

NCC SAR TEST REPORT

Equipment : Mobile Cellular Phone
Brand Name : Motorola
Model Name : XT2201-1
Applicant : Motorola Mobility LLC
222 W, Merchandise Mart Plaza, Chicago IL 60654 USA
Manufacturer : Motorola Mobility LLC
222 W, Merchandise Mart Plaza, Chicago, IL60654 USA
CNS 14959:2005
STANDARD : CNS 14958-1:2005
IEC 62209-1:2016

The product was received on Nov. 30, 2021 and testing was started from Dec. 14, 2021 and completed on Jan. 09, 2022. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Cona Huang / Deputy Manager



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History of this test report

Report No.	Version	Description	Issued Date
TA1O1903-02	Rev. 01	Initial issue of report	Jan. 24, 2022

1 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Motorola Mobility LLC Mobile Cellular Phone Motorola XT2201-1 are as follows.

Frequency Band		Highest SAR Summary
		Head (Separation 0mm)
		10g SAR (W/kg)
GSM	GSM900	0.66
WCDMA	WCDMA I	0.05
	WCDMA VIII	0.64
LTE	LTE Band 1	0.81
	LTE Band 3	0.81
	LTE Band 7	0.51
	LTE Band 8	0.71
	LTE Band 28	0.50
	LTE Band 38	0.67
	LTE Band 41	0.55
FR1	FR1 n1	0.71
	FR1 n3	0.64
	FR1 n7	0.66
	FR1 n8	0.11
	FR1 n28	0.53
	FR1 n38	0.68
	FR1 n41	0.03
	FR1 n78	0.57
Date of Testing:		2021/12/14 ~ 2022/1/9

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (2.0 W/kg) specified in CNS 14959:2005, and had been tested in accordance with the measurement methods and procedures specified in CNS 14958-1:2005.

Reviewed by: Jason Wang
Report Producer: Paula Chen

2 Guidance Standard

The Specific Absorption Rate (SAR) testing specification, method and procedure for this device is in accordance with the following standards:

- CNS 14959:2005
- CNS 14958-1:2005
- IEC 62209-1:2016

3 Device Category and SAR Limits

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user. Limit for General Population/Uncontrolled exposure should be applied for this device, it is 2.0 W/kg as averaged over any 10 gram of tissue.

4 General Information

4.1 Description of Device Under Test (DUT)

Product Feature & Specification	
DUT Type	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2201-1
IMEI Code	IMEI 1: 355871980031954 IMEI 2: 355871980031962
Wireless Technology and Frequency Range	GSM900 : 890 MHz ~ 915 MHz WCDMA Band I : 1920 MHz -1980 MHz WCDMA Band VIII : 885 MHz -915 MHz LTE Band 1: 1920 MHz~1980 MHz LTE Band 3: 1710 MHz~1785 MHz LTE Band 7: 2500 MHz~2570 MHz LTE Band 8: 885 MHz~915 MHz LTE Band 28: 703 MHz~748 MHz LTE Band 38: 2570 MHz~2620 MHz LTE Band 41: 2500 MHz ~ 2690 MHz 5G NR n1: 1920 MHz ~ 1980 MHz 5G NR n3: 1710 MHz ~ 1785 MHz 5G NR n7: 2500 MHz ~ 2570 MHz 5G NR n8: 885 MHz ~ 915 MHz 5G NR n28: 703 MHz ~ 748 MHz 5G NR n38: 2570 MHz ~ 2620 MHz 5G NR n41: 2500 MHz ~ 2690 MHz 5G NR n78: 3300 MHz ~ 3570 MHz
Mode	GSM RMC 12.2Kbps LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, QPSK/16QAM/64QAM/256QAM
HW Version	DVT2
DUT Stage	Identical Prototype
Remark: 1. The detail internal, external and transmit antenna photo please refer to Sporton report no.: EP101903-02. 2. This device has two samples; RF exposure evaluation selects Sample 1 as the main test, Sample 2 spot check worst case found in Sample 1. 3. The difference between Sample 1 and Sample 2 please refer to Product Equality Declaration (PED). 4. The device support sensor detect and power manage for SAR compliance: Ant 1: LTE B1/B3/B7/B8/B28/B41, FR1 n1/n3/n7/n38	

Accessory List		
AC Adapter 1	Brand Name :	Motorola
	Model Name :	MC-681
	Manufacturer :	Salom
AC Adapter 2	Brand Name :	Motorola
	Model Name :	MC-681
	Manufacturer :	Chenyang
Battery	Brand Name :	Motorola
	Model Name :	NA50
Earphone 1	Brand Name :	Motorola
	Model Name :	MD211(SH38D20195)
Earphone 2	Brand Name :	Motorola
	Model Name :	MD211(SH38D39180)
USB Cable	Brand Name :	Motorola
	Model Name :	SC18D24968
OceanBlue	Brand Name :	ThinkReality A3 AR Glasses
	Model Name :	A3
OceanBlue Industrial Kit-Y Cable	Brand Name :	ThinkReality A3 Industrial Kit-Y Cable
	Model Name :	A3 Y Cable

Antenna Information				
Antenna 0	Brand Name	Moto	Peak Gain	GSM900: -4.3 dBi WCDMA Band I: -0.3 dBi WCDMA Band VIII: -4.3 dBi LTE Band 1 :-0.3 dBi LTE Band 3 :-0.5 dBi LTE Band 7 :1.0 dBi LTE Band 8 :-4.3 dBi LTE Band 28 :-3.5 dBi LTE Band 38 :0.7 dBi LTE Band 41 :1.0 dBi 5G NR n1: -0.3 dBi 5G NR n3: -0.5 dBi 5G NR n7: 1.0 dBi 5G NR n8: -4.3 dBi 5G NR n28: -3.5 dBi 5G NR n41: 1.0 dBi
	Model Name	ANT0	Type	IFA Antenna
Antenna 1	Brand Name	Moto	Peak Gain	GSM900: -3.7 dBi WCDMA Band VIII: -3.7 dBi LTE Band 1: -2.0 dBi LTE Band 3: -1.5 dBi LTE Band 7: -0.9 dBi LTE Band 8: -3.7 dBi LTE Band 28: -4.8 dBi LTE Band 38: -0.9 dBi LTE Band 41: -0.3 dBi 5G NR n1: -2.0 dBi 5G NR n3: -1.5 dBi 5G NR n7: -0.9 dBi 5G NR n8: -3.7 dBi 5G NR n28: -4.8 dBi 5G NR n38: -0.9 dBi 5G NR n41: -0.3 dBi
	Model Name	ANT1	Type	IFA Antenna
Antenna 2	Brand Name	Moto	Peak Gain	5G NR n78: -0.3 dBi
	Model Name	ANT2	Type	IFA Antenna
Antenna 3	Brand Name	Moto	Peak Gain	5G NR n78: -3.0 dBi
	Model Name	ANT3	Type	Loop Antenna
Antenna 7	Brand Name	Moto	Peak Gain	5G NR n78: -0.2 dBi
	Model Name	ANT7	Type	IFA Antenna
Antenna 8	Brand Name	Moto	Peak Gain	5G NR n78: -1.5 dBi
	Model Name	ANT8	Type	PIFA Antenna

5 Specific Absorption Rate (SAR)

5.1 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.

5.2 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:

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

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

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

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

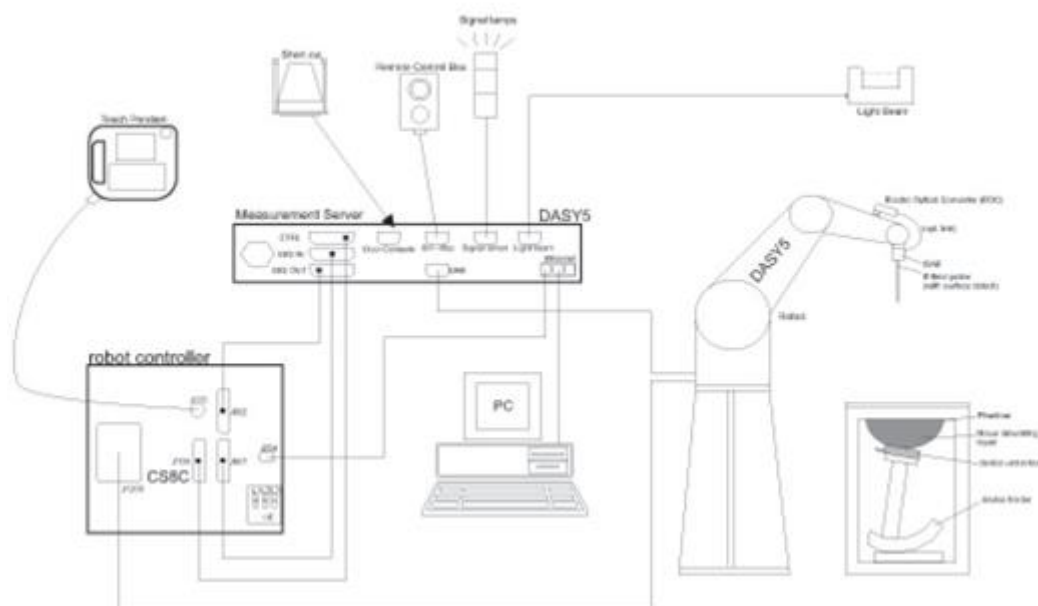
Where: C is the specific heat capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

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

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

6 SAR Measurement System

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



- A standard high precision 6-axis robot 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 or Win7 and the DASY 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.

6.1 Test Site Location

The SAR measurement facilities used to collect data are within both Sporton Lab list below test site location are accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190 and 3786).

Test Site	EMC & Wireless Communications Laboratory		Wensan Laboratory		
Test Site Location	TW1190 No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan		TW3786 No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan		
Test Site No.	SAR01-HY	SAR03-HY	SAR08-HY	SAR09-HY	SAR15-HY
	SAR04-HY	SAR05-HY	SAR11-HY	SAR12-HY	
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	

7 Measurement Procedures

The measurement procedures are as follows:

- (a) Link DUT with base station emulator in middle channel
- (b) Set base station emulator to allow DUT to radiate maximum output power
- (c) Measure output power through RF cable and power meter
- (d) Place the DUT in the positions described in the last section
- (e) Set scan area, grid size and other setting on the DASY software
- (f) Taking data for the middle channel on each testing position
- (g) Find out the largest SAR result on these testing positions of each band
- (h) Measure SAR results for the lowest and highest channels in worst SAR testing position

According to the CNS 14958-1 standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- (a) Power reference measurement
- (b) Area scan
- (c) Zoom scan
- (d) Power drift measurement

7.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the CNS 14958-1 standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

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

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

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

7.2 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures 5x5x7 points with step size 8, 8 and 5 mm for 300 MHz to 3 GHz. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

7.3 SAR Averaged Methods

In DASy, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

7.4 Power Drift Monitoring

All SAR testing is under the DUT install full charged battery and transmit maximum output power. In DASy measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of DUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drift more than 5%, the SAR will be retested.

8 Test Equipment List

Brand Name	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit ⁽²⁾	D750V3	1107	Mar. 08, 2019	Mar. 05, 2022
SPEAG	900MHz System Validation Kit ⁽²⁾	D900V2	190	Sep. 04, 2020	Sep. 02, 2022
SPEAG	1800MHz System Validation Kit	D1800V2	2d076	Aug. 18, 2021	Aug. 17, 2022
SPEAG	2000MHz System Validation Kit	D2000V2	1010	Aug. 17, 2021	Aug. 16, 2022
SPEAG	2600MHz System Validation Kit	D2600V2	1008	Aug. 17, 2021	Aug. 16, 2022
SPEAG	3300MHz System Validation Kit ⁽²⁾	D3300V2	1005	Apr. 11, 2019	Apr. 08, 2022
SPEAG	3500MHz System Validation Kit ⁽²⁾	D3500V2	1014	Jan. 29, 2019	Jan. 26, 2022
SPEAG	Data Acquisition Electronics	DAE4	376	Nov. 22, 2021	Nov. 21, 2022
SPEAG	Data Acquisition Electronics	DAE4	699	Feb. 16, 2021	Feb. 15, 2022
SPEAG	Dosimetric E-Field Probe	ES3DV3	3115	Nov. 23, 2021	Nov. 22, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	3642	Apr. 26, 2021	Apr. 25, 2022
RCPTWN	Thermometer	HTC-1	TM685-1	Oct. 28, 2021	Oct. 27, 2022
RCPTWN	Thermometer	HTC-1	TM560-2	Oct. 28, 2021	Oct. 27, 2022
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Oct. 21, 2021	Oct. 20, 2022
Keysight	Wireless Communication Test Set	E5515C	MY50267236	Mar. 21, 2021	Mar. 20, 2022
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Oct. 24, 2021	Oct. 23, 2022
Keysight	ENA Network Analyzer	E5071C	MY46104758	Sep. 07, 2021	Sep. 06, 2022
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 24, 2021	Sep. 23, 2022
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3252	Jul. 15, 2021	Jul. 14, 2022
Anritsu	Power Meter	ML2495A	1419002	Aug. 18, 2021	Aug. 17, 2022
Anritsu	Power Sensor	MA2411B	1911176	Aug. 18, 2021	Aug. 17, 2022
Anritsu	Power Meter	ML2495A	1804003	Oct. 09, 2021	Oct. 08, 2022
Anritsu	Power Sensor	MA2411B	1726150	Oct. 09, 2021	Oct. 08, 2022
Anritsu	Spectrum Analyzer	N9010A	MY53470118	Jan. 15, 2021	Jan. 14, 2022
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 19, 2021	Aug. 18, 2022
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 12, 2021	Oct. 11, 2022
Mini-Circuits	Power Amplifier	ZVE-8G+	479102029	Sep. 06, 2021	Sep. 05, 2022
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.

9 System Verification

9.1 Tissue Verification

The tissue dielectric parameters of tissue-equivalent media used for SAR measurements must be characterized within a temperature range of 18°C to 25°C, measured with calibrated instruments and apparatuses, such as network analyzers and temperature probes. The temperature of the tissue-equivalent medium during SAR measurement must also be within 18°C to 25°C and within $\pm 2^\circ\text{C}$ of the temperature when the tissue parameters are characterized. The tissue dielectric measurement system must be calibrated before use. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements.

The liquid tissue depth was at least 15cm in the phantom for all SAR testing.

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ϵ_r)	Conductivity Target (σ)	Permittivity Target (ϵ_r)	Delta (σ) (%)	Delta (ϵ_r) (%)	Limit (%)	Date
750	22.5	0.901	42.988	0.89	41.90	1.24	2.60	± 5	2021/12/14
900	22.5	0.965	42.405	0.97	41.50	-0.52	2.18	± 5	2021/12/14
900	22.4	0.950	42.664	0.97	41.50	-2.06	2.80	± 5	2022/1/9
1800	22.5	1.446	40.313	1.40	40.00	3.29	0.78	± 5	2021/12/14
1800	22.4	1.406	40.284	1.40	40.00	0.43	0.71	± 5	2022/1/9
2000	22.6	1.398	39.976	1.40	40.00	-0.14	-0.06	± 5	2021/12/15
2000	22.4	1.422	39.363	1.40	40.00	1.57	-1.59	± 5	2022/1/9
2600	22.6	1.983	39.332	1.96	39.00	1.17	0.85	± 5	2021/12/15
2600	22.2	1.940	37.954	1.96	39.00	-1.02	-2.68	± 5	2021/12/16
3300	22.2	2.818	38.533	2.70	38.13	4.37	1.06	± 5	2021/12/16
3500	22.2	3.006	38.298	2.91	37.90	3.30	1.05	± 5	2021/12/16

9.2 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Test Site	Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
SAR01	2021/12/14	750	250	D750V3-1107	EX3DV4 - SN3642	DAE4 Sn699	1.360	5.61	5.44	-3.03
SAR01	2021/12/14	900	50	D900V2-190	EX3DV4 - SN3642	DAE4 Sn699	0.334	6.93	6.68	-3.61
SAR05	2022/1/9	900	50	D900V2-190	ES3DV3 - SN3115	DAE4 Sn376	0.346	6.93	6.92	-0.14
SAR01	2021/12/14	1800	50	D1800V2-2d076	EX3DV4 - SN3642	DAE4 Sn699	0.968	20.10	19.36	-3.68
SAR05	2022/1/9	1800	50	D1800V2-2d076	ES3DV3 - SN3115	DAE4 Sn376	0.994	20.10	19.88	-1.09
SAR01	2021/12/15	2000	50	D2000V2-1010	EX3DV4 - SN3642	DAE4 Sn699	0.984	21.70	19.68	-9.31
SAR05	2022/1/9	2000	50	D2000V2-1010	ES3DV3 - SN3115	DAE4 Sn376	0.998	21.70	19.96	-8.02
SAR01	2021/12/15	2600	250	D2600V2-1008	EX3DV4 - SN3642	DAE4 Sn699	6.290	25.80	25.16	-2.48
SAR01	2021/12/16	2600	250	D2600V2-1008	EX3DV4 - SN3642	DAE4 Sn699	6.150	25.80	24.6	-4.65
SAR01	2021/12/16	3300	100	D3300V2-1005	EX3DV4 - SN3642	DAE4 Sn699	2.510	25.20	25.1	-0.40
SAR01	2021/12/16	3500	100	D3500V2-1014	EX3DV4 - SN3642	DAE4 Sn699	2.550	25.60	25.5	-0.39

