.83
		2593	21.73	20.68
		2548.3	21.70	20.68
		2503.5	21.66	20.68
	75RB (0)	2682.5	21.80	20.76
		2637.8	21.82	20.79
		2593	21.71	20.72
		2548.3	21.67	20.71
		2503.5	21.68	20.68
20 MHz	1RB High (99)	2680	22.92	21.91
		2636.5	22.97	21.90
		2593	22.86	21.97
		2549.5	22.77	21.74
		2506	22.83	21.69
	1RB Middle (50)	2680	22.97	21.95
		2636.5	23.01	21.88
		2593	22.88	22.01
		2549.5	22.83	21.80
		2506	22.85	21.75
	1RB Low (0)	2680	22.89	21.87
		2636.5	22.96	21.85
		2593	22.83	21.92
		2549.5	22.74	21.74
		2506	22.81	21.69

	50RB High (50)	2680	21.85	20.80
		2636.5	21.79	20.79
		2593	21.70	20.74
		2549.5	21.72	20.72
		2506	21.73	20.73
	50RB Middle (25)	2680	21.84	20.79
		2636.5	21.89	20.87
		2593	21.79	20.79
		2549.5	21.77	20.76
		2506	21.77	20.78
	50RB Low (0)	2680	21.74	20.70
		2636.5	21.86	20.87
		2593	21.78	20.82
		2549.5	21.77	20.78
		2506	21.67	20.68
	100RB (0)	2680	21.82	20.74
		2636.5	21.79	20.79
		2593	21.76	20.75
		2549.5	21.73	20.74
		2506	21.72	20.68

Band 66				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
1.4 MHz	1RB High (5)	1779.3	22.59	21.75
		1745	22.62	21.78
		1710.7	22.52	21.77
	1RB Middle (3)	1779.3	22.81	22.05
		1745	22.74	21.85
		1710.7	22.80	21.85
	1RB Low (0)	1779.3	22.68	21.78
		1745	22.59	21.82
		1710.7	22.61	22.05
	3RB High (3)	1779.3	22.71	21.91
		1745	22.75	21.83
		1710.7	22.78	21.75
	3RB Middle (1)	1779.3	22.77	21.91
		1745	22.78	22.01
		1710.7	22.87	21.98
	3RB Low (0)	1779.3	22.81	21.73
		1745	22.70	21.98
		1710.7	22.79	21.97
	6RB (0)	1779.3	21.72	21.89
		1745	21.69	20.84
		1710.7	21.66	20.84
3 MHz	1RB High (14)	1778.5	22.62	21.59
		1745	22.62	21.74
		1711.5	22.68	22.07
	1RB Middle (7)	1778.5	22.88	21.80
		1745	22.78	21.95
		1711.5	22.82	22.23
	1RB Low (0)	1778.5	22.71	21.80
		1745	22.73	22.10
		1711.5	22.62	21.71
	8RB High (7)	1778.5	21.66	20.76
		1745	21.63	20.78
		1711.5	21.63	20.73
	8RB Middle (4)	1778.5	21.71	20.86
		1745	21.68	20.78
		1711.5	21.68	20.84
	8RB Low (0)	1778.5	21.69	20.82
		1745	21.63	20.79
		1711.5	21.63	20.86
	15RB (0)	1778.5	21.67	20.66
		1745	21.65	20.74
		1711.5	21.67	20.72

5 MHz	1RB High (24)	1777.5	22.64	22.11
		1745	22.63	21.72
		1712.5	22.53	21.71
	1RB Middle (12)	1777.5	22.93	22.38
		1745	22.91	22.05
		1712.5	22.82	22.01
	1RB Low (0)	1777.5	22.56	22.12
		1745	22.62	22.12
		1712.5	22.56	21.71
	12RB High (13)	1777.5	21.67	20.74
		1745	21.72	20.86
		1712.5	21.63	20.77
	12RB Middle (6)	1777.5	21.75	20.83
		1745	21.74	20.83
		1712.5	21.73	20.80
	12RB Low (0)	1777.5	21.69	20.74
		1745	21.67	20.71
		1712.5	21.68	20.76
	25RB (0)	1777.5	21.67	20.74
		1745	21.70	20.64
		1712.5	21.65	20.64
10 MHz	1RB High (49)	1775	22.66	22.05
		1745	22.69	21.66
		1715	22.55	22.03
	1RB Middle (24)	1775	22.70	22.18
		1745	22.78	21.71
		1715	22.71	22.22
	1RB Low (0)	1775	22.60	22.08
		1745	22.65	21.67
		1715	22.58	22.02
	25RB High (25)	1775	21.69	20.76
		1745	21.74	20.85
		1715	21.66	20.75
	25RB Middle (12)	1775	22.77	20.78
		1745	21.73	20.83
		1715	21.67	20.69
	25RB Low (0)	1775	21.68	20.79
		1745	21.69	20.77
		1715	21.67	20.78
	50RB (0)	1775	21.72	20.76
		1745	21.73	20.73
		1715	21.68	20.73
15 MHz	1RB High (74)	1772.5	22.63	21.62
		1745	22.55	21.56
		1717.5	22.60	21.57
	1RB Middle (37)	1772.5	22.74	21.47
		1745	22.65	21.69
		1717.5	22.68	21.58

	1RB Low (0)	1772.5	22.58	21.54
		1745	22.56	21.54
		1717.5	22.63	22.08
	36RB High (38)	1772.5	21.77	20.75
		1745	21.74	20.73
		1717.5	21.69	20.66
	36RB Middle (19)	1772.5	21.70	20.73
		1745	21.66	20.78
		1717.5	21.63	20.59
	36RB Low (0)	1772.5	21.73	20.70
		1745	21.68	20.66
		1717.5	21.63	20.58
	75RB (0)	1772.5	21.75	20.77
		1745	21.70	20.68
		1717.5	21.64	20.66
20 MHz	1RB High (99)	1770	22.41	21.87
		1745	22.39	21.82
		1720	22.46	21.93
	1RB Middle (50)	1770	22.70	22.24
		1745	22.68	22.21
		1720	22.67	22.21
	1RB Low (0)	1770	22.34	21.84
		1745	22.36	21.85
		1720	22.42	22.02
	50RB High (50)	1770	21.69	20.69
		1745	21.63	20.59
		1720	21.53	20.58
	50RB Middle (25)	1770	21.65	20.69
		1745	21.60	20.60
		1720	21.57	20.60
	50RB Low (0)	1770	21.72	20.80
		1745	21.56	20.56
		1720	21.50	20.53
	100RB (0)	1770	21.67	20.68
		1745	21.60	20.62
		1720	21.49	20.57

Band 71				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
5 MHz	1RB High (24)	695.5	22.48	21.97
		680.5	22.51	21.97
		665.5	22.48	21.59
	1RB Middle (12)	695.5	22.76	22.25
		680.5	22.80	22.23
		665.5	22.72	21.82
	1RB Low (0)	695.5	22.44	21.62
		680.5	22.51	21.92
		665.5	22.52	21.94
	12RB High (13)	695.5	21.53	20.57
		680.5	21.57	20.66
		665.5	21.59	20.66
	12RB Middle (6)	695.5	21.59	20.64
		680.5	21.58	20.65
		665.5	21.58	20.66
	12RB Low (0)	695.5	21.45	20.63
		680.5	21.52	20.60
		665.5	21.52	20.57
	25RB (0)	695.5	21.53	20.60
		680.5	21.54	20.64
		665.5	21.59	20.67
10 MHz	1RB High (49)	693	22.48	21.45
		680.5	22.57	21.49
		668	22.47	21.53
	1RB Middle (24)	693	22.58	21.64
		680.5	22.70	21.58
		668	22.58	21.61
	1RB Low (0)	693	22.42	21.48
		680.5	22.52	21.65
		668	22.49	21.48
	25RB High (25)	693	21.45	20.68
		680.5	21.63	20.68
		668	21.63	20.68
	25RB Middle (12)	693	21.53	20.61
		680.5	21.61	20.62
		668	21.56	20.63
	25RB Low (0)	693	21.39	20.52
		680.5	21.58	20.72
		668	21.46	20.50
	50RB (0)	693	21.43	20.56
		680.5	21.60	20.63
		668	21.54	20.57

15 MHz	1RB High (74)	690.5	22.47	21.41
		680.5	22.52	21.82
		670.5	22.47	21.85
	1RB Middle (37)	690.5	22.54	21.49
		680.5	22.59	21.93
		670.5	22.53	21.87
	1RB Low (0)	690.5	22.41	21.41
		680.5	22.39	21.50
		670.5	22.52	21.37
	36RB High (38)	690.5	21.59	20.65
		680.5	21.62	20.56
		670.5	21.47	20.46
	36RB Middle (19)	690.5	21.60	20.58
		680.5	21.59	20.58
		670.5	21.53	20.60
	36RB Low (0)	690.5	21.57	20.52
		680.5	21.57	20.57
		670.5	21.45	20.49
	75RB (0)	690.5	21.57	20.61
		680.5	21.61	20.59
		670.5	21.47	20.45
20 MHz	1RB High (99)	688	22.39	21.86
		683	22.41	21.77
		673	22.45	21.95
	1RB Middle (50)	688	22.60	22.06
		683	22.63	21.98
		673	22.62	22.10
	1RB Low (0)	688	22.31	21.81
		683	22.28	21.66
		673	22.38	21.87
	50RB High (50)	688	21.45	20.46
		683	21.37	20.35
		673	21.44	20.48
	50RB Middle (25)	688	21.48	20.54
		683	21.51	20.51
		673	21.49	20.55
	50RB Low (0)	688	21.39	20.47
		683	21.42	20.44
		673	21.25	20.29
	100RB (0)	688	21.40	20.43
		683	21.41	20.46
		673	21.36	20.42

Low power

Table 11.3-5: The conducted Power for LTE

Band 7				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
5 MHz	1RB High (24)	2567.5	13.08	12.23
		2535	13.10	12.25
		2502.5	13.10	12.58
	1RB Middle (12)	2567.5	13.31	12.49
		2535	13.36	12.50
		2502.5	13.31	12.82
	1RB Low (0)	2567.5	13.07	12.24
		2535	13.07	12.22
		2502.5	13.09	12.58
	12RB High (13)	2567.5	12.20	11.22
		2535	12.14	11.17
		2502.5	12.12	11.30
	12RB Middle (6)	2567.5	12.23	11.21
		2535	12.21	11.24
		2502.5	12.21	11.35
	12RB Low (0)	2567.5	12.15	11.18
		2535	12.11	11.16
		2502.5	12.17	11.30
	25RB (0)	2567.5	12.19	11.12
		2535	12.14	11.13
		2502.5	12.19	11.23
10 MHz	1RB High (49)	2565	13.20	12.18
		2535	13.22	12.12
		2505	13.18	12.53
	1RB Middle (24)	2565	13.33	12.37
		2535	13.37	12.18
		2505	13.37	12.64
	1RB Low (0)	2565	13.29	12.17
		2535	13.31	12.10
		2505	13.28	12.48
	25RB High (25)	2565	12.24	11.32
		2535	12.24	11.24
		2505	12.25	11.29
	25RB Middle (12)	2565	12.27	11.29
		2535	12.21	11.16
		2505	12.25	11.23
	25RB Low (0)	2565	12.24	11.30
		2535	12.22	11.20
		2505	12.22	11.23
	50RB (0)	2565	12.29	11.25
		2535	12.23	11.19
		2505	12.22	11.23

15 MHz	1RB High (74)	2562.5	13.12	12.56
		2535	13.09	12.05
		2507.5	13.15	12.50
	1RB Middle (37)	2562.5	13.14	12.73
		2535	13.19	12.16
		2507.5	13.27	12.56
	1RB Low (0)	2562.5	13.10	12.57
		2535	13.08	12.01
		2507.5	13.17	12.51
	36RB High (38)	2562.5	12.26	11.18
		2535	12.25	11.22
		2507.5	12.21	11.24
	36RB Middle (19)	2562.5	12.27	11.23
		2535	12.29	11.19
		2507.5	12.27	11.28
	36RB Low (0)	2562.5	12.24	11.23
		2535	12.22	11.16
		2507.5	12.28	11.24
	75RB (0)	2562.5	12.22	11.23
		2535	12.22	11.20
		2507.5	12.25	11.23
20 MHz	1RB High (99)	2560	12.95	12.52
		2535	13.02	12.57
		2510	12.95	12.50
	1RB Middle (50)	2560	13.29	12.89
		2535	13.32	12.82
		2510	13.28	12.83
	1RB Low (0)	2560	12.98	12.49
		2535	13.00	12.50
		2510	13.01	12.50
	50RB High (50)	2560	12.18	11.06
		2535	12.26	11.24
		2510	12.14	11.21
	50RB Middle (25)	2560	12.20	11.13
		2535	12.27	11.24
		2510	12.11	11.20
	50RB Low (0)	2560	12.31	11.32
		2535	12.22	11.19
		2510	12.15	11.16
	100RB (0)	2560	12.21	11.27
		2535	12.06	11.15
		2510	12.23	11.23

Band 12				
Bandwidth (MHz)	RB allocation	Frequency (MHz)	QPSK	16QAM
	RB offset (Start RB)		Actual output power (dBm)	Actual output power (dBm)
1.4 MHz	1RB High (5)	715.3	17.61	17.77
		707.5	17.66	17.81
		699.7	17.77	18.14
	1RB Middle (3)	715.3	17.79	17.92
		707.5	17.81	18.02
		699.7	17.88	18.33
	1RB Low (0)	715.3	17.59	17.75
		707.5	17.70	17.83
		699.7	17.76	18.11
	3RB High (3)	715.3	17.78	17.94
		707.5	17.73	17.77
		699.7	17.77	18.00
	3RB Middle (1)	715.3	17.80	18.00
		707.5	17.79	17.84
		699.7	17.87	18.01
	3RB Low (0)	715.3	17.77	17.93
		707.5	17.72	17.80
		699.7	17.80	18.00
	6RB (0)	715.3	17.72	17.90
		707.5	17.74	17.87
		699.7	17.77	17.67
3 MHz	1RB High (14)	714.5	17.63	17.71
		707.5	17.70	17.63
		700.5	17.74	18.14
	1RB Middle (7)	714.5	17.82	17.93
		707.5	17.84	17.79
		700.5	17.92	18.32
	1RB Low (0)	714.5	17.64	17.75
		707.5	17.61	17.63
		700.5	17.74	18.14
	8RB High (7)	714.5	17.68	17.73
		707.5	17.67	17.80
		700.5	17.71	17.83
	8RB Middle (4)	714.5	17.73	17.82
		707.5	17.75	17.83
		700.5	17.76	17.91
	8RB Low (0)	714.5	17.71	17.76
		707.5	17.72	17.86
		700.5	17.72	17.86
	15RB (0)	714.5	17.70	17.69
		707.5	17.71	17.76
		700.5	17.72	17.79

5 MHz	1RB High (24)	713.5	17.67	18.18
		707.5	17.65	17.82
		701.5	17.69	17.88
	1RB Middle (12)	713.5	17.93	18.48
		707.5	17.95	18.11
		701.5	17.99	18.20
	1RB Low (0)	713.5	17.64	18.16
		707.5	17.61	17.82
		701.5	17.69	17.89
	12RB High (13)	713.5	17.74	17.89
		707.5	17.72	17.79
		701.5	17.85	17.94
	12RB Middle (6)	713.5	17.82	17.95
		707.5	17.81	17.88
		701.5	17.83	17.95
	12RB Low (0)	713.5	17.79	17.92
		707.5	17.76	17.87
		701.5	17.77	17.86
	25RB (0)	713.5	17.76	17.86
		707.5	17.77	17.78
		701.5	17.83	17.88
10 MHz	1RB High (49)	711	17.70	17.74
		707.5	17.71	17.64
		704	17.70	18.12
	1RB Middle (24)	711	17.73	17.82
		707.5	17.82	17.78
		704	17.82	18.23
	1RB Low (0)	711	17.66	17.73
		707.5	17.74	17.63
		704	17.65	18.10
	25RB High (25)	711	17.71	17.79
		707.5	17.72	17.75
		704	17.70	17.80
	25RB Middle (12)	711	17.75	17.86
		707.5	17.78	17.83
		704	17.74	17.84
	25RB Low (0)	711	17.81	17.91
		707.5	17.78	17.81
		704	17.68	17.79
	50RB (0)	711	17.74	17.81
		707.5	17.74	17.77
		704	17.72	17.81

Band 13				
Bandwidth (MHz)	RB allocation	Frequency (MHz)	QPSK	16QAM
	RB offset (Start RB)		Actual output power (dBm)	Actual output power (dBm)
5 MHz	1RB High (24)	784.5	17.64	17.75
		782	17.63	17.76
		779.5	17.65	18.14
	1RB Middle (12)	784.5	17.88	18.05
		782	17.90	18.08
		779.5	17.98	18.45
	1RB Low (0)	784.5	17.59	17.77
		782	17.65	17.80
		779.5	17.69	18.16
	12RB High (13)	784.5	17.66	17.72
		782	17.66	17.73
		779.5	17.75	17.90
	12RB Middle (6)	784.5	17.78	17.83
		782	17.75	17.83
		779.5	17.79	17.92
	12RB Low (0)	784.5	17.71	17.76
		782	17.68	17.77
		779.5	17.71	17.89
	25RB (0)	784.5	17.69	17.65
		782	17.65	17.68
		779.5	17.72	17.79
10 MHz	1RB High (49)	782	17.75	17.69
	1RB Middle (24)	782	17.79	17.69
	1RB Low (0)	782	17.69	17.64
	25RB High (25)	782	17.72	17.74
	25RB Middle (12)	782	17.78	17.83
	25RB Low (0)	782	17.72	17.80
	50RB (0)	782	17.68	17.73

Band 25				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
1.4 MHz	1RB High (5)	1914.3	15.53	15.70
		1882.5	15.52	15.76
		1850.7	15.69	16.01
	1RB Middle (3)	1914.3	15.68	15.82
		1882.5	15.74	15.85
		1850.7	15.85	16.25
	1RB Low (0)	1914.3	15.49	15.65
		1882.5	15.52	15.70
		1850.7	15.68	16.09
	3RB High (3)	1914.3	15.70	15.95
		1882.5	15.61	15.68
		1850.7	15.73	15.97
	3RB Middle (1)	1914.3	15.74	15.92
		1882.5	15.65	15.74
		1850.7	15.81	15.99
	3RB Low (0)	1914.3	15.62	15.84
		1882.5	15.60	15.69
		1850.7	15.75	15.97
	6RB (0)	1914.3	15.69	15.84
		1882.5	15.57	15.76
		1850.7	15.72	15.67
3 MHz	1RB High (14)	1913.5	15.54	15.60
		1882.5	15.56	15.51
		1851.5	15.69	16.06
	1RB Middle (7)	1913.5	15.70	15.85
		1882.5	15.65	15.70
		1851.5	15.88	16.23
	1RB Low (0)	1913.5	15.56	15.73
		1882.5	15.55	15.61
		1851.5	15.72	16.08
	8RB High (7)	1913.5	15.57	15.65
		1882.5	15.55	15.68
		1851.5	15.62	15.71
	8RB Middle (4)	1913.5	15.61	15.72
		1882.5	15.61	15.71
		1851.5	15.67	15.79
	8RB Low (0)	1913.5	15.59	15.68
		1882.5	15.60	15.72
		1851.5	15.70	15.80
	15RB (0)	1913.5	15.57	15.62
		1882.5	15.61	15.65
		1851.5	15.65	15.69

5 MHz	1RB High (24)	1912.5	15.56	15.65
		1882.5	15.51	15.70
		1852.5	15.56	16.09
	1RB Middle (12)	1912.5	15.84	15.95
		1882.5	15.83	15.96
		1852.5	15.82	16.36
	1RB Low (0)	1912.5	15.62	15.67
		1882.5	15.56	15.70
		1852.5	15.62	16.11
	12RB High (13)	1912.5	15.61	15.67
		1882.5	15.56	15.68
		1852.5	15.62	15.75
	12RB Middle (6)	1912.5	15.67	15.72
		1882.5	15.65	15.74
		1852.5	15.72	15.84
	12RB Low (0)	1912.5	15.66	15.69
		1882.5	15.61	15.65
		1852.5	15.70	15.80
	25RB (0)	1912.5	15.63	15.59
		1882.5	15.58	15.63
		1852.5	15.63	15.77
10 MHz	1RB High (49)	1910	15.57	15.61
		1882.5	15.51	15.57
		1855	15.70	16.07
	1RB Middle (24)	1910	15.69	15.79
		1882.5	15.69	15.73
		1855	15.81	16.16
	1RB Low (0)	1910	15.52	15.65
		1882.5	15.55	15.56
		1855	15.72	16.06
	25RB High (25)	1910	15.65	15.78
		1882.5	15.57	15.65
		1855	15.64	15.72
	25RB Middle (12)	1910	15.69	15.79
		1882.5	15.66	15.75
		1855	15.71	15.79
	25RB Low (0)	1910	15.69	15.83
		1882.5	15.67	15.69
		1855	15.77	15.86
	50RB (0)	1910	15.69	15.74
		1882.5	15.63	15.65
		1855	15.74	15.77
15 MHz	1RB High (74)	1907.5	15.51	15.53
		1882.5	15.58	15.93
		1857.5	15.58	16.11
	1RB Middle (37)	1907.5	15.62	15.61
		1882.5	15.69	16.04
		1857.5	15.74	16.24

	1RB Low (0)	1907.5	15.55	15.56
		1882.5	15.61	15.97
		1857.5	15.67	16.16
	36RB High (38)	1907.5	15.66	15.61
		1882.5	15.57	15.63
		1857.5	15.66	15.64
	36RB Middle (19)	1907.5	15.72	15.71
		1882.5	15.68	15.69
		1857.5	15.69	15.65
	36RB Low (0)	1907.5	15.65	15.64
		1882.5	15.62	15.66
		1857.5	15.74	15.72
	75RB (0)	1907.5	15.66	15.65
		1882.5	15.59	15.63
		1857.5	15.68	15.66
20 MHz	1RB High (99)	1905	15.46	15.99
		1882.5	15.51	16.14
		1860	15.44	15.94
	1RB Middle (50)	1905	15.81	16.36
		1882.5	15.76	16.33
		1860	15.78	16.31
	1RB Low (0)	1905	15.47	16.02
		1882.5	15.52	16.09
		1860	15.48	16.03
	50RB High (50)	1905	15.55	15.58
		1882.5	15.52	15.54
		1860	15.74	15.75
	50RB Middle (25)	1905	15.66	15.72
		1882.5	15.62	15.68
		1860	15.75	15.77
	50RB Low (0)	1905	15.55	15.60
		1882.5	15.60	15.68
		1860	15.80	15.82
	100RB (0)	1905	15.57	15.59
		1882.5	15.57	15.58
		1860	15.80	15.87

Band 26				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
1.4 MHz	1RB High (5)	848.3	17.61	17.68
		831.5	17.66	17.72
		814.7	17.67	18.02
	1RB Middle (3)	848.3	17.76	17.86
		831.5	17.80	17.94
		814.7	17.78	18.12
	1RB Low (0)	848.3	17.53	17.66
		831.5	17.67	17.74
		814.7	17.65	17.97
	3RB High (3)	848.3	17.73	17.80
		831.5	17.72	17.67
		814.7	17.64	17.81
	3RB Middle (1)	848.3	17.74	17.89
		831.5	17.73	17.73
		814.7	17.69	17.85
	3RB Low (0)	848.3	17.77	17.83
		831.5	17.69	17.74
		814.7	17.65	17.83
	6RB (0)	848.3	17.80	17.84
		831.5	17.70	17.82
		814.7	17.67	17.56
3 MHz	1RB High (14)	847.5	17.66	18.02
		831.5	17.69	17.72
		815.5	17.70	17.69
	1RB Middle (7)	847.5	17.74	18.18
		831.5	17.76	17.86
		815.5	17.76	17.84
	1RB Low (0)	847.5	17.62	18.01
		831.5	17.63	17.74
		815.5	17.66	17.74
	8RB High (7)	847.5	17.65	17.72
		831.5	17.69	17.73
		815.5	17.70	17.74
	8RB Middle (4)	847.5	17.68	17.78
		831.5	17.69	17.73
		815.5	17.74	17.72
	8RB Low (0)	847.5	17.65	17.81
		831.5	17.68	17.71
		815.5	17.68	17.68
	15RB (0)	847.5	17.64	17.66
		831.5	17.70	17.66
		815.5	17.72	17.64

5 MHz	1RB High (24)	846.5	17.63	17.70
		831.5	17.64	17.83
		816.5	17.63	18.09
	1RB Middle (12)	846.5	17.81	17.91
		831.5	17.89	17.99
		816.5	17.84	18.34
	1RB Low (0)	846.5	17.56	17.68
		831.5	17.65	17.75
		816.5	17.61	18.06
	12RB High (13)	846.5	17.56	17.61
		831.5	17.67	17.75
		816.5	17.66	17.80
	12RB Middle (6)	846.5	17.66	17.67
		831.5	17.70	17.74
		816.5	17.71	17.83
	12RB Low (0)	846.5	17.62	17.65
		831.5	17.61	17.68
		816.5	17.64	17.76
	25RB (0)	846.5	17.64	17.61
		831.5	17.65	17.67
		816.5	17.65	17.74
10 MHz	1RB High (49)	844	17.65	17.97
		831.5	17.58	17.66
		820	17.63	17.58
	1RB Middle (24)	844	17.79	18.07
		831.5	17.72	17.75
		820	17.75	17.69
	1RB Low (0)	844	17.63	17.94
		831.5	17.54	17.64
		820	17.60	17.57
	25RB High (25)	844	17.54	17.61
		831.5	17.68	17.78
		820	17.68	17.69
	25RB Middle (12)	844	17.63	17.70
		831.5	17.69	17.78
		820	17.72	17.75
	25RB Low (0)	844	17.76	17.80
		831.5	17.68	17.77
		820	17.65	17.72
	50RB (0)	844	17.65	17.66
		831.5	17.67	17.72
		820	17.67	17.66
15 MHz	1RB High (74)	841.5	17.63	18.07
		831.5	17.63	17.54
		822.5	17.70	18.01
	1RB Middle (37)	841.5	17.75	18.13
		831.5	17.71	17.66
		822.5	17.80	18.11

	1RB Low (0)	841.5	17.63	18.06
		831.5	17.64	17.56
		822.5	17.69	18.00
	36RB High (38)	841.5	17.65	17.63
		831.5	17.75	17.69
		822.5	17.75	17.78
	36RB Middle (19)	841.5	17.72	17.63
		831.5	17.74	17.75
		822.5	17.77	17.78
	36RB Low (0)	841.5	17.73	17.69
		831.5	17.71	17.66
		822.5	17.71	17.76
	75RB (0)	841.5	17.69	17.67
		831.5	17.76	17.74
		822.5	17.72	17.75

Band 41 – PC2				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
5 MHz	1RB High (24)	2687.5	16.43	15.64
		2640.3	16.35	15.74
		2593	16.31	15.53
		2545.8	16.24	15.60
		2498.5	16.27	15.58
	1RB Middle (12)	2687.5	16.63	15.87
		2640.3	16.60	15.99
		2593	16.52	15.72
		2545.8	16.49	15.75
		2498.5	16.45	15.80
	1RB Low (0)	2687.5	16.43	15.73
		2640.3	16.33	15.74
		2593	16.29	15.55
		2545.8	16.23	15.49
		2498.5	16.20	15.57
	12RB High (13)	2687.5	15.37	14.40
		2640.3	15.36	14.49
		2593	15.28	14.34
		2545.8	15.25	14.22
		2498.5	15.20	14.32
	12RB Middle (6)	2687.5	15.39	14.41
		2640.3	15.34	14.49
		2593	15.29	14.35
		2545.8	15.25	14.23
		2498.5	15.22	14.32
	12RB Low (0)	2687.5	15.38	14.38
		2640.3	15.34	14.49
		2593	15.27	14.36
		2545.8	15.24	14.20
		2498.5	15.15	14.26
	25RB (0)	2687.5	15.38	14.43
		2640.3	15.33	14.40
		2593	15.26	14.33
		2545.8	15.23	14.26
		2498.5	15.15	14.23
10 MHz	1RB High (49)	2685	16.46	15.66
		2639	16.34	15.87