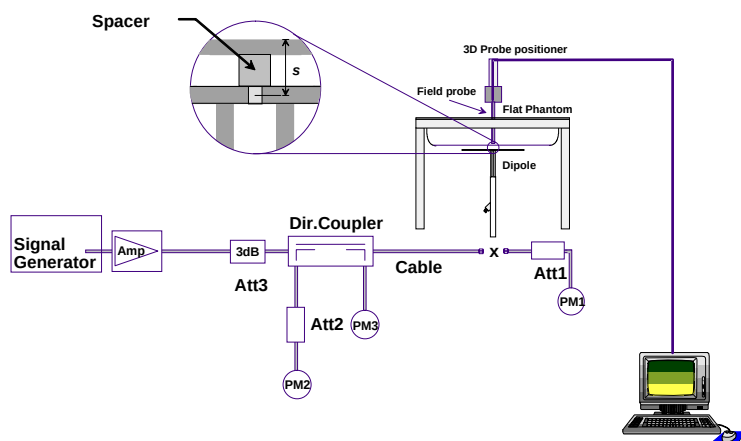


Fig 10.2.1 System Performance Check Setup



Fig 10.2.2 Setup Photo

10 RF Exposure Position

Figure 11.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled "M," the left ear reference point (ERP) is marked "LE," and the right ERP is marked "RE." Each ERP is 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 11.1.2 The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Figure 11.1.3). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Figure 11.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

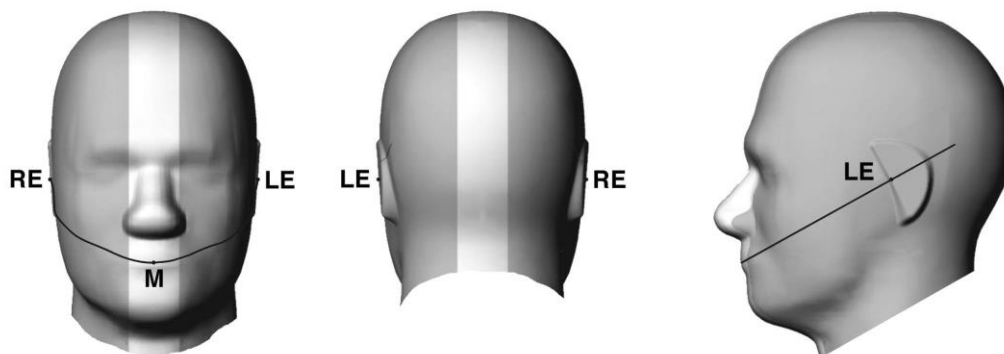


Fig 11.1.1 Front, back, and side views of SAM twin phantom

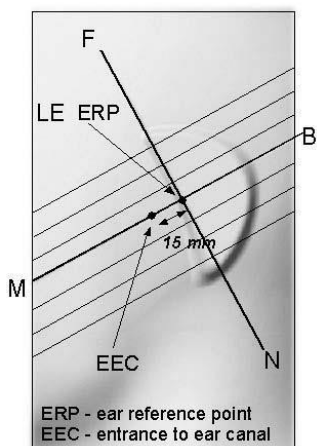


Fig 11.1.2 Close-up side view of phantom showing the ear region.

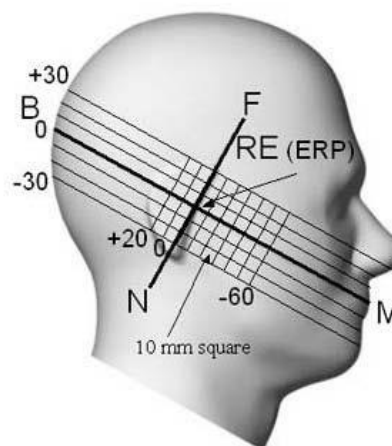


Fig 11.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

10.1 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width w_t of the handset at the level of the acoustic output (point A in Figure 11.2.1 and Figure 11.2.2), and the midpoint of the width w_b of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 11.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 11.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 11.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 11.2.3. The actual rotation angles should be documented in the test report.

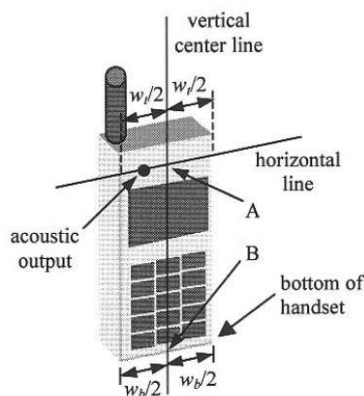


Fig 11.2.1 Handset vertical and horizontal reference lines—“fixed case”

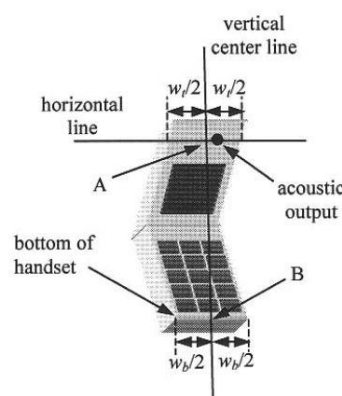


Fig 11.2.2 Handset vertical and horizontal reference lines—“clam-shell case”

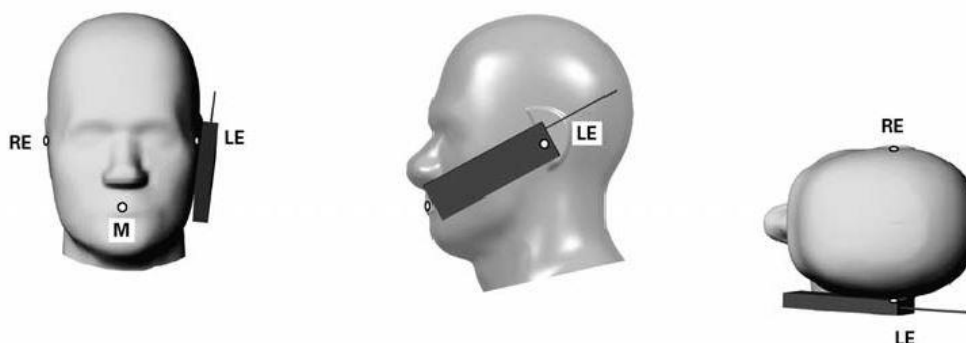


Fig 11.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

10.2 Definition of the tilt position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
3. Rotate the handset around the horizontal line by 15°.
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See below figure 11.3.1. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

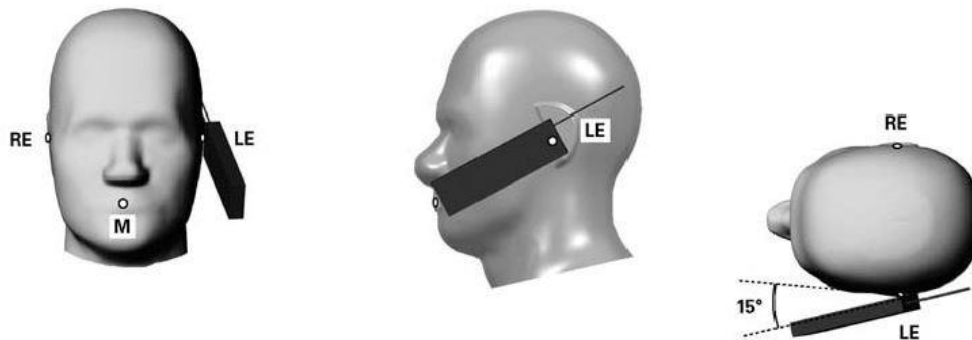


Fig 11.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

11 GSM/UMTS/LTE Conducted Power (Unit: dBm)

<GSM 900_Ant 0>

GSM900	Burst Average Power (dBm)			Frame-Average Power (dBm)		
TX Channel	1	37	124	1	37	124
Frequency (MHz)	890.2	897.4	914.8	890.2	897.4	914.8
GSM 1 Tx slot	32.83	32.58	32.61	23.83	23.58	23.61

<GSM 900_Ant 1>

GSM900	Burst Average Power (dBm)			Frame-Average Power (dBm)		
TX Channel	1	37	124	1	37	124
Frequency (MHz)	890.2	897.4	914.8	890.2	897.4	914.8
GSM 1 Tx slot	32.44	32.30	32.13	23.44	23.30	23.13

<WCDMA B1_Ant 0>

Band		WCDMA B1		
TX Channel		9612	9750	9888
Rx Channel		10562	10700	10838
Frequency (MHz)		1922.4	1950	1977.6
3GPP Rel 99	RMC 12.2Kbps	24.22	24.20	24.19

<WCDMA B8_Ant 0>

Band		WCDMA B8		
TX Channel		2737	2800	2863
Rx Channel		2962	3025	3088
Frequency (MHz)		887.4	900	912.6
3GPP Rel 99	RMC 12.2Kbps	24.09	23.99	23.99

<WCDMA B8_Ant 1>

Band		WCDMA B8		
TX Channel		2737	2800	2863
Rx Channel		2962	3025	3088
Frequency (MHz)		887.4	900	912.6
3GPP Rel 99	RMC 12.2Kbps	23.27	23.15	23.05

<LTE Output Power>
Note:

Choose the highest output power among all configurations of bandwidths, RBs, modulations to test SAR at middle channel and determine the worst configuration for further high/low channel test.

<LTE Band 1_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				18100	18300	18500
Frequency (MHz)				1930	1950	1970
20	QPSK	1	0	22.44	22.88	22.49
20	QPSK	1	99	22.46	22.51	22.46
20	QPSK	18	0	22.75	22.83	22.73
20	QPSK	18	82	22.74	22.76	22.72
20	16QAM	1	0	22.63	22.75	22.67
20	16QAM	1	99	22.78	22.69	22.80
20	16QAM	18	0	22.78	22.79	22.73
20	16QAM	18	82	22.84	22.70	22.77
20	64QAM	1	0	22.69	22.76	22.76
20	64QAM	1	99	22.62	22.75	22.70
20	64QAM	18	0	22.67	22.78	22.74
20	64QAM	18	82	22.81	22.68	22.84
20	256QAM	1	0	19.57	19.35	19.43
20	256QAM	1	99	19.08	19.19	19.16
20	256QAM	18	0	19.20	19.15	19.04
20	256QAM	18	82	19.33	19.34	19.20
Channel				18050	18300	18550
Frequency (MHz)				1925	1950	1975
10	QPSK	1	0	22.85	22.50	22.69
10	QPSK	1	49	22.80	22.64	22.81
10	QPSK	12	0	22.69	22.86	22.77
10	QPSK	12	38	22.87	22.63	22.87
10	16QAM	1	0	22.82	22.64	22.77
10	16QAM	1	49	22.70	22.68	22.81
10	16QAM	12	0	22.70	22.85	22.67
10	16QAM	12	38	22.63	22.69	22.66
10	64QAM	1	0	22.80	22.68	22.73
10	64QAM	1	49	22.58	22.86	22.78
10	64QAM	12	0	22.67	22.78	22.76
10	64QAM	12	38	22.64	22.82	22.61
10	256QAM	1	0	19.45	19.35	19.26
10	256QAM	1	49	19.03	19.11	19.17
10	256QAM	12	0	19.06	19.28	19.00
10	256QAM	12	38	19.29	19.36	19.11
Channel				18025	18300	18575
Frequency (MHz)				1922.5	1950	1977.5
5	QPSK	1	0	22.67	22.87	22.81
5	QPSK	1	24	22.54	22.79	22.65
5	QPSK	8	0	22.78	22.71	22.55
5	QPSK	8	17	22.63	22.54	22.71
5	16QAM	1	0	22.57	22.77	22.59
5	16QAM	1	24	22.77	22.66	22.55
5	16QAM	8	0	22.72	22.70	22.62
5	16QAM	8	17	22.70	22.71	22.81
5	64QAM	1	0	22.71	22.75	22.63
5	64QAM	1	24	22.70	22.64	22.82
5	64QAM	8	0	22.67	22.64	22.59
5	64QAM	8	17	22.60	22.60	22.67
5	256QAM	1	0	19.42	19.39	19.51
5	256QAM	1	24	19.26	19.11	19.18
5	256QAM	8	0	19.27	19.35	18.96
5	256QAM	8	17	19.18	19.32	19.11

<LTE Band 1_ Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				18100	18300	18500
Frequency (MHz)				1930	1950	1970
20	QPSK	1	0	20.06	20.15	20.02
20	QPSK	1	99	20.08	20.03	19.99
20	QPSK	18	0	19.98	19.88	19.76
20	QPSK	18	82	19.86	19.87	19.86
20	16QAM	1	0	19.86	19.77	19.73
20	16QAM	1	99	19.81	19.87	19.87
20	16QAM	18	0	20.01	19.87	19.68
20	16QAM	18	82	19.85	19.95	19.94
20	64QAM	1	0	20.09	19.92	19.99
20	64QAM	1	99	20.11	19.99	20.07
20	64QAM	18	0	20.00	19.79	19.78
20	64QAM	18	82	19.91	19.96	19.99
20	256QAM	1	0	18.68	18.63	18.59
20	256QAM	1	99	18.52	18.52	18.54
20	256QAM	18	0	18.50	18.52	18.43
20	256QAM	18	82	18.50	18.46	18.52
Channel				18050	18300	18550
Frequency (MHz)				1925	1950	1975
10	QPSK	1	0	19.96	20.04	19.90
10	QPSK	1	49	19.99	19.83	19.85
10	QPSK	12	0	19.83	19.70	19.69
10	QPSK	12	38	19.82	19.78	19.80
10	16QAM	1	0	19.81	19.71	19.68
10	16QAM	1	49	19.76	19.75	19.86
10	16QAM	12	0	19.92	19.75	19.61
10	16QAM	12	38	19.78	19.75	19.81
10	64QAM	1	0	19.86	19.82	19.78
10	64QAM	1	49	19.99	19.83	19.98
10	64QAM	12	0	19.89	19.79	19.71
10	64QAM	12	38	19.74	19.87	19.91
10	256QAM	1	0	18.48	18.52	18.53
10	256QAM	1	49	18.43	18.41	18.31
10	256QAM	12	0	18.45	18.43	18.30
10	256QAM	12	38	18.42	18.40	18.41
Channel				18025	18300	18575
Frequency (MHz)				1922.5	1950	1977.5
5	QPSK	1	0	20.00	19.99	19.99
5	QPSK	1	24	19.98	19.92	19.86
5	QPSK	8	0	19.87	19.72	19.69
5	QPSK	8	17	19.78	19.75	19.73
5	16QAM	1	0	19.81	19.66	19.66
5	16QAM	1	24	19.68	19.68	19.77
5	16QAM	8	0	19.90	19.74	19.61
5	16QAM	8	17	19.69	19.86	19.78
5	64QAM	1	0	19.96	19.84	19.81
5	64QAM	1	24	20.04	19.86	19.94
5	64QAM	8	0	19.85	19.75	19.63
5	64QAM	8	17	19.76	19.83	19.84
5	256QAM	1	0	18.51	18.51	18.59
5	256QAM	1	24	18.43	18.38	18.39
5	256QAM	8	0	18.44	18.47	18.35
5	256QAM	8	17	18.41	18.41	18.39