		2593	16.27	15.80
		2547	16.34	15.55
		2501	16.23	15.69
	1RB Middle (24)	2685	16.45	15.65
		2639	16.33	15.91
		2593	16.25	15.76
		2547	16.36	15.55
		2501	16.22	15.69
	1RB Low (0)	2685	16.44	15.64
		2639	16.31	15.83
		2593	16.22	15.72
		2547	16.30	15.49
		2501	16.19	15.64
	25RB High (25)	2685	15.31	14.36
		2639	15.36	14.45
		2593	15.29	14.43
		2547	15.24	14.27
		2501	15.27	14.29
	25RB Middle (12)	2685	15.29	14.38
		2639	15.33	14.42
		2593	15.27	14.40
		2547	15.19	14.26
		2501	15.17	14.22
	25RB Low (0)	2685	15.34	14.32
		2639	15.36	14.42
		2593	15.30	14.38
		2547	15.31	14.23
		2501	15.19	14.24
	50RB (0)	2685	15.30	14.34
		2639	15.35	14.44
		2593	15.28	14.36
		2547	15.20	14.23
		2501	15.22	14.23
15 MHz	1RB High (74)	2682.5	16.30	15.83
		2637.8	16.40	15.65
		2593	16.27	15.54
		2548.3	16.21	15.74
		2503.5	16.22	15.54
	1RB Middle (37)	2682.5	16.37	15.89
		2637.8	16.30	15.74
		2593	16.28	15.55
		2548.3	16.19	15.71

		2503.5	16.25	15.51
	1RB Low (0)	2682.5	16.39	15.80
		2637.8	16.35	15.58
		2593	16.28	15.50
		2548.3	16.19	15.67
		2503.5	16.18	15.46
	36RB High (38)	2682.5	15.43	14.36
		2637.8	15.29	14.37
		2593	15.25	14.23
		2548.3	15.29	14.18
		2503.5	15.23	14.25
	36RB Middle (19)	2682.5	15.37	14.38
		2637.8	15.32	14.36
		2593	15.31	14.32
		2548.3	15.29	14.23
		2503.5	15.25	14.33
	36RB Low (0)	2682.5	15.30	14.34
		2637.8	15.32	14.33
		2593	15.28	14.26
		2548.3	15.22	14.16
		2503.5	15.12	14.27
	75RB (0)	2682.5	15.33	14.44
		2637.8	15.33	14.34
		2593	15.26	14.29
		2548.3	15.25	14.25
		2503.5	15.23	14.22
20 MHz	1RB High (99)	2680	16.36	15.76
		2636.5	16.52	15.56
		2593	16.31	15.76
		2549.5	16.31	15.50
		2506	16.34	15.36
	1RB Middle (50)	2680	16.68	15.94
		2636.5	16.75	15.84
		2593	16.59	15.97
		2549.5	16.51	15.75
		2506	16.60	15.64
	1RB Low (0)	2680	16.31	15.59
		2636.5	16.52	15.55
		2593	16.39	15.75
		2549.5	16.25	15.57
		2506	16.34	15.40
	50RB	2680	15.44	14.38

	High (50)	2636.5	15.32	14.37
		2593	15.24	14.30
		2549.5	15.18	14.17
		2506	15.20	14.33
	50RB Middle (25)	2680	15.35	14.42
		2636.5	15.35	14.40
		2593	15.34	14.39
		2549.5	15.27	14.21
		2506	15.24	14.32
	50RB Low (0)	2680	15.38	14.37
		2636.5	15.37	14.42
		2593	15.41	14.42
		2549.5	15.22	14.19
		2506	15.16	14.11
	100RB (0)	2680	15.32	14.37
		2636.5	15.38	14.41
		2593	15.31	14.33
		2549.5	15.22	14.18
		2506	15.22	14.22

Band 41 – PC3				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
5 MHz	1RB High (24)	2687.5	13.30	12.27
		2640.3	13.34	12.43
		2593	13.38	12.22
		2545.8	13.21	12.18
		2498.5	13.17	12.21
	1RB Middle (12)	2687.5	13.22	12.22
		2640.3	13.25	12.35
		2593	13.29	12.08
		2545.8	13.10	12.08
		2498.5	13.09	12.16
	1RB Low (0)	2687.5	13.30	12.26
		2640.3	13.34	12.41
		2593	13.37	12.19
		2545.8	13.21	12.14
		2498.5	13.16	12.18
	12RB High (13)	2687.5	12.33	11.31
		2640.3	12.39	11.41
		2593	12.31	11.27
		2545.8	12.25	11.16
		2498.5	12.23	11.19
	12RB Middle (6)	2687.5	12.43	11.37
		2640.3	12.50	11.47
		2593	12.37	11.37
		2545.8	12.29	11.23
		2498.5	12.26	11.26
	12RB Low (0)	2687.5	12.34	11.27
		2640.3	12.37	11.40
		2593	12.32	11.28
		2545.8	12.21	11.14
		2498.5	12.14	11.13
	25RB (0)	2687.5	12.34	11.40
		2640.3	12.42	11.38
		2593	12.33	11.30
		2545.8	12.23	11.23
		2498.5	12.19	11.17
10 MHz	1RB	2685	13.32	12.34

	High (49)	2639	13.44	12.54
		2593	13.46	12.30
		2547	13.21	12.19
		2501	13.23	12.33
	1RB Middle (24)	2685	13.49	12.46
		2639	13.59	12.69
		2593	13.63	12.49
		2547	13.41	12.39
		2501	13.41	12.52
	1RB Low (0)	2685	13.32	12.31
		2639	13.39	12.50
		2593	13.41	12.26
		2547	13.17	12.18
		2501	13.19	12.30
	25RB High (25)	2685	12.37	11.35
		2639	12.42	11.42
		2593	12.34	11.31
		2547	12.25	11.21
		2501	12.29	11.23
	25RB Middle (12)	2685	12.31	11.34
		2639	12.41	11.36
		2593	12.35	11.33
		2547	12.23	11.17
		2501	12.22	11.19
	25RB Low (0)	2685	12.40	11.39
		2639	12.49	11.45
		2593	12.35	11.37
		2547	12.33	11.25
		2501	12.27	11.24
	50RB (0)	2685	12.32	11.35
		2639	12.43	11.44
		2593	12.34	11.30
		2547	12.22	11.25
		2501	12.25	11.27
15 MHz	1RB High (74)	2682.5	13.33	12.28
		2637.8	13.38	12.42
		2593	13.43	12.31
		2548.3	13.24	12.16
		2503.5	13.25	12.22
	1RB Middle (37)	2682.5	13.39	12.37
		2637.8	13.41	12.48
		2593	13.48	12.33

		2548.3	13.25	12.21
		2503.5	13.20	12.27
	1RB Low (0)	2682.5	13.34	12.30
		2637.8	13.39	12.45
		2593	13.41	12.29
		2548.3	13.28	12.19
		2503.5	13.21	12.24
	36RB High (38)	2682.5	12.37	11.33
		2637.8	12.44	11.41
		2593	12.39	11.32
		2548.3	12.25	11.22
		2503.5	12.28	11.26
	36RB Middle (19)	2682.5	12.35	11.32
		2637.8	12.45	11.42
		2593	12.36	11.32
		2548.3	12.29	11.22
		2503.5	12.30	11.27
	36RB Low (0)	2682.5	12.32	11.30
		2637.8	12.45	11.40
		2593	12.36	11.29
		2548.3	12.30	11.22
		2503.5	12.21	11.20
	75RB (0)	2682.5	12.32	11.30
		2637.8	12.42	11.41
		2593	12.35	11.32
		2548.3	12.25	11.26
		2503.5	12.25	11.21
20 MHz	1RB High (99)	2680	13.44	12.33
		2636.5	13.56	12.31
		2593	13.49	12.55
		2549.5	13.32	12.22
		2506	13.36	12.10
	1RB Middle (50)	2680	13.52	12.42
		2636.5	13.63	12.42
		2593	13.55	12.57
		2549.5	13.42	12.28
		2506	13.45	12.21
	1RB Low (0)	2680	13.41	12.29
		2636.5	13.59	12.30
		2593	13.44	12.44
		2549.5	13.36	12.28
		2506	13.34	12.09

	50RB High (50)	2680	12.43	11.41
		2636.5	12.45	11.41
		2593	12.34	11.33
		2549.5	12.27	11.22
		2506	12.36	11.30
	50RB Middle (25)	2680	12.43	11.37
		2636.5	12.50	11.48
		2593	12.42	11.43
		2549.5	12.38	11.31
		2506	12.41	11.30
	50RB Low (0)	2680	12.38	11.37
		2636.5	12.51	11.49
		2593	12.48	11.45
		2549.5	12.32	11.26
		2506	12.30	11.22
	100RB (0)	2680	12.40	11.37
		2636.5	12.48	11.44
		2593	12.39	11.36
		2549.5	12.30	11.21
		2506	12.29	11.28

Band 66				
Bandwidth (MHz)	RB allocation	Frequency (MHz)	QPSK	16QAM
	RB offset (Start RB)		Actual output power (dBm)	Actual output power (dBm)
1.4 MHz	1RB High (5)	1779.3	15.54	15.62
		1745	15.55	15.84
		1710.7	15.50	15.55
	1RB Middle (3)	1779.3	15.73	15.83
		1745	15.75	16.00
		1710.7	15.70	15.77
	1RB Low (0)	1779.3	15.54	15.64
		1745	15.53	15.88
		1710.7	15.46	15.55
	3RB High (3)	1779.3	15.56	15.56
		1745	15.55	15.73
		1710.7	15.58	15.75
	3RB Middle (1)	1779.3	15.59	15.59
		1745	15.61	15.77
		1710.7	15.62	15.75
	3RB Low (0)	1779.3	15.51	15.56
		1745	15.53	15.71
		1710.7	15.53	15.70
	6RB (0)	1779.3	15.60	15.70
		1745	15.58	15.49
		1710.7	15.58	15.76
3 MHz	1RB High (14)	1778.5	15.58	15.54
		1745	15.64	15.94
		1711.5	15.52	15.56
	1RB Middle (7)	1778.5	15.74	15.71
		1745	15.77	16.11
		1711.5	15.71	15.81
	1RB Low (0)	1778.5	15.56	15.56
		1745	15.60	15.91
		1711.5	15.58	15.66
	8RB High (7)	1778.5	15.57	15.65
		1745	15.56	15.64
		1711.5	15.57	15.59
	8RB Middle (4)	1778.5	15.64	15.72
		1745	15.59	15.72
		1711.5	15.60	15.67
	8RB Low (0)	1778.5	15.61	15.70
		1745	15.57	15.65
		1711.5	15.59	15.61

	15RB (0)	1778.5	15.56	15.59
		1745	15.55	15.56
		1711.5	15.55	15.49
5 MHz	1RB High (24)	1777.5	15.57	15.67
		1745	15.50	15.95
		1712.5	15.51	15.62
	1RB Middle (12)	1777.5	15.86	15.96
		1745	15.74	16.27
		1712.5	15.76	15.87
	1RB Low (0)	1777.5	15.53	15.63
		1745	15.49	15.98
		1712.5	15.55	15.64
	12RB High (13)	1777.5	15.59	15.59
		1745	15.58	15.69
		1712.5	15.57	15.58
	12RB Middle (6)	1777.5	15.64	15.68
		1745	15.62	15.72
		1712.5	15.62	15.62
	12RB Low (0)	1777.5	15.60	15.61
		1745	15.54	15.68
		1712.5	15.54	15.57
	25RB (0)	1777.5	15.55	15.58
		1745	15.53	15.60
		1712.5	15.55	15.51
10 MHz	1RB High (49)	1775	15.54	15.50
		1745	15.62	15.87
		1715	15.48	15.54
	1RB Middle (24)	1775	15.70	15.69
		1745	15.74	16.07
		1715	15.68	15.70
	1RB Low (0)	1775	15.52	15.53
		1745	15.56	15.85
		1715	15.49	15.53
	25RB High (25)	1775	15.62	15.63
		1745	15.65	15.67
		1715	15.60	15.68
	25RB Middle (12)	1775	15.64	15.66
		1745	15.62	15.65
		1715	15.59	15.70
	25RB Low (0)	1775	15.56	15.60
		1745	15.56	15.61
		1715	15.60	15.69
	50RB (0)	1775	15.59	15.59
		1745	15.63	15.63
		1715	15.59	15.60
15 MHz	1RB High (74)	1772.5	15.53	15.88
		1745	15.48	15.89
		1717.5	15.49	15.45

	1RB Middle (37)	1772.5	15.68	15.96
		1745	15.61	16.04
		1717.5	15.54	15.54
	1RB Low (0)	1772.5	15.53	15.88
		1745	15.52	15.95
		1717.5	15.49	15.47
	36RB High (38)	1772.5	15.66	15.69
		1745	15.61	15.56
		1717.5	15.60	15.60
	36RB Middle (19)	1772.5	15.62	15.67
		1745	15.62	15.57
		1717.5	15.61	15.55
	36RB Low (0)	1772.5	15.66	15.66
		1745	15.56	15.52
		1717.5	15.56	15.52
	75RB (0)	1772.5	15.59	15.61
		1745	15.60	15.58
		1717.5	15.58	15.56
20 MHz	1RB High (99)	1770	15.39	15.93
		1745	15.44	15.79
		1720	15.48	15.95
	1RB Middle (50)	1770	15.75	16.27
		1745	15.78	16.14
		1720	15.75	16.16
	1RB Low (0)	1770	15.39	15.87
		1745	15.37	15.80
		1720	15.46	15.97
	50RB High (50)	1770	15.72	15.63
		1745	15.58	15.56
		1720	15.51	15.50
	50RB Middle (25)	1770	15.64	15.63
		1745	15.60	15.55
		1720	15.56	15.61
	50RB Low (0)	1770	15.68	15.68
		1745	15.53	15.50
		1720	15.51	15.52
	100RB (0)	1770	15.66	15.66
		1745	15.58	15.55
		1720	15.56	15.57

Band 71				
Bandwidth (MHz)	RB allocation RB offset (Start RB)	Frequency (MHz)	QPSK Actual output power (dBm)	16QAM Actual output power (dBm)
5 MHz	1RB High (24)	695.5	17.74	17.84
		680.5	17.67	17.80
		665.5	17.70	18.16
	1RB Middle (12)	695.5	18.01	18.13
		680.5	17.99	18.16
		665.5	17.98	18.49
	1RB Low (0)	695.5	17.70	17.82
		680.5	17.71	17.81
		665.5	17.68	18.19
	12RB High (13)	695.5	17.79	17.85
		680.5	17.77	17.85
		665.5	17.79	17.99
	12RB Middle (6)	695.5	17.83	17.90
		680.5	17.80	17.88
		665.5	17.86	17.99
	12RB Low (0)	695.5	17.73	17.76
		680.5	17.72	17.84
		665.5	17.76	17.89
	25RB (0)	695.5	17.78	17.75
		680.5	17.74	17.81
		665.5	17.79	17.88
10 MHz	1RB High (49)	693	17.72	18.13
		680.5	17.69	17.78
		668	17.82	17.71
	1RB Middle (24)	693	17.79	18.26
		680.5	17.82	17.89
		668	17.89	17.82
	1RB Low (0)	693	17.61	18.10
		680.5	17.64	17.76
		668	17.77	17.67
	25RB High (25)	693	17.71	17.89
		680.5	17.77	17.90
		668	17.80	17.89
	25RB Middle (12)	693	17.78	17.88
		680.5	17.80	17.95
		668	17.80	17.89
	25RB Low (0)	693	17.66	17.76
		680.5	17.73	17.86
		668	17.68	17.72

	50RB (0)	693	17.67	17.82
		680.5	17.76	17.82
		668	17.74	17.78
15 MHz	1RB High (74)	690.5	17.67	17.72
		680.5	17.73	18.07
		670.5	17.71	18.17
	1RB Middle (37)	690.5	17.70	17.72
		680.5	17.81	18.14
		670.5	17.74	18.24
	1RB Low (0)	690.5	17.63	17.61
		680.5	17.75	18.08
		670.5	17.71	18.18
	36RB High (38)	690.5	17.87	17.86
		680.5	17.83	17.83
		670.5	17.76	17.73
	36RB Middle (19)	690.5	17.81	17.79
		680.5	17.79	17.76
		670.5	17.76	17.74
	36RB Low (0)	690.5	17.86	17.82
		680.5	17.78	17.82
		670.5	17.67	17.63
	75RB (0)	690.5	17.88	17.88
		680.5	17.78	17.83
		670.5	17.70	17.70
20 MHz	1RB High (99)	688	17.65	18.20
		683	17.62	18.06
		673	17.66	18.12
	1RB Middle (50)	688	17.80	18.32
		683	17.79	18.27
		673	17.88	18.40
	1RB Low (0)	688	17.49	18.05
		683	17.52	17.96
		673	17.61	18.14
	50RB High (50)	688	17.68	17.73
		683	17.59	17.61
		673	17.67	17.73
	50RB Middle (25)	688	17.71	17.73
		683	17.72	17.76
		673	17.70	17.75
	50RB Low (0)	688	17.66	17.72
		683	17.65	17.65
		673	17.51	17.56
	100RB (0)	688	17.65	17.68
		683	17.62	17.66
		673	17.58	17.66

Uplink maximum output power is measured with downlink carrier aggregation active, using the channel with highest measured maximum output power when downlink carrier aggregation is inactive. SAR test in not required since maximum output power when downlink carrier aggregation active is not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.

11.4 Wi-Fi and BT Measurement result

The maximum output power of BT is 10.30dBm.
The maximum tune up of BT is 11dBm.

The average conducted power for Wi-Fi is as following:

WiFi 2.4G-Normal Power

2.4GHz	
FCC	
802.11b(dBm)	
Channel\data rate	1Mbps
11(2462MHz)	18.95
6(2437MHz)	19.34
1(2412MHz)	19.04
Tune up	19.50
802.11g(dBm)	
Channel\data rate	6Mbps
11(2462MHz)	16.29
Tune up	17.50
6(2437MHz)	18.05
Tune up	18.50
1(2412MHz)	16.64
Tune up	17.50
802.11n(dBm)-20MHz	
Channel\data rate	MCS0
11(2462MHz)	15.30
Tune up	16.50
6(2437MHz)	15.28
Tune up	16.50
1(2412MHz)	15.72
Tune up	16.50
802.11n(dBm)-40MHz	
Channel\data rate	MCS0
9(2452MHz)	15.72
Tune up	16.50
6(2437MHz)	14.98
Tune up	16.50
3(2422MHz)	15.90
Tune up	16.50

WiFi 2.4G-Low Power

FCC	
802.11b(dBm)	
Channel\data rate	1Mbps
11(2462MHz)	11.63
6(2437MHz)	11.93
1(2412MHz)	11.79
Tune up	12.00
802.11g(dBm)	
Channel\data rate	6Mbps
11(2462MHz)	9.23
Tune up	10.00
6(2437MHz)	10.87
Tune up	11.00
1(2412MHz)	9.31
Tune up	10.00
802.11n(dBm)-20MHz	
Channel\data rate	MCS0
11(2462MHz)	8.40
Tune up	9.00
6(2437MHz)	7.78
Tune up	9.00
1(2412MHz)	8.33
Tune up	9.00
802.11n(dBm)-40MHz	
Channel\data rate	MCS0
9(2452MHz)	8.41
Tune up	9.00
6(2437MHz)	7.55
Tune up	9.00
3(2422MHz)	8.76
Tune up	9.00

WiFi 5G-Normal Power

5GHz		
802.11a(dBm)		
Channel\data rate	6Mbps	
36(5180 MHz)	17.34	
40(5200 MHz)	17.60	
44(5220 MHz)	17.35	
48(5240 MHz)	**17.98**	
52(5260 MHz)	**18.13**	
56(5280 MHz)	18.15	
60(5300 MHz)	17.81	
64(5320 MHz)	18.11	
tune up	18.50	
149(5745 MHz)	18.25	
153(5765 MHz)	18.01	
157(5785 MHz)	18.21	
161(5805 MHz)	**17.81**	
165(5825 MHz)	18.09	
tune up	19.00	

WiFi 5G-Low Power

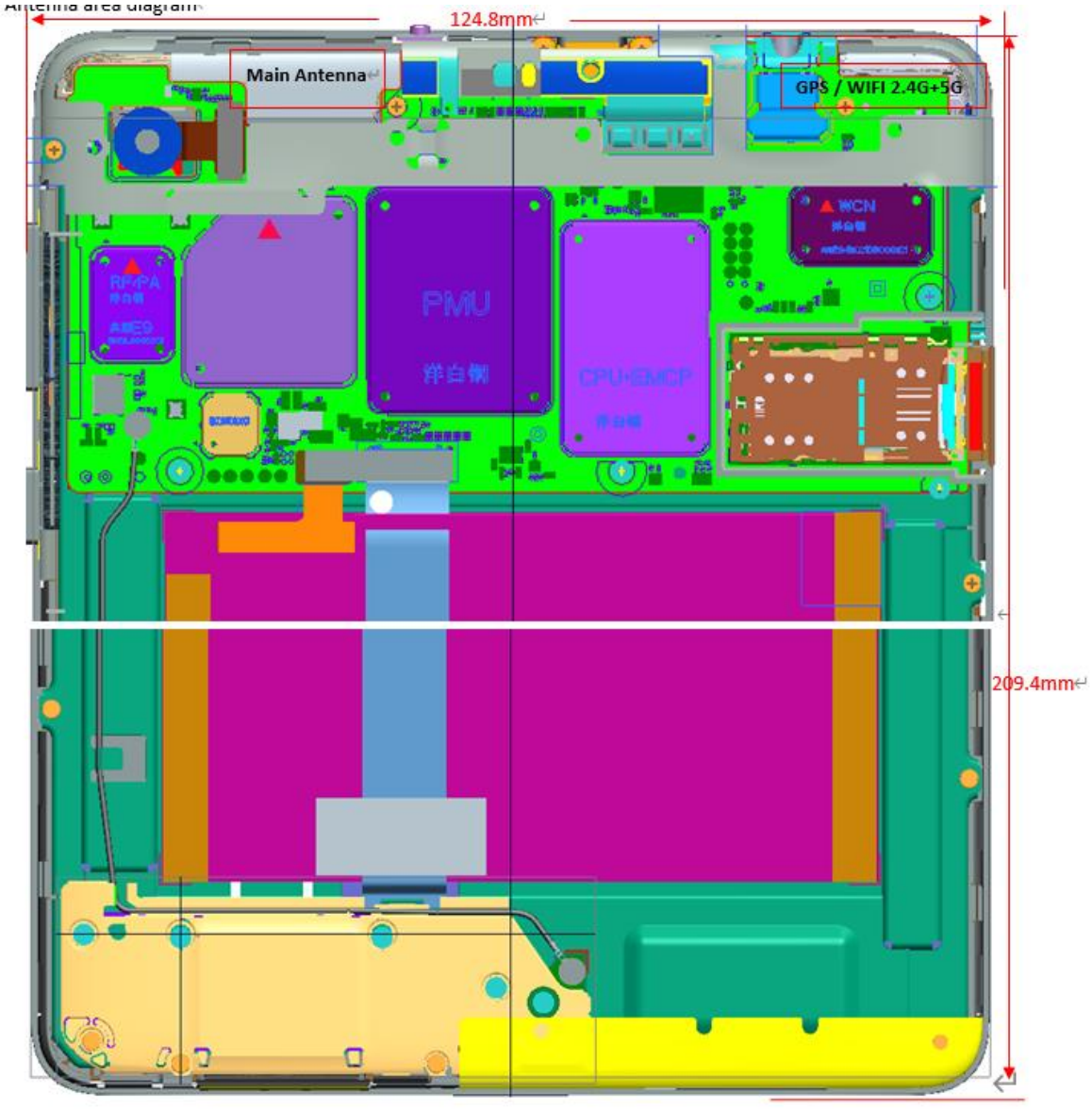
5GHz		
802.11a(dBm)		
Channel\data rate	6Mbps	
36(5180 MHz)	8.02	11.00
40(5200 MHz)	8.22	
44(5220 MHz)	8.24	
48(5240 MHz)	**8.20**	
52(5260 MHz)	**8.26**	
56(5280 MHz)	8.03	
60(5300 MHz)	8.11	
64(5320 MHz)	8.01	
Tune up	9.50	
149(5745 MHz)	9.18	
153(5765 MHz)	9.24	
157(5785 MHz)	9.27	
161(5805 MHz)	**9.53**	
165(5825 MHz)	9.48	
Tune up	10.00	

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.

12.2 Transmit Antenna Separation Distances



Picture 12.1 Antenna Locations

12.3 SAR Measurement Positions

According to the KDB616217 D04, 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
Main antenna	No	Yes	No	Yes	Yes	No
WLAN	No	Yes	Yes	No	Yes	No

12.4 Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied. The 1-g SAR test exclusion threshold for 100 MHz to 6 GHz at test separation distances≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

Table 12.1: Standalone SAR test exclusion considerations

Band/Mode	F(GHz)	Position	SAR test exclusion threshold (mW)	RF output power		SAR test exclusion
				dBm	mW	
Bluetooth	2.441	Body	19.2	11	12.59	Yes
2.4GHz WLAN	2.45	Body	19.17	19.5	89.13	No
5G WLAN UNII-1	5.2	Body	13.16	18.5	70.79	No
5G WLAN UNII-2A	5.3	Body	13.03	18.5	70.79	No
5G WLAN UNII-3	5.8	Body	12.78	19	79.43	No

13 Evaluation of Simultaneous

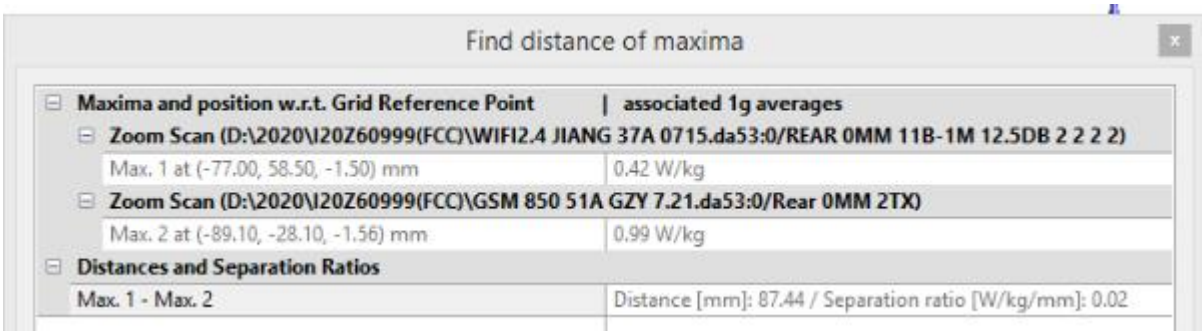
Table 13.1: The sum of reported SAR values for main antenna and WiFi2.4G

	Position	Band	Main antenna	WLAN antenna	Sum	Distance (mm)	Ratio
Maximum reported SAR value for Body	Rear 0mm	GSM850	1.21	0.43	**1.64**	87.44	**0.024**
	Rear 0mm	WCDMA1700	1.11	0.43	**1.54**	/	**/**
	Rear 0mm	WCDMA1900	1.20	0.43	**1.63**	104.02	**0.020**
	Rear 0mm	LTE Band7	1.19	0.43	**1.62**	115.12	**0.018**
	Rear 0mm	LTE Band25	1.20	0.43	**1.63**	103.63	**0.020**
	Rear 0mm	LTE Band66	1.11	0.43	**1.54**	/	**/**

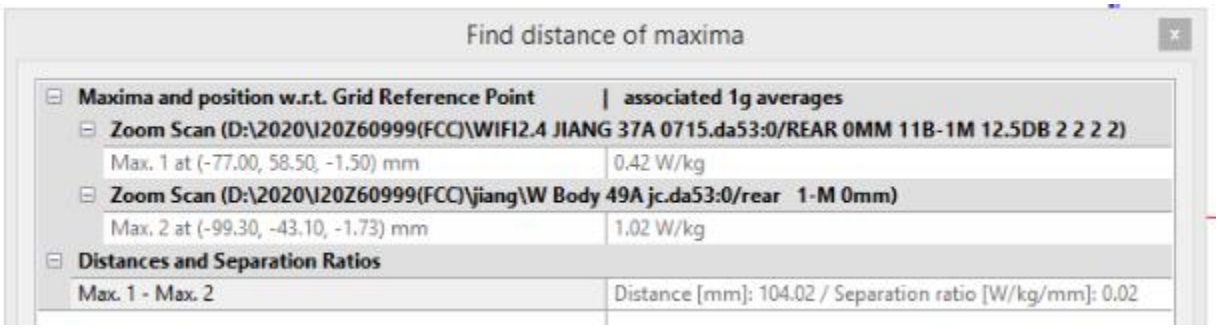
Table 13.2: The sum of reported SAR values for main antenna and WiFi5G

	Position	Band	Main antenna	WLAN antenna	Sum	Distance (mm)	Ratio
Maximum reported SAR value for Body	Rear 0mm	GSM850	1.21	0.66	**1.87**	80.62	**0.032**
	Rear 0mm	GSM1900	1.05	0.66	**1.71**	96.68	**0.023**
	Rear 0mm	WCDMA1700	1.11	0.66	**1.77**	94.87	**0.025**
	Rear 0mm	WCDMA1900	1.20	0.66	**1.86**	97.82	**0.026**
	Rear 0mm	LTE Band7	1.19	0.66	**1.85**	108.67	**0.023**
	Rear 0mm	LTE Band25	1.20	0.66	**1.86**	96.49	**0.026**
	Rear 0mm	LTE Band26	0.92	0.66	**1.58**	/	**/**
	Rear 0mm	LTE Band41 PC2	0.92	0.66	**1.58**	/	**/**
	Rear 0mm	LTE Band66	1.11	0.66	**1.77**	102.29	**0.023**

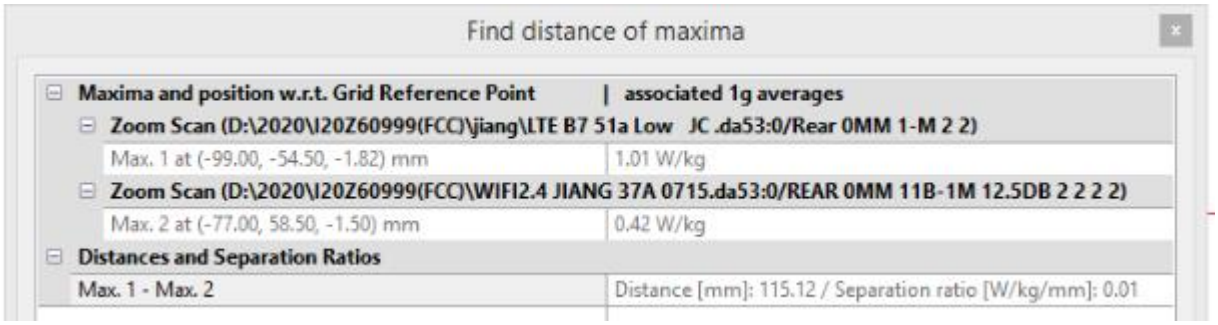
According to the KDB 447498 D01, when the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR to peak location separation ratio. The ratio is determined by $(SAR1 + SAR2)^{1.5}/Ri$, rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion.