<LTE Band 3_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				19300	19575	19850
Frequency (MHz)				1720	1747.5	1775
20	QPSK	1	0	23.13	22.59	22.73
20	QPSK	1	99	22.71	22.80	22.66
20	QPSK	18	0	22.98	22.66	22.93
20	QPSK	18	82	22.98	22.97	22.91
20	16QAM	1	0	22.58	22.73	22.58
20	16QAM	1	99	22.91	22.96	22.98
20	16QAM	18	0	22.87	22.95	22.65
20	16QAM	18	82	22.93	22.90	22.49
20	64QAM	1	0	22.52	23.00	22.57
20	64QAM	1	99	22.68	22.87	22.85
20	64QAM	18	0	22.99	22.93	22.71
20	64QAM	18	82	22.81	22.85	22.71
20	256QAM	1	0	19.59	19.59	19.42
20	256QAM	1	99	19.29	19.50	19.41
20	256QAM	18	0	18.98	19.17	19.18
20	256QAM	18	82	19.46	19.44	19.26
Channel				19250	19575	19900
Frequency (MHz)				1715	1747.5	1780
10	QPSK	1	0	23.03	22.85	22.87
10	QPSK	1	49	22.93	22.83	22.75
10	QPSK	12	0	23.04	22.97	22.81
10	QPSK	12	38	22.95	22.90	22.74
10	16QAM	1	0	22.55	22.91	22.60
10	16QAM	1	49	22.69	22.73	23.03
10	16QAM	12	0	22.48	22.49	22.94
10	16QAM	12	38	22.63	22.50	23.00
10	64QAM	1	0	22.52	22.56	22.98
10	64QAM	1	49	22.58	22.95	22.48
10	64QAM	12	0	22.55	22.93	22.93
10	64QAM	12	38	23.07	22.87	22.75
10	256QAM	1	0	19.62	19.43	19.25
10	256QAM	1	49	19.48	19.34	19.17
10	256QAM	12	0	19.13	19.22	19.14
10	256QAM	12	38	19.33	19.27	19.17
Channel				19225	19575	19925
Frequency (MHz)				1712.5	1747.5	1782.5
5	QPSK	1	0	22.96	22.90	22.84
5	QPSK	1	24	23.03	22.96	22.72
5	QPSK	8	0	22.88	22.96	22.86
5	QPSK	8	17	22.52	22.93	22.76
5	16QAM	1	0	22.59	22.71	22.47
5	16QAM	1	24	22.61	22.64	22.52
5	16QAM	8	0	22.56	22.92	22.83
5	16QAM	8	17	22.56	22.63	22.84
5	64QAM	1	0	22.64	22.64	22.54
5	64QAM	1	24	22.65	22.66	22.57
5	64QAM	8	0	22.67	22.89	22.88
5	64QAM	8	17	22.52	22.57	23.02
5	256QAM	1	0	19.74	19.42	19.48
5	256QAM	1	24	19.46	19.23	19.39
5	256QAM	8	0	19.03	18.98	19.23
5	256QAM	8	17	19.39	19.27	19.16
Channel				19207	19575	19943
Frequency (MHz)				1710.7	1747.5	1784.3
1.4	QPSK	1	0	23.02	22.78	22.72
1.4	QPSK	1	5	23.10	22.77	22.69
1.4	QPSK	5	0	22.96	22.94	22.75
1.4	QPSK	5	1	23.03	23.03	22.80

1.4	16QAM	1	0	23.06	22.99	22.97
1.4	16QAM	1	5	22.77	23.11	22.64
1.4	16QAM	5	0	22.54	22.57	22.95
1.4	16QAM	5	1	22.90	22.99	22.89
1.4	64QAM	1	0	22.52	22.97	22.81
1.4	64QAM	1	5	22.59	22.95	22.93
1.4	64QAM	5	0	23.01	22.96	22.87
1.4	64QAM	5	1	22.95	23.12	23.10
1.4	256QAM	1	0	19.57	19.51	19.33
1.4	256QAM	1	5	19.15	19.47	19.44
1.4	256QAM	5	0	19.07	19.24	19.22
1.4	256QAM	5	1	19.32	19.24	19.41

<LTE Band 3_ Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				19300	19575	19850
Frequency (MHz)				1720	1747.5	1775
20	QPSK	1	0	17.51	17.69	17.56
20	QPSK	1	99	17.58	17.56	17.63
20	QPSK	18	0	17.33	17.57	17.51
20	QPSK	18	82	17.30	17.56	17.56
20	16QAM	1	0	17.32	17.56	17.54
20	16QAM	1	99	17.41	17.58	17.52
20	16QAM	18	0	17.32	17.54	17.54
20	16QAM	18	82	17.36	17.54	17.55
20	64QAM	1	0	17.47	17.55	17.51
20	64QAM	1	99	17.27	17.60	17.46
20	64QAM	18	0	17.43	17.61	17.52
20	64QAM	18	82	17.43	17.46	17.43
20	256QAM	1	0	17.36	17.62	17.56
20	256QAM	1	99	17.39	17.54	17.59
20	256QAM	18	0	17.37	17.59	17.52
20	256QAM	18	82	17.24	17.53	17.33
Channel				19250	19575	19900
Frequency (MHz)				1715	1747.5	1780
10	QPSK	1	0	17.49	17.63	17.41
10	QPSK	1	49	17.50	17.38	17.54
10	QPSK	12	0	17.25	17.41	17.38
10	QPSK	12	38	17.25	17.49	17.54
10	16QAM	1	0	17.31	17.40	17.52
10	16QAM	1	49	17.34	17.50	17.37
10	16QAM	12	0	17.21	17.49	17.42
10	16QAM	12	38	17.24	17.44	17.47
10	64QAM	1	0	17.30	17.40	17.40
10	64QAM	1	49	17.19	17.53	17.36
10	64QAM	12	0	17.31	17.52	17.49
10	64QAM	12	38	17.29	17.46	17.24
10	256QAM	1	0	17.29	17.49	17.41
10	256QAM	1	49	17.32	17.38	17.46
10	256QAM	12	0	17.24	17.47	17.38
10	256QAM	12	38	17.21	17.40	17.15
Channel				19225	19575	19925
Frequency (MHz)				1712.5	1747.5	1782.5
5	QPSK	1	0	17.42	17.58	17.44
5	QPSK	1	24	17.48	17.45	17.54
5	QPSK	8	0	17.24	17.49	17.47
5	QPSK	8	17	17.26	17.43	17.50
5	16QAM	1	0	17.24	17.46	17.43
5	16QAM	1	24	17.30	17.49	17.36
5	16QAM	8	0	17.27	17.38	17.43
5	16QAM	8	17	17.21	17.52	17.47
5	64QAM	1	0	17.32	17.34	17.45

5	64QAM	1	24	17.25	17.43	17.38
5	64QAM	8	0	17.27	17.43	17.43
5	64QAM	8	17	17.27	17.50	17.36
5	256QAM	1	0	17.29	17.46	17.43
5	256QAM	1	24	17.28	17.47	17.38
5	256QAM	8	0	17.16	17.38	17.35
5	256QAM	8	17	17.16	17.45	17.19
Channel				19207	19575	19943
Frequency (MHz)				1710.7	1747.5	1784.3
1.4	QPSK	1	0	17.33	17.63	17.42
1.4	QPSK	1	5	17.54	17.48	17.60
1.4	QPSK	5	0	17.23	17.45	17.46
1.4	QPSK	5	1	17.22	17.45	17.48
1.4	16QAM	1	0	17.21	17.44	17.48
1.4	16QAM	1	5	17.27	17.48	17.34
1.4	16QAM	5	0	17.19	17.43	17.36
1.4	16QAM	5	1	17.27	17.52	17.50
1.4	64QAM	1	0	17.37	17.35	17.38
1.4	64QAM	1	5	17.15	17.56	17.43
1.4	64QAM	5	0	17.29	17.45	17.46
1.4	64QAM	5	1	17.28	17.37	17.33
1.4	256QAM	1	0	17.34	17.52	17.34
1.4	256QAM	1	5	17.26	17.46	17.48
1.4	256QAM	5	0	17.18	17.41	17.52
1.4	256QAM	5	1	17.16	17.48	17.25

<LTE Band 7_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				20850	21100	21350
Frequency (MHz)				2510	2535	2560
20	QPSK	1	0	23.29	23.52	23.48
20	QPSK	1	99	23.32	23.37	23.44
20	QPSK	18	0	23.24	23.34	23.06
20	QPSK	18	82	23.22	23.26	23.10
20	16QAM	1	0	23.12	23.25	23.11
20	16QAM	1	99	23.31	23.31	23.11
20	16QAM	18	0	22.88	23.17	23.08
20	16QAM	18	82	23.12	23.33	23.30
20	64QAM	1	0	23.28	23.09	23.33
20	64QAM	1	99	23.46	23.40	23.03
20	64QAM	18	0	22.91	23.05	23.00
20	64QAM	18	82	23.11	23.23	23.03
20	256QAM	1	0	19.29	19.37	19.45
20	256QAM	1	99	19.48	19.48	19.42
20	256QAM	18	0	19.46	19.61	19.15
20	256QAM	18	82	19.56	19.56	19.33
Channel				20800	21100	21400
Frequency (MHz)				2505	2535	2565
10	QPSK	1	0	23.11	23.15	23.35
10	QPSK	1	49	23.27	23.29	23.22
10	QPSK	12	0	23.13	23.29	23.27
10	QPSK	12	38	23.16	23.39	23.28
10	16QAM	1	0	23.35	23.39	23.48
10	16QAM	1	49	23.42	23.50	23.38
10	16QAM	12	0	23.17	23.36	23.34
10	16QAM	12	38	23.30	23.51	23.31
10	64QAM	1	0	23.34	23.33	23.10
10	64QAM	1	49	23.33	23.38	23.33
10	64QAM	12	0	23.00	23.28	23.21
10	64QAM	12	38	23.30	23.46	23.34
10	256QAM	1	0	19.37	19.21	19.42
10	256QAM	1	49	19.44	19.41	19.37



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10	256QAM	12	0	19.38	19.29	19.15
10	256QAM	12	38	19.56	19.36	19.19
Channel				20775	21100	21425
Frequency (MHz)				2502.5	2535	2567.5
5	QPSK	1	0	22.99	23.26	23.22
5	QPSK	1	24	23.39	23.35	23.23
5	QPSK	8	0	23.04	23.24	23.21
5	QPSK	8	17	23.29	23.34	23.37
5	16QAM	1	0	23.20	23.29	23.18
5	16QAM	1	24	23.47	23.22	23.29
5	16QAM	8	0	23.19	23.34	23.22
5	16QAM	8	17	23.16	23.50	23.44
5	64QAM	1	0	23.18	23.13	23.26
5	64QAM	1	24	23.44	23.45	23.38
5	64QAM	8	0	23.19	23.35	23.39
5	64QAM	8	17	23.21	23.44	23.35
5	256QAM	1	0	19.24	19.40	19.33
5	256QAM	1	24	19.26	19.63	19.26
5	256QAM	8	0	19.31	19.60	19.16
5	256QAM	8	17	19.26	19.51	19.35

<LTE Band 7_ Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				20850	21100	21350
Frequency (MHz)				2510	2535	2560
20	QPSK	1	0	18.85	19.12	19.04
20	QPSK	1	99	18.89	19.00	19.00
20	QPSK	18	0	18.57	18.56	18.66
20	QPSK	18	82	18.64	18.86	18.66
20	16QAM	1	0	18.63	18.68	18.68
20	16QAM	1	99	18.65	18.74	18.66
20	16QAM	18	0	18.50	18.70	18.71
20	16QAM	18	82	18.73	18.92	18.72
20	64QAM	1	0	18.56	18.68	18.57
20	64QAM	1	99	18.77	18.96	18.86
20	64QAM	18	0	18.69	18.80	18.55
20	64QAM	18	82	18.68	18.89	18.84
20	256QAM	1	0	18.34	18.65	18.35
20	256QAM	1	99	18.45	18.59	18.29
20	256QAM	18	0	18.37	18.40	18.34
20	256QAM	18	82	18.54	18.41	18.43
Channel				20800	21100	21400
Frequency (MHz)				2505	2535	2565
10	QPSK	1	0	18.66	18.97	18.90
10	QPSK	1	49	18.89	18.99	18.73
10	QPSK	12	0	18.50	18.52	18.57
10	QPSK	12	38	18.79	18.81	18.73
10	16QAM	1	0	18.55	18.64	18.50
10	16QAM	1	49	18.47	18.67	18.55
10	16QAM	12	0	18.66	18.55	18.47
10	16QAM	12	38	18.61	18.71	18.63
10	64QAM	1	0	18.45	18.51	18.46
10	64QAM	1	49	18.74	18.93	18.86
10	64QAM	12	0	18.46	18.60	18.49
10	64QAM	12	38	18.62	18.78	18.64
10	256QAM	1	0	18.18	18.54	18.18
10	256QAM	1	49	18.36	18.51	18.12
10	256QAM	12	0	18.35	18.29	18.20
10	256QAM	12	38	18.28	18.42	18.31
Channel				20775	21100	21425
Frequency (MHz)				2502.5	2535	2567.5
5	QPSK	1	0	18.80	18.92	18.92

5	QPSK	1	24	18.95	18.85	18.69
5	QPSK	8	0	18.46	18.69	18.55
5	QPSK	8	17	18.63	18.54	18.54
5	16QAM	1	0	18.53	18.43	18.49
5	16QAM	1	24	18.41	18.61	18.55
5	16QAM	8	0	18.44	18.78	18.48
5	16QAM	8	17	18.71	18.82	18.56
5	64QAM	1	0	18.44	18.72	18.53
5	64QAM	1	24	18.67	18.75	18.85
5	64QAM	8	0	18.53	18.60	18.57
5	64QAM	8	17	18.58	18.81	18.60
5	256QAM	1	0	18.33	18.30	18.20
5	256QAM	1	24	18.21	18.24	18.16
5	256QAM	8	0	18.20	18.42	18.25
5	256QAM	8	17	18.32	18.21	18.36

<LTE Band 8_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				21550	21650	21750
Frequency (MHz)				890	900	910
10	QPSK	1	0	22.43	22.89	22.36
10	QPSK	1	49	22.43	22.43	22.40
10	QPSK	12	0	22.43	22.68	22.34
10	QPSK	12	38	22.29	22.48	22.22
10	16QAM	1	0	22.76	22.67	22.52
10	16QAM	1	49	22.72	22.79	22.86
10	16QAM	12	0	22.51	22.81	22.40
10	16QAM	12	38	22.74	22.50	22.81
10	64QAM	1	0	22.43	22.41	22.66
10	64QAM	1	49	22.49	22.54	22.76
10	64QAM	12	0	22.57	22.73	22.36
10	64QAM	12	38	22.39	22.45	22.44
10	256QAM	1	0	19.15	18.88	18.97
10	256QAM	1	49	19.15	19.00	19.29
10	256QAM	12	0	18.98	19.00	18.95
10	256QAM	12	38	18.81	18.92	19.01
Channel				21525	21650	21775
Frequency (MHz)				887.5	900	912.5
5	QPSK	1	0	22.69	22.71	22.63
5	QPSK	1	24	22.39	22.73	22.83
5	QPSK	8	0	22.53	22.41	22.80
5	QPSK	8	17	22.43	22.43	22.78
5	16QAM	1	0	22.51	22.45	22.62
5	16QAM	1	24	22.59	22.66	22.60
5	16QAM	8	0	22.59	22.44	22.88
5	16QAM	8	17	22.51	22.84	22.44
5	64QAM	1	0	22.34	22.57	22.50
5	64QAM	1	24	22.61	22.63	22.71
5	64QAM	8	0	22.38	22.50	22.88
5	64QAM	8	17	22.35	22.45	22.35
5	256QAM	1	0	19.15	18.83	18.99
5	256QAM	1	24	19.17	18.99	19.14
5	256QAM	8	0	19.01	19.08	19.01
5	256QAM	8	17	18.89	18.74	18.87
Channel				21507	21650	21793
Frequency (MHz)				885.7	900	914.3
1.4	QPSK	1	0	22.39	22.35	22.67
1.4	QPSK	1	5	22.41	22.66	22.88
1.4	QPSK	5	0	22.53	22.69	22.87
1.4	QPSK	5	1	22.37	22.82	22.83
1.4	16QAM	1	0	22.76	22.64	22.50
1.4	16QAM	1	5	22.29	22.80	22.72

1.4	16QAM	5	0	22.35	22.50	22.82
1.4	16QAM	5	1	22.48	22.38	22.53
1.4	64QAM	1	0	22.43	22.48	22.47
1.4	64QAM	1	5	22.73	22.77	22.62
1.4	64QAM	5	0	22.44	22.76	22.39
1.4	64QAM	5	1	22.41	22.51	22.69
1.4	256QAM	1	0	19.12	18.98	19.04
1.4	256QAM	1	5	19.21	18.96	19.17
1.4	256QAM	5	0	18.87	18.94	18.85
1.4	256QAM	5	1	18.58	18.89	18.80

<LTE Band 8_ Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				21550	21650	21750
Frequency (MHz)				890	900	910
10	QPSK	1	0	22.47	22.56	22.27
10	QPSK	1	49	22.25	22.30	22.22
10	QPSK	12	0	22.47	22.36	22.30
10	QPSK	12	38	22.32	22.46	22.31
10	16QAM	1	0	22.38	22.49	22.32
10	16QAM	1	49	22.17	22.31	22.14
10	16QAM	12	0	22.44	22.22	22.26
10	16QAM	12	38	22.32	22.47	22.28
10	64QAM	1	0	22.42	22.55	22.24
10	64QAM	1	49	22.20	22.28	22.18
10	64QAM	12	0	22.46	22.31	22.22
10	64QAM	12	38	22.27	22.43	22.29
10	256QAM	1	0	20.00	20.01	19.80
10	256QAM	1	49	19.64	19.82	19.54
10	256QAM	12	0	19.91	19.64	19.74
10	256QAM	12	38	19.93	19.88	19.80
Channel				21525	21650	21775
Frequency (MHz)				887.5	900	912.5
5	QPSK	1	0	22.41	22.49	22.21
5	QPSK	1	24	22.12	22.23	22.16
5	QPSK	8	0	22.42	22.30	22.28
5	QPSK	8	17	22.29	22.42	22.30
5	16QAM	1	0	22.35	22.41	22.17
5	16QAM	1	24	22.14	22.27	22.10
5	16QAM	8	0	22.36	22.23	22.17
5	16QAM	8	17	22.26	22.41	22.27
5	64QAM	1	0	22.37	22.45	22.18
5	64QAM	1	24	22.13	22.27	22.08
5	64QAM	8	0	22.41	22.19	22.18
5	64QAM	8	17	22.25	22.41	22.29
5	256QAM	1	0	19.89	20.03	19.65
5	256QAM	1	24	19.65	19.73	19.57
5	256QAM	8	0	19.82	19.73	19.82
5	256QAM	8	17	19.66	19.94	19.69
Channel				21507	21650	21793
Frequency (MHz)				885.7	900	914.3
1.4	QPSK	1	0	22.30	22.40	22.21
1.4	QPSK	1	5	22.07	22.15	22.08
1.4	QPSK	5	0	22.35	22.22	22.17
1.4	QPSK	5	1	22.18	22.29	22.18
1.4	16QAM	1	0	22.29	22.43	22.18
1.4	16QAM	1	5	22.06	22.16	22.03
1.4	16QAM	5	0	22.26	22.17	22.17
1.4	16QAM	5	1	22.19	22.32	22.18
1.4	64QAM	1	0	22.23	22.46	22.17
1.4	64QAM	1	5	22.04	22.08	22.06
1.4	64QAM	5	0	22.29	22.19	22.12

1.4	64QAM	5	1	22.15	22.29	22.15
1.4	256QAM	1	0	19.76	19.96	19.70
1.4	256QAM	1	5	19.63	19.53	19.62
1.4	256QAM	5	0	19.92	19.63	19.71
1.4	256QAM	5	1	19.58	19.85	19.62

<LTE Band 28_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				27310	27435	27560
Frequency (MHz)				713	725.5	738
20	QPSK	1	0	22.37	22.77	22.71
20	QPSK	1	99	22.37	22.50	22.40
20	QPSK	18	0	22.64	22.74	22.25
20	QPSK	18	82	22.40	22.40	22.28
20	16QAM	1	0	22.36	22.35	22.73
20	16QAM	1	99	22.66	22.50	22.37
20	16QAM	18	0	22.07	22.20	22.30
20	16QAM	18	82	22.29	22.51	22.43
20	64QAM	1	0	22.18	22.55	22.25
20	64QAM	1	99	22.67	22.27	22.39
20	64QAM	18	0	21.98	22.36	22.20
20	64QAM	18	82	22.31	22.45	22.24
20	256QAM	1	0	18.14	18.46	18.13
20	256QAM	1	99	18.55	18.43	18.45
20	256QAM	18	0	18.14	18.21	18.12
20	256QAM	18	82	18.26	18.46	18.40
Channel				27260	27435	27610
Frequency (MHz)				708	725.5	743
10	QPSK	1	0	22.27	22.29	22.22
10	QPSK	1	49	22.14	22.33	22.25
10	QPSK	12	0	22.16	22.31	22.18
10	QPSK	12	38	22.16	22.33	22.34
10	16QAM	1	0	22.69	22.70	22.50
10	16QAM	1	49	22.32	22.63	22.68
10	16QAM	12	0	22.20	22.33	22.30
10	16QAM	12	38	22.42	22.25	22.34
10	64QAM	1	0	22.08	22.01	22.03
10	64QAM	1	49	22.54	22.46	22.41
10	64QAM	12	0	22.32	22.33	22.30
10	64QAM	12	38	22.25	22.26	22.24
10	256QAM	1	0	18.18	18.00	18.08
10	256QAM	1	49	18.49	18.42	18.38
10	256QAM	12	0	18.27	18.18	18.43
10	256QAM	12	38	18.45	18.12	18.28
Channel				27235	27435	27635
Frequency (MHz)				705.5	725.5	745.5
5	QPSK	1	0	22.44	22.44	22.25
5	QPSK	1	24	22.22	22.50	22.35
5	QPSK	8	0	22.59	22.61	22.50
5	QPSK	8	17	22.38	22.46	22.52
5	16QAM	1	0	22.53	22.50	22.40
5	16QAM	1	24	22.27	22.38	22.47
5	16QAM	8	0	22.41	22.35	22.49
5	16QAM	8	17	22.49	22.60	22.42
5	64QAM	1	0	22.45	22.69	22.63
5	64QAM	1	24	22.33	22.54	22.38
5	64QAM	8	0	22.38	22.24	22.58
5	64QAM	8	17	22.36	22.55	22.60
5	256QAM	1	0	18.52	18.56	18.59
5	256QAM	1	24	18.45	18.62	18.22
5	256QAM	8	0	18.49	18.14	18.66
5	256QAM	8	17	18.46	18.58	18.49

Channel				27225	27435	27645
Frequency (MHz)				704.5	725.5	746.5
3	QPSK	1	0	22.35	22.39	22.44
3	QPSK	1	14	22.34	22.45	22.36
3	QPSK	4	0	22.31	22.66	22.46
3	QPSK	4	11	22.33	22.48	22.35
3	16QAM	1	0	22.70	22.65	22.43
3	16QAM	1	14	22.27	22.69	22.43
3	16QAM	4	0	22.56	22.61	22.63
3	16QAM	4	11	22.30	22.59	22.55
3	64QAM	1	0	22.36	22.33	22.54
3	64QAM	1	14	22.47	22.65	22.54
3	64QAM	4	0	22.44	22.26	22.56
3	64QAM	4	11	22.48	22.60	22.50
3	256QAM	1	0	18.29	18.49	18.52
3	256QAM	1	14	18.54	18.59	18.67
3	256QAM	4	0	18.43	18.35	18.37
3	256QAM	4	11	18.47	18.62	18.54

<LTE Band 28_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				27310	27435	27560
Frequency (MHz)				713	725.5	738
20	QPSK	1	0	22.10	22.35	22.01
20	QPSK	1	99	22.33	22.25	22.23
20	QPSK	18	0	22.12	22.34	22.12
20	QPSK	18	82	22.33	22.34	22.20
20	16QAM	1	0	21.95	22.32	21.92
20	16QAM	1	99	22.30	22.27	22.16
20	16QAM	18	0	22.07	22.26	22.14
20	16QAM	18	82	22.32	22.33	22.18
20	64QAM	1	0	22.04	22.31	21.90
20	64QAM	1	99	22.30	22.29	22.23
20	64QAM	18	0	22.06	22.30	22.16
20	64QAM	18	82	22.26	22.29	22.16
20	256QAM	1	0	18.83	18.63	18.72
20	256QAM	1	99	18.93	18.81	18.75
20	256QAM	18	0	18.42	18.32	18.49
20	256QAM	18	82	18.14	18.11	18.07
Channel				27260	27435	27610
Frequency (MHz)				708	725.5	743
10	QPSK	1	0	21.98	22.32	21.93
10	QPSK	1	49	22.24	22.24	22.11
10	QPSK	12	0	22.08	22.31	22.11
10	QPSK	12	38	22.26	22.28	22.13
10	16QAM	1	0	21.94	22.27	21.90
10	16QAM	1	49	22.24	22.14	22.08
10	16QAM	12	0	22.02	22.24	22.01
10	16QAM	12	38	22.26	22.23	22.16
10	64QAM	1	0	21.97	22.28	21.87
10	64QAM	1	49	22.28	22.15	22.07
10	64QAM	12	0	22.00	22.28	22.08
10	64QAM	12	38	22.27	22.24	22.15
10	256QAM	1	0	18.72	18.51	18.68
10	256QAM	1	49	18.91	18.79	18.75
10	256QAM	12	0	18.52	18.33	18.50
10	256QAM	12	38	18.06	18.03	18.10
Channel				27235	27435	27635
Frequency (MHz)				705.5	725.5	745.5
5	QPSK	1	0	21.98	22.32	21.93
5	QPSK	1	24	22.24	22.24	22.11
5	QPSK	8	0	22.08	22.31	22.11

5	QPSK	8	17	22.26	22.28	22.13
5	16QAM	1	0	21.94	22.27	21.90
5	16QAM	1	24	22.24	22.14	22.08
5	16QAM	8	0	22.02	22.24	22.01
5	16QAM	8	17	22.26	22.23	22.16
5	64QAM	1	0	21.97	22.28	21.87
5	64QAM	1	24	22.28	22.15	22.07
5	64QAM	8	0	22.00	22.28	22.08
5	64QAM	8	17	22.27	22.24	22.15
5	256QAM	1	0	18.72	18.51	18.68
5	256QAM	1	24	18.91	18.79	18.75
5	256QAM	8	0	18.52	18.33	18.50
5	256QAM	8	17	18.06	18.03	18.10
Channel				27225	27435	27645
Frequency (MHz)				704.5	725.5	746.5
3	QPSK	1	0	21.82	22.29	21.74
3	QPSK	1	14	22.20	22.15	22.02
3	QPSK	4	0	21.96	22.18	21.96
3	QPSK	4	11	22.16	22.22	22.08
3	16QAM	1	0	21.83	22.23	21.83
3	16QAM	1	14	22.21	22.15	22.01
3	16QAM	4	0	21.89	22.19	21.99
3	16QAM	4	11	22.09	22.22	22.06
3	64QAM	1	0	21.88	22.25	21.75
3	64QAM	1	14	22.16	22.05	21.98
3	64QAM	4	0	21.93	22.14	22.00
3	64QAM	4	11	22.15	22.24	22.00
3	256QAM	1	0	18.76	18.60	18.80
3	256QAM	1	14	18.87	18.79	18.81
3	256QAM	4	0	18.47	18.24	18.61
3	256QAM	4	11	18.18	18.29	18.28

<TDD LTE SAR Measurement>

TDD LTE configuration setup for SAR measurement

SAR was tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

- 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
- “special subframe S” contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS

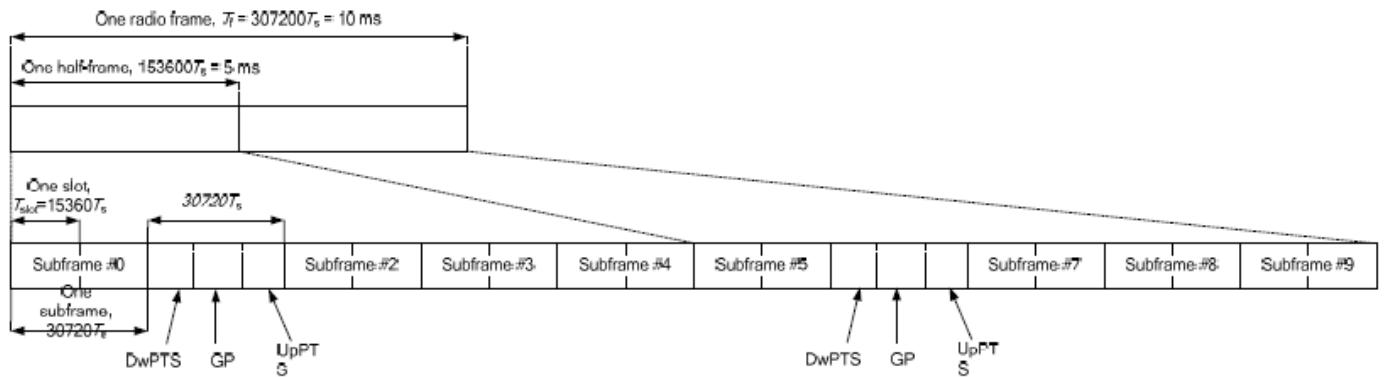


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

Table 4.2-2: 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

Table 4.2-1: 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	$26336 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$			$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	
9	$13168 \cdot T_s$			-	-	

Special subframe (30720·T _s): Normal cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
Uplink duty factor in one special subframe	0~4	7.13%	8.33%
	5~9	14.3%	16.7%

Special subframe(30720·T _s): Extended cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
Uplink duty factor in one special subframe	0~3	7.13%	8.33%
	4~7	14.3%	16.7%

The highest duty factor is resulted from:

- i. uplink-downlink configuration: 0. In a half-frame consisted of 5 subframes, uplink operation is in 3 uplink subframes and 1 special subframe.
- ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
- iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is:
 $(3+0.167)/5 = 63.3\%$
- iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is:
 $(3+0.143)/5 = 62.9\%$
- v. For SAR measurement the duty cycle 1:1.59 (62.9 %) was used perform testing.
- vi. Considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix $63.3\%/62.9\% = 1.006$ is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = (measured SAR) * (scaling factor for extended cyclic prefix).

<LTE Band 38_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				37850	38000	38150
Frequency (MHz)				2580	2595	2610
20	QPSK	1	0	23.41	23.53	23.22
20	QPSK	1	99	23.41	23.28	23.24
20	QPSK	18	0	23.23	23.27	23.29
20	QPSK	18	82	23.36	23.29	23.29
20	16QAM	1	0	23.33	23.31	23.27
20	16QAM	1	99	23.26	23.47	23.37
20	16QAM	18	0	23.37	23.25	23.28
20	16QAM	18	82	23.40	23.36	23.30
20	64QAM	1	0	23.28	23.18	23.17
20	64QAM	1	99	23.29	23.26	23.26
20	64QAM	18	0	23.32	23.28	23.21
20	64QAM	18	82	23.35	23.34	23.33
20	256QAM	1	0	21.58	21.35	21.41
20	256QAM	1	99	21.37	21.23	21.17
20	256QAM	18	0	21.01	21.21	20.96
20	256QAM	18	82	21.42	21.36	21.27
Channel				37800	38000	38200
Frequency (MHz)				2575	2595	2615
10	QPSK	1	0	23.44	23.40	23.32
10	QPSK	1	49	23.43	23.43	23.40
10	QPSK	12	0	23.42	23.37	23.37
10	QPSK	12	38	23.43	23.39	23.37
10	16QAM	1	0	23.31	23.39	23.39
10	16QAM	1	49	23.47	23.32	23.28
10	16QAM	12	0	23.41	23.44	23.45
10	16QAM	12	38	23.35	23.45	23.38
10	64QAM	1	0	23.33	23.36	23.29
10	64QAM	1	49	23.29	23.29	23.24
10	64QAM	12	0	23.40	23.37	23.39
10	64QAM	12	38	23.48	23.39	23.38
10	256QAM	1	0	21.58	21.62	21.42
10	256QAM	1	49	21.29	21.44	21.21
10	256QAM	12	0	21.19	21.30	21.21
10	256QAM	12	38	21.66	21.20	21.16
Channel				37775	38000	38225
Frequency (MHz)				2572.5	2595	2617.5
5	QPSK	1	0	23.43	23.41	23.33
5	QPSK	1	24	23.37	23.44	23.38
5	QPSK	8	0	23.52	23.39	23.37
5	QPSK	8	17	23.38	23.41	23.37
5	16QAM	1	0	23.45	23.39	23.33
5	16QAM	1	24	23.39	23.45	23.39
5	16QAM	8	0	23.42	23.44	23.43
5	16QAM	8	17	23.36	23.34	23.38
5	64QAM	1	0	23.44	23.31	23.39
5	64QAM	1	24	23.28	23.43	23.26
5	64QAM	8	0	23.44	23.40	23.41
5	64QAM	8	17	23.47	23.37	23.36
5	256QAM	1	0	21.28	21.36	21.21
5	256QAM	1	24	21.52	21.17	20.99
5	256QAM	8	0	21.17	21.08	21.02
5	256QAM	8	17	21.26	21.21	21.27