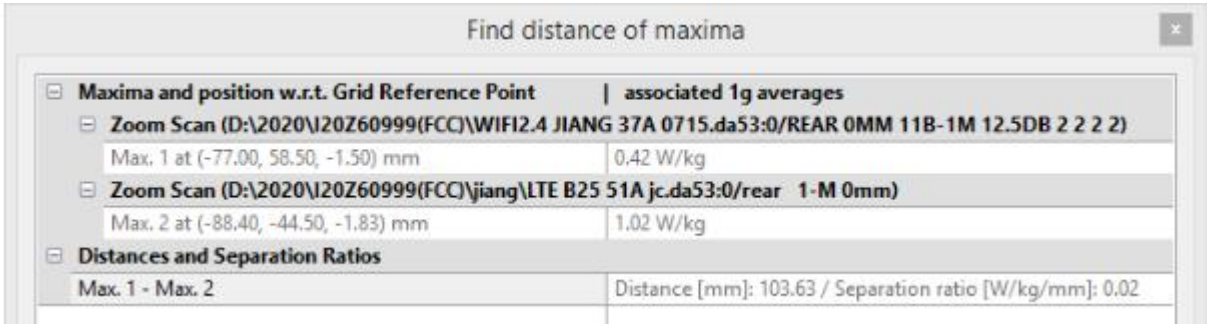
Picture 13.1 Distance evaluation for GSM850 and WLAN2.4G



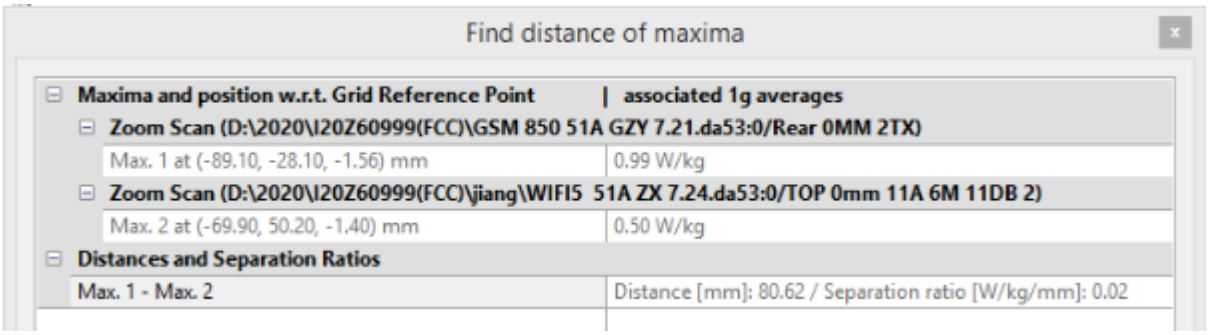
Picture 13.2 Distance evaluation for WCDMA1900 and WLAN2.4G



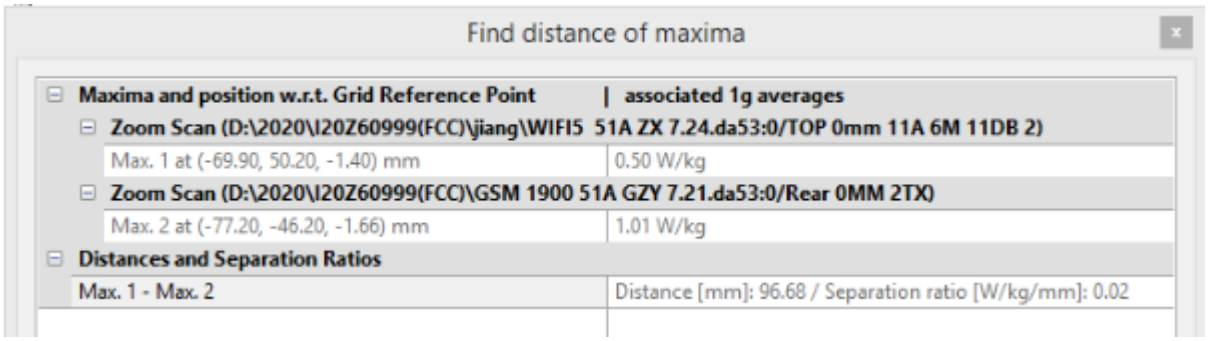
Picture 13.3 Distance evaluation for LTE B7 and WLAN2.4G



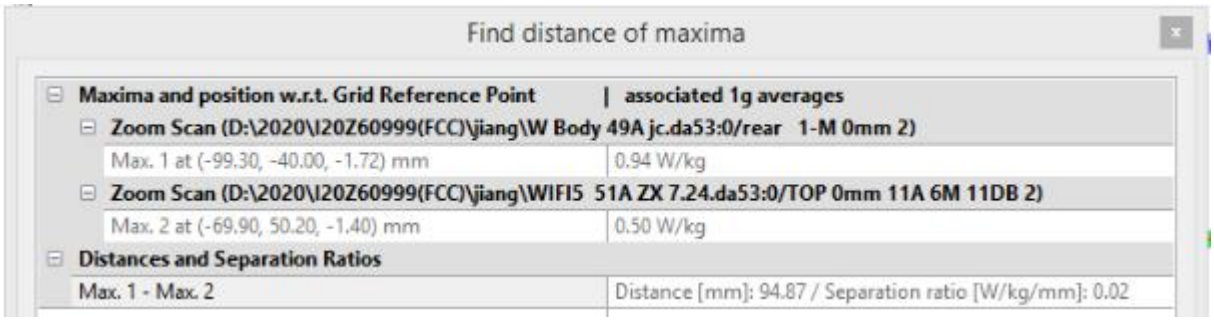
Picture 13.4 Distance evaluation for LTE 25 and WLAN2.4G



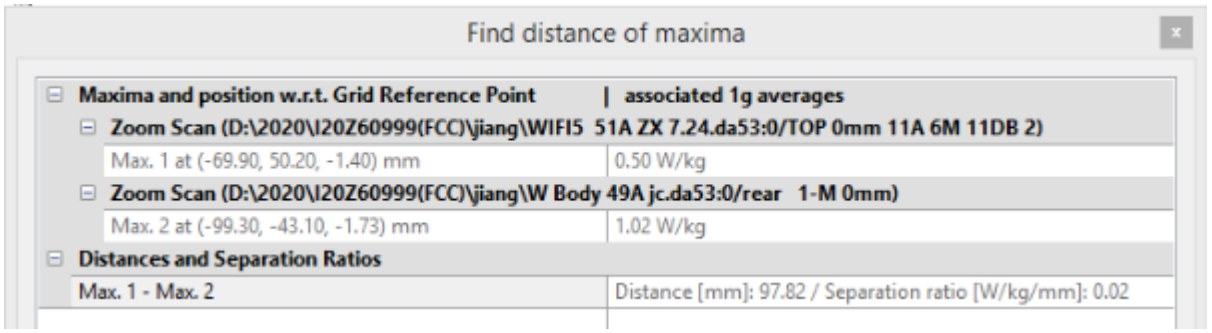
Picture 13.5 Distance evaluation for GSM850 and WLAN5G



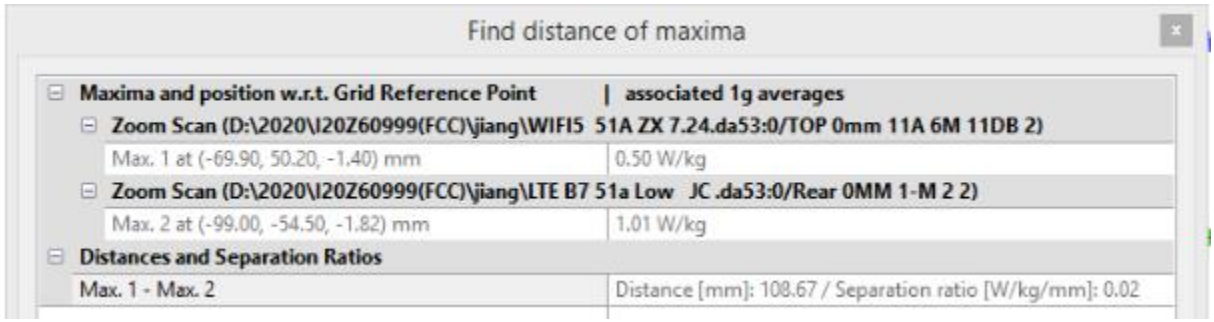
Picture 13.6 Distance evaluation for GSM1900 and WLAN5G



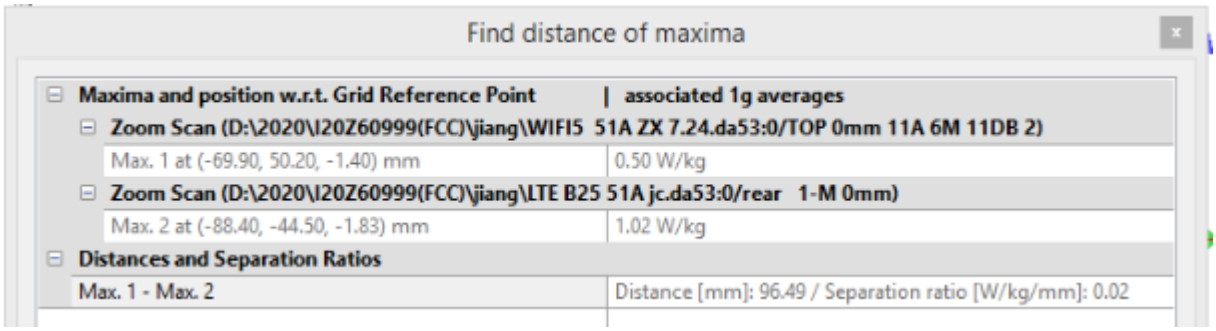
Picture 13.7 Distance evaluation for WCDMA1700 and WLAN5G



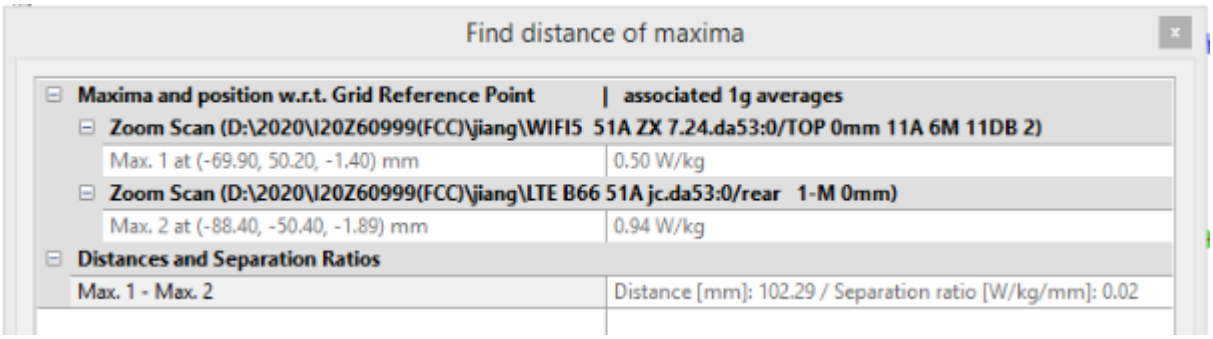
Picture 13.8 Distance evaluation for WCDMA1900 and WLAN5G



Picture 13.9 Distance evaluation for LTE B7 and WLAN5G



Picture 13.10 Distance evaluation for LTE 25 and WLAN5G



Picture 13.11 Distance evaluation for LTE B66 and WLAN5G

Table 13.2: The sum of reported SAR values for main antenna and BT

	Position	Main antenna	BT	Sum
Maximum reported SAR value for Body	Rear 0mm	1.21	<0.01 [1]	**1.27**

[1] - The head SAR of BT is too low to get it, so the “<0.01” is used to indicate the head SAR of BT.

14 SAR Test Result

It is determined by user manual for the distance between the EUT and the phantom bottom. The distance are 0mm, 7mm, 9mm, 12mm and 14mm, 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-gSAR 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 for GSM850/1900 – Normal power	1:4
GPRS&EGPRS for GSM850/1900 – Low power	1:4
WCDMA&LTE FDD	1:1
LTE B41 PC2	1:2.309
LTE B41 PC3	1:1.58

14.1 SAR results for Fast SAR

Table 14.1-1: SAR Values (GSM 850 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
190	836.6	GPRS (2)	Rear 15mm	/	30.80	32.00	0.254	**0.33**	0.342	**0.45**	0.02
190	836.6	GPRS (2)	Right 10mm	/	30.80	32.00	0.115	**0.15**	0.174	**0.23**	0.06
190	836.6	GPRS (2)	Top 12mm	/	30.80	32.00	0.261	**0.34**	0.385	**0.51**	0.08
251	848.8	GPRS (2)	Rear 0mm	/	24.49	25.50	0.379	**0.48**	0.849	**1.07**	0.07
190	836.6	GPRS (2)	Rear 0mm	/	24.51	25.50	0.391	**0.49**	0.910	**1.14**	-0.09
128	824.2	GPRS (2)	Rear 0mm	Fig.1	24.62	25.50	0.453	**0.55**	0.987	**1.21**	0.05
190	836.6	GPRS (2)	Right 0mm	/	24.51	25.50	0.104	**0.13**	0.190	**0.24**	-0.04
190	836.6	GPRS (2)	Top 0mm	/	24.51	25.50	0.235	**0.30**	0.400	**0.50**	-0.05
128	824.2	EGPRS (2)	Rear 0mm	/	24.60	25.50	0.431	**0.53**	0.955	**1.17**	0.06
128	824.2	GPRS (2)	Rear 0mm	Headset	24.62	25.50	0.421	**0.52**	0.947	**1.16**	0.03

Table 14.1-2: SAR Values (GSM 1900 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
661	1880	GPRS (2)	Rear 15mm	/	27.84	29.00	0.152	**0.20**	0.248	**0.32**	0.09
661	1880	GPRS (2)	Right 10mm	/	27.84	29.00	0.201	**0.26**	0.344	**0.45**	-0.01
661	1880	GPRS (2)	Top 12mm	/	27.84	29.00	0.268	**0.35**	0.475	**0.62**	0.13
810	1909.8	GPRS (2)	Rear 0mm	/	19.71	20.00	0.351	**0.38**	0.677	**0.72**	0.19
661	1880	GPRS (2)	Rear 0mm	/	19.59	20.00	0.414	**0.45**	0.819	**0.90**	-0.01
512	1850.2	GPRS (2)	Rear 0mm	Fig.2	19.82	20.00	0.516	**0.54**	1.010	**1.05**	-0.10
661	1880	GPRS (2)	Right 0mm	/	19.59	20.00	0.115	**0.13**	0.240	**0.26**	-0.04
661	1880	GPRS (2)	Top 0mm	/	19.59	20.00	0.196	**0.22**	0.433	**0.48**	-0.13
810	1909.8	EGPRS (2)	Rear 0mm	/	19.82	20.00	0.504	**0.53**	0.983	**1.02**	0.17

Table 14.1-3: SAR Values (WCDMA 850 MHz Band - Body)

Ambient Temperature: 22.9 ºC		Liquid Temperature: 22.5ºC								
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
4182	836.4	Rear 15mm	/	23.01	24.00	0.113	**0.14**	0.156	**0.20**	0.08
4182	836.4	Right 10mm	/	23.01	24.00	0.041	**0.05**	0.059	**0.07**	0.09
4182	836.4	Top 12mm	/	23.01	24.00	0.188	**0.24**	0.275	**0.35**	0.10
4233	846.6	Rear 0mm	/	18.16	19.00	0.250	**0.30**	0.556	**0.67**	0.06
4182	836.4	Rear 0mm	Fig.3	18.11	19.00	0.318	**0.39**	0.661	**0.81**	-0.08
4132	826.4	Rear 0mm	/	18.16	19.00	0.278	**0.34**	0.640	**0.78**	-0.13
4182	836.4	Right 0mm	/	18.11	19.00	0.067	**0.08**	0.125	**0.15**	0.10
4182	836.4	Top 0mm	/	18.11	19.00	0.200	**0.25**	0.411	**0.50**	0.12

Table 14.1-4: SAR Values (WCDMA 1700 MHz Band - Body)

Ambient Temperature: 22.9 ºC		Liquid Temperature: 22.5ºC								
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
1412	1732.4	Rear 15mm	/	22.99	24.00	0.185	**0.23**	0.304	**0.38**	-0.03
1412	1732.4	Right 10mm	/	22.99	24.00	0.178	**0.22**	0.310	**0.39**	0.12
1412	1732.4	Top 12mm	/	22.99	24.00	0.224	**0.28**	0.375	**0.47**	0.01
1513	1752.6	Rear 0mm	/	15.79	16.50	0.498	**0.59**	0.880	**1.04**	-0.09
1412	1732.4	Rear 0mm	/	15.89	16.50	0.504	**0.58**	0.924	**1.06**	0.07
1312	1712.4	Rear 0mm	Fig.4	15.77	16.50	0.513	**0.61**	0.937	**1.11**	0.05
1412	1732.4	Right 0mm	/	15.89	16.50	0.197	**0.23**	0.382	**0.44**	-0.07
1412	1732.4	Top 0mm	/	15.89	16.50	0.202	**0.23**	0.419	**0.48**	0.02

Table 14.1-5: SAR Values (WCDMA 1900 MHz Band - Body)

Ambient Temperature: 22.9 ºC		Liquid Temperature: 22.5ºC								
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
9400	1880	Rear 15mm	/	23.03	24.00	0.175	**0.22**	0.278	**0.35**	0.02
9400	1880	Right 10mm	/	23.03	24.00	0.195	**0.24**	0.329	**0.41**	0.10
9400	1880	Top 12mm	/	23.03	24.00	0.320	**0.40**	0.571	**0.71**	0.01
9538	1907.6	Rear 0mm	/	15.92	16.50	0.504	**0.58**	0.971	**1.11**	0.07
9400	1880	Rear 0mm	/	15.90	16.50	0.503	**0.58**	0.970	**1.11**	0.12
9262	1852.4	Rear 0mm	Fig.5	15.81	16.50	0.528	**0.62**	1.020	**1.20**	-0.02
9400	1880	Right 0mm	/	15.90	16.50	0.144	**0.17**	0.301	**0.35**	0.03
9400	1880	Top 0mm		15.90	16.50	0.296	**0.34**	0.692	**0.79**	0.04

Table 14.1-6: SAR Values (LTE Band7 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
21100	2535	1RB_Mid	Rear 15mm	/	22.61	23.50	0.181	**0.22**	0.321	**0.39**	0.13
21100	2535	1RB_Mid	Right 10mm	/	22.61	23.50	0.197	**0.24**	0.447	**0.55**	0.12
21350	2560	1RB_Mid	Top 12mm	/	22.61	23.50	0.351	**0.43**	0.659	**0.81**	-0.03
21100	2535	1RB_Mid	Top 12mm	/	22.60	23.50	0.381	**0.47**	0.720	**0.89**	0.08
20850	2510	1RB_Mid	Top 12mm	/	22.52	23.50	0.341	**0.43**	0.653	**0.82**	0.09
21350	2560	1RB_Mid	Rear 0mm	Fig.6	13.29	14.00	0.392	**0.46**	1.010	**1.19**	-0.12
21100	2535	1RB_Mid	Rear 0mm	/	13.32	14.00	0.386	**0.45**	0.986	**1.15**	0.04
20850	2510	1RB_Mid	Rear 0mm	/	13.28	14.00	0.333	**0.39**	0.905	**1.07**	-0.03
21350	2560	1RB_Mid	Right 0mm	/	13.29	14.00	0.232	**0.27**	0.664	**0.78**	-0.04
21100	2535	1RB_Mid	Right 0mm	/	13.32	14.00	0.246	**0.29**	0.719	**0.84**	0.13
20850	2510	1RB_Mid	Right 0mm	/	13.28	14.00	0.255	**0.30**	0.743	**0.88**	-0.05
21350	2560	1RB_Mid	Top 0mm	/	13.29	14.00	0.232	**0.27**	0.666	**0.78**	-0.05
21100	2535	1RB_Mid	Top 0mm	/	13.32	14.00	0.248	**0.29**	0.752	**0.88**	-0.12
20850	2510	1RB_Mid	Top 0mm	/	13.28	14.00	0.258	**0.30**	0.780	**0.92**	0.05
21350	2560	50RB_Low	Rear 15mm	/	21.57	22.50	0.160	**0.20**	0.291	**0.36**	0.02
21350	2560	50RB_Low	Right 10mm	/	21.57	22.50	0.181	**0.22**	0.391	**0.48**	0.00
21350	2560	50RB_Low	Top 12mm	/	21.57	22.50	0.290	**0.36**	0.545	**0.68**	0.07
21350	2560	50RB_Low	Rear 0mm	/	12.31	13.00	0.320	**0.38**	0.816	**0.96**	0.00
21100	2535	50RB_Mid	Rear 0mm	/	12.27	13.00	0.316	**0.37**	0.709	**0.84**	0.07
20850	2510	50RB_High	Rear 0mm	/	12.15	13.00	0.321	**0.39**	0.720	**0.88**	0.05
21350	2560	50RB_Low	Right 0mm	/	12.31	13.00	0.195	**0.23**	0.602	**0.71**	0.08
21350	2560	50RB_Low	Top 0mm	/	12.31	13.00	0.235	**0.28**	0.622	**0.73**	0.02
21350	2560	100RB	Top 12mm	/	21.49	22.50	0.274	**0.35**	0.517	**0.65**	0.06
21350	2560	100RB	Rear 0mm	/	12.21	13.00	0.314	**0.38**	0.708	**0.85**	0.08
21350	2560	100RB	Right 0mm	/	12.21	13.00	0.203	**0.24**	0.611	**0.73**	-0.10
21350	2560	100RB	Top 0mm	/	12.21	13.00	0.253	**0.30**	0.772	**0.93**	0.08

Note: The LTE mode is QPSK_20MHz.

Table 14.1-7: SAR Values (LTE Band12 - Body)

Ambient Temperature: 22.9 °C					Liquid Temperature: 22.5°C						
Frequency		Mode	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
23095	707.5	1RB_Mid	Rear 15mm	/	22.87	24.00	0.133	**0.17**	0.162	**0.21**	0.06
23095	707.5	1RB_Mid	Right 10mm	/	22.87	24.00	0.044	**0.06**	0.065	**0.08**	0.08
23095	707.5	1RB_Mid	Top 12mm	/	22.87	24.00	0.149	**0.19**	0.215	**0.28**	0.08
23130	711	1RB_Mid	Rear 0mm	/	17.73	19.00	0.348	**0.47**	0.566	**0.76**	0.11
23095	707.5	1RB_Mid	Rear 0mm	Fig.7	17.82	19.00	0.394	**0.52**	0.638	**0.84**	0.01
23060	704	1RB_Mid	Rear 0mm	/	17.82	19.00	0.348	**0.46**	0.562	**0.74**	-0.03
23095	707.5	1RB_Mid	Right 0mm	/	17.82	19.00	0.090	**0.12**	0.120	**0.16**	0.07
23095	707.5	1RB_Mid	Top 0mm	/	17.82	19.00	0.176	**0.23**	0.286	**0.38**	0.07
23095	707.5	25RB_Low	Rear 15mm	/	21.75	23.00	0.102	**0.14**	0.122	**0.16**	0.12
23095	707.5	25RB_Low	Right 10mm	/	21.75	23.00	0.036	**0.05**	0.060	**0.08**	0.13
23095	707.5	25RB_Low	Top 12mm	/	21.75	23.00	0.117	**0.16**	0.168	**0.22**	0.02
23130	711	25RB_Low	Rear 0mm	/	17.81	19.00	0.309	**0.41**	0.505	**0.66**	0.09
23130	711	25RB_Low	Right 0mm	/	17.81	19.00	0.078	**0.10**	0.105	**0.14**	0.08
23130	711	25RB_Low	Top 0mm	/	17.81	19.00	0.115	**0.15**	0.150	**0.20**	-0.11
23130	711	100RB	Rear 0mm	/	17.74	19.00	0.271	**0.36**	0.440	**0.59**	0.00

Note: The LTE mode is QPSK_10MHz.

Table 14.1-8: SAR Values (LTE Band13 - Body)

Ambient Temperature: 22.9 °C					Liquid Temperature: 22.5°C						
Frequency		Mode	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
23230	782	1RB_Mid	Rear 15mm	/	22.73	24.00	0.109	**0.15**	0.131	**0.18**	0.00
23230	782	1RB_Mid	Right 10mm	/	22.73	24.00	0.038	**0.05**	0.057	**0.08**	0.01
23230	782	1RB_Mid	Top 12mm	/	22.73	24.00	0.160	**0.21**	0.233	**0.31**	0.09
23230	782	1RB_Mid	Rear 0mm	Fig.8	17.79	19.00	0.328	**0.43**	0.690	**0.91**	-0.13
23230	782	1RB_Mid	Right 0mm	/	17.79	19.00	0.070	**0.09**	0.126	**0.17**	-0.06
23230	782	1RB_Mid	Top 0mm	/	17.79	19.00	0.223	**0.29**	0.409	**0.54**	-0.10
23230	782	25RB_ Mid	Rear 15mm	/	21.75	23.00	0.085	**0.11**	0.102	**0.14**	0.07
23230	782	25RB_ Mid	Right 10mm	/	21.75	23.00	0.029	**0.04**	0.048	**0.06**	0.05
23230	782	25RB_ Mid	Top 12mm	/	21.75	23.00	0.124	**0.17**	0.180	**0.24**	0.11
23230	782	25RB_ Mid	Rear 0mm	/	17.78	19.00	0.254	**0.34**	0.534	**0.71**	-0.02
23230	782	25RB_ Mid	Right 0mm	/	17.78	19.00	0.063	**0.08**	0.097	**0.13**	-0.13
23230	782	25RB_ Mid	Top 0mm	/	17.78	19.00	0.174	**0.23**	0.319	**0.42**	0.13
23230	782	100RB	Rear 0mm	/	17.68	19.00	0.247	**0.33**	0.519	**0.70**	0.16

Note: The LTE mode is QPSK_10MHz.