<LTE Band 38 (HPUE) _Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				37850	38000	38150
Frequency (MHz)				2580	2595	2610
20	QPSK	1	0	26.72	26.78	26.62
20	QPSK	1	99	26.72	26.65	26.61
20	QPSK	18	0	26.71	26.63	26.60
20	QPSK	18	82	26.71	26.71	26.68
20	16QAM	1	0	26.60	26.72	26.54
20	16QAM	1	99	26.63	26.59	26.67
20	16QAM	18	0	26.56	26.60	26.59
20	16QAM	18	82	26.73	26.65	26.65
20	64QAM	1	0	26.61	26.66	26.57
20	64QAM	1	99	26.66	26.66	26.65
20	64QAM	18	0	26.58	26.63	26.59
20	64QAM	18	82	26.68	26.66	26.59
20	256QAM	1	0	24.56	24.69	24.39
20	256QAM	1	99	24.55	24.41	24.42
20	256QAM	18	0	24.76	24.67	24.34
20	256QAM	18	82	24.64	24.62	24.45
Channel				37800	38000	38200
Frequency (MHz)				2575	2595	2615
10	QPSK	1	0	26.65	26.73	26.62
10	QPSK	1	49	26.63	26.57	26.57
10	QPSK	12	0	26.63	26.61	26.58
10	QPSK	12	38	26.70	26.66	26.65
10	16QAM	1	0	26.60	26.66	26.47
10	16QAM	1	49	26.60	26.51	26.67
10	16QAM	12	0	26.55	26.53	26.56
10	16QAM	12	38	26.69	26.55	26.60
10	64QAM	1	0	26.57	26.57	26.56
10	64QAM	1	49	26.56	26.60	26.64
10	64QAM	12	0	26.54	26.59	26.51
10	64QAM	12	38	26.61	26.58	26.55
10	256QAM	1	0	24.51	24.60	24.32
10	256QAM	1	49	24.53	24.35	24.37
10	256QAM	12	0	24.66	24.58	24.29
10	256QAM	12	38	24.58	24.56	24.42
Channel				37775	38000	38225
Frequency (MHz)				2572.5	2595	2617.5
5	QPSK	1	0	26.69	26.71	26.57
5	QPSK	1	24	26.66	26.61	26.54
5	QPSK	8	0	26.69	26.55	26.57
5	QPSK	8	17	26.61	26.64	26.58
5	16QAM	1	0	26.50	26.69	26.54
5	16QAM	1	24	26.60	26.58	26.60
5	16QAM	8	0	26.46	26.53	26.50
5	16QAM	8	17	26.72	26.63	26.62
5	64QAM	1	0	26.55	26.65	26.57
5	64QAM	1	24	26.56	26.57	26.65
5	64QAM	8	0	26.51	26.61	26.58
5	64QAM	8	17	26.62	26.60	26.55
5	256QAM	1	0	24.52	24.67	24.36
5	256QAM	1	24	24.55	24.37	24.42
5	256QAM	8	0	24.71	24.58	24.29
5	256QAM	8	17	24.54	24.56	24.42

<LTE Band 38_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				37850	38000	38150
Frequency (MHz)				2580	2595	2610
20	QPSK	1	0	21.33	21.52	21.39
20	QPSK	1	99	21.39	21.46	21.32
20	QPSK	18	0	21.36	21.29	21.42
20	QPSK	18	82	21.51	21.47	21.22
20	16QAM	1	0	21.33	21.31	21.29
20	16QAM	1	99	21.24	21.17	21.22
20	16QAM	18	0	21.37	21.33	21.40
20	16QAM	18	82	21.21	21.21	21.26
20	64QAM	1	0	21.10	21.37	21.24
20	64QAM	1	99	21.14	21.19	21.15
20	64QAM	18	0	21.29	21.37	21.35
20	64QAM	18	82	21.45	21.47	21.29
20	256QAM	1	0	18.84	19.01	18.97
20	256QAM	1	99	18.83	18.92	18.80
20	256QAM	18	0	18.73	18.98	18.95
20	256QAM	18	82	18.88	18.85	18.66
Channel				37800	38000	38200
Frequency (MHz)				2575	2595	2615
10	QPSK	1	0	21.22	21.44	21.29
10	QPSK	1	49	21.38	21.29	21.18
10	QPSK	12	0	21.22	21.20	21.29
10	QPSK	12	38	21.37	21.44	21.10
10	16QAM	1	0	21.26	21.18	21.19
10	16QAM	1	49	21.19	21.04	21.15
10	16QAM	12	0	21.30	21.33	21.34
10	16QAM	12	38	21.04	21.17	21.12
10	64QAM	1	0	21.03	21.24	21.21
10	64QAM	1	49	20.98	21.12	21.05
10	64QAM	12	0	21.30	21.24	21.22
10	64QAM	12	38	21.41	21.42	21.22
10	256QAM	1	0	18.75	18.99	18.86
10	256QAM	1	49	18.79	18.84	18.74
10	256QAM	12	0	18.64	18.88	18.85
10	256QAM	12	38	18.78	18.66	18.66
Channel				37775	38000	38225
Frequency (MHz)				2572.5	2595	2617.5
5	QPSK	1	0	21.26	21.41	21.38
5	QPSK	1	24	21.40	21.39	21.23
5	QPSK	8	0	21.25	21.31	21.39
5	QPSK	8	17	21.40	21.41	21.18
5	16QAM	1	0	21.37	21.22	21.29
5	16QAM	1	24	21.16	21.14	21.16
5	16QAM	8	0	21.41	21.31	21.42
5	16QAM	8	17	21.14	21.20	21.18
5	64QAM	1	0	21.04	21.25	21.27
5	64QAM	1	24	21.14	21.16	21.06
5	64QAM	8	0	21.31	21.30	21.30
5	64QAM	8	17	21.43	21.42	21.16
5	256QAM	1	0	18.72	18.93	18.95
5	256QAM	1	24	18.82	18.84	18.76
5	256QAM	8	0	18.73	18.94	18.83
5	256QAM	8	17	18.88	18.75	18.68

<LTE Band 38 (HPUE) _Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				37850	38000	38150
Frequency (MHz)				2580	2595	2610
20	QPSK	1	0	23.37	23.42	23.38
20	QPSK	1	99	23.36	23.25	23.29
20	QPSK	18	0	23.20	23.22	23.24
20	QPSK	18	82	23.33	23.34	23.34
20	16QAM	1	0	23.26	23.36	23.25
20	16QAM	1	99	23.37	23.37	23.23
20	16QAM	18	0	23.27	23.29	23.20
20	16QAM	18	82	23.19	23.33	23.37
20	64QAM	1	0	23.26	23.34	23.21
20	64QAM	1	99	23.34	23.31	23.36
20	64QAM	18	0	23.30	23.25	23.30
20	64QAM	18	82	23.36	23.37	23.28
20	256QAM	1	0	20.73	20.96	20.92
20	256QAM	1	99	20.82	20.79	20.91
20	256QAM	18	0	20.66	20.97	20.80
20	256QAM	18	82	20.87	20.89	21.03
Channel				37800	38000	38200
Frequency (MHz)				2575	2595	2615
10	QPSK	1	0	23.31	23.32	23.28
10	QPSK	1	49	23.28	23.21	23.29
10	QPSK	12	0	23.11	23.15	23.21
10	QPSK	12	38	23.31	23.29	23.32
10	16QAM	1	0	23.21	23.28	23.22
10	16QAM	1	49	23.36	23.37	23.22
10	16QAM	12	0	23.23	23.26	23.13
10	16QAM	12	38	23.16	23.30	23.27
10	64QAM	1	0	23.25	23.34	23.20
10	64QAM	1	49	23.33	23.24	23.29
10	64QAM	12	0	23.29	23.16	23.28
10	64QAM	12	38	23.27	23.28	23.21
10	256QAM	1	0	20.66	20.96	20.87
10	256QAM	1	49	20.76	20.75	20.86
10	256QAM	12	0	20.60	20.96	20.72
10	256QAM	12	38	20.79	20.87	20.93
Channel				37775	38000	38225
Frequency (MHz)				2572.5	2595	2617.5
5	QPSK	1	0	23.27	23.40	23.37
5	QPSK	1	24	23.35	23.22	23.25
5	QPSK	8	0	23.13	23.16	23.20
5	QPSK	8	17	23.30	23.30	23.33
5	16QAM	1	0	23.26	23.32	23.21
5	16QAM	1	24	23.36	23.28	23.23
5	16QAM	8	0	23.24	23.24	23.12
5	16QAM	8	17	23.10	23.26	23.37
5	64QAM	1	0	23.21	23.30	23.20
5	64QAM	1	24	23.25	23.21	23.26
5	64QAM	8	0	23.29	23.21	23.28
5	64QAM	8	17	23.28	23.31	23.18
5	256QAM	1	0	20.72	20.88	20.88
5	256QAM	1	24	20.74	20.77	20.85
5	256QAM	8	0	20.66	20.97	20.70
5	256QAM	8	17	20.81	20.85	21.01

<LTE Band 41_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				39790	40640	41490
Frequency (MHz)				2510	2595	2680
20	QPSK	1	0	23.32	23.46	23.31
20	QPSK	1	99	23.19	23.27	23.27
20	QPSK	18	0	23.39	23.37	23.14
20	QPSK	18	82	23.42	23.26	23.28
20	16QAM	1	0	23.06	23.30	23.33
20	16QAM	1	99	23.34	23.41	23.25
20	16QAM	18	0	23.42	23.12	23.33
20	16QAM	18	82	23.41	23.30	23.17
20	64QAM	1	0	23.39	23.32	23.40
20	64QAM	1	99	23.34	23.26	23.26
20	64QAM	18	0	23.03	23.16	23.09
20	64QAM	18	82	23.18	23.23	23.10
20	256QAM	1	0	20.09	19.78	19.92
20	256QAM	1	99	19.82	19.98	19.66
20	256QAM	18	0	19.65	19.82	19.78
20	256QAM	18	82	19.39	19.36	19.45
Channel				39740	40640	41540
Frequency (MHz)				2505	2595	2685
10	QPSK	1	0	23.35	23.31	23.25
10	QPSK	1	49	23.09	23.19	23.42
10	QPSK	12	0	23.37	23.05	23.28
10	QPSK	12	38	23.08	23.24	23.22
10	16QAM	1	0	23.31	23.18	23.31
10	16QAM	1	49	23.36	23.26	23.34
10	16QAM	12	0	23.02	23.17	23.33
10	16QAM	12	38	23.37	23.11	23.32
10	64QAM	1	0	23.28	23.17	23.30
10	64QAM	1	49	23.27	23.17	23.19
10	64QAM	12	0	23.34	23.15	23.30
10	64QAM	12	38	23.40	23.17	23.22
10	256QAM	1	0	19.80	19.70	19.79
10	256QAM	1	49	19.72	19.99	19.76
10	256QAM	12	0	19.60	19.59	19.91
10	256QAM	12	38	19.50	19.40	19.53
Channel				39715	40640	41565
Frequency (MHz)				2502.5	2595	2687.5
5	QPSK	1	0	23.10	23.12	23.20
5	QPSK	1	24	23.39	23.19	23.15
5	QPSK	8	0	23.42	23.25	23.20
5	QPSK	8	17	23.45	23.26	23.19
5	16QAM	1	0	23.30	23.04	23.28
5	16QAM	1	24	23.28	23.23	23.20
5	16QAM	8	0	23.13	23.22	23.38
5	16QAM	8	17	23.31	23.27	23.12
5	64QAM	1	0	23.10	23.25	23.18
5	64QAM	1	24	23.29	23.21	23.22
5	64QAM	8	0	23.12	23.10	23.36
5	64QAM	8	17	23.11	23.20	23.13
5	256QAM	1	0	20.03	20.00	19.82
5	256QAM	1	24	19.55	20.09	19.65
5	256QAM	8	0	19.69	19.72	19.64
5	256QAM	8	17	19.55	19.63	19.57

<LTE Band 41_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				39790	40640	41490
Frequency (MHz)				2510	2595	2680
20	QPSK	1	0	20.97	21.28	21.06
20	QPSK	1	99	20.96	21.18	21.11
20	QPSK	18	0	20.92	21.12	21.02
20	QPSK	18	82	20.96	21.16	20.98
20	16QAM	1	0	20.94	21.02	20.96
20	16QAM	1	99	20.98	21.21	21.22
20	16QAM	18	0	20.87	21.17	20.83
20	16QAM	18	82	20.85	21.22	21.23
20	64QAM	1	0	20.95	21.07	20.79
20	64QAM	1	99	20.83	21.15	21.14
20	64QAM	18	0	21.16	21.12	21.00
20	64QAM	18	82	21.01	21.23	21.10
20	256QAM	1	0	18.47	18.77	18.53
20	256QAM	1	99	18.46	18.68	18.61
20	256QAM	18	0	18.47	18.73	18.51
20	256QAM	18	82	18.51	18.63	18.44
Channel				39740	40640	41540
Frequency (MHz)				2505	2595	2685
10	QPSK	1	0	20.98	21.17	20.94
10	QPSK	1	49	20.89	20.98	21.03
10	QPSK	12	0	20.83	21.02	20.97
10	QPSK	12	38	20.94	21.09	20.81
10	16QAM	1	0	20.85	20.99	20.84
10	16QAM	1	49	20.94	21.05	21.07
10	16QAM	12	0	20.78	21.06	20.81
10	16QAM	12	38	20.76	21.03	21.19
10	64QAM	1	0	20.87	20.91	20.75
10	64QAM	1	49	20.79	20.95	21.04
10	64QAM	12	0	21.13	21.02	20.85
10	64QAM	12	38	20.86	21.06	21.04
10	256QAM	1	0	18.32	18.78	18.43
10	256QAM	1	49	18.29	18.54	18.53
10	256QAM	12	0	18.35	18.62	18.29
10	256QAM	12	38	18.41	18.52	18.37
Channel				39715	40640	41565
Frequency (MHz)				2502.5	2595	2687.5
5	QPSK	1	0	20.87	21.19	21.02
5	QPSK	1	24	20.87	21.11	20.94
5	QPSK	8	0	20.76	21.06	20.92
5	QPSK	8	17	20.96	21.03	20.95
5	16QAM	1	0	20.84	20.90	20.78
5	16QAM	1	24	20.92	21.18	21.15
5	16QAM	8	0	20.83	21.09	20.82
5	16QAM	8	17	20.75	21.11	21.02
5	64QAM	1	0	20.80	20.94	20.80
5	64QAM	1	24	20.76	21.07	21.01
5	64QAM	8	0	21.10	20.99	20.85
5	64QAM	8	17	20.93	21.08	21.03
5	256QAM	1	0	18.39	18.67	18.39
5	256QAM	1	24	18.40	18.64	18.62
5	256QAM	8	0	18.31	18.68	18.36
5	256QAM	8	17	18.31	18.55	18.41

12 5G NR Output Power (Unit: dBm)

General Note:

1. The 5G FR1 support SCS 15KHz for FCC, SCS 30KHz for TDD and support DFT-s/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM, detail support bandwidth as following power table.
2. Due to test setup limitations, SAR testing for NR was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission.
3. For DFT-OFDM and CP-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class 3, the CP-OFDM mode will not higher than DFT-OFDM mode
4. For DFT-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class 3, full measurement on Pi/2 BPSK/QPSK with largest bandwidth, for 16QAM/64QMA/256QAM output power will spot check inner full configuration at Pi/2 BPSK to ensure output power will not higher than I Pi/2 BPSK, for smaller bandwidth output power will spot check inner full configuration at Pi/2 BPSK to ensure output power will not higher than largest supported bandwidth.
5. Choose the highest output power among all configurations of bandwidths, RBs, modulations to test SAR at middle channel I and determine the worst configuration for further high/low channel test.

<3GPP 38.101 MPR>

Table 6.2.2-1 Maximum power reduction (MPR) for power class 3

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	Pi/2 BPSK	$\leq 3.5^1$	$\leq 1.2^1$	$\leq 0.2^1$
		$\leq 0.5^2$	$\leq 0.5^2$	0 ²
	QPSK	≤ 1		0
	16 QAM	≤ 2		≤ 1
	64 QAM	≤ 2.5		
CP-OFDM	256 QAM	≤ 4.5		
	QPSK	≤ 3		≤ 1.5
	16 QAM	≤ 3		≤ 2
	64 QAM	≤ 3.5		
	256 QAM	≤ 6.5		

NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability *powerBoosting-pi2BPSK* and if the IE *powerBoostPi2BPSK* is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79. The reference power of 0 dB MPR is 26 dBm.

NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 with Pi/2 BPSK modulation and if the IE *powerBoostPi2BPSK* is set to 0 and if more than 40 % of slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79.