Table 14.1-9: SAR Values (LTE band25 - Body)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
26140	1860	1RB_Mid	Rear 15mm	/	22.76	24.00	0.276	**0.37**	0.452	**0.60**	-0.01
26140	1860	1RB_Mid	Right 10mm	/	22.76	24.00	0.087	**0.12**	0.162	**0.22**	0.09
26140	1860	1RB_Mid	Top 12mm	/	22.76	24.00	0.243	**0.32**	0.444	**0.59**	0.09
26590	1905	1RB_Mid	Rear 0mm	Fig.9	15.81	16.50	0.528	**0.62**	1.020	**1.20**	0.10
26365	1882.5	1RB_Mid	Rear 0mm	/	15.76	16.50	0.521	**0.62**	0.980	**1.16**	-0.08
26140	1860	1RB_Mid	Rear 0mm	/	15.78	16.50	0.525	**0.62**	0.991	**1.17**	-0.09
26140	1860	1RB_Mid	Right 0mm	/	15.81	16.50	0.110	**0.13**	0.225	**0.26**	-0.09
26590	1905	1RB_Mid	Top 0mm	/	15.81	16.50	0.337	**0.40**	0.728	**0.85**	0.09
26365	1882.5	1RB_Mid	Top 0mm	/	15.76	16.50	0.333	**0.39**	0.699	**0.83**	0.15
26140	1860	1RB_Mid	Top 0mm	/	15.78	16.50	0.335	**0.40**	0.707	**0.84**	-0.06
26140	1860	50RB_High	Rear 15mm	/	21.73	23.00	0.209	**0.28**	0.344	**0.46**	0.04
26140	1860	50RB_High	Right 10mm	/	21.73	23.00	0.078	**0.10**	0.146	**0.20**	0.02
26140	1860	50RB_High	Top 12mm	/	21.73	23.00	0.186	**0.25**	0.339	**0.45**	-0.01
26590	1905	50RB_Mid	Rear 0mm	/	15.66	16.50	0.416	**0.50**	0.798	**0.97**	0.04
26365	1882.5	50RB_Mid	Rear 0mm	/	15.62	16.50	0.426	**0.52**	0.830	**1.02**	0.10
26140	1860	50RB_Low	Rear 0mm	/	15.80	16.50	0.398	**0.47**	0.812	**0.95**	-0.09
26140	1860	50RB_Low	Right 0mm	/	15.80	16.50	0.109	**0.13**	0.215	**0.25**	-0.08
26140	1860	50RB_Low	Top 0mm	/	15.80	16.50	0.259	**0.30**	0.561	**0.66**	-0.02
26140	1860	100RB	Rear 0mm	/	15.80	16.50	0.418	**0.49**	0.794	**0.93**	0.14
26140	1860	100RB	Top 0mm	/	15.80	16.50	0.252	**0.30**	0.532	**0.63**	0.07

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-10: SAR Values (LTE band26 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
26775	822.5	1RB_Mid	Rear 15mm	/	22.71	24.00	0.123	**0.17**	0.163	**0.22**	0.13
26775	822.5	1RB_Mid	Right 10mm	/	22.71	24.00	0.053	**0.07**	0.078	**0.10**	-0.02
26775	822.5	1RB_Mid	Top 12mm	/	22.71	24.00	0.175	**0.24**	0.255	**0.34**	0.13
26965	841.5	1RB_Mid	Rear 0mm	Fig.10	17.75	19.00	0.315	**0.42**	0.687	**0.92**	0.02
26865	831.5	1RB_Mid	Rear 0mm	/	17.71	19.00	0.312	**0.42**	0.677	**0.91**	0.10
26775	822.5	1RB_Mid	Rear 0mm	/	17.80	19.00	0.311	**0.41**	0.677	**0.89**	-0.07
26775	822.5	1RB_Mid	Right 0mm	/	17.80	19.00	0.061	**0.08**	0.088	**0.12**	0.04
26775	822.5	1RB_Mid	Top 0mm	/	17.80	19.00	0.188	**0.25**	0.281	**0.37**	-0.12
26865	831.5	36RB_High	Rear 15mm	/	21.68	23.00	0.098	**0.13**	0.130	**0.18**	-0.01
26865	831.5	36RB_High	Right 10mm	/	21.68	23.00	0.043	**0.06**	0.062	**0.08**	0.05
26865	831.5	36RB_High	Top 12mm	/	21.68	23.00	0.137	**0.19**	0.199	**0.27**	0.10
26775	822.5	36RB_ Mid	Rear 0mm	/	17.77	19.00	0.228	**0.30**	0.470	**0.62**	0.11
26775	822.5	36RB_ Mid	Right 0mm	/	17.77	19.00	0.047	**0.06**	0.068	**0.09**	-0.02
26775	822.5	36RB_ Mid	Top 0mm	/	17.77	19.00	0.150	**0.20**	0.224	**0.30**	-0.06
26865	831.5	75RB	Rear 0mm	/	17.76	19.00	0.219	**0.29**	0.441	**0.59**	0.17

Note: The LTE mode is QPSK_15MHz.

Table 14.1-11: SAR Values (LTE band41 - Body) – Power Class 2

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
41055	2636.5	1RB_Mid	Rear 15mm	/	26.10	27.00	0.118	**0.15**	0.234	**0.29**	0.09
41055	2636.5	1RB_Mid	Right 10mm	/	26.10	27.00	0.245	**0.30**	0.541	**0.67**	0.09
41055	2636.5	1RB_Mid	Top 12mm		26.10	27.00	0.305	**0.38**	0.583	**0.72**	0.02
41490	2680	1RB_Mid	Rear 0mm	/	16.68	17.00	0.296	**0.32**	0.737	**0.79**	-0.02
41055	2636.5	1RB_Mid	Rear 0mm		16.75	17.00	0.322	**0.34**	0.869	**0.92**	0.08
40620	2593	1RB_Mid	Rear 0mm		16.59	17.00	0.299	**0.33**	0.765	**0.84**	-0.07
40185	2549.5	1RB_Mid	Rear 0mm		16.51	17.00	0.315	**0.35**	0.804	**0.90**	-0.09
39750	2506	1RB_Mid	Rear 0mm		16.60	17.00	0.335	**0.37**	0.825	**0.90**	-0.07
41490	2680	1RB_Mid	Right 0mm	/	16.75	17.00	0.239	**0.25**	0.700	**0.74**	-0.06
41490	2680	1RB_Mid	Top 0mm	Fig.11	16.68	17.00	0.328	**0.35**	0.863	**0.93**	-0.02
41055	2636.5	1RB_Mid	Top 0mm		16.75	17.00	0.290	**0.31**	0.861	**0.91**	-0.01
40620	2593	1RB_Mid	Top 0mm		16.59	17.00	0.254	**0.28**	0.764	**0.84**	-0.07
40185	2549.5	1RB_Mid	Top 0mm		16.51	17.00	0.239	**0.27**	0.725	**0.81**	0.06
39750	2506	1RB_Mid	Top 0mm		16.60	17.00	0.250	**0.27**	0.755	**0.83**	0.09

41055	2636.5	50RB_Mid	Rear 14mm	/	24.87	26.00	0.089	**0.12**	0.177	**0.23**	0.12
41055	2636.5	50RB_Mid	Right 12mm	/	24.87	26.00	0.180	**0.23**	0.419	**0.54**	0.1
41055	2636.5	50RB_Mid	Top 12mm	/	24.87	26.00	0.155	**0.20**	0.375	**0.49**	0.09
41490	2680	50RB_High	Rear 0mm	/	15.44	16.00	0.182	**0.21**	0.470	**0.53**	0.12
41490	2680	50RB_High	Right 0mm	/	15.44	16.00	0.213	**0.24**	0.562	**0.64**	0.09
41490	2680	50RB_High	Top 0mm	/	15.44	16.00	0.191	**0.22**	0.470	**0.53**	0.01
41055	2636.5	100RB	Rear 0mm	/	15.38	16.00	0.168	**0.19**	0.452	**0.52**	0.05
41055	2636.5	100RB	Top 0mm		15.38	16.00	0.172	**0.20**	0.463	**0.53**	0.18

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-12: SAR Values (LTE band41 - Body) – Power Class 3

Ambient Temperature: 22.9 ºC					Liquid Temperature: 22.5ºC						
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
41055	2636.5	1RB_Mid	Rear 15mm	/	23.01	24.00	0.081	**0.10**	0.168	**0.21**	-0.03
41055	2636.5	1RB_Mid	Right 10mm	/	23.01	24.00	0.160	**0.20**	0.362	**0.45**	0.06
41055	2636.5	1RB_Mid	Top 12mm	/	23.01	24.00	0.226	**0.28**	0.431	**0.54**	0.01
41490	2680	1RB_High	Rear 0mm	/	13.44	14.00	0.191	**0.22**	0.450	**0.51**	0.10
41490	2680	1RB_High	Right 0mm	/	13.44	14.00	0.189	**0.22**	0.481	**0.55**	0.01
41490	2680	1RB_High	Top 0mm	Fig.12	13.44	14.00	0.242	**0.28**	0.643	**0.73**	-0.01
41055	2636.5	50RB_Mid	Rear 15mm	/	21.89	23.00	0.062	**0.08**	0.127	**0.16**	0.04
41055	2636.5	50RB_Mid	Right 10mm	/	21.89	23.00	0.126	**0.16**	0.284	**0.37**	0.02
41055	2636.5	50RB_Mid	Top 12mm	/	21.89	23.00	0.137	**0.18**	0.280	**0.36**	0.02
41490	2680	50RB_High	Rear 0mm	/	12.43	13.00	0.135	**0.15**	0.281	**0.32**	-0.10
41055	2636.5	50RB_High	Right 0mm	/	12.43	13.00	0.148	**0.17**	0.379	**0.43**	-0.02
41490	2680	50RB_High	Top 0mm	/	12.43	13.00	0.194	**0.22**	0.519	**0.59**	0.09

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-13: SAR Values (LTE band66 - Body)

Ambient Temperature: 22.9 ºC					Liquid Temperature: 22.5ºC						
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
132572	1770	1RB_Mid	Rear 15mm	/	22.70	24.00	0.271	**0.37**	0.417	**0.56**	0.08
132572	1770	1RB_Mid	Right 10mm	/	22.70	24.00	0.096	**0.13**	0.137	**0.18**	0.13
132572	1770	1RB_Mid	Top 12mm	/	22.70	24.00	0.246	**0.33**	0.393	**0.53**	0.08
132572	1770	1RB_Mid	Rear 0mm	/	15.75	16.50	0.473	**0.56**	0.853	**1.01**	-0.12
132322	1745	1RB_Mid	Rear 0mm	/	15.78	16.50	0.497	**0.59**	0.824	**0.97**	-0.13
132072	1720	1RB_Mid	Rear 0mm	Fig.13	15.75	16.50	0.516	**0.61**	0.938	**1.11**	-0.05
132072	1720	1RB_Mid	Right 0mm	/	15.78	16.50	0.133	**0.16**	0.240	**0.28**	-0.01

132072	1720	1RB_Mid	Top 0mm	/	15.78	16.50	0.195	**0.23**	0.415	**0.49**	-0.01
132572	1770	50RB_Low	Rear 15mm	/	21.72	23.00	0.211	**0.28**	0.324	**0.44**	0.07
132572	1770	50RB_Low	Right 10mm	/	21.72	23.00	0.076	**0.10**	0.108	**0.15**	0.02
132572	1770	50RB_Low	Top 12mm	/	21.72	23.00	0.195	**0.26**	0.311	**0.42**	-0.03
132572	1770	50RB_High	Rear 0mm	/	15.72	16.50	0.348	**0.42**	0.624	**0.75**	-0.11
132322	1745	50RB_ Mid	Rear 0mm	/	15.60	16.50	0.380	**0.47**	0.687	**0.85**	-0.10
132072	1720	50RB_ Mid	Rear 0mm	/	15.56	16.50	0.396	**0.49**	0.719	**0.89**	0.08
132572	1770	50RB_High	Right 0mm	/	15.72	16.50	0.119	**0.14**	0.220	**0.26**	0.12
132572	1770	50RB_High	Top 0mm	/	15.72	16.50	0.160	**0.19**	0.335	**0.40**	0.03
132572	1770	100RB	Rear 0mm	/	15.66	16.50	0.357	**0.43**	0.641	**0.78**	-0.06

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-14: SAR Values (LTE band71 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
133322	683	1RB_Mid	Rear 15mm	/	22.63	24.00	0.142	**0.19**	0.173	**0.24**	-0.02
133322	683	1RB_Mid	Right 10mm	/	22.63	24.00	0.046	**0.06**	0.067	**0.09**	0.04
133322	683	1RB_Mid	Top 12mm	/	22.63	24.00	0.159	**0.22**	0.229	**0.31**	-0.02
133372	688	1RB_Mid	Rear 0mm	/	17.80	19.00	0.232	**0.31**	0.633	**0.83**	0.03
133322	683	1RB_Mid	Rear 0mm	/	17.79	19.00	0.287	**0.38**	0.625	**0.83**	0.10
133222	673	1RB_Mid	Rear 0mm	Fig.14	17.88	19.00	0.303	**0.39**	0.659	**0.85**	0.00
133222	673	1RB_Mid	Right 0mm	/	17.88	19.00	0.058	**0.08**	0.139	**0.18**	0.08
133222	673	1RB_Mid	Top 0mm	/	17.88	19.00	0.105	**0.14**	0.260	**0.34**	0.03
133322	683	50RB_ Mid	Rear 15mm	/	21.51	23.00	0.111	**0.16**	0.135	**0.19**	-0.03
133322	683	50RB_ Mid	Right 10mm	/	21.51	23.00	0.036	**0.05**	0.051	**0.07**	0.10
133322	683	50RB_ Mid	Top 12mm	/	21.51	23.00	0.123	**0.17**	0.175	**0.25**	0.08
133322	683	50RB_ Mid	Rear 0mm	/	17.72	19.00	0.184	**0.25**	0.504	**0.68**	0.02
133322	683	50RB_ Mid	Right 0mm	/	17.72	19.00	0.053	**0.07**	0.115	**0.15**	-0.11
133322	683	50RB_ Mid	Top 0mm	/	17.72	19.00	0.099	**0.13**	0.230	**0.31**	0.11
133372	688	100RB	Rear 0mm	/	17.65	19.00	0.160	**0.22**	0.440	**0.60**	0.02

Note1: The LTE mode is QPSK_20MHz.

14.2 SAR results for Standard procedure

There is zoom scan measurement to be added for the highest measured SAR in each exposure configuration/band.

Table 14.2-1: SAR Values (GSM 850 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
128	824.2	GPRS (2)	Rear 0mm	Fig.1	24.62	25.50	0.453	**0.55**	0.987	**1.21**	0.05

Table 14.2-2: SAR Values (GSM 1900 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
512	1850.2	GPRS (2)	Rear 0mm	Fig.2	19.82	20.00	0.516	**0.54**	1.010	**1.05**	-0.10

Table 14.2-3: SAR Values (WCDMA 850 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
4182	836.4	Rear 0mm	Fig.3	18.11	19.00	0.318	**0.39**	0.661	**0.81**	-0.08

Table 14.2-4: SAR Values (WCDMA 1700 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
1312	1712.4	Rear 0mm	Fig.4	15.77	16.50	0.513	**0.61**	0.937	**1.11**	0.05

Table 14.2-5: SAR Values (WCDMA 1900 MHz Band - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz									
9262	1852.4	Rear 0mm	Fig.5	15.81	16.50	0.528	**0.62**	1.020	**1.20**	-0.02

Table 14.2-6: SAR Values (LTE Band7 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
21350	2560	1RB_Mid	Rear 0mm	Fig.6	13.29	14.00	0.392	**0.46**	1.010	**1.19**	-0.12

Note: The LTE mode is QPSK_20MHz.

Table 14.2-7: SAR Values (LTE Band12 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
23095	707.5	1RB_Mid	Rear 0mm	Fig.7	17.82	19.00	0.394	**0.52**	0.638	**0.84**	0.01

Note: The LTE mode is QPSK_10MHz.

Table 14.2-8: SAR Values (LTE Band13 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
23230	782	1RB_Mid	Rear 0mm	Fig.8	17.79	19.00	0.328	**0.43**	0.690	**0.91**	-0.13

Note: The LTE mode is QPSK_10MHz.

Table 14.2-9: SAR Values (LTE band25 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
26590	1905	1RB_Mid	Rear 0mm	Fig.9	15.81	16.50	0.528	**0.62**	1.020	**1.20**	0.10

Note1: The LTE mode is QPSK_20MHz.

Table 14.2-10: SAR Values (LTE band26 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
26965	841.5	1RB_Mid	Rear 0mm	Fig.10	17.75	19.00	0.315	**0.42**	0.687	**0.92**	0.02

Note: The LTE mode is QPSK_15MHz.

Table 14.2-11: SAR Values (LTE band41 - Body) – Power Class 2

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
41490	2680	1RB_Mid	Top 0mm	Fig.11	16.68	17.00	0.328	**0.35**	0.863	**0.93**	-0.02

Note1: The LTE mode is QPSK_20MHz.

Table 14.2-12: SAR Values (LTE band41 - Body) – Power Class 3

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
41490	2680	1RB_High	Top 0mm	Fig.12	13.44	14.00	0.242	**0.28**	0.643	**0.73**	-0.01

Note1: The LTE mode is QPSK_20MHz.

Table 14.2-13: SAR Values (LTE band66 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
132072	1720	1RB_Mid	Rear 0mm	Fig.13	15.75	16.50	0.516	**0.61**	0.938	**1.11**	-0.05

Note1: The LTE mode is QPSK_20MHz.

Table 14.2-14: SAR Values (LTE band71 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
Frequency		Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
133222	673	1RB_Mid	Rear 0mm	Fig.14	17.88	19.00	0.303	**0.39**	0.659	**0.85**	0.00

Note1: The LTE mode is QPSK_20MHz.

14.3 WLAN Evaluation for 2.4G

According to the KDB248227 D01, SAR is measured for 2.4GHz 802.11b DSSS using the initial test position procedure.

Body Evaluation

Table 14.3-1: SAR Values (WLAN - Body)– 802.11b (Fast SAR)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
2437	6	Rear 15mm	/	19.34	19.50	0.101	**0.10**	0.182	**0.19**	-0.07
2437	6	Left 8mm	/	19.34	19.50	0.089	**0.09**	0.176	**0.18**	-0.17
2437	6	Top 12mm	/	19.34	19.50	0.147	**0.15**	0.270	**0.28**	-0.08
2437	6	Rear 0mm	/	11.93	12.00	0.223	**0.23**	0.456	**0.46**	0.09
2437	6	Left 0mm	/	11.93	12.00	0.062	**0.06**	0.131	**0.13**	0.06
2437	6	Top 0mm	/	11.93	12.00	0.124	**0.13**	0.303	**0.31**	-0.19

As shown above table, the initial test position for body is “Rear”. So the body SAR of WLAN is presented as below:

Table 14.3-5: SAR Values (WLAN - Body)– 802.11b (Full SAR)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C										
Frequency		Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
2437	6	Rear 0mm	Fig.15	11.93	12.00	0.198	**0.20**	0.424	**0.43**	0.09
2437	6	Top 0mm	/	11.93	12.00	0.117	**0.12**	0.300	**0.30**	-0.19

Note1: When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest estimated 1-g SAR conditions determined by area scans, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg.

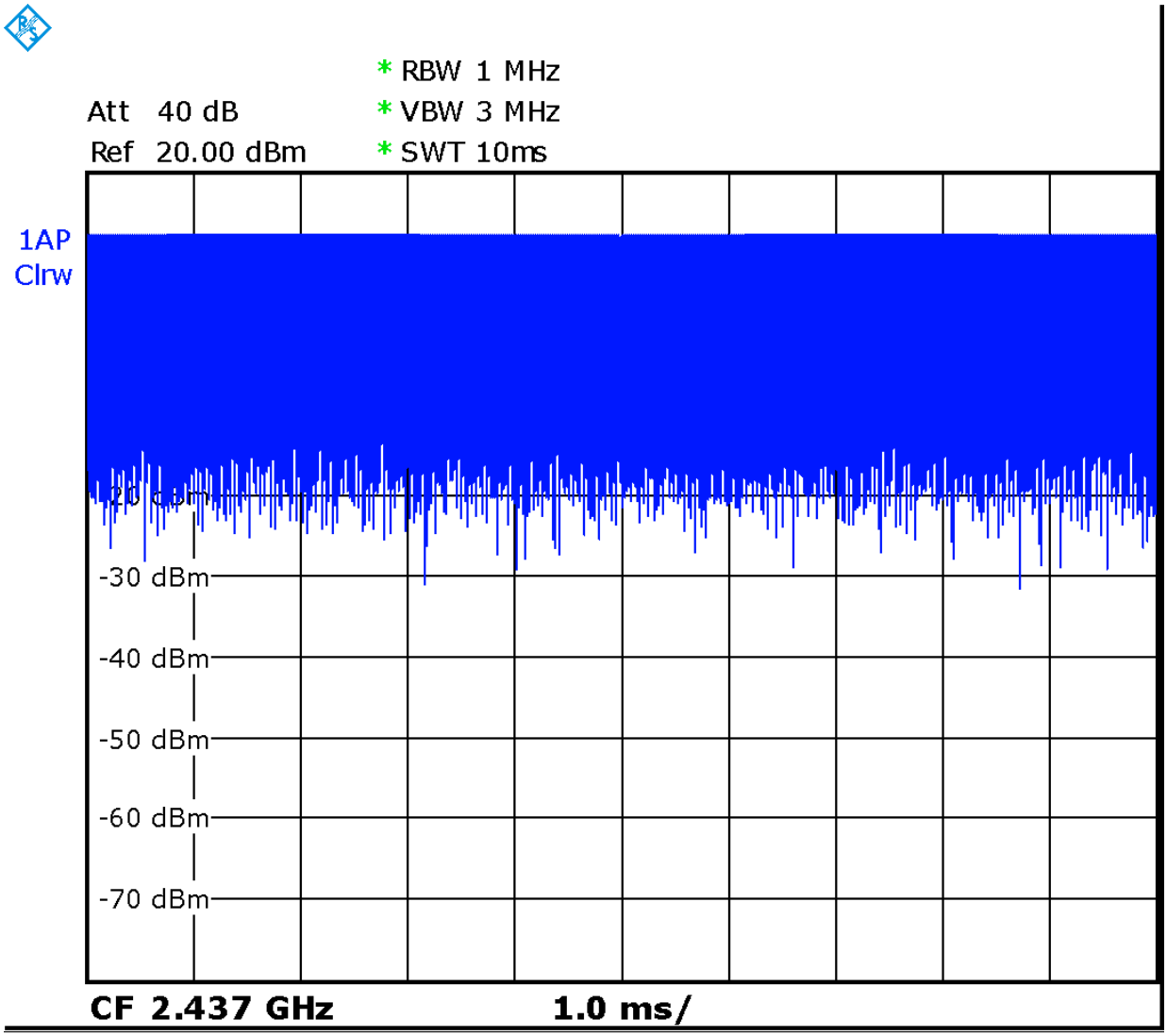
Note2: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. The scaled reported SAR is presented as below.

Table 14.3-6: SAR Values (WLAN - Body) – 802.11b (Scaled Reported SAR)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5°C						
Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.					
2437	6	Rear 0mm	100%	100%	**0.43**	**0.43**

SAR is not required for OFDM because the 802.11b adjusted SAR ≤ 1.2 W/kg.



Picture 14.1 Duty factor plot

14.4 WLAN Evaluation For 5G

Table 14.4-1: OFDM mode specified maximum output power of WLAN antenna

802.11 mode	a	g	n		ac			
Ch. BW(MHz)	20	20	20	40	20	40	80	160
U-NII-1	X		X	X	X	X	X	
U-NII-2A	X		X	X	X	X	X	
U-NII-2C								
U-NII-3	X		X	X	X	X	X	
§ 15.247 (5.8 GHz)								
X: maximum(conducted) output power(mW), including tolerance, specified for production units								

Table 14.4-2: Maximum output power specified of WLAN antenna for Normal Power

802.11 mode	a	g	n		ac			
Ch. BW(MHz)	20	20	20	40	20	40	80	160
U-NII-1	71		63	63	45	45	45	
U-NII-2A	71		63	63	45	45	45	
U-NII-2C								
U-NII-3	79		71	71	45	45	45	
§ 15.247 (5.8 GHz)								

- The maximum output power specified for production units is the same for all channels, modulations and data rates in each channel bandwidth configuration of the 802.11a/g/n/ac modes.
- The blue highlighted cells represent highest output configurations in each standalone or aggregated frequency band, with tune-up tolerance included.

Table 14.4-3: Maximum output power specified of WLAN antenna for Low Power

802.11 mode	a	g	n		ac			
Ch. BW(MHz)	20	20	20	40	20	40	80	160
U-NII-1	9		8	8	7	7	7	
U-NII-2A	9		8	8	7	7	7	
U-NII-2C								
U-NII-3	10		9	9	7	7	7	
§ 15.247 (5.8 GHz)								

- The maximum output power specified for production units is the same for all channels, modulations and data rates in each channel bandwidth configuration of the 802.11a/g/n/ac modes.
- The blue highlighted cells represent highest output configurations in each standalone or aggregated frequency band, with tune-up tolerance included.

Table 14.4-4: Maximum output power measured of WLAN antenna, for the applicable OFDM configurations according to the default power measurement procedures for selection initial test configurations - Normal Power

802.11 mode	a	n		ac		
BW(MHz)	**20**	**20**	**40**	**20**	**40**	**80**
U-NII-1	36/40/44/48 **54/58/54/63**	36/40/44/48 Lower power	38/46 Lower power	36/40/44/48 Lower power	38/46 Lower power	42 Lower power
U-NII-2A	52/56/60/64 **65/65/60/65**	52/56/60/64 Lower power	54/62 Lower power	52/56/60/64 Lower power	54/62 Lower power	58 Lower power
U-NII-3	149/153/157/161/165 **67/63/66/60/64**	149/153/157/161/165 Lower power	151/159 Lower power	149/153/157/161/165 Lower power	151/159 Lower power	155 Lower power

- The **bold numbers** is the maximum output measured power (mW).
- Channels with measured maximum power within 0.25dB are considered to have the same measured output. Channels selected for initial test configuration are highlighted in yellow.

Table 14.4-5: Maximum output power measured of WLAN antenna, for the applicable OFDM configurations according to the default power measurement procedures for selection initial test configurations – Low Power

802.11 mode	a	n		ac		
BW(MHz)	**20**	**20**	**40**	**20**	**40**	**80**
U-NII-1	36/40/44/48 **6/7/7/7**	36/40/44/48 Lower power	38/46 Lower power	36/40/44/48 Lower power	38/46 Lower power	42 Lower power
U-NII-2A	52/56/60/64 **7/6/6/6**	52/56/60/64 Lower power	54/62 Lower power	52/56/60/64 Lower power	54/62 Lower power	58 Lower power
U-NII-3	149/153/157/161/165 **8/8/8/9/9**	149/153/157/161/165 Lower power	151/159 Lower power	149/153/157/161/165 Lower power	151/159 Lower power	155 Lower power

- The **bold numbers** is the maximum output measured power (mW).
- Channels with measured maximum power within 0.25dB are considered to have the same measured output. Channels selected for initial test configuration are highlighted in yellow.

Table 14.4-6: Reported SAR of initial test configuration for Normal Power Body

802.11 mode	a	n		ac		
BW(MHz)	20	20	40	20	40	80
U-NII-1	36/40/44/48 UNII-2A exclusion applied	36/40/44/48	38/46	36/40/44/48	38/46	42
U-NII-2A	52/56/60/64 **0.33**	52/56/60/64	54/62	52/56/60/64	54/62	58
U-NII-3	149/153/157/161/165 **0.42**	149/153/157/161/165	151/159	149/153/157/161/165	151/159	155
Highest measured output power channel tested initially are in yellow highlight. The tune up of UNII-1 is less than UNII-2A. SAR is measured for UNII-2A band first. Adjusted SAR of UNII-2A band is ≤ 1.2 W/kg. SAR is not required for UNII-1 band.						

Table 14.4-8: Reported SAR of initial test configuration for Low Power Body

802.11 mode	a	n		ac		
BW(MHz)	20	20	40	20	40	80
U-NII-1	36/40/44/48 UNII-2A exclusion applied	36/40/44/48	38/46	36/40/44/48	38/46	42
U-NII-2A	52/56/60/64 **0.66**	52/56/60/64	54/62	52/56/60/64	54/62	58
U-NII-3	149/153/157/161/165 **0.59**	149/153/157/161/165	151/159	149/153/157/161/165	151/159	155
Highest measured output power channel tested initially are in yellow highlight. The tune up of UNII-1 is less than UNII-2A. SAR is measured for UNII-2A band first. Adjusted SAR of UNII-2A band is ≤ 1.2 W/kg. SAR is not required for UNII-1 band.						

Table 14.4-10: SAR Values (WLAN - Normal Power Body)

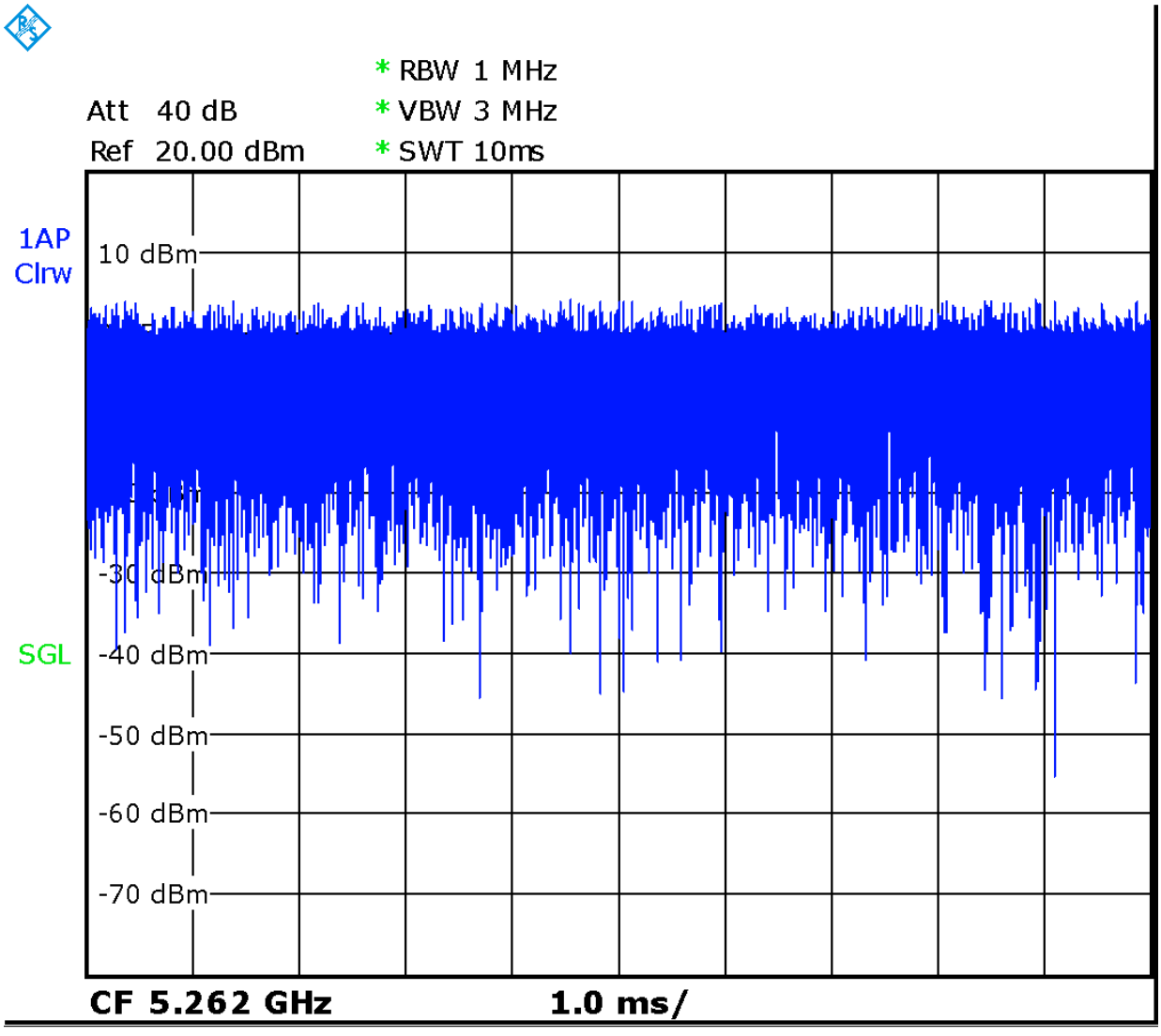
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.									
56	5280	Rear 15mm	/	18.15	18.50	0.060	**0.07**	0.154	**0.17**	-0.13
56	5280	Left 8mm	/	18.15	18.50	0.072	**0.08**	0.163	**0.18**	0.11
56	5280	Top 12mm	/	18.15	18.50	0.121	**0.13**	0.309	**0.33**	-0.02
52	5260	Rear 0mm	Fig.16	8.26	9.50	0.134	**0.18**	0.497	**0.66**	0.05
52	5260	Left 0mm	/	8.26	9.50	0.034	**0.05**	0.088	**0.12**	0.11
52	5260	Top 0mm	/	8.26	9.50	0.099	**0.13**	0.386	**0.51**	0.09
149	5745	Rear 15mm	/	18.25	19.00	0.070	**0.08**	0.180	**0.21**	0.05
149	5745	Left 8mm	/	18.25	19.00	0.087	**0.10**	0.220	**0.26**	-0.10
149	5745	Top 12mm	/	18.25	19.00	0.138	**0.16**	0.354	**0.42**	-0.12
161	5805	Rear 0mm	/	9.53	10.00	0.114	**0.13**	0.408	**0.45**	0.08
161	5805	Left 0mm	/	9.53	10.00	0.039	**0.04**	0.131	**0.15**	0.09

161	5805	Top 0mm	/	9.53	10.00	0.128	**0.14**	0.526	**0.59**	0.01

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. The scaled reported SAR is presented as below.

Table 14.4-14: SAR Values (WLAN - Body) – Scaled Reported SAR

Frequency		Test Position	D (mm)	Actual duty factor	maximum duty factor	Reported SAR (1g) (W/kg)	Scaled reported SAR (1g) (W/kg)
MHz	Ch.						
52	5260	Rear	0	400%	100%	**0.66**	**0.66**



Picture 14.3 The plot of duty factor

14.5 SAR results for Fast BT

Table 15.5-2: SAR Values (Bluetooth - Body)

Ambient Temperature: 22.2 ºC Liquid Temperature: 22 ºC										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch	MHz									
78	2480	Rear 0mm	/	10.30	11	< 0.01	**< 0.01**	< 0.01	**< 0.01**	/
78	2480	Left 0mm	/	10.30	11	< 0.01	**< 0.01**	< 0.01	**< 0.01**	/
78	2480	Top 0mm	/	10.30	11	< 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.

Table 15.1: SAR Measurement Variability for Body GSM850 (1g)

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
128	824.2	Rear	0	0.987	0.959	1.03	/

Table 15.2: SAR Measurement Variability for Body GSM1900 (1g)

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
512	1850.2	Rear	0	1.01	0.963	1.05	/

Table 15.3: SAR Measurement Variability for Body W1700 (1g)

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
1312	1712.4	Rear	0	0.937	0.903	1.04	/

Table 15.4: SAR Measurement Variability for Body W1900 (1g)

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz						
9262	1852.4	Rear	0	1.02	0.955	1.07	/

Table 15.5: SAR Measurement Variability for Body LTE B7 (1g)

Frequency		Mode	Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz							
21350	2560	1RB_Mid	Rear	0	1.01	0.963	1.05	/

Table 15.6: SAR Measurement Variability for Body LTE B25 (1g)

Frequency		Mode	Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz							
26590	1905	1RB_Mid	Rear	0	1.02	0.952	1.07	/

Table 15.7: SAR Measurement Variability for Body LTE B41 (1g) – PC2

Frequency		Mode	Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz							
41490	2680	1RB_Mid	Top	0	0.863	0.832	1.04	/

Table 15.8: SAR Measurement Variability for Body LTE B66 (1g)

Frequency		Mode	Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz							
132072	1720	1RB_Mid	Rear	0	0.938	0.897	1.05	/

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	B	5.0	R	√3	0.6	0.49	1.7	1.4	∞

	(target)									
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	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
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	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	7.0	R	$\sqrt{3}$	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	$\sqrt{3}$	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		$u_c^{'} = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						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	A	3.4	N	1	1	1	3.4	3.4	5

	uncertainty									
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	February 10, 2020	One year
02	Power meter	NRP2	106277	September 4, 2019	One year
03	Power sensor	NRP8S	104291		
04	Signal Generator	MG3700A	6201052605	June 18, 2019	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	CMW500	166370	June 27, 2019	One year
07	E-field Probe	SPEAG EX3DV4	3617	January 30, 2020	One year
08	DAE	SPEAG DAE4	777	January 8, 2020	One year
09	Dipole Validation Kit	SPEAG D750V3	1078	June 18,2020	One year
10	Dipole Validation Kit	SPEAG D835V2	4d092	June 17,2020	One year
11	Dipole Validation Kit	SPEAG D1750V2	1111	April 29,2020	One year
12	Dipole Validation Kit	SPEAG D1900V2	5d142	June 24,2020	One year
13	Dipole Validation Kit	SPEAG D2450V2	735	December 17,2019	One year
14	Dipole Validation Kit	SPEAG D2600V2	1058	June 29,2020	One year
15	Dipole Validation Kit	SPEAG D5GHzV2	1040	June 23,2020	One year

END OF REPORT BODY

ANNEX A Graph Results

GSM850_CH128 Rear
Date: 7/16/2020
Electronics: DAE4 Sn777
Medium: Head 835 MHz
Medium parameters used: f = 824.2; σ = 0.908 mho/m; εr = 41.5; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: GSM850 824.2 Duty Cycle: 1：4
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.28 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.373 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 2.81 W/kg
SAR(1 g) = 0.987 W/kg; SAR(10 g) = 0.453 W/kg
Maximum value of SAR (measured) = 2.01 W/kg

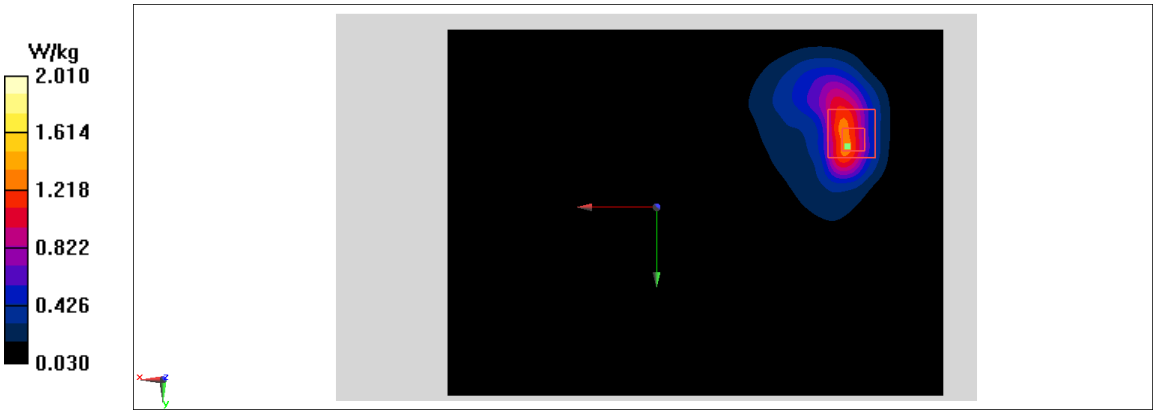


Fig A.1

PCS1900_CH512 Rear
Date: 7/19/2020
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1850.2; σ = 1.328 mho/m; εr = 40.11; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: PCS1900 1850.2 Duty Cycle: 1：4
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.62 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.996 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 1.95 W/kg
SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.516 W/kg
Maximum value of SAR (measured) = 1.5 W/kg

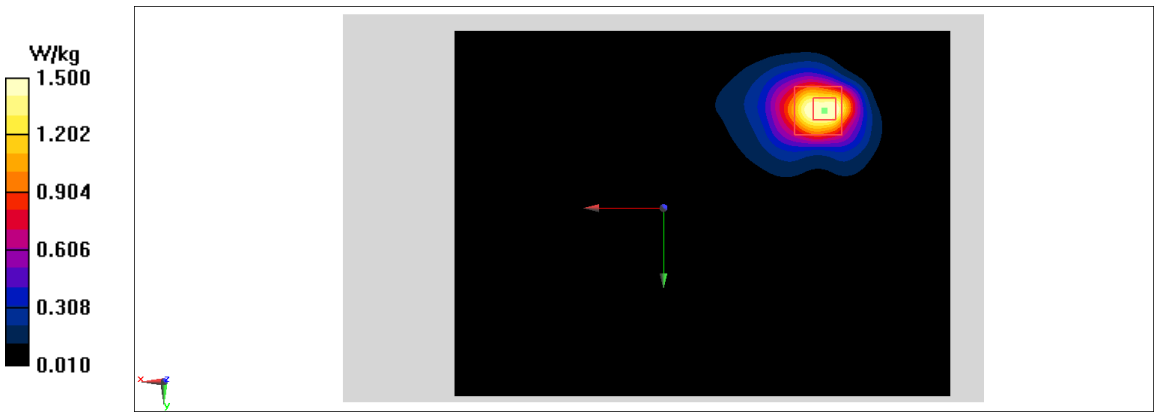


Fig A.2

WCDMA1900-BII_CH9262 Rear
Date: 7/19/2020
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1852.4; σ = 1.329 mho/m; εr = 40.11; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA1900-BII 1852.4 Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.79 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.729 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 2.02 W/kg
SAR(1 g) = 1.02 W/kg; SAR(10 g) = 0.528 W/kg
Maximum value of SAR (measured) = 1.5 W/kg

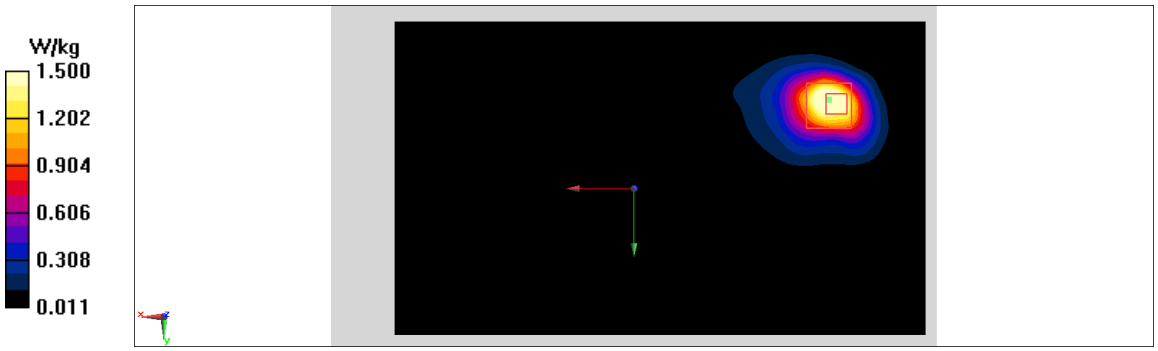


Fig A.3

WCDMA1700-BIV_CH1312 Rear
Date: 7/18/2020
Electronics: DAE4 Sn777
Medium: Head 1750 MHz
Medium parameters used: f = 1712.4; σ = 1.319 mho/m; εr = 39.91; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WCDMA1700-BIV 1712.4 Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.51 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.951 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.73 W/kg
SAR(1 g) = 0.937 W/kg; SAR(10 g) = 0.513 W/kg
Maximum value of SAR (measured) = 1.31 W/kg

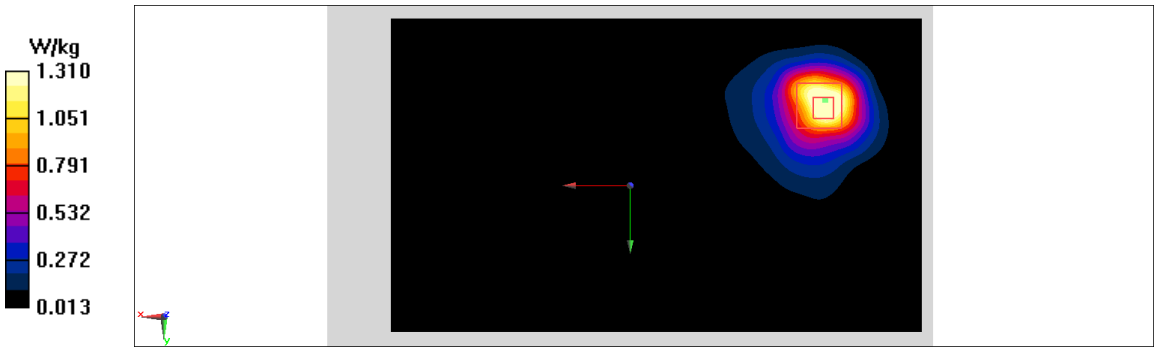


Fig A.4

WCDMA850-BV_CH4183 Rear
Date: 7/16/2020
Electronics: DAE4 Sn777
Medium: Head 835 MHz
Medium parameters used: f = 836.6; σ = 0.92 mho/m; εr = 41.49; 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 – SN3617 ConvF(9.66,9.66,9.66)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.857 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.536 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.72 W/kg
SAR(1 g) = 0.661 W/kg; SAR(10 g) = 0.318 W/kg
Maximum value of SAR (measured) = 0.996 W/kg

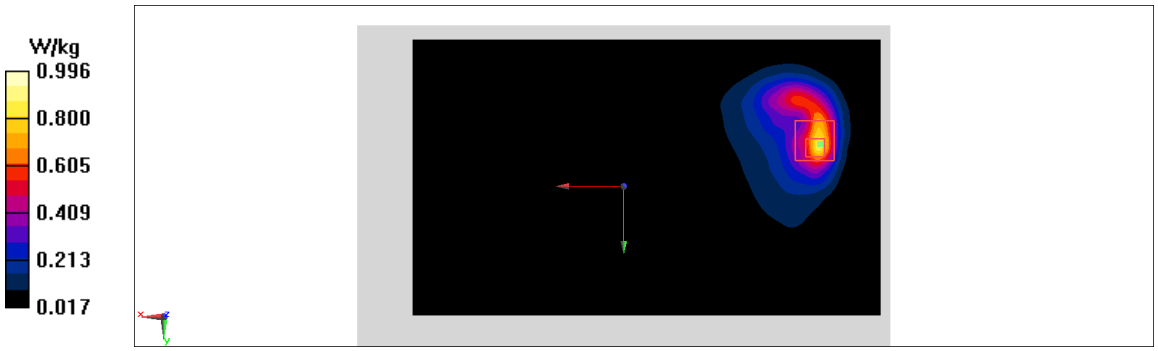


Fig A.5

LTE2500-FDD7_CH21350 Rear
Date: 7/22/2020
Electronics: DAE4 Sn777
Medium: Head 2600 MHz
Medium parameters used: f = 2560 MHz; σ = 1.923 mho/m; εr = 39.15; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE2500-FDD7 2560 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(7.65,7.65,7.65)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 2.25 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.201 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 2.82 W/kg
SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.392 W/kg
Maximum value of SAR (measured) = 2 W/kg

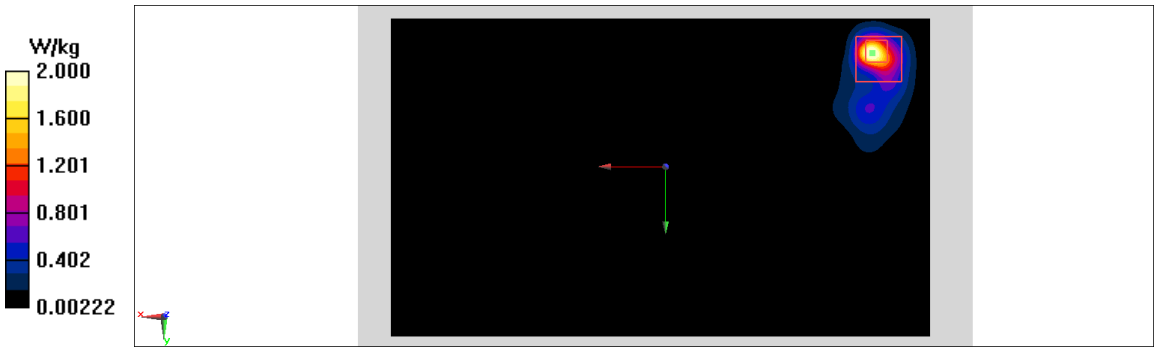


Fig A.6

LTE700-FDD12_CH23095 Rear
Date: 7/14/2020
Electronics: DAE4 Sn777
Medium: Head 750 MHz
Medium parameters used: f = 707.5 MHz; σ = 0.855 mho/m; εr = 42.76; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE700-FDD12 707.5 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.638 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.489 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 2 W/kg
SAR(1 g) = 0.638 W/kg; SAR(10 g) = 0.394 W/kg
Maximum value of SAR (measured) = 1.38 W/kg

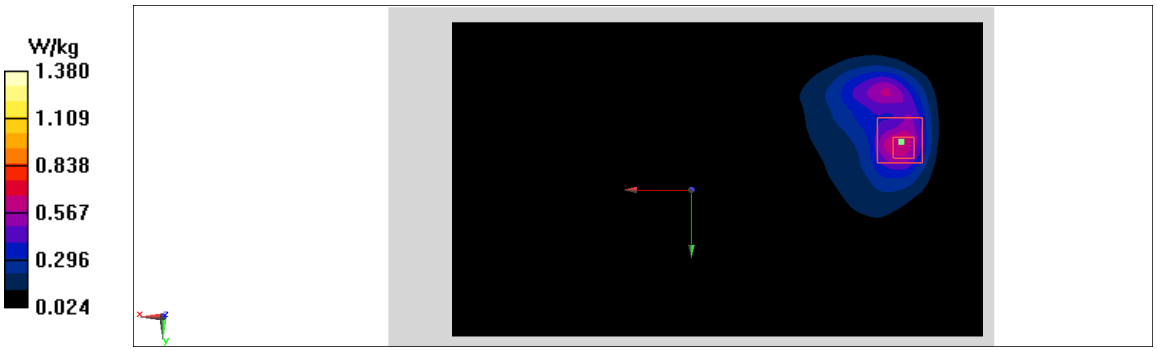


Fig A.7

LTE750-FDD13_CH23230 Rear
Date: 7/14/2020
Electronics: DAE4 Sn777
Medium: Head 750 MHz
Medium parameters used: f = 782 MHz; σ = 0.925 mho/m; εr = 42.67; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE750-FDD13 782 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.696 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.373 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.95 W/kg
SAR(1 g) = 0.69 W/kg; SAR(10 g) = 0.328 W/kg
Maximum value of SAR (measured) = 1.36 W/kg

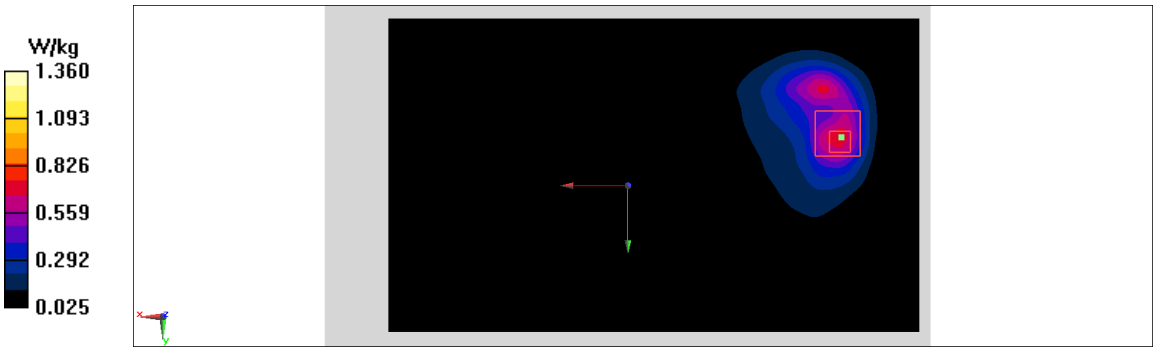


Fig A.8

LTE1900-FDD25_CH26590 Rear
Date: 7/20/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1905 MHz; σ = 1.402 mho/m; εr = 39.43; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE1900-FDD25 1905 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.69 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.131 V/m; Power Drift = 0.1 dB
Peak SAR (extrapolated) = 1.89 W/kg
SAR(1 g) = 1.02 W/kg; SAR(10 g) = 0.528 W/kg
Maximum value of SAR (measured) = 1.52 W/kg

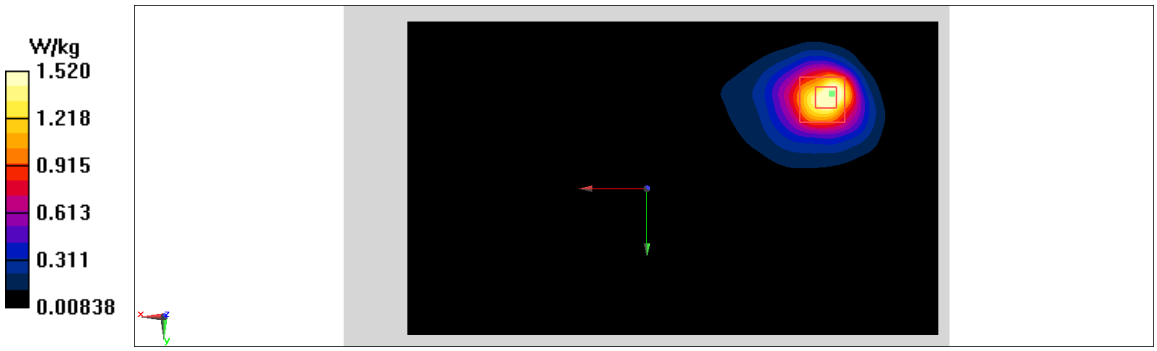


Fig A.9

LTE850-FDD26_CH26965 Rear
Date: 7/17/2020
Electronics: DAE4 Sn777
Medium: head 835 MHz
Medium parameters used: f = 841.5 MHz; σ = 0.907 mho/m; εr = 40.84; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE850-FDD26 841.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.54 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.513 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 2.06 W/kg
SAR(1 g) = 0.687 W/kg; SAR(10 g) = 0.315 W/kg
Maximum value of SAR (measured) = 1.48 W/kg

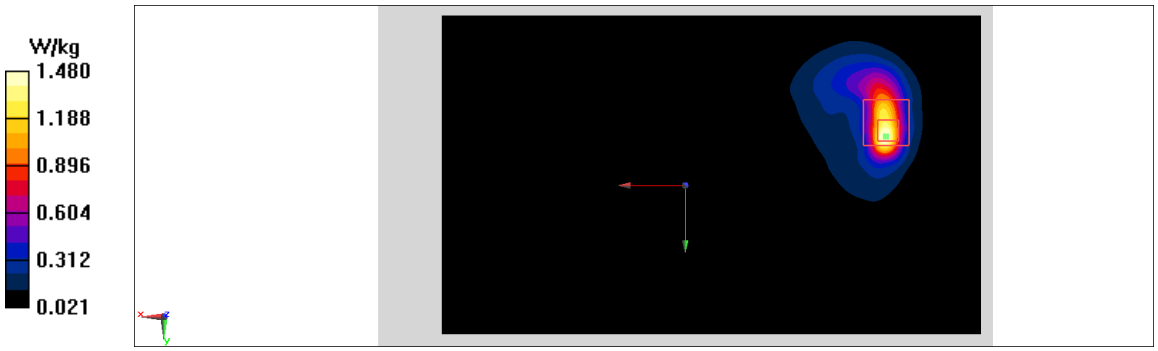


Fig A.10

LTE2600-TDD41_CH41490 Top
Date: 7/23/2020
Electronics: DAE4 Sn777
Medium: head 2600 MHz
Medium parameters used: f = 2680; σ = 2.032 mho/m; εr = 38.4; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE2600-TDD41 2680 Duty Cycle: 1:2.309
Probe: EX3DV4 – SN3617 ConvF(7.52,7.52,7.52)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.14 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.555 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 2.27 W/kg
SAR(1 g) = 0.863 W/kg; SAR(10 g) = 0.328 W/kg
Maximum value of SAR (measured) = 1.5 W/kg