Table 6.2.2-2 Maximum power reduction (MPR) for power class 2

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	Pi/2 BPSK	≤ 3.5	≤ 0.5	0
	QPSK	≤ 3.5	≤ 1	0
	16 QAM	≤ 3.5	≤ 2	≤ 1
	64 QAM	≤ 3.5	≤ 2.5	
	256 QAM	≤ 4.5		
CP-OFDM	QPSK	≤ 3.5	≤ 3	≤ 1.5
	16 QAM	≤ 3.5	≤ 3	≤ 2
	64 QAM	≤ 3.5		
	256 QAM	≤ 6.5		

<n1_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				388000	390000	392000
Frequency (MHz)				1940	1950	1960
40	PI/2 BPSK	108	54	22.09	22.19	22.12
40	PI/2 BPSK	216	0	21.99	22.23	22.10
40	PI/2 BPSK	1	0	21.82	21.97	21.69
40	PI/2 BPSK	1	215	22.12	22.17	21.98
40	QPSK	108	54	22.77	22.79	22.73
40	QPSK	216	0	21.94	22.24	22.13
40	QPSK	1	0	22.04	22.24	21.99
40	QPSK	1	215	22.05	22.17	21.82
40	16QAM	108	54	22.15	22.19	21.96
40	64QAM	108	54	21.90	22.16	21.89
40	256QAM	108	54	20.17	20.44	20.36
Channel				387000	390000	393000
Frequency (MHz)				1935	1950	1965
30	PI/2 BPSK	80	40	22.70	22.69	22.64
Channel				386500	390000	393500
Frequency (MHz)				1932.5	1950	1967.5
25	PI/2 BPSK	64	32	22.65	22.73	22.67
Channel				386000	390000	394000
Frequency (MHz)				1930	1950	1970
20	PI/2 BPSK	50	25	22.72	22.74	22.73
Channel				385500	390000	394500
Frequency (MHz)				1927.5	1950	1972.5
15	PI/2 BPSK	36	18	22.69	22.70	22.66
Channel				385000	390000	395000
Frequency (MHz)				1925	1950	1975
10	PI/2 BPSK	25	12	22.73	22.62	22.71
Channel				384500	390000	395500
Frequency (MHz)				1922.5	1950	1977.5
5	PI/2 BPSK	12	6	22.74	22.77	22.60

<n1_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				388000	390000	392000
Frequency (MHz)				1940	1950	1960
40	PI/2 BPSK	108	54	23.30	23.28	23.21
40	PI/2 BPSK	216	0	23.11	23.35	23.21
40	PI/2 BPSK	1	0	22.50	22.72	22.56
40	PI/2 BPSK	1	215	22.91	22.99	22.63
40	QPSK	108	54	23.44	23.46	23.33
40	QPSK	216	0	23.17	23.33	23.31
40	QPSK	1	0	22.62	22.92	22.82
40	QPSK	1	215	22.87	23.04	22.81
40	16QAM	108	54	23.27	23.35	23.21
40	64QAM	108	54	23.12	23.36	23.31
40	256QAM	108	54	21.55	21.70	21.50
Channel				387000	390000	393000
Frequency (MHz)				1935	1950	1965
30	PI/2 BPSK	80	40	23.25	23.30	23.18
Channel				386500	390000	393500
Frequency (MHz)				1932.5	1950	1967.5
25	PI/2 BPSK	64	32	23.21	23.26	23.22
Channel				386000	390000	394000
Frequency (MHz)				1930	1950	1970
20	PI/2 BPSK	50	25	23.29	23.31	23.21
Channel				385500	390000	394500
Frequency (MHz)				1927.5	1950	1972.5
15	PI/2 BPSK	36	18	23.29	23.39	23.26
Channel				385000	390000	395000
Frequency (MHz)				1925	1950	1975
10	PI/2 BPSK	25	12	23.27	23.28	23.09
Channel				384500	390000	395500
Frequency (MHz)				1922.5	1950	1977.5
5	PI/2 BPSK	12	6	23.30	23.35	23.24

<n3_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				345000	349500	354000
Frequency (MHz)				1725	1747.5	1770
30	PI/2 BPSK	80	40	21.94	22.31	22.13
30	PI/2 BPSK	160	0	22.08	22.35	22.06
30	PI/2 BPSK	1	0	22.08	22.17	22.02
30	PI/2 BPSK	1	159	22.16	22.26	22.11
30	QPSK	80	40	22.35	22.44	22.45
30	QPSK	160	0	22.04	22.23	22.12
30	QPSK	1	0	21.96	22.16	22.12
30	QPSK	1	159	22.08	22.21	22.04
30	16QAM	80	40	22.05	22.41	22.28
30	64QAM	80	40	22.00	22.25	21.96
30	256QAM	80	40	20.08	20.45	20.36
Channel				344500	349500	354500
Frequency (MHz)				1722.5	1747.5	1772.5
25	PI/2 BPSK	64	32	22.25	22.28	22.21
Channel				344000	349500	355000
Frequency (MHz)				1720	1747.5	1775
20	PI/2 BPSK	50	25	22.25	22.36	22.28
Channel				343500	349500	355500
Frequency (MHz)				1717.5	1747.5	1777.5
15	PI/2 BPSK	36	18	22.13	22.23	22.33
Channel				343000	349500	356000
Frequency (MHz)				1715	1747.5	1780
10	PI/2 BPSK	25	12	22.16	22.30	22.17
Channel				342500	349500	356500
Frequency (MHz)				1712.5	1747.5	1782.5
5	PI/2 BPSK	12	6	22.29	22.25	22.35

<n3_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				345000	349500	354000
Frequency (MHz)				1725	1747.5	1770
30	PI/2 BPSK	80	40	23.21	23.34	23.31
30	PI/2 BPSK	160	0	23.34	23.25	23.09
30	PI/2 BPSK	1	0	23.06	23.33	23.04
30	PI/2 BPSK	1	159	23.08	23.35	23.19
30	QPSK	80	40	23.18	23.39	23.15
30	QPSK	160	0	23.22	23.19	23.21
30	QPSK	1	0	22.96	23.29	23.10
30	QPSK	1	159	23.17	23.32	23.24
30	16QAM	80	40	23.03	23.14	23.27
30	64QAM	80	40	23.21	23.11	22.98
30	256QAM	80	40	21.23	21.52	21.44
Channel				344500	349500	354500
Frequency (MHz)				1722.5	1747.5	1772.5
25	PI/2 BPSK	64	32	23.18	23.22	23.16
Channel				344000	349500	355000
Frequency (MHz)				1720	1747.5	1775
20	PI/2 BPSK	50	25	23.02	23.19	23.09
Channel				343500	349500	355500
Frequency (MHz)				1717.5	1747.5	1777.5
15	PI/2 BPSK	36	18	23.17	23.24	23.19
Channel				343000	349500	356000
Frequency (MHz)				1715	1747.5	1780
10	PI/2 BPSK	25	12	23.16	23.26	23.23
Channel				342500	349500	356500
Frequency (MHz)				1712.5	1747.5	1782.5
5	PI/2 BPSK	12	6	23.03	23.17	23.21

<n7_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				504000	507000	510000
Frequency (MHz)				2520	2535	2550
40	PI/2 BPSK	108	54	21.38	21.66	21.42
40	PI/2 BPSK	216	0	21.67	21.78	21.63
40	PI/2 BPSK	1	0	21.74	21.94	21.84
40	PI/2 BPSK	1	215	21.72	21.94	21.73
40	QPSK	108	54	22.27	22.38	22.36
40	QPSK	216	0	21.59	21.71	21.68
40	QPSK	1	0	21.72	21.89	21.62
40	QPSK	1	215	21.88	21.94	21.89
40	16QAM	108	54	21.42	21.68	21.58
40	64QAM	108	54	20.91	21.14	20.93
40	256QAM	108	54	18.83	19.19	19.01
Channel				503000	507000	511000
Frequency (MHz)				2515	2535	2555
30	PI/2 BPSK	80	40	22.05	22.30	22.19
Channel				502500	507000	511500
Frequency (MHz)				2512.5	2535	2557.5
25	PI/2 BPSK	64	32	22.05	22.30	22.19
Channel				502000	507000	512000
Frequency (MHz)				2510	2535	2560
20	PI/2 BPSK	50	25	22.16	22.28	22.28
Channel				501500	507000	512500
Frequency (MHz)				2507.5	2535	2562.5
15	PI/2 BPSK	36	18	22.13	22.23	22.24
Channel				501000	507000	513000
Frequency (MHz)				2505	2535	2565
10	PI/2 BPSK	25	12	22.18	22.19	22.25
Channel				500500	507000	513500
Frequency (MHz)				2502.5	2535	2567.5
5	PI/2 BPSK	12	6	22.14	22.21	22.33

<n7_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				504000	507000	510000
Frequency (MHz)				2520	2535	2550
40	PI/2 BPSK	108	54	23.59	23.57	23.50
40	PI/2 BPSK	216	0	23.15	23.50	23.16
40	PI/2 BPSK	1	0	23.45	23.59	23.38
40	PI/2 BPSK	1	215	23.33	23.51	23.41
40	QPSK	108	54	23.25	23.60	23.21
40	QPSK	216	0	23.38	23.51	23.47
40	QPSK	1	0	23.25	23.43	23.23
40	QPSK	1	215	23.44	23.34	23.46
40	16QAM	108	54	23.04	23.46	23.39
40	64QAM	108	54	22.79	22.89	22.66
40	256QAM	108	54	20.65	20.92	20.63
Channel				503000	507000	511000
Frequency (MHz)				2515	2535	2555
30	PI/2 BPSK	80	40	23.33	23.47	23.33
Channel				502500	507000	511500
Frequency (MHz)				2512.5	2535	2557.5
25	PI/2 BPSK	64	32	23.32	23.52	23.27
Channel				502000	507000	512000
Frequency (MHz)				2510	2535	2560
20	PI/2 BPSK	50	25	23.42	23.45	23.38
Channel				501500	507000	512500
Frequency (MHz)				2507.5	2535	2562.5
15	PI/2 BPSK	36	18	23.40	23.40	23.35
Channel				501000	507000	513000
Frequency (MHz)				2505	2535	2565
10	PI/2 BPSK	25	12	23.31	23.42	23.34
Channel				500500	507000	513500
Frequency (MHz)				2502.5	2535	2567.5
5	PI/2 BPSK	12	6	23.43	23.55	23.39

<n8_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				179000	180000	181000
Frequency (MHz)				895	900	905
20	PI/2 BPSK	50	25	23.17	23.27	23.14
20	PI/2 BPSK	100	0	22.91	23.23	23.12
20	PI/2 BPSK	1	0	22.72	23.01	22.75
20	PI/2 BPSK	1	105	22.70	23.03	22.87
20	QPSK	50	25	22.89	23.30	23.23
20	QPSK	100	0	22.87	23.16	22.78
20	QPSK	1	0	22.93	23.02	22.86
20	QPSK	1	105	22.66	22.98	22.72
20	16QAM	50	25	22.89	23.22	23.09
20	64QAM	50	25	23.00	23.29	23.08
20	256QAM	50	25	21.60	21.73	21.51
Channel				178500	180000	181500
Frequency (MHz)				892.5	900	907.5
15	PI/2 BPSK	36	18	23.12	23.18	22.98
Channel				178000	180000	182000
Frequency (MHz)				890	900	910
10	PI/2 BPSK	25	12	23.12	23.07	23.09
Channel				177500	180000	182500
Frequency (MHz)				887.5	900	912.5
5	PI/2 BPSK	12	6	23.04	23.27	23.16

<n28_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				143600	145100	146600
Frequency (MHz)				718	725.5	733
30	PI/2 BPSK	80	40	22.49	22.91	22.79
30	PI/2 BPSK	160	0	22.41	22.74	22.45
30	PI/2 BPSK	1	0	22.66	22.83	22.51
30	PI/2 BPSK	1	159	6.83	6.96	6.68
30	QPSK	80	40	23.11	23.05	23.00
30	QPSK	160	0	22.28	22.52	22.33
30	QPSK	1	0	22.71	22.83	22.68
30	QPSK	1	159	7.44	7.76	7.66
30	16QAM	80	40	22.84	22.97	22.69
30	64QAM	80	40	22.70	22.84	22.72
30	256QAM	80	40	20.50	20.82	20.53
Channel				142600	145100	147600
Frequency (MHz)				713	725.5	738
20	PI/2 BPSK	50	25	22.85	23.02	22.98
Channel				142100	145100	148100
Frequency (MHz)				710.5	725.5	740.5
15	PI/2 BPSK	36	18	23.01	23.02	23.01
Channel				141600	145100	148600
Frequency (MHz)				708	725.5	743
10	PI/2 BPSK	25	12	22.91	22.90	22.89
Channel				141100	145100	149100
Frequency (MHz)				705.5	725.5	745.5
5	PI/2 BPSK	12	6	22.91	22.94	22.92

<n28_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				143600	145100	146600
Frequency (MHz)				718	725.5	733
30	PI/2 BPSK	80	40	22.71	22.70	22.74
30	PI/2 BPSK	160	0	22.55	22.68	22.53
30	PI/2 BPSK	1	0	22.48	22.70	22.60
30	PI/2 BPSK	1	159	22.37	22.21	22.24
30	QPSK	80	40	22.71	22.78	22.64
30	QPSK	160	0	22.55	22.68	22.53
30	QPSK	1	0	22.63	22.75	22.51
30	QPSK	1	159	22.34	22.38	22.32
30	16QAM	80	40	22.54	22.70	22.75
30	64QAM	80	40	22.56	22.65	22.66
30	256QAM	80	40	20.51	20.83	20.63
Channel				142600	145100	147600
Frequency (MHz)				713	725.5	738
20	PI/2 BPSK	50	25	22.57	22.66	22.46
Channel				142100	145100	148100
Frequency (MHz)				710.5	725.5	740.5
15	PI/2 BPSK	36	18	22.66	22.68	22.53
Channel				141600	145100	148600
Frequency (MHz)				708	725.5	743
10	PI/2 BPSK	25	12	22.54	22.74	22.43
Channel				141100	145100	149100
Frequency (MHz)				705.5	725.5	745.5
5	PI/2 BPSK	12	6	22.53	22.62	22.50

<n38_Ant 1>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				518004	519000	519996
Frequency (MHz)				2590.02	2595	2599.98
40	PI/2 BPSK	50	25	23.21	23.32	23.07
40	PI/2 BPSK	100	0	22.66	22.91	22.66
40	PI/2 BPSK	1	0	22.91	23.06	22.73
40	PI/2 BPSK	1	105	22.59	23.00	22.63
40	QPSK	50	25	23.24	23.34	23.26
40	QPSK	100	0	23.28	23.33	23.21
40	QPSK	1	0	22.63	22.62	22.43
40	QPSK	1	105	22.17	22.45	22.36
40	16QAM	50	25	22.32	22.40	22.25
40	64QAM	50	25	20.68	20.97	20.88
40	256QAM	50	25	18.85	18.94	18.81
Channel				517002	519000	520998
Frequency (MHz)				2585.01	2595	2604.99
30	PI/2 BPSK	36	18	23.11	23.20	22.92
Channel				516000	519000	522000
Frequency (MHz)				2580	2595	2610
20	PI/2 BPSK	25	12	23.12	23.21	22.92
Channel				515502	519000	522498
Frequency (MHz)				2577.51	2595	2612.49
15	PI/2 BPSK	18	9	23.09	23.13	22.91
Channel				515004	519000	522996
Frequency (MHz)				2575.02	2595	2614.98
10	PI/2 BPSK	12	6	23.14	23.10	23.02

<n41_Ant 0>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				510000	519000	528000
Frequency (MHz)				2550	2595	2640
100	PI/2 BPSK	135	67	22.19	22.27	21.95
100	PI/2 BPSK	270	0	21.52	21.75	21.66
100	PI/2 BPSK	1	0	21.40	21.72	21.42
100	PI/2 BPSK	1	272	21.69	21.82	21.58
100	QPSK	135	67	22.73	22.79	22.74
100	QPSK	270	0	20.94	21.16	20.95
100	QPSK	1	0	20.98	21.25	21.14
100	QPSK	1	272	20.91	21.29	21.21
100	16QAM	135	67	20.92	21.22	21.14
100	64QAM	135	67	19.53	19.66	19.57
100	256QAM	135	67	17.52	17.71	17.65
Channel				509004	519000	528996
Frequency (MHz)				2545.02	2595	2644.98
90	PI/2 BPSK	120	60	22.56	22.66	22.57
Channel				508002	519000	529998
Frequency (MHz)				2540.01	2595	2649.99
80	PI/2 BPSK	108	54	22.69	22.78	22.64
Channel				506004	519000	531996
Frequency (MHz)				2530.02	2595	2659.98
60	PI/2 BPSK	81	40	22.65	22.71	22.65
Channel				505002	519000	532998
Frequency (MHz)				2525.01	2595	2664.99
50	PI/2 BPSK	64	32	22.50	22.66	22.63
Channel				504000	519000	534000
Frequency (MHz)				2520	2595	2670
40	PI/2 BPSK	50	25	22.61	22.65	22.67
Channel				503004	519000	534996
Frequency (MHz)				2515.02	2595	2674.98
30	PI/2 BPSK	36	18	22.54	22.63	22.65
Channel				502500	519000	535500
Frequency (MHz)				2512.5	2595	2677.5
25	PI/2 BPSK	32	16	22.51	22.60	22.61
Channel				502002	519000	535998
Frequency (MHz)				2510.01	2595	2679.99
20	PI/2 BPSK	25	12	22.62	22.76	22.57