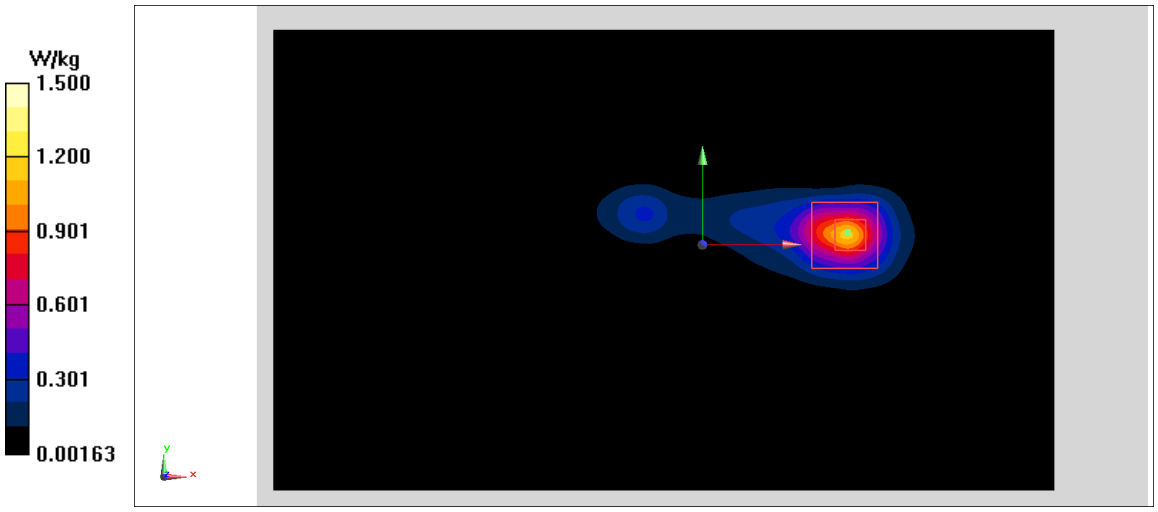


Fig A.11

LTE2600-TDD41_CH41490 Top
Date: 7/23/2020
Electronics: DAE4 Sn777
Medium: head 2600 MHz
Medium parameters used: f = 2680; σ = 2.032 mho/m; εr = 38.4; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE2600-TDD41 2680 Duty Cycle: 1:1.58
Probe: EX3DV4 – SN3617 ConvF(7.52,7.52,7.52)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.826 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.365 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 2.02 W/kg
SAR(1 g) = 0.643 W/kg; SAR(10 g) = 0.242 W/kg
Maximum value of SAR (measured) = 1.29 W/kg

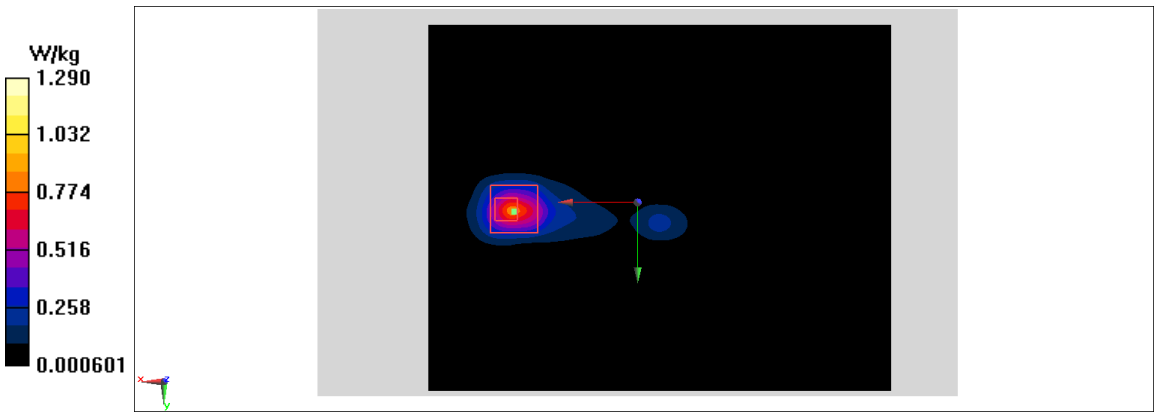


Fig A.12

LTE1700-FDD66_CH132072 Rear
Date: 7/18/2020
Electronics: DAE4 Sn777
Medium: Head 1750 MHz
Medium parameters used: f = 782 MHz; σ = 0.435 mho/m; εr = 41.02; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE1700-FDD66 782 MHz Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.45 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.241 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.74 W/kg
SAR(1 g) = 0.938 W/kg; SAR(10 g) = 0.516 W/kg
Maximum value of SAR (measured) = 1.37 W/kg

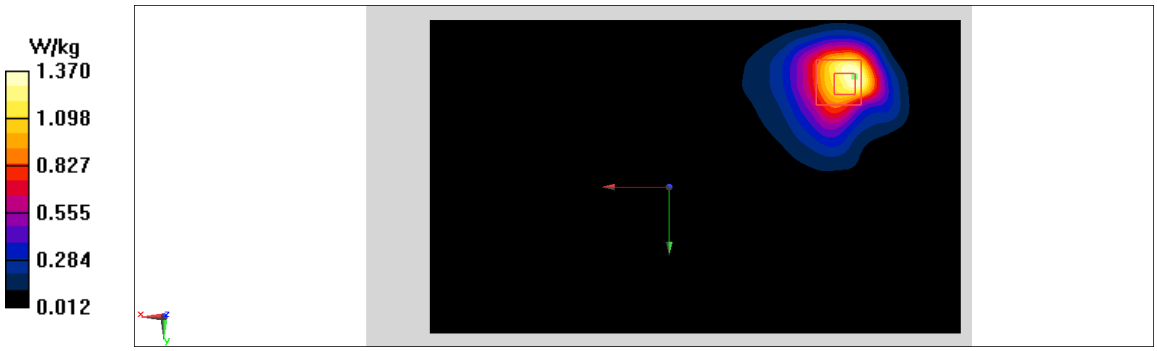


Fig A.13

LTE700-FDD71_CH133222 Rear
Date: 7/15/2020
Electronics: DAE4 Sn777
Medium: head 750 MHz
Medium parameters used: f = 2680; σ = 2.73 mho/m; εr = 39.64; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: LTE700-FDD71 2680 Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.52 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.799 V/m; Power Drift = 0 dB
Peak SAR (extrapolated) = 2.1 W/kg
SAR(1 g) = 0.659 W/kg; SAR(10 g) = 0.303 W/kg
Maximum value of SAR (measured) = 1.48 W/kg

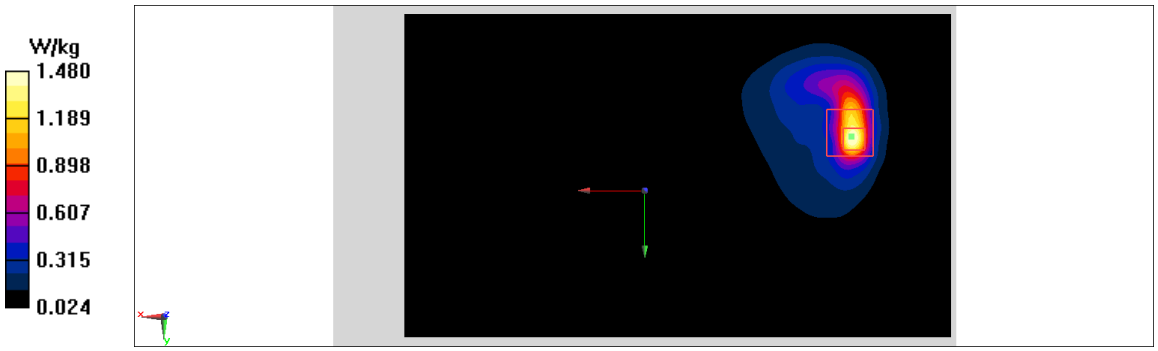


Fig A.14

WLAN2450_CH6 Rear
Date: 7/21/2020
Electronics: DAE4 Sn777
Medium: Head 2450 MHz
Medium parameters used: f = 2437; σ = 1.805 mho/m; εr = 39; 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 – SN3617 ConvF(7.65,7.65,7.65)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.774 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.815 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.424 W/kg; SAR(10 g) = 0.198 W/kg
Maximum value of SAR (measured) = 0.789 W/kg

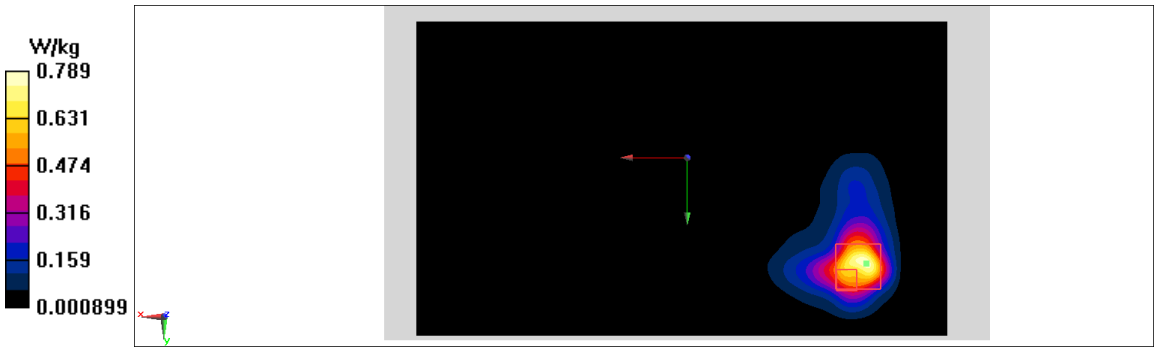


Fig A.15

WLAN5G_CH52 Rear
Date: 7/24/2020
Electronics: DAE4 Sn777
Medium: Head 5200 MHz
Medium parameters used: f = 5260; σ = 4.753 mho/m; εr = 36.46; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C
Communication System: WLAN5G 5260 Duty Cycle: 1：1
Probe: EX3DV4 – SN3617 ConvF(5.49,5.49,5.49)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.13 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.46 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 2.31 W/kg
SAR(1 g) = 0.497 W/kg; SAR(10 g) = 0.134 W/kg
Maximum value of SAR (measured) = 1.27 W/kg

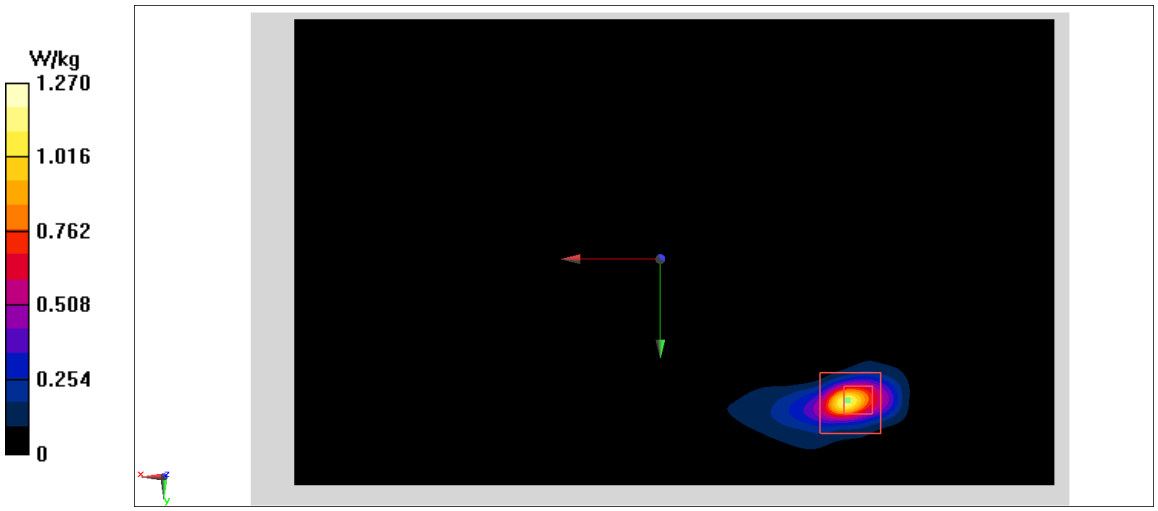


Fig A.16

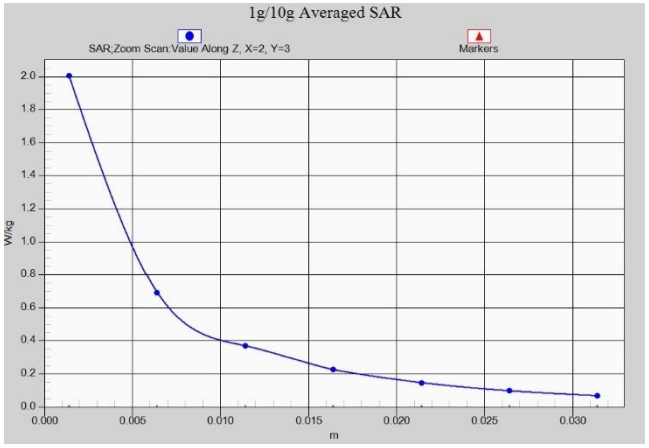


Fig. 1-1 Z-Scan at power reference point (850 MHz)

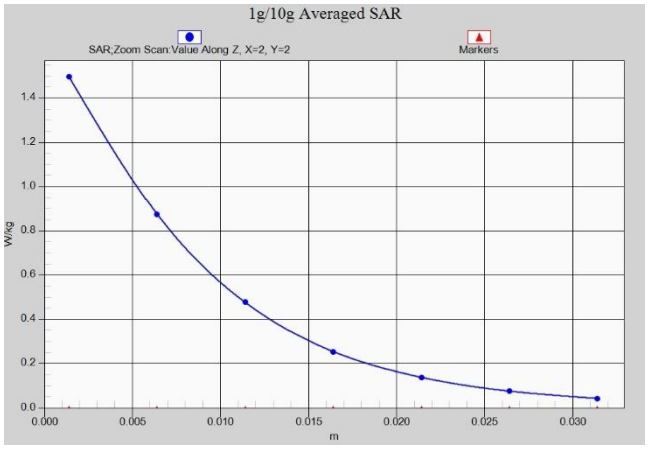


Fig. 1-2 Z-Scan at power reference point (1900 MHz)

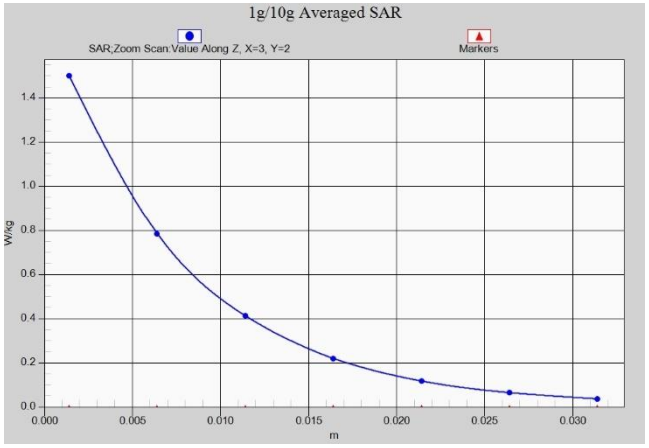


Fig. 1-3 Z-Scan at power reference point (WCDMA1900)

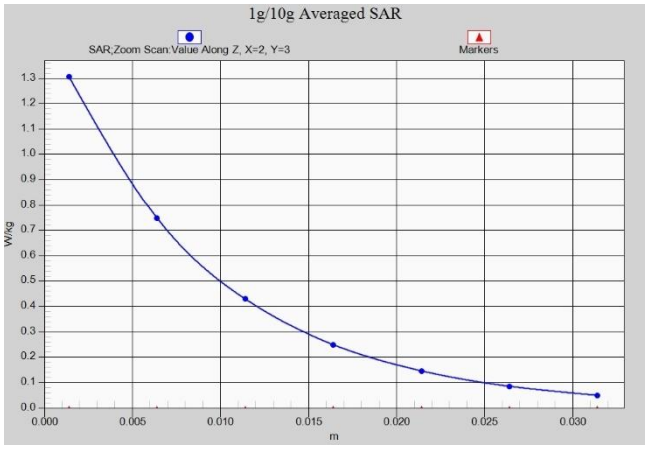


Fig. 1-4 Z-Scan at power reference point (WCDMA1700)

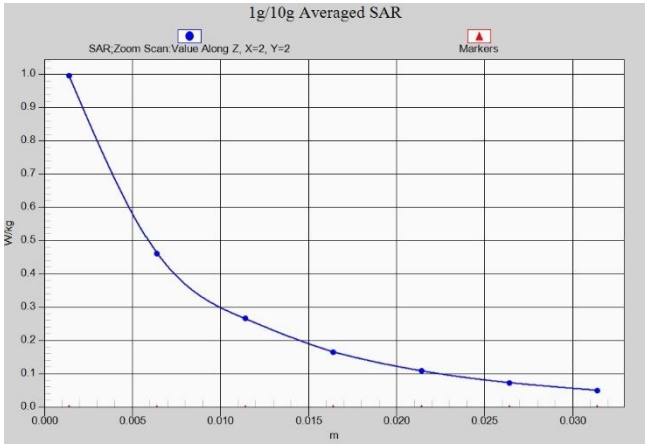


Fig. 1-5 Z-Scan at power reference point (WCDMA850)

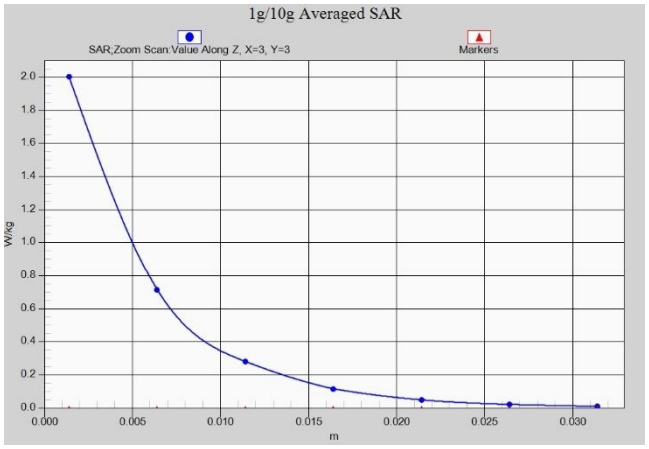


Fig. 1-6 Z-Scan at power reference point (LTE Band7)

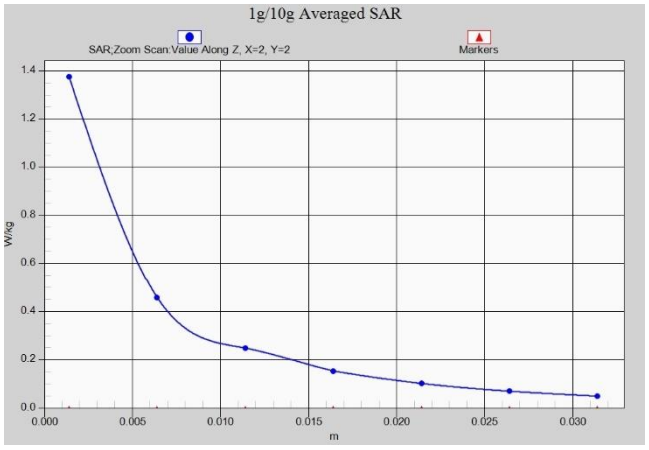


Fig. 1-7 Z-Scan at power reference point (LTE Band12)

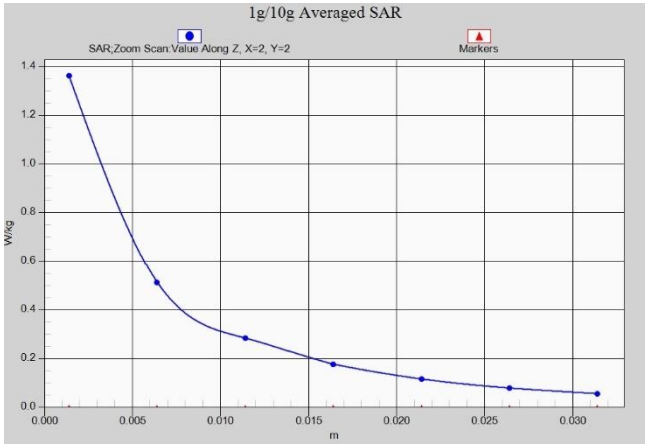


Fig. 1-8 Z-Scan at power reference point (LTE Band13)

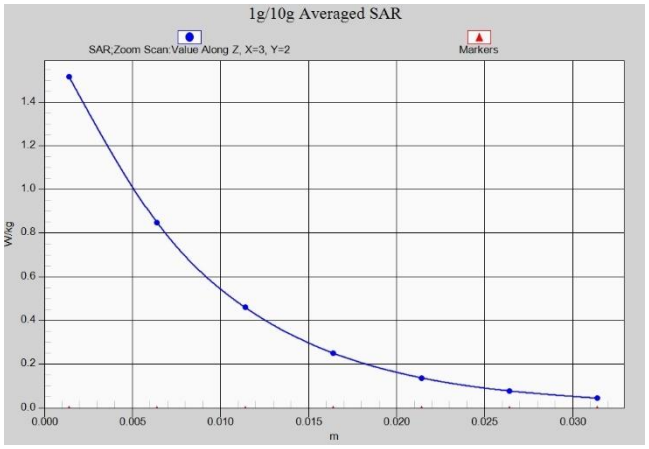


Fig. 1-9 Z-Scan at power reference point (LTE Band25)

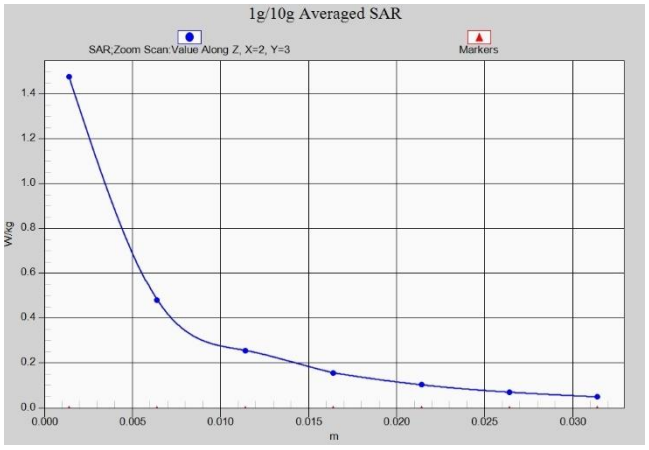


Fig. 1-10 Z-Scan at power reference point (LTE Band26)

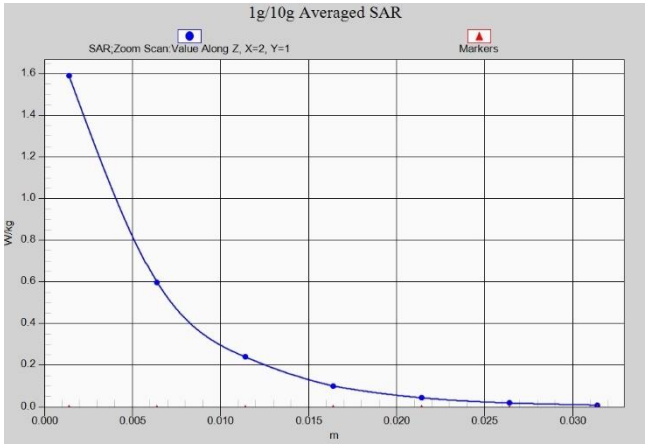


Fig. 1-11 Z-Scan at power reference point (LTE Band41)

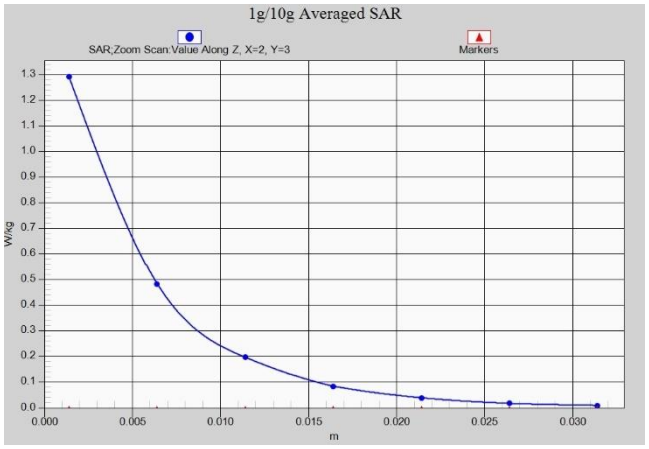


Fig. 1-12 Z-Scan at power reference point (LTE Band41)

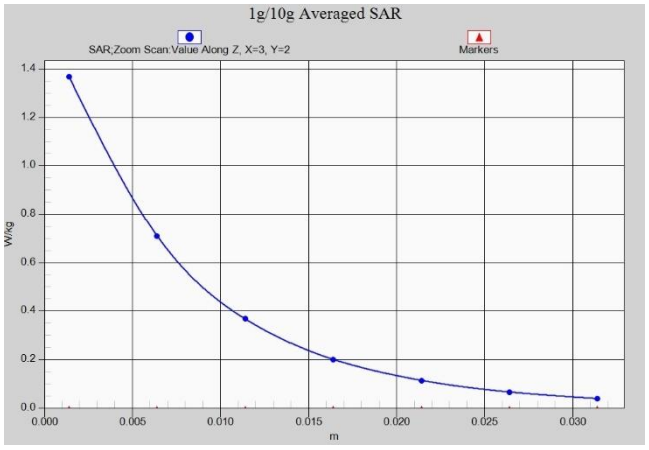


Fig. 1-13 Z-Scan at power reference point (LTE Band66)

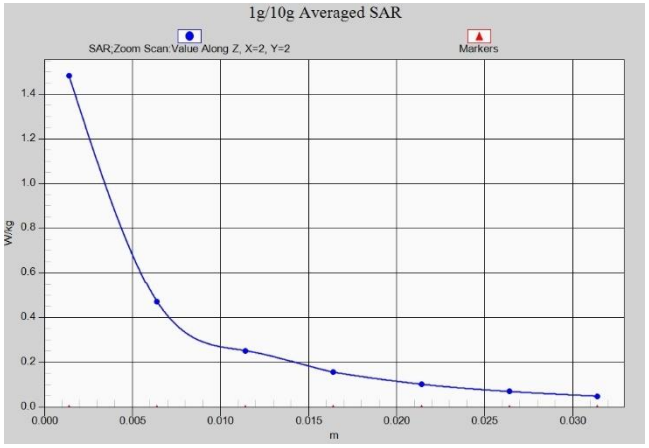


Fig. 1-14 Z-Scan at power reference point (LTE Band71)

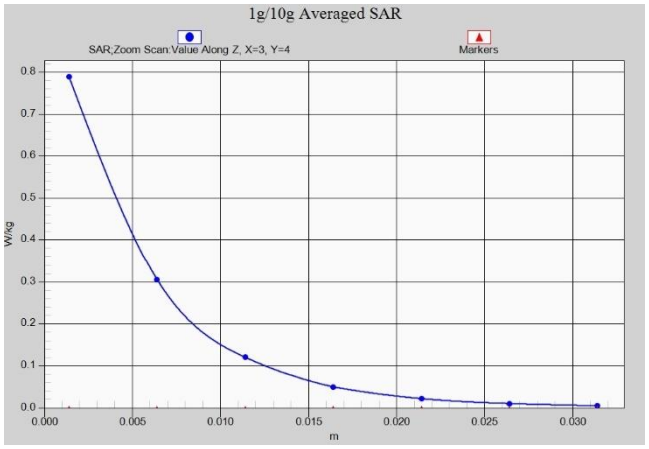


Fig. 1-15 Z-Scan at power reference point (wifi2450)

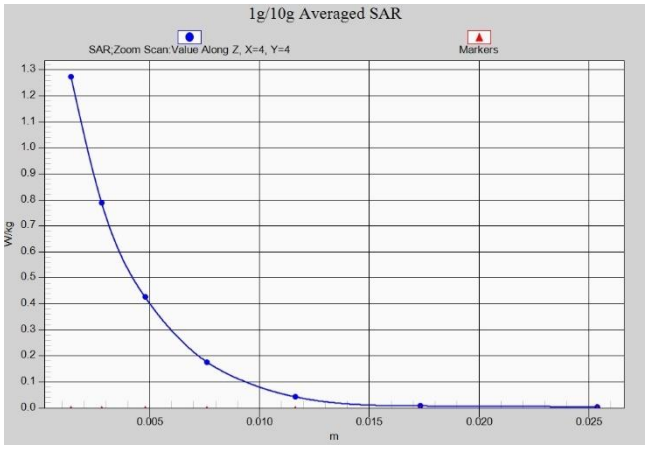


Fig. 1-16 Z-Scan at power reference point (wifi5G)

WLAN5250_CH56 Rear 0mm
Date: 7/30/2018
Electronics: DAE4 Sn1525
Medium: body 5250 MHz
Medium parameters used: f = 5280 MHz; σ = 5.476 mho/m; εr = 48.7; ρ = 1000 kg/m^3
Ambient Temperature: 22.3ºC, Liquid Temperature: 22.3ºC
Communication System: WLAN5250 5280 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7464 ConvF(5.29,5.29,5.29)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.331 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.477 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.545 W/kg
SAR(1 g) = 0.246 W/kg; SAR(10 g) = 0.06 W/kg
Maximum value of SAR (measured) = 0.283 W/kg

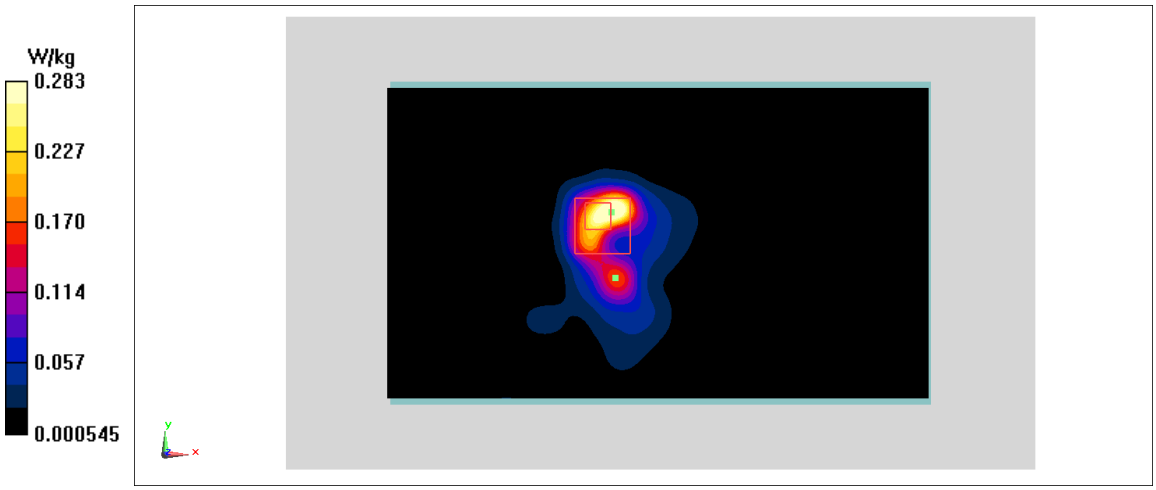


Fig.17 WLAN5G

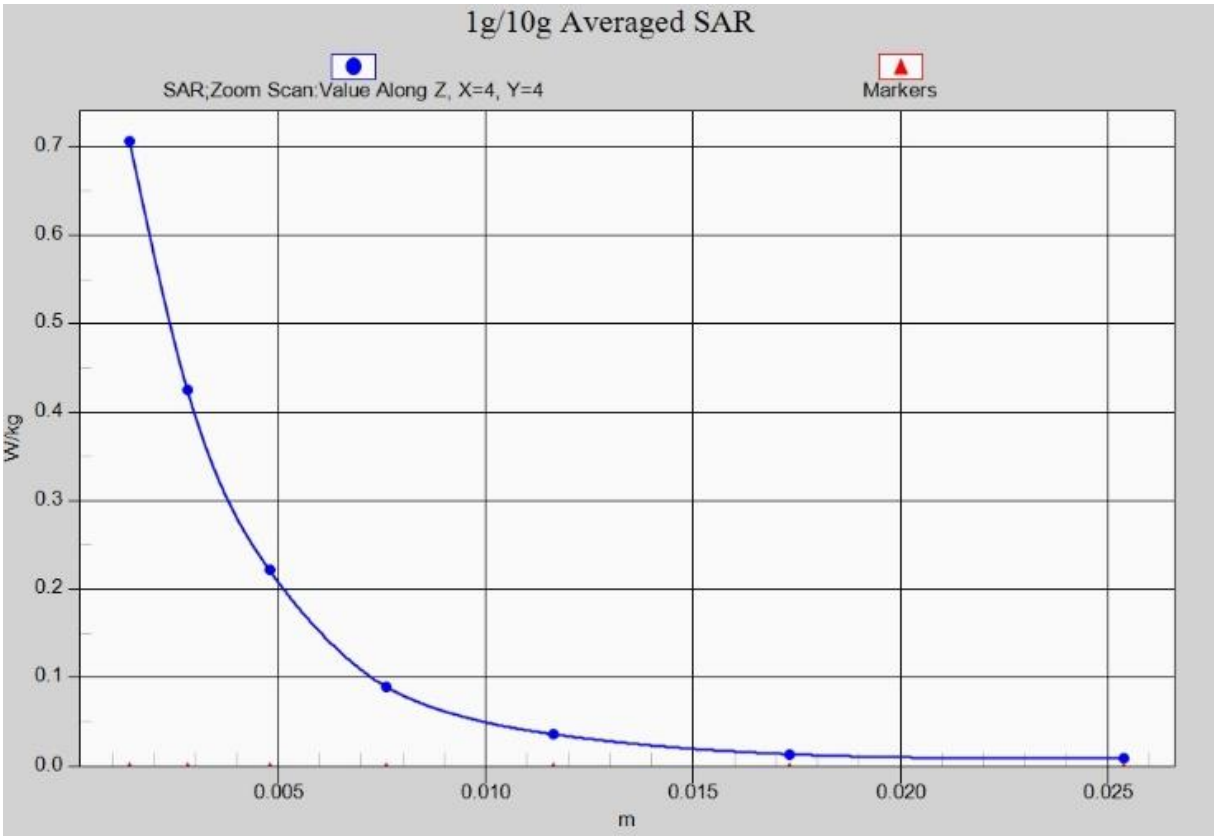


Fig. 17-1 Z-Scan at power reference point (WLAN5G)

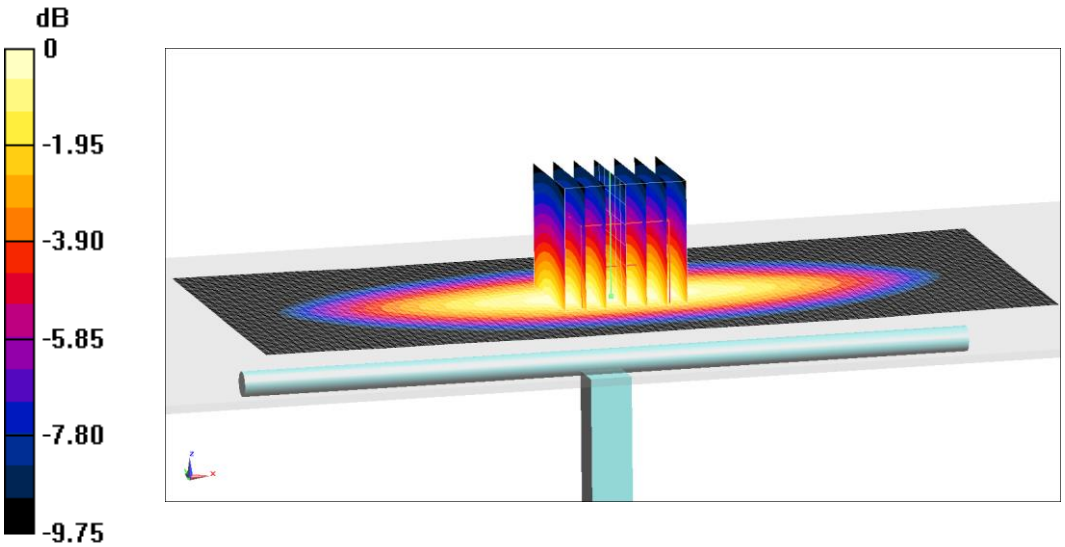
ANNEX B System Verification Results

750 MHz

Date: 7/14/2020
Electronics: DAE4 Sn777
Medium: Head 750 MHz
Medium parameters used: f = 750 MHz; σ =0.895 mho/m; ε_r = 42.71; 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 – SN3617 ConvF(10.07,10.07,10.07)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 55.77 V/m; Power Drift = -0.03
Fast SAR: SAR(1 g) = 2.15 W/kg; SAR(10 g) = 1.36 W/kg
Maximum value of SAR (interpolated) = 2.81 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =55.77 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.52 W/kg
SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.39 W/kg
Maximum value of SAR (measured) = 2.87 W/kg



0 dB = 2.87 W/kg = 4.58 dB W/kg

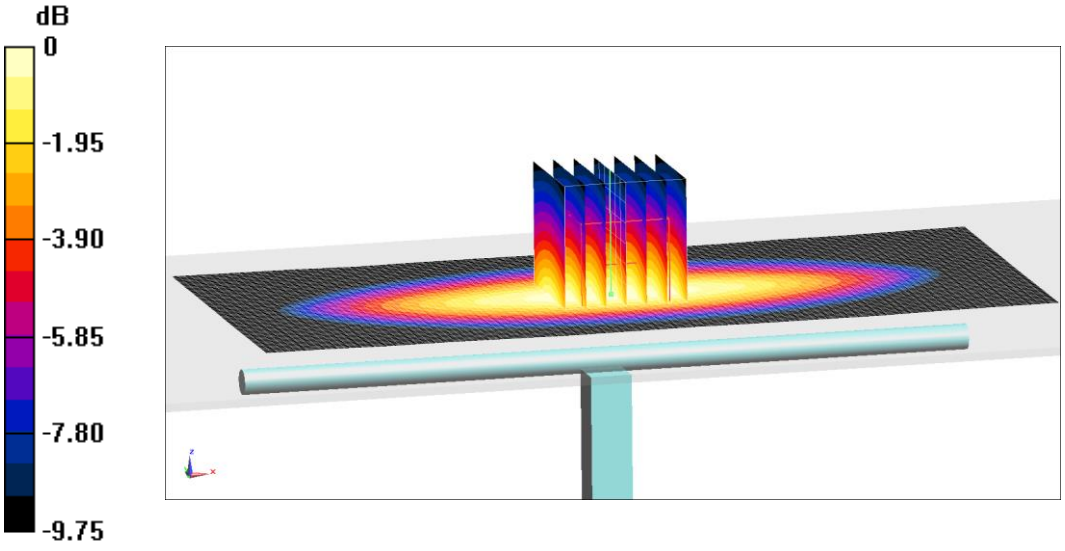
Fig.B.1 validation 750 MHz 250mW

750 MHz

Date: 7/15/2020
Electronics: DAE4 Sn777
Medium: Head 750 MHz
Medium parameters used: f = 750 MHz; σ =0.896 mho/m; ε_r = 41.96; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 54.52 V/m; Power Drift = -0.05
Fast SAR: SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.38 W/kg
Maximum value of SAR (interpolated) = 2.84 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =54.52 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.48 W/kg
SAR(1 g) = 2.08 W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (measured) = 2.83 W/kg



0 dB = 2.83 W/kg = 4.52 dB W/kg

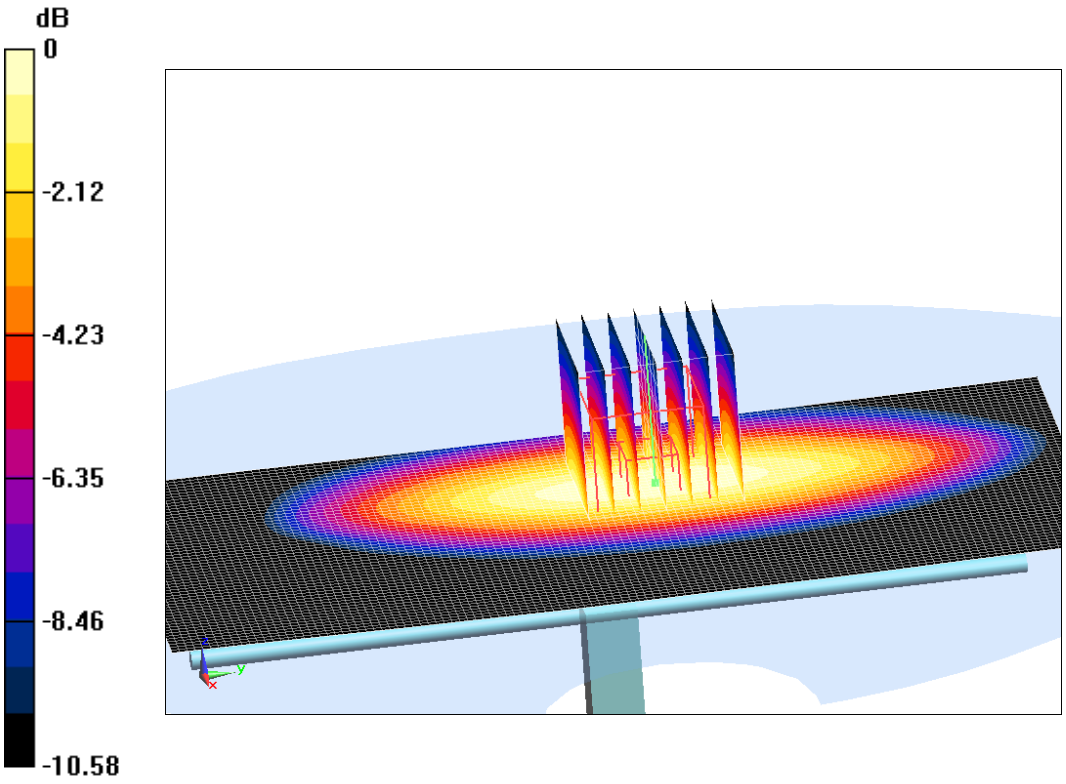
Fig.B.2 validation 750 MHz 250mW

835 MHz

Date: 7/16/2020
Electronics: DAE4 Sn777
Medium: Head 835 MHz
Medium parameters used: f = 835 MHz; σ =0.918 mho/m; ε_r = 41.49; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 57.49 V/m; Power Drift = -0.02
Fast SAR: SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.53 W/kg
Maximum value of SAR (interpolated) = 3.08 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =57.49 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.79 W/kg
SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.57 W/kg
Maximum value of SAR (measured) = 3.22 W/kg



0 dB = 3.22 W/kg = 5.08 dB W/kg

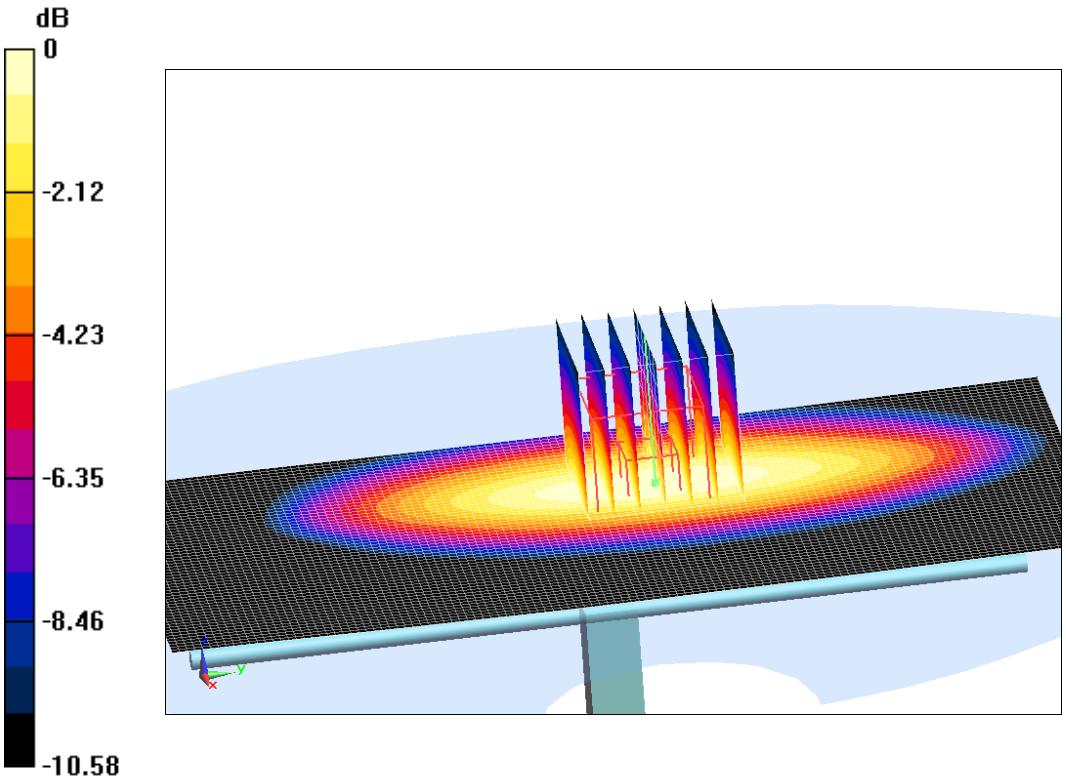
Fig.B.3 validation 835 MHz 250mW

835 MHz

Date: 7/17/2020
Electronics: DAE4 Sn777
Medium: Head 835 MHz
Medium parameters used: f = 835 MHz; σ =0.9 mho/m; ε_r = 40.85; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 56.95 V/m; Power Drift = 0.02
Fast SAR: SAR(1 g) = 2.33 W/kg; SAR(10 g) = 1.54 W/kg
Maximum value of SAR (interpolated) = 3.08 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =56.95 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.67 W/kg
SAR(1 g) = 2.33 W/kg; SAR(10 g) = 1.56 W/kg
Maximum value of SAR (measured) = 3.29 W/kg



0 dB = 3.29 W/kg = 5.17 dB W/kg

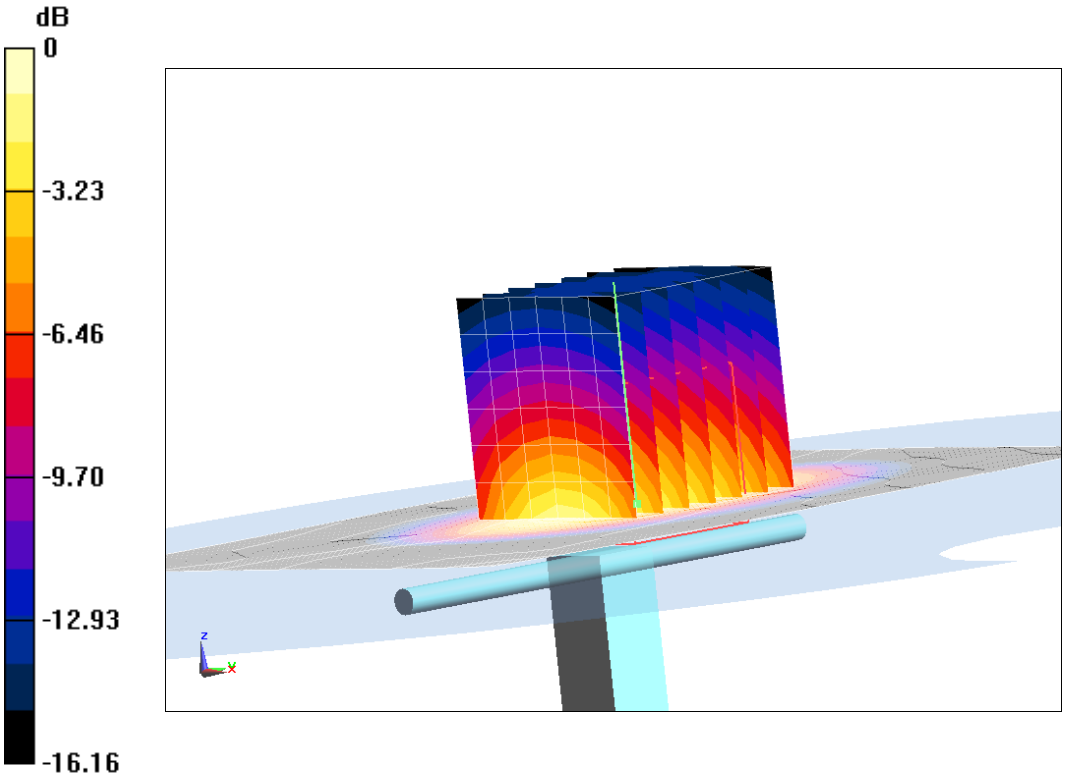
Fig.B.4 validation 835 MHz 250mW

1750 MHz

Date: 7/18/2020
Electronics: DAE4 Sn777
Medium: Head 1750 MHz
Medium parameters used: f = 1750 MHz; σ =1.355 mho/m; ε_r = 39.86; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 93.65 V/m; Power Drift = 0.04
Fast SAR: SAR(1 g) = 8.75 W/kg; SAR(10 g) = 4.62 W/kg
Maximum value of SAR (interpolated) = 13.8 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =93.65 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 16.68 W/kg
SAR(1 g) = 8.72 W/kg; SAR(10 g) = 4.73 W/kg
Maximum value of SAR (measured) = 13.68 W/kg



0 dB = 13.68 W/kg = 11.36 dB W/kg

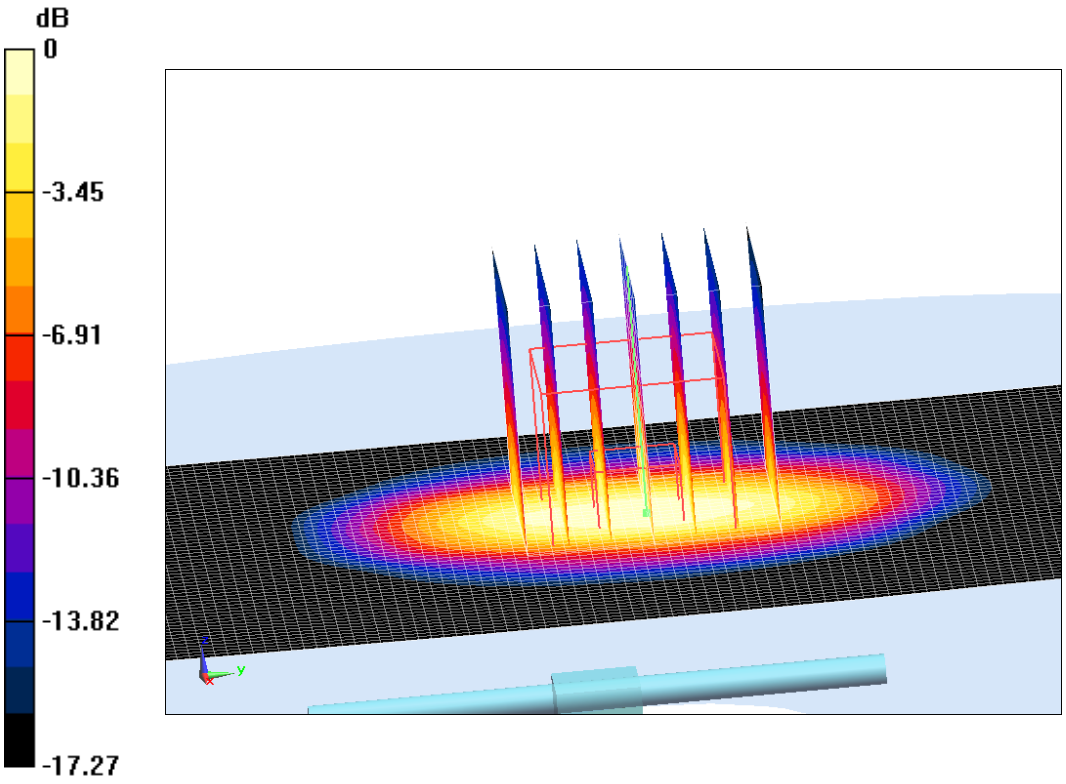
Fig.B.5 validation 1750 MHz 250mW

1900 MHz

Date: 7/19/2020
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.375 mho/m; ε_r = 40.05; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 107.27 V/m; Power Drift = 0.05
Fast SAR: SAR(1 g) = 10.12 W/kg; SAR(10 g) = 5.23 W/kg
Maximum value of SAR (interpolated) = 15.34 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =107.27 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 18.52 W/kg
SAR(1 g) = 9.83 W/kg; SAR(10 g) = 5.18 W/kg
Maximum value of SAR (measured) = 15.8 W/kg



0 dB = 15.8 W/kg = 11.99 dB W/kg

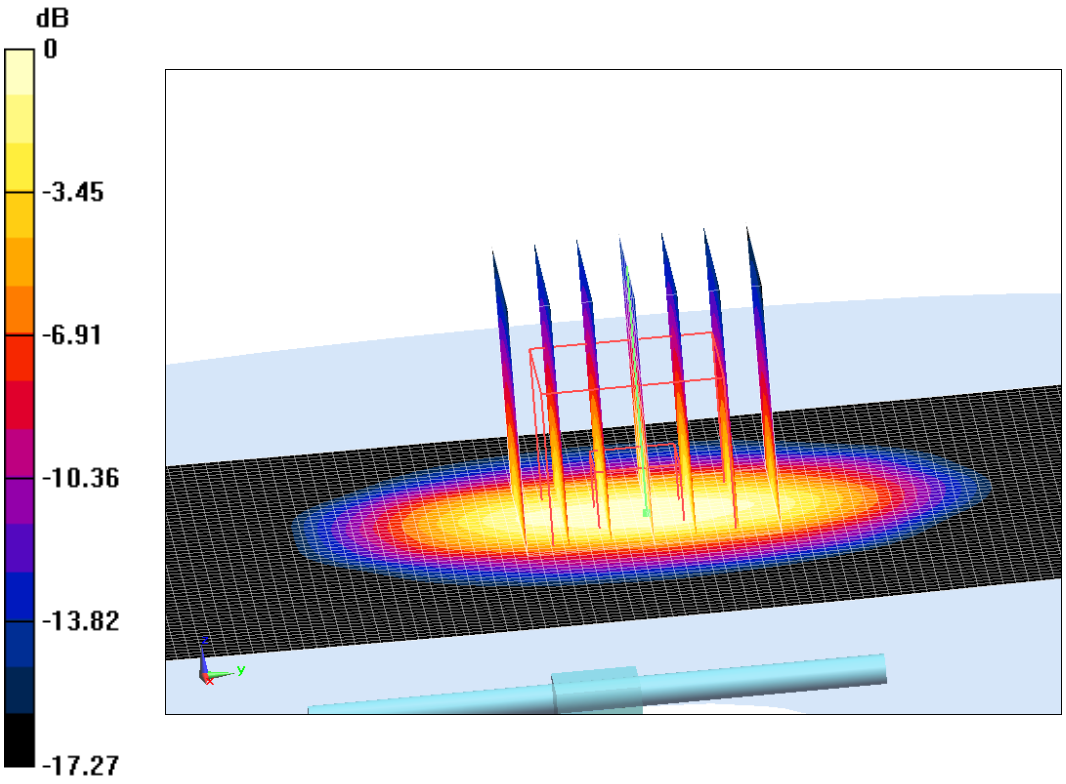
Fig.B.6 validation 1900 MHz 250mW

1900 MHz

Date: 7/20/2020
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.397 mho/m; ε_r = 39.44; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 110.36 V/m; Power Drift = -0.08
Fast SAR: SAR(1 g) = 10.02 W/kg; SAR(10 g) = 5.16 W/kg
Maximum value of SAR (interpolated) = 15.45 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =110.36 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 18.53 W/kg
SAR(1 g) = 10.06 W/kg; SAR(10 g) = 5.29 W/kg
Maximum value of SAR (measured) = 15.47 W/kg