<n78_Ant 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				623334	629000	634666
Frequency (MHz)				3350.01	3435	3519.99
100	PI/2 BPSK	135	67	22.70	22.76	22.66
100	PI/2 BPSK	270	0	22.45	22.74	22.57
100	PI/2 BPSK	1	0	22.04	22.19	21.96
100	PI/2 BPSK	1	272	21.99	22.28	22.19
100	QPSK	135	67	22.47	22.87	22.19
100	QPSK	270	0	22.68	22.73	22.44
100	QPSK	1	0	22.04	22.15	21.92
100	QPSK	1	272	22.08	22.26	21.97
100	16QAM	135	67	22.66	22.74	22.48
100	64QAM	135	67	22.73	22.72	22.52
100	256QAM	135	67	20.97	21.28	21.06
Channel				623000	629000	635000
Frequency (MHz)				3345	3435	3525
90	PI/2 BPSK	120	60	22.57	22.40	22.00
Channel				622668	629000	635332
Frequency (MHz)				3340.02	3435	3529.98
80	PI/2 BPSK	108	54	22.46	22.54	22.27
Channel				622334	629000	635666
Frequency (MHz)				3335.01	3435	3534.99
70	PI/2 BPSK	90	45	22.25	22.63	22.30
Channel				622000	629000	636000
Frequency (MHz)				3330	3435	3540
60	PI/2 BPSK	81	40	22.56	22.71	22.08
Channel				621668	629000	636332
Frequency (MHz)				3325.02	3435	3544.98
50	PI/2 BPSK	64	32	22.35	22.54	22.03
Channel				621334	629000	636666
Frequency (MHz)				3320.01	3435	3549.99
40	PI/2 BPSK	50	25	22.27	22.72	22.23
Channel				621000	629000	637000
Frequency (MHz)				3315	3435	3555
30	PI/2 BPSK	36	18	22.32	22.65	22.05
Channel				620668	629000	637332
Frequency (MHz)				3310.02	3435	3559.98
20	PI/2 BPSK	25	12	22.53	22.55	22.10

< n78 (HPUE) _Ant 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				623334	629000	634666
Frequency (MHz)				3350.01	3435	3519.99
100	PI/2 BPSK	135	67	23.77	23.93	23.72
100	PI/2 BPSK	270	0	23.43	23.48	23.07
100	PI/2 BPSK	1	0	21.22	21.47	21.11
100	PI/2 BPSK	1	272	21.35	21.59	21.35
100	QPSK	135	67	24.67	24.85	24.66
100	QPSK	270	0	22.79	23.02	22.90
100	QPSK	1	0	21.32	21.30	21.11
100	QPSK	1	272	21.11	21.48	21.35
100	16QAM	135	67	23.20	23.32	23.10
100	64QAM	135	67	22.13	22.49	22.20
100	256QAM	135	67	20.11	20.28	20.03
Channel				623000	629000	635000
Frequency (MHz)				3345	3435	3525
90	PI/2 BPSK	120	60	24.61	24.83	24.58
Channel				622668	629000	635332
Frequency (MHz)				3340.02	3435	3529.98
80	PI/2 BPSK	108	54	24.61	24.79	24.58
Channel				622334	629000	635666
Frequency (MHz)				3335.01	3435	3534.99
70	PI/2 BPSK	90	45	24.53	24.73	24.51
Channel				622000	629000	636000
Frequency (MHz)				3330	3435	3540
60	PI/2 BPSK	81	40	24.58	24.83	24.53
Channel				621668	629000	636332
Frequency (MHz)				3325.02	3435	3544.98
50	PI/2 BPSK	64	32	24.61	24.79	24.51
Channel				621334	629000	636666
Frequency (MHz)				3320.01	3435	3549.99
40	PI/2 BPSK	50	25	24.55	24.81	24.56
Channel				621000	629000	637000
Frequency (MHz)				3315	3435	3555
30	PI/2 BPSK	36	18	24.54	24.82	24.48
Channel				620668	629000	637332
Frequency (MHz)				3310.02	3435	3559.98
20	PI/2 BPSK	25	12	24.52	24.82	24.50

<n78_Ant 3>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				623334	629000	634666
Frequency (MHz)				3350.01	3435	3519.99
100	PI/2 BPSK	135	67	22.65	22.81	22.84
100	PI/2 BPSK	270	0	22.52	22.28	22.38
100	PI/2 BPSK	1	0	19.48	19.76	19.50
100	PI/2 BPSK	1	272	19.97	19.91	20.11
100	QPSK	135	67	22.28	22.95	22.19
100	QPSK	270	0	22.12	22.03	21.70
100	QPSK	1	0	19.46	19.63	19.53
100	QPSK	1	272	19.96	19.82	19.53
100	16QAM	135	67	22.36	22.36	22.30
100	64QAM	135	67	20.52	20.79	20.61
100	256QAM	135	67	19.07	18.83	18.52
Channel				623000	629000	635000
Frequency (MHz)				3345	3435	3525
90	PI/2 BPSK	120	60	22.12	22.92	22.13
Channel				622668	629000	635332
Frequency (MHz)				3340.02	3435	3529.98
80	PI/2 BPSK	108	54	21.79	22.57	21.78
Channel				622334	629000	635666
Frequency (MHz)				3335.01	3435	3534.99
70	PI/2 BPSK	90	45	21.56	22.49	21.53
Channel				622000	629000	636000
Frequency (MHz)				3330	3435	3540
60	PI/2 BPSK	81	40	21.56	22.49	21.67
Channel				621668	629000	636332
Frequency (MHz)				3325.02	3435	3544.98
50	PI/2 BPSK	64	32	21.54	22.50	21.70
Channel				621334	629000	636666
Frequency (MHz)				3320.01	3435	3549.99
40	PI/2 BPSK	50	25	21.72	22.40	21.48
Channel				621000	629000	637000
Frequency (MHz)				3315	3435	3555
30	PI/2 BPSK	36	18	21.61	22.39	21.59
Channel				620668	629000	637332
Frequency (MHz)				3310.02	3435	3559.98
20	PI/2 BPSK	25	12	21.34	22.29	21.43

<n78_Ant 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				623334	629000	634666
Frequency (MHz)				3350.01	3435	3519.99
100	PI/2 BPSK	135	67	22.61	22.77	22.73
100	PI/2 BPSK	270	0	22.64	22.64	22.41
100	PI/2 BPSK	1	0	22.60	22.76	22.74
100	PI/2 BPSK	1	272	22.35	22.43	22.50
100	QPSK	135	67	22.40	22.88	22.81
100	QPSK	270	0	22.53	22.76	22.36
100	QPSK	1	0	22.44	22.75	22.46
100	QPSK	1	272	22.50	22.50	22.50
100	16QAM	135	67	22.82	22.80	22.48
100	64QAM	135	67	22.75	22.78	22.66
100	256QAM	135	67	22.02	21.80	21.78
Channel				623000	629000	635000
Frequency (MHz)				3345	3435	3525
90	PI/2 BPSK	120	60	22.53	22.73	22.59
Channel				622668	629000	635332
Frequency (MHz)				3340.02	3435	3529.98
80	PI/2 BPSK	108	54	22.47	22.61	22.73
Channel				622334	629000	635666
Frequency (MHz)				3335.01	3435	3534.99
70	PI/2 BPSK	90	45	22.43	22.70	22.57
Channel				622000	629000	636000
Frequency (MHz)				3330	3435	3540
60	PI/2 BPSK	81	40	22.35	22.71	22.69
Channel				621668	629000	636332
Frequency (MHz)				3325.02	3435	3544.98
50	PI/2 BPSK	64	32	22.44	22.81	22.50
Channel				621334	629000	636666
Frequency (MHz)				3320.01	3435	3549.99
40	PI/2 BPSK	50	25	22.40	22.82	22.69
Channel				621000	629000	637000
Frequency (MHz)				3315	3435	3555
30	PI/2 BPSK	36	18	22.51	22.78	22.67
Channel				620668	629000	637332
Frequency (MHz)				3310.02	3435	3559.98
20	PI/2 BPSK	25	12	22.46	22.66	22.79

<n78 (HPUE) _Ant 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				623334	629000	634666
Frequency (MHz)				3350.01	3435	3519.99
100	PI/2 BPSK	135	67	25.14	25.09	24.66
100	PI/2 BPSK	270	0	24.59	24.58	24.47
100	PI/2 BPSK	1	0	22.66	22.82	22.68
100	PI/2 BPSK	1	272	22.54	22.70	22.87
100	QPSK	135	67	25.05	25.30	25.03
100	QPSK	270	0	24.26	24.42	24.62
100	QPSK	1	0	22.83	22.86	22.81
100	QPSK	1	272	22.51	22.64	22.49
100	16QAM	135	67	24.56	24.40	24.10
100	64QAM	135	67	23.19	23.13	23.34
100	256QAM	135	67	21.74	21.73	21.82
Channel				623000	629000	635000
Frequency (MHz)				3345	3435	3525
90	PI/2 BPSK	120	60	25.01	25.20	25.02
Channel				622668	629000	635332
Frequency (MHz)				3340.02	3435	3529.98
80	PI/2 BPSK	108	54	25.04	25.27	24.93
Channel				622334	629000	635666
Frequency (MHz)				3335.01	3435	3534.99
70	PI/2 BPSK	90	45	24.97	25.27	24.97
Channel				622000	629000	636000
Frequency (MHz)				3330	3435	3540
60	PI/2 BPSK	81	40	24.99	25.21	24.95
Channel				621668	629000	636332
Frequency (MHz)				3325.02	3435	3544.98
50	PI/2 BPSK	64	32	24.97	25.22	24.99
Channel				621334	629000	636666
Frequency (MHz)				3320.01	3435	3549.99
40	PI/2 BPSK	50	25	25.00	25.26	25.02
Channel				621000	629000	637000
Frequency (MHz)				3315	3435	3555
30	PI/2 BPSK	36	18	25.02	25.22	24.98
Channel				620668	629000	637332
Frequency (MHz)				3310.02	3435	3559.98
20	PI/2 BPSK	25	12	24.99	25.23	25.02

<n78_Ant 8>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.
Channel				623334	629000	634666
Frequency (MHz)				3350.01	3435	3519.99
100	PI/2 BPSK	135	67	21.77	22.10	21.89
100	PI/2 BPSK	270	0	22.08	22.00	21.60
100	PI/2 BPSK	1	0	22.07	22.03	21.56
100	PI/2 BPSK	1	272	21.81	21.83	21.75
100	QPSK	135	67	22.17	21.94	21.64
100	QPSK	270	0	22.03	21.89	21.68
100	QPSK	1	0	22.16	22.02	21.51
100	QPSK	1	272	22.14	21.84	21.75
100	16QAM	135	67	22.08	22.10	21.79
100	64QAM	135	67	22.03	21.95	21.65
100	256QAM	135	67	22.06	21.88	21.60
Channel				623000	629000	635000
Frequency (MHz)				3345	3435	3525
90	PI/2 BPSK	120	60	21.77	21.81	21.67
Channel				622668	629000	635332
Frequency (MHz)				3340.02	3435	3529.98
80	PI/2 BPSK	108	54	21.85	22.03	21.70
Channel				622334	629000	635666
Frequency (MHz)				3335.01	3435	3534.99
70	PI/2 BPSK	90	45	21.87	22.02	21.70
Channel				622000	629000	636000
Frequency (MHz)				3330	3435	3540
60	PI/2 BPSK	81	40	21.65	21.69	21.61
Channel				621668	629000	636332
Frequency (MHz)				3325.02	3435	3544.98
50	PI/2 BPSK	64	32	21.65	21.80	21.44
Channel				621334	629000	636666
Frequency (MHz)				3320.01	3435	3549.99
40	PI/2 BPSK	50	25	21.72	21.75	21.61
Channel				621000	629000	637000
Frequency (MHz)				3315	3435	3555
30	PI/2 BPSK	36	18	21.50	21.60	21.44
Channel				620668	629000	637332
Frequency (MHz)				3310.02	3435	3559.98
20	PI/2 BPSK	25	12	21.66	21.60	21.25

13 SAR Test Result

General Note:

1. The reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
 - b. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
2. For TDD LTE SAR measurement the duty cycle 1:1.59 (62.9 %) was used perform testing.
3. Considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = (measured SAR) * (scaling factor for extended cyclic prefix).

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Power Drift (dB)	Measured 10g SAR (W/kg)
	GSM900_Ant 0	GSM Voice	Right Cheek	0mm	Sample 1	37	897.4	-0.16	0.130
	GSM900_Ant 0	GSM Voice	Right Tilted	0mm	Sample 1	37	897.4	-0.15	0.067
	GSM900_Ant 0	GSM Voice	Left Cheek	0mm	Sample 1	37	897.4	0.08	0.077
	GSM900_Ant 0	GSM Voice	Left Tilted	0mm	Sample 1	37	897.4	0.18	0.057
	GSM900_Ant 0	GSM Voice	Right Cheek	0mm	Sample 1	1	890.2	-0.14	0.138
	GSM900_Ant 0	GSM Voice	Right Cheek	0mm	Sample 1	124	914.8	0.19	0.147
	GSM900_Ant 0	GSM Voice	Right Cheek	0mm	Sample 2	124	914.8	-0.09	0.072
	GSM900_Ant 1	GSM Voice	Right Cheek	0mm	Sample 1	37	897.4	-0.01	0.538
	GSM900_Ant 1	GSM Voice	Right Tilted	0mm	Sample 1	37	897.4	-0.09	0.500
	GSM900_Ant 1	GSM Voice	Left Cheek	0mm	Sample 1	37	897.4	-0.06	0.619
	GSM900_Ant 1	GSM Voice	Left Tilted	0mm	Sample 1	37	897.4	0.17	0.594
01	GSM900_Ant 1	GSM Voice	Left Cheek	0mm	Sample 1	1	890.2	-0.14	0.658
	GSM900_Ant 1	GSM Voice	Left Cheek	0mm	Sample 1	124	914.8	0.19	0.485
	GSM900_Ant 1	GSM Voice	Left Cheek	0mm	Sample 2	1	890.2	-0.04	0.126

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Power Drift (dB)	Measured 10g SAR (W/kg)
	WCDMA I_Ant 0	RMC 12.2Kbps	Right Cheek	0mm	Sample 1	9750	1950	-0.06	0.032
	WCDMA I_Ant 0	RMC 12.2Kbps	Right Tilted	0mm	Sample 1	9750	1950	-0.19	0.008
02	WCDMA I_Ant 0	RMC 12.2Kbps	Left Cheek	0mm	Sample 1	9750	1950	-0.08	0.045
	WCDMA I_Ant 0	RMC 12.2Kbps	Left Tilted	0mm	Sample 1	9750	1950	0.03	0.021
	WCDMA I_Ant 0	RMC 12.2Kbps	Left Cheek	0mm	Sample 1	9612	1922.4	-0.01	0.038
	WCDMA I_Ant 0	RMC 12.2Kbps	Left Cheek	0mm	Sample 1	9888	1977.6	0.03	0.033
	WCDMA I_Ant 0	RMC 12.2Kbps	Left Cheek	0mm	Sample 2	9750	1950	0.02	0.024
	WCDMA VIII_Ant 0	RMC 12.2Kbps	Right Cheek	0mm	Sample 1	2800	900	-0.04	0.109
	WCDMA VIII_Ant 0	RMC 12.2Kbps	Right Tilted	0mm	Sample 1	2800	900	0.18	0.060
	WCDMA VIII_Ant 0	RMC 12.2Kbps	Left Cheek	0mm	Sample 1	2800	900	-0.01	0.071
	WCDMA VIII_Ant 0	RMC 12.2Kbps	Left Tilted	0mm	Sample 1	2800	900	-0.15	0.048
	WCDMA VIII_Ant 0	RMC 12.2Kbps	Right Cheek	0mm	Sample 1	2737	887.4	0.07	0.119
	WCDMA VIII_Ant 0	RMC 12.2Kbps	Right Cheek	0mm	Sample 1	2863	912.6	0.06	0.114
	WCDMA VIII_Ant 0	RMC 12.2Kbps	Right Cheek	0mm	Sample 2	2737	887.4	0.07	0.082
	WCDMA VIII_Ant 1	RMC 12.2Kbps	Right Cheek	0mm	Sample 1	2800	900	0.15	0.498
	WCDMA VIII_Ant 1	RMC 12.2Kbps	Right Tilted	0mm	Sample 1	2800	900	-0.13	0.493
03	WCDMA VIII_Ant 1	RMC 12.2Kbps	Left Cheek	0mm	Sample 1	2800	900	-0.01	0.644
	WCDMA VIII_Ant 1	RMC 12.2Kbps	Left Tilted	0mm	Sample 1	2800	900	-0.18	0.621
	WCDMA VIII_Ant 1	RMC 12.2Kbps	Left Cheek	0mm	Sample 1	2737	887.4	0.08	0.589
	WCDMA VIII_Ant 1	RMC 12.2Kbps	Left Cheek	0mm	Sample 1	2863	912.6	0.18	0.474
	WCDMA VIII_Ant 1	RMC 12.2Kbps	Left Cheek	0mm	Sample 2	2800	900	-0.05	0.618

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Power Drift (dB)	Measured 10g SAR (W/kg)
	LTE Band 1_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	18300	1950	0.04	0.033
	LTE Band 1_Ant 0	20M	QPSK	1	0	Right Tilted	0mm	Sample 1	18300	1950	-0.02	0.011
	LTE Band 1_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	18300	1950	0.14	0.051
	LTE Band 1_Ant 0	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	18300	1950	0.13	0.014
	LTE Band 1_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	18100	1930	0.08	0.046
	LTE Band 1_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	18500	1970	0	0.045
	LTE Band 1_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	Sample 2	18300	1950	0.05	0.045
	LTE Band 1_Ant 1	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	18300	1950	0.1	0.353
	LTE Band 1_Ant 1	20M	QPSK	1	0	Right Tilted	0mm	Sample 1	18300	1950	-0.15	0.414
	LTE Band 1_Ant 1	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	18300	1950	-0.16	0.592
	LTE Band 1_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	18300	1950	0.08	0.638
	LTE Band 1_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	18100	1930	0.03	0.660
	LTE Band 1_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	18500	1970	0.04	0.696
04	LTE Band 1_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 2	18500	1970	-0.15	0.807
	LTE Band 1_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 2	18300	1950	-0.18	0.748
	LTE Band 1_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 2	18100	1930	-0.07	0.730
	LTE Band 3_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	19575	1747.5	-0.1	0.043
	LTE Band 3_Ant 0	20M	QPSK	1	0	Right Tilted	0mm	Sample 1	19575	1747.5	-0.07	0.015
	LTE Band 3_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	19575	1747.5	0.19	0.040
	LTE Band 3_Ant 0	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	19575	1747.5	-0.06	0.040
	LTE Band 3_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	19300	1720	0.16	0.061
	LTE Band 3_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	19850	1775	-0.08	0.015
	LTE Band 3_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 2	19300	1720	0.1	0.024
	LTE Band 3_Ant 1	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	19575	1747.5	-0.06	0.345
	LTE Band 3_Ant 1	20M	QPSK	1	0	Right Tilted	0mm	Sample 1	19575	1747.5	-0.17	0.388
	LTE Band 3_Ant 1	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	19575	1747.5	-0.01	0.558
	LTE Band 3_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	19575	1747.5	-0.13	0.608
	LTE Band 3_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	19300	1720	0.1	0.576
	LTE Band 3_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	19850	1775	0.01	0.683
05	LTE Band 3_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 2	19850	1775	-0.11	0.813
	LTE Band 3_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 2	19575	1747.5	0.08	0.791
	LTE Band 3_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 2	19300	1720	-0.03	0.806
	LTE Band 7_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	21100	2535	-0.01	0.052
	LTE Band 7_Ant 0	20M	QPSK	1	0	Right Tilted	0mm	Sample 1	21100	2535	-0.15	0.017
	LTE Band 7_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	21100	2535	0.11	0.028
	LTE Band 7_Ant 0	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	21100	2535	0.03	0.027
	LTE Band 7_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	20850	2510	0.02	0.049
	LTE Band 7_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	21350	2560	-0.04	0.046
	LTE Band 7_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 2	21100	2535	0.03	0.035
	LTE Band 7_Ant 1	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	21100	2535	0.18	0.289
	LTE Band 7_Ant 1	20M	QPSK	1	0	Right Tilted	0mm	Sample 1	21100	2535	0.04	0.268
	LTE Band 7_Ant 1	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	21100	2535	-0.06	0.388
	LTE Band 7_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	21100	2535	0.14	0.438
06	LTE Band 7_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	20850	2510	0.07	0.511
	LTE Band 7_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	21350	2560	-0.01	0.458
	LTE Band 7_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 2	20850	2510	-0.11	0.506

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Power Drift (dB)	Measured 10g SAR (W/kg)
	LTE Band 8_Ant 0	10M	QPSK	1	0	Right Cheek	0mm	Sample 1	21650	900	-0.17	0.188
	LTE Band 8_Ant 0	10M	QPSK	1	0	Right Tilted	0mm	Sample 1	21650	900	-0.05	0.094
	LTE Band 8_Ant 0	10M	QPSK	1	0	Left Cheek	0mm	Sample 1	21650	900	0.09	0.103
	LTE Band 8_Ant 0	10M	QPSK	1	0	Left Tilted	0mm	Sample 1	21650	900	-0.17	0.051
	LTE Band 8_Ant 0	10M	QPSK	1	0	Right Cheek	0mm	Sample 1	21550	890	0.14	0.169
	LTE Band 8_Ant 0	10M	QPSK	1	0	Right Cheek	0mm	Sample 1	21750	910	-0.09	0.167
	LTE Band 8_Ant 0	10M	QPSK	1	0	Right Cheek	0mm	Sample 2	21650	900	0.07	0.120
	LTE Band 8_Ant 1	10M	QPSK	1	0	Right Cheek	0mm	Sample 1	21650	900	-0.14	0.640
	LTE Band 8_Ant 1	10M	QPSK	1	0	Right Tilted	0mm	Sample 1	21650	900	0	0.595
	LTE Band 8_Ant 1	10M	QPSK	1	0	Left Cheek	0mm	Sample 1	21650	900	0.06	0.558
	LTE Band 8_Ant 1	10M	QPSK	1	0	Left Tilted	0mm	Sample 1	21650	900	0.01	0.701
07	LTE Band 8_Ant 1	10M	QPSK	1	0	Left Tilted	0mm	Sample 1	21550	890	-0.18	0.711
	LTE Band 8_Ant 1	10M	QPSK	1	0	Left Tilted	0mm	Sample 1	21750	910	0.12	0.698
	LTE Band 8_Ant 1	10M	QPSK	1	0	Left Tilted	0mm	Sample 2	21550	890	-0.17	0.637
	LTE Band 28_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	27435	725.5	-0.01	0.134
	LTE Band 28_Ant 0	20M	QPSK	1	0	Right Tilted	0mm	Sample 1	27435	725.5	-0.18	0.107
	LTE Band 28_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	27435	725.5	0.03	0.124
	LTE Band 28_Ant 0	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	27435	725.5	-0.07	0.081
	LTE Band 28_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	27310	713	-0.14	0.115
	LTE Band 28_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	27560	738	-0.17	0.127
	LTE Band 28_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 2	27435	725.5	-0.12	0.034
	LTE Band 28_Ant 1	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	27435	725.5	0.11	0.230
	LTE Band 28_Ant 1	20M	QPSK	1	0	Right Tilted	0mm	Sample 1	27435	725.5	0.13	0.196
08	LTE Band 28_Ant 1	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	27435	725.5	0.05	0.495
	LTE Band 28_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	27435	725.5	0.11	0.294
	LTE Band 28_Ant 1	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	27310	713	0.09	0.398
	LTE Band 28_Ant 1	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	27560	738	0.02	0.369
	LTE Band 28_Ant 1	20M	QPSK	1	0	Left Cheek	0mm	Sample 2	27435	725.5	-0.11	0.177

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	LTE Band 38_HPUE_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	38000	2595	42.9	1.009	0.01	0.022	0.022
	LTE Band 38_HPUE_Ant 0	20M	QPSK	1	0	Right Tilted	0mm	Sample 1	38000	2595	42.9	1.009	-0.13	0.012	0.012
	LTE Band 38_HPUE_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	38000	2595	42.9	1.009	0.09	0.014	0.014
	LTE Band 38_HPUE_Ant 0	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	38000	2595	42.9	1.009	0.1	0.013	0.013
	LTE Band 38_HPUE_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	37850	2580	42.9	1.009	0.15	0.036	0.036
	LTE Band 38_HPUE_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	38150	2610	42.9	1.009	-0.08	0.042	0.042
	LTE Band 38_HPUE_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 2	38150	2610	42.9	1.009	0	0.024	0.024
	LTE Band 38_HPUE_Ant 1	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	38000	2595	42.9	1.009	0.17	0.332	0.335
	LTE Band 38_HPUE_Ant 1	20M	QPSK	1	0	Right Tilted	0mm	Sample 1	38000	2595	42.9	1.009	0.01	0.468	0.472
	LTE Band 38_HPUE_Ant 1	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	38000	2595	42.9	1.009	-0.15	0.521	0.526
	LTE Band 38_HPUE_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	38000	2595	42.9	1.009	0	0.647	0.653
	LTE Band 38_HPUE_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	37850	2580	42.9	1.009	0.12	0.611	0.616
09	LTE Band 38_HPUE_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	38150	2610	42.9	1.009	0.08	0.664	0.670
	LTE Band 38_HPUE_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 2	38150	2610	42.9	1.009	-0.07	0.504	0.509
	LTE Band 41_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	40640	2595	62.9	1.006	-0.01	0.042	0.042
	LTE Band 41_Ant 0	20M	QPSK	1	0	Right Tilted	0mm	Sample 1	40640	2595	62.9	1.006	-0.05	0.008	0.008
	LTE Band 41_Ant 0	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	40640	2595	62.9	1.006	0.13	0.028	0.028
	LTE Band 41_Ant 0	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	40640	2595	62.9	1.006	0.17	0.022	0.022
	LTE Band 41_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	39790	2510	62.9	1.006	0.08	0.026	0.026
	LTE Band 41_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	41490	2680	62.9	1.006	0.05	0.029	0.029
	LTE Band 41_Ant 0	20M	QPSK	1	0	Right Cheek	0mm	Sample 2	40640	2595	62.9	1.006	0.11	0.028	0.028
	LTE Band 41_Ant 1	20M	QPSK	1	0	Right Cheek	0mm	Sample 1	40640	2595	62.9	1.006	-0.06	0.274	0.276
	LTE Band 41_Ant 1	20M	QPSK	1	0	Right Tilted	0mm	Sample 1	40640	2595	62.9	1.006	0.11	0.339	0.341
	LTE Band 41_Ant 1	20M	QPSK	1	0	Left Cheek	0mm	Sample 1	40640	2595	62.9	1.006	0.15	0.391	0.393
	LTE Band 41_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	40640	2595	62.9	1.006	-0.09	0.515	0.518
	LTE Band 41_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	39790	2510	62.9	1.006	0.1	0.415	0.417
10	LTE Band 41_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 1	41490	2680	62.9	1.006	-0.03	0.551	0.554
	LTE Band 41_Ant 1	20M	QPSK	1	0	Left Tilted	0mm	Sample 2	41490	2680	62.9	1.006	-0.19	0.312	0.314

<5G NR SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Power Drift (dB)	Measured 10g SAR (W/kg)
	FR1 n1_Ant 0	40M	QPSK	108	54	Right Cheek	0mm	Sample 1	390000	1950	-0.03	0.011
	FR1 n1_Ant 0	40M	QPSK	108	54	Right Tilted	0mm	Sample 1	390000	1950	-0.11	0.011
	FR1 n1_Ant 0	40M	QPSK	108	54	Left Cheek	0mm	Sample 1	390000	1950	-0.11	0.033
	FR1 n1_Ant 0	40M	QPSK	108	54	Left Tilted	0mm	Sample 1	390000	1950	-0.07	0.022
	FR1 n1_Ant 0	40M	QPSK	108	54	Left Cheek	0mm	Sample 1	388000	1940	-0.01	0.034
	FR1 n1_Ant 0	40M	QPSK	108	54	Left Cheek	0mm	Sample 1	392000	1960	0.12	0.031
	FR1 n1_Ant 0	40M	QPSK	108	54	Left Cheek	0mm	Sample 2	388000	1940	0.08	0.024
	FR1 n1_Ant 1	40M	QPSK	108	54	Right Cheek	0mm	Sample 1	390000	1950	-0.09	0.374
	FR1 n1_Ant 1	40M	QPSK	108	54	Right Tilted	0mm	Sample 1	390000	1950	0.18	0.458
	FR1 n1_Ant 1	40M	QPSK	108	54	Left Cheek	0mm	Sample 1	390000	1950	-0.13	0.665
	FR1 n1_Ant 1	40M	QPSK	108	54	Left Tilted	0mm	Sample 1	390000	1950	0.12	0.704
11	FR1 n1_Ant 1	40M	QPSK	108	54	Left Tilted	0mm	Sample 1	388000	1940	0.01	0.706
	FR1 n1_Ant 1	40M	QPSK	108	54	Left Tilted	0mm	Sample 1	392000	1960	-0.18	0.638
	FR1 n1_Ant 1	40M	QPSK	108	54	Left Tilted	0mm	Sample 2	388000	1940	-0.15	0.581



Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Power Drift (dB)	Measured 10g SAR (W/kg)
	FR1 n3_Ant 0	30M	QPSK	80	40	Right Cheek	0mm	Sample 1	349500	1747.5	-0.05	0.029
	FR1 n3_Ant 0	30M	QPSK	80	40	Right Tilted	0mm	Sample 1	349500	1747.5	-0.1	0.023
	FR1 n3_Ant 0	30M	QPSK	80	40	Left Cheek	0mm	Sample 1	349500	1747.5	-0.14	0.031
	FR1 n3_Ant 0	30M	QPSK	80	40	Left Tilted	0mm	Sample 1	349500	1747.5	-0.03	0.002
	FR1 n3_Ant 0	30M	QPSK	80	40	Left Cheek	0mm	Sample 1	345000	1725	0.05	0.034
	FR1 n3_Ant 0	30M	QPSK	80	40	Left Cheek	0mm	Sample 1	354000	1770	-0.15	0.025
	FR1 n3_Ant 0	30M	QPSK	80	40	Left Cheek	0mm	Sample 2	345000	1725	-0.08	0.022
	FR1 n3_Ant 1	30M	QPSK	80	40	Right Cheek	0mm	Sample 1	349500	1747.5	0.07	0.311
	FR1 n3_Ant 1	30M	QPSK	80	40	Right Tilted	0mm	Sample 1	349500	1747.5	0.05	0.367
	FR1 n3_Ant 1	30M	QPSK	80	40	Left Cheek	0mm	Sample 1	349500	1747.5	0.18	0.518
	FR1 n3_Ant 1	30M	QPSK	80	40	Left Tilted	0mm	Sample 1	349500	1747.5	0	0.541
	FR1 n3_Ant 1	30M	QPSK	80	40	Left Tilted	0mm	Sample 1	345000	1725	0.14	0.518
12	FR1 n3_Ant 1	30M	QPSK	80	40	Left Tilted	0mm	Sample 1	354000	1770	0.05	0.635
	FR1 n3_Ant 1	30M	QPSK	80	40	Left Tilted	0mm	Sample 2	354000	1770	0	0.587
	FR1 n7_Ant 0	40M	QPSK	108	54	Right Cheek	0mm	Sample 1	507000	2535	0.03	0.034
	FR1 n7_Ant 0	40M	QPSK	108	54	Right Tilted	0mm	Sample 1	507000	2535	-0.09	0.018
	FR1 n7_Ant 0	40M	QPSK	108	54	Left Cheek	0mm	Sample 1	507000	2535	0.15	0.021
	FR1 n7_Ant 0	40M	QPSK	108	54	Left Tilted	0mm	Sample 1	507000	2535	0.19	0.022
	FR1 n7_Ant 0	40M	QPSK	108	54	Right Cheek	0mm	Sample 1	504000	2520	-0.01	0.035
	FR1 n7_Ant 0	40M	QPSK	108	54	Right Cheek	0mm	Sample 1	510000	2550	0.12	0.037
	FR1 n7_Ant 0	40M	QPSK	108	54	Right Cheek	0mm	Sample 2	510000	2550	0.11	0.031
	FR1 n7_Ant 1	40M	QPSK	108	54	Right Cheek	0mm	Sample 1	507000	2535	0.06	0.367
	FR1 n7_Ant 1	40M	QPSK	108	54	Right Tilted	0mm	Sample 1	507000	2535	0.07	0.414
	FR1 n7_Ant 1	40M	QPSK	108	54	Left Cheek	0mm	Sample 1	507000	2535	-0.11	0.513
	FR1 n7_Ant 1	40M	QPSK	108	54	Left Tilted	0mm	Sample 1	507000	2535	-0.15	0.603
	FR1 n7_Ant 1	40M	QPSK	108	54	Left Tilted	0mm	Sample 1	504000	2520	-0.1	0.645
13	FR1 n7_Ant 1	40M	QPSK	108	54	Left Tilted	0mm	Sample 1	510000	2550	0.04	0.660
	FR1 n7_Ant 1	40M	QPSK	108	54	Left Tilted	0mm	Sample 2	510000	2550	0.02	0.641
14	FR1 n8_Ant 0	20M	QPSK	50	25	Right Cheek	0mm	Sample 1	180000	900	-0.02	0.107
	FR1 n8_Ant 0	20M	QPSK	50	25	Right Tilted	0mm	Sample 1	180000	900	-0.13	0.050
	FR1 n8_Ant 0	20M	QPSK	50	25	Left Cheek	0mm	Sample 1	180000	900	-0.09	0.066
	FR1 n8_Ant 0	20M	QPSK	50	25	Left Tilted	0mm	Sample 1	180000	900	-0.03	0.035
	FR1 n8_Ant 0	20M	QPSK	50	25	Right Cheek	0mm	Sample 1	179000	895	-0.17	0.073
	FR1 n8_Ant 0	20M	QPSK	50	25	Right Cheek	0mm	Sample 1	181000	905	-0.04	0.093
	FR1 