0 dB = 15.47 W/kg = 11.89 dB W/kg

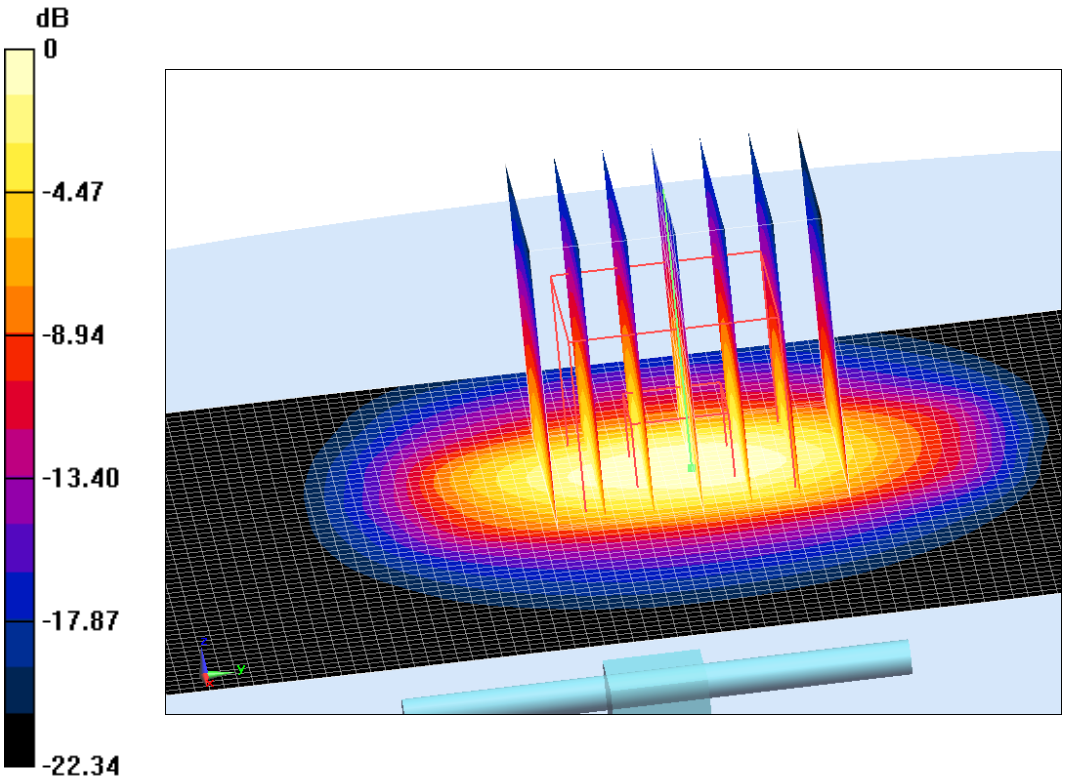
Fig.B.7 validation 1900 MHz 250mW

2450 MHz

Date: 7/21/2020
Electronics: DAE4 Sn777
Medium: Head 2450 MHz
Medium parameters used: f = 2450 MHz; σ =1.817 mho/m; ε_r = 38.98; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(7.65,7.65,7.65)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 105.04 V/m; Power Drift = 0.03
Fast SAR: SAR(1 g) = 12.95 W/kg; SAR(10 g) = 6.11 W/kg
Maximum value of SAR (interpolated) = 21.81 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =105.04 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 27.46 W/kg
SAR(1 g) = 13.17 W/kg; SAR(10 g) = 5.93 W/kg
Maximum value of SAR (measured) = 21.81 W/kg



0 dB = 21.81 W/kg = 13.39 dB W/kg

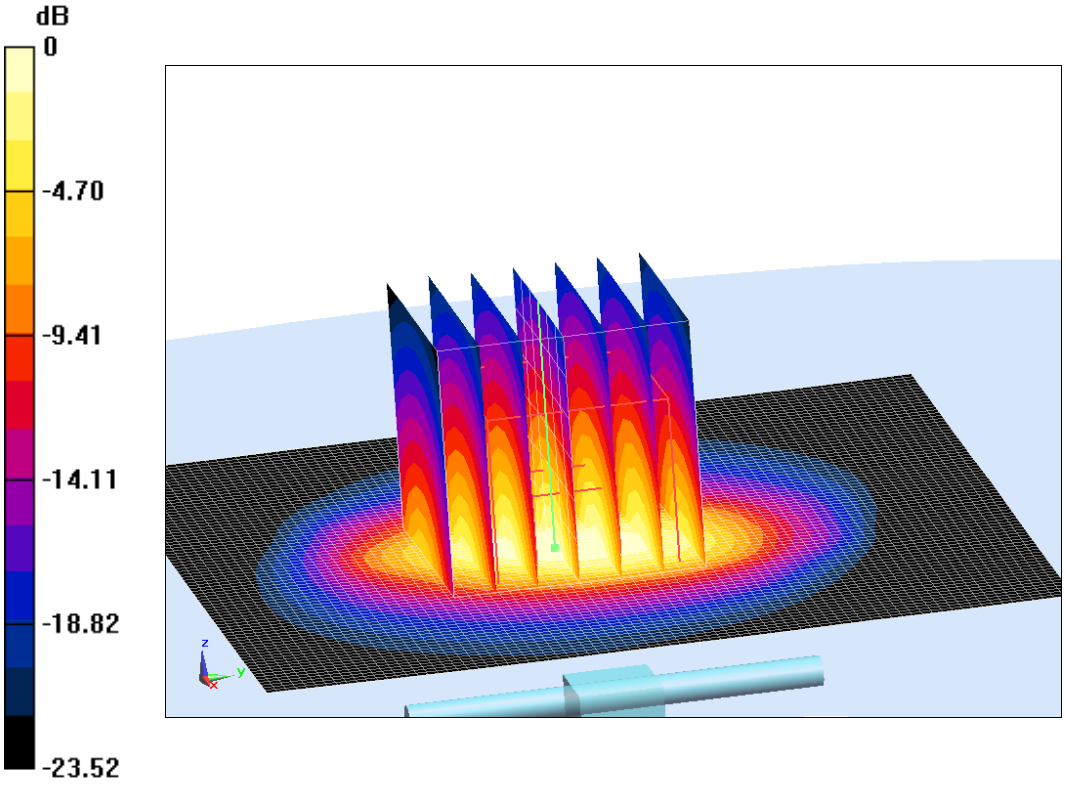
Fig.B.8 validation 2450 MHz 250mW

2600 MHz

Date: 7/22/2020
Electronics: DAE4 Sn777
Medium: Head 2600 MHz
Medium parameters used: f = 2600 MHz; σ =1.961 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 2600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(7.52,7.52,7.52)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 101.53 V/m; Power Drift = 0.04
Fast SAR: SAR(1 g) = 14.3 W/kg; SAR(10 g) = 6.26 W/kg
Maximum value of SAR (interpolated) = 25.03 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =101.53 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 31.62 W/kg
SAR(1 g) = 14.46 W/kg; SAR(10 g) = 6.33 W/kg
Maximum value of SAR (measured) = 25.1 W/kg



0 dB = 25.1 W/kg = 14 dB W/kg

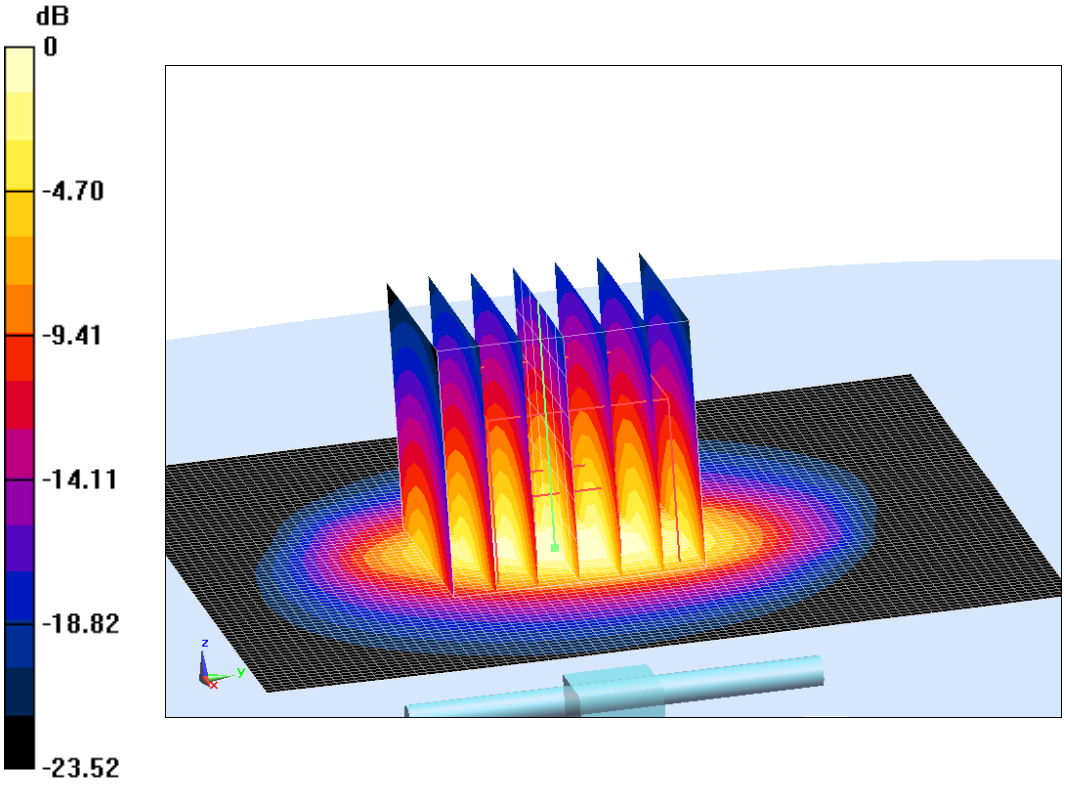
Fig.B.9 validation 2600 MHz 250mW

2600 MHz

Date: 7/23/2020
Electronics: DAE4 Sn777
Medium: Head 2600 MHz
Medium parameters used: f = 2600 MHz; σ =1.942 mho/m; ε_r = 38.63; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 2600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(7.52,7.52,7.52)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 99.01 V/m; Power Drift = 0.06
Fast SAR: SAR(1 g) = 14.16 W/kg; SAR(10 g) = 6.21 W/kg
Maximum value of SAR (interpolated) = 24.61 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =99.01 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 30.97 W/kg
SAR(1 g) = 14.13 W/kg; SAR(10 g) = 6.35 W/kg
Maximum value of SAR (measured) = 25.22 W/kg



0 dB = 25.22 W/kg = 14.02 dB W/kg

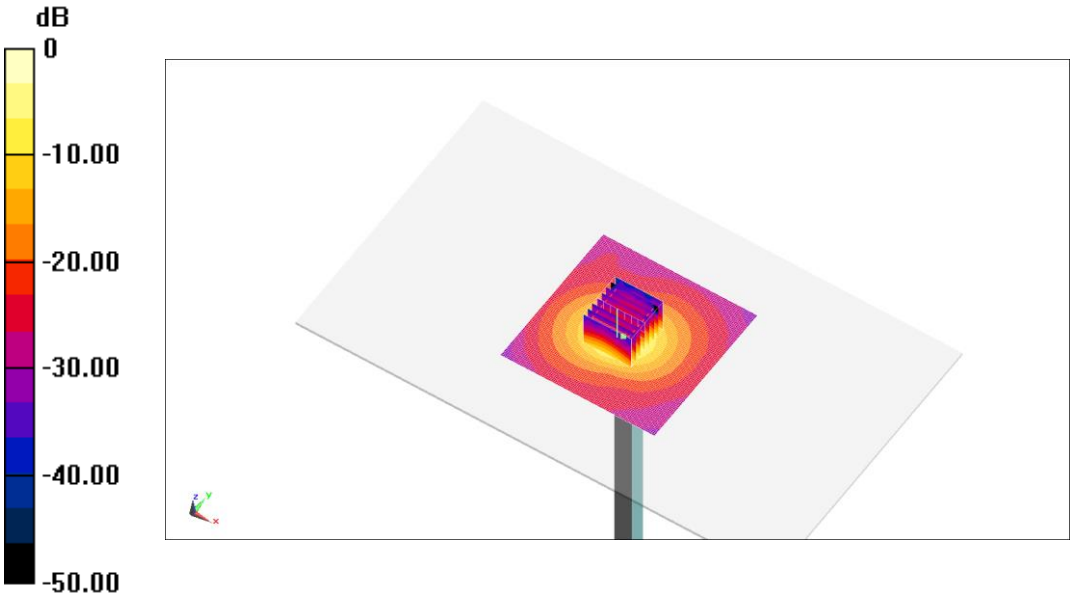
Fig.B.10 validation 2600 MHz 250mW

5200 MHz

Date: 7/24/2020
Electronics: DAE4 Sn777
Medium: Head 5200 MHz
Medium parameters used: f = 5200 MHz; σ =4.693 mho/m; ε_r = 36.53; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 5200 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(5.49,5.49,5.49)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 18.22 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =63.52 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 30.68 W/kg
SAR(1 g) = 18.68 W/kg; SAR(10 g) = 5.46 W/kg
Maximum value of SAR (measured) = 18.1 W/kg



0 dB = 18.1 W/kg = 12.58 dB W/kg

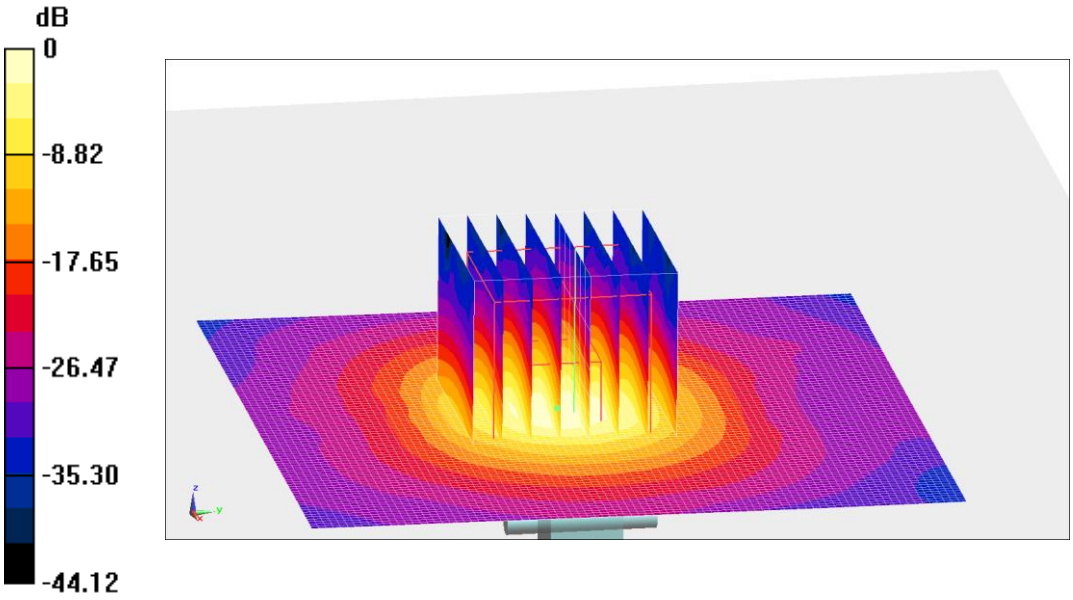
Fig.B.11 validation 5200 MHz 100mW

5800 MHz

Date: 7/25/2020
Electronics: DAE4 Sn777
Medium: Head 5800 MHz
Medium parameters used: f = 5800 MHz; σ =5.233 mho/m; ε_r = 34.9; ρ = 1000 kg/m^3
Ambient Temperature: 22.5ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 5800 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(5.00, 5.00, 5.00)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 19.36 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =67.33 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 33.25 W/kg
SAR(1 g) = 20.12 W/kg; SAR(10 g) = 5.65 W/kg
Maximum value of SAR (measured) = 19.18 W/kg



0 dB = 19.18 W/kg = 12.83 dB W/kg

Fig.B.12 validation 5800 MHz 100mW

The SAR system verification must be required that the area scan estimated 1-g SAR is within 3% of the zoom scan 1-g SAR.

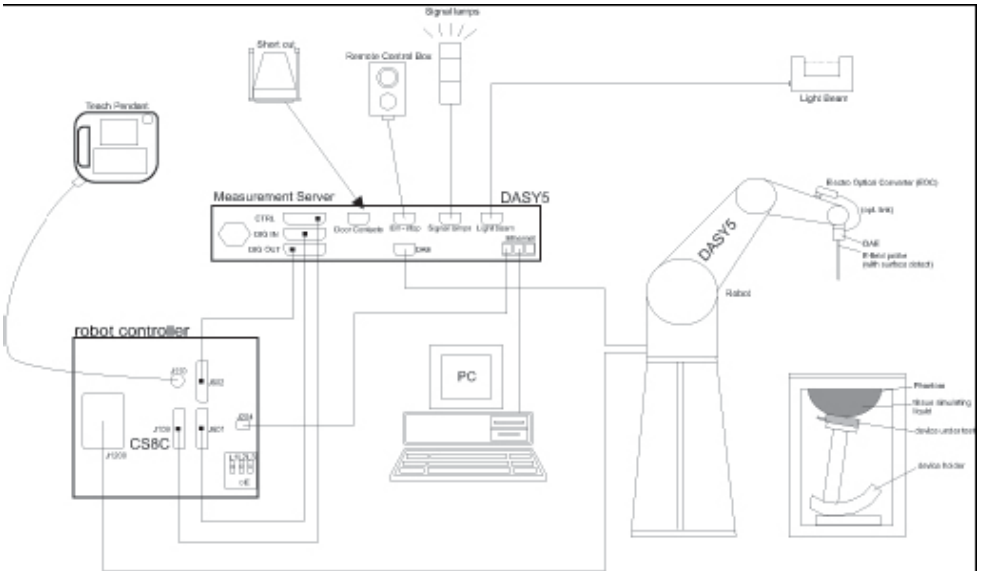
Table B.1 Comparison between area scan and zoom scan for system verification

Date	Band	Position	Area scan (1g)	Zoom scan (1g)	Drift (%)
2020/7/14	750 MHz	Head	2.15	2.11	1.90
2020/7/15	750 MHz	Head	2.07	2.08	-0.48
2020/7/16	835 MHz	Head	2.37	2.327	1.85
2020/7/17	835 MHz	Head	2.33	2.33	0.00
2020/7/18	1750 MHz	Head	8.75	8.72	0.34
2020/7/19	1900 MHz	Head	10.12	9.83	2.95
2020/7/20	1900 MHz	Head	10.02	10.06	-0.40
2020/7/21	2450 MHz	Head	12.95	13.17	-1.67
2020/7/22	2600 MHz	Head	14.3	14.46	-1.11
2020/7/23	2600 MHz	Head	14.16	14.13	0.21

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.

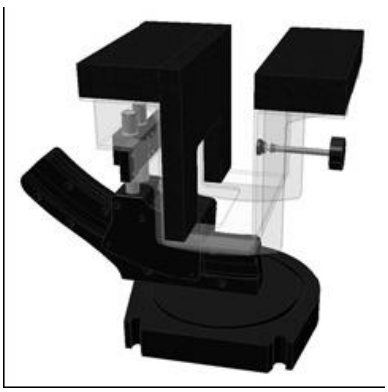
The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales are the ear reference 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).

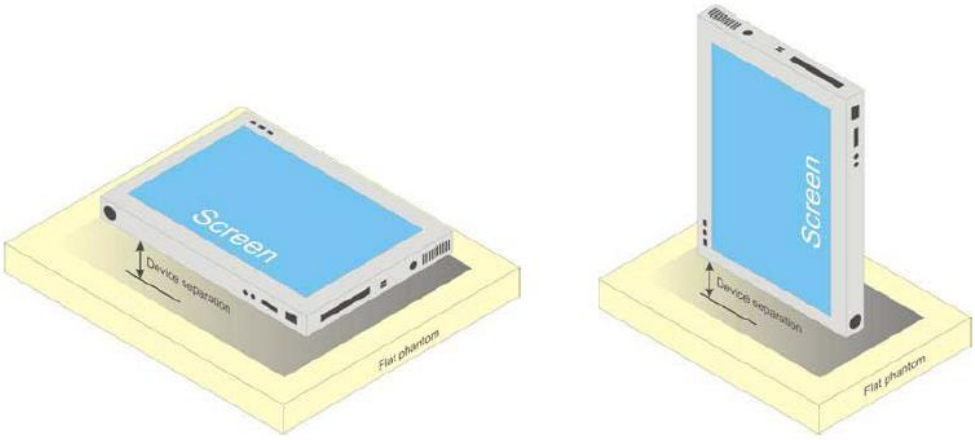
Shell Thickness: 2±0. 2 mm
Filling Volume: Approx. 25 liters
Dimensions: 810 x l000 x 500 mm (H x L x W)
Available: Special

Picture C.10: SAM Twin Phantom

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

D.1 Body-supported device

Other devices that fall into this category include tablet type portable computers and credit card transaction authorisation terminals, point-of-sale and/or inventory terminals. Where these devices may be torso or limb-supported, the same principles for body-supported devices are applied.
The example in Picture D.1 shows a tablet form factor portable computer for which SAR should be separately assessed with
a) each surface and
b) the separation distances
positioned against the flat phantom that correspond to the intended use as specified by the manufacturer. If the intended use is not specified in the user instructions, the device shall be tested directly against the flat phantom in all usable orientations.



Picture D.1 Tablet form factor portable computer

D.2 DUT Setup Photos

Picture D.2

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, 5G 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 3617

Probe SN.	Liquid name	Validation date	Frequency point	Status (OK or Not)
3617	Head 750MHz	Feb.17,2020	750 MHz	OK
3617	Head 850MHz	Feb.17,2020	835 MHz	OK
3617	Head 900MHz	Feb.17,2020	900 MHz	OK
3617	Head 1750MHz	Feb.17,2020	1750 MHz	OK
3617	Head 1810MHz	Feb.17,2020	1810 MHz	OK
3617	Head 1900MHz	Feb.18,2020	1900 MHz	OK
3617	Head 2000MHz	Feb.18,2020	2000 MHz	OK
3617	Head 2100MHz	Feb.18,2020	2100 MHz	OK
3617	Head 2300MHz	Feb.18,2020	2300 MHz	OK
3617	Head 2450MHz	Feb.18,2020	2450 MHz	OK
3617	Head 2600MHz	Feb.19,2020	2600 MHz	OK
3617	Head 3500MHz	Feb.19,2020	3500 MHz	OK
3617	Head 3700MHz	Feb.19,2020	3700 MHz	OK
3617	Head 5200MHz	Feb.19,2020	5250 MHz	OK
3617	Head 5500MHz	Feb.19,2020	5600 MHz	OK
3617	Head 5800MHz	Feb.19,2020	5800 MHz	OK
3617	Body 750MHz	Feb.19,2020	750 MHz	OK
3617	Body 850MHz	Feb.20,2020	835 MHz	OK
3617	Body 900MHz	Feb.20,2020	900 MHz	OK
3617	Body 1750MHz	Feb.20,2020	1750 MHz	OK
3617	Body 1810MHz	Feb.20,2020	1810 MHz	OK
3617	Body 1900MHz	Feb.20,2020	1900 MHz	OK
3617	Body 2000MHz	Feb.21,2020	2000 MHz	OK
3617	Body 2100MHz	Feb.21,2020	2100 MHz	OK
3617	Body 2300MHz	Feb.21,2020	2300 MHz	OK
3617	Body 2450MHz	Feb.21,2020	2450 MHz	OK
3617	Body 2600MHz	Feb.21,2020	2600 MHz	OK
3617	Body 3500MHz	Feb.22,2020	3500 MHz	OK
3617	Body 3700MHz	Feb.22,2020	3700 MHz	OK
3617	Body 5200MHz	Feb.22,2020	5250 MHz	OK
3617	Body 5500MHz	Feb.22,2020	5600 MHz	OK
3617	Body 5800MHz	Feb.22,2020	5800 MHz	OK

ANNEX G Probe Calibration Certificate

Probe 3617 Calibration Certificate

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

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Accreditation No.: SCS 0108

Client CTTL (Auden) **Certificate No: EX3-3617_Jan20/2**

CALIBRATION CERTIFICATE (Replacement of No: EX3-3617_Jan20)

Object	EX3DV4 - SN:3617
Calibration procedure(s)	QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v5, QA CAL-23.v5, QA CAL-25.v7 Calibration procedure for dosimetric E-field probes
Calibration date:	January 30, 2020

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	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-19 (No. 217-02894)	Apr-20
DAE4	SN: 660	27-Dec-19 (No. DAE4-660_Dec19)	Dec-20
Reference Probe ES3DV2	SN: 3013	31-Dec-19 (No. ES3-3013_Dec19)	Dec-20
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 7, 2020

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

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Accreditation No.: SCS 0108

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.e., 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 ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect 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 with CW signal (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; Dx,y,z; VRx,y,z*: *A, B, C, D* 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 ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values 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 ± 50 MHz to ± 100 MHz.
- *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).

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3617

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.35	0.21	0.32	± 10.1 %
DCP (mV)[B]	104.3	93.8	97.1	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Max dev.	Max Unc[E] (k=2)
0	CW	X	0.00	0.00	1.00	0.00	130.5	± 3.5 %	± 4.7 %
		Y	0.00	0.00	1.00		137.4		
		Z	0.00	0.00	1.00		129.2		
10352-AAA	Pulse Waveform (200Hz, 10%)	X	5.74	74.31	15.16	10.00	60.0	± 2.6 %	± 9.6 %
		Y	20.00	84.63	18.23		60.0		
		Z	20.00	90.64	20.98		60.0		
10353-AAA	Pulse Waveform (200Hz, 20%)	X	11.18	82.57	16.62	6.99	80.0	± 1.6 %	± 9.6 %
		Y	11.60	81.13	15.97		80.0		
		Z	20.00	91.54	20.06		80.0		
10354-AAA	Pulse Waveform (200Hz, 40%)	X	20.00	88.75	16.93	3.98	95.0	± 1.0 %	± 9.6 %
		Y	1.22	64.13	8.17		95.0		
		Z	20.00	94.77	20.04		95.0		
10355-AAA	Pulse Waveform (200Hz, 60%)	X	20.00	90.94	16.71	2.22	120.0	± 1.3 %	± 9.6 %
		Y	0.41	60.00	4.32		120.0		
		Z	20.00	99.77	20.92		120.0		
10387-AAA	QPSK Waveform, 1 MHz	X	0.73	63.23	9.65	0.00	150.0	± 4.1 %	± 9.6 %
		Y	0.47	60.00	5.82		150.0		
		Z	0.73	63.00	9.63		150.0		
10388-AAA	QPSK Waveform, 10 MHz	X	2.46	70.66	17.17	0.00	150.0	± 1.7 %	± 9.6 %
		Y	2.10	68.37	15.67		150.0		
		Z	2.45	70.34	17.05		150.0		
10396-AAA	64-QAM Waveform, 100 kHz	X	3.34	72.82	19.20	3.01	150.0	± 1.6 %	± 9.6 %
		Y	3.57	72.45	19.52		150.0		
		Z	3.45	73.00	19.94		150.0		
10399-AAA	64-QAM Waveform, 40 MHz	X	3.61	68.21	16.41	0.00	150.0	± 3.8 %	± 9.6 %
		Y	3.40	67.13	15.82		150.0		
		Z	3.62	68.06	16.39		150.0		
10414-AAA	WLAN CCDF, 64-QAM, 40MHz	X	4.88	66.26	15.89	0.00	150.0	± 6.6 %	± 9.6 %
		Y	4.57	64.95	15.35		150.0		
		Z	4.92	66.18	15.92		150.0		

Note: For details on UID parameters see Appendix

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 E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3617

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	41.2	299.64	34.06	12.13	0.82	5.00	1.88	0.20	1.00
Y	42.0	334.64	39.96	9.91	1.46	5.06	0.00	0.82	1.01
Z	42.8	318.14	35.45	11.95	0.73	5.04	1.02	0.40	1.01

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	13
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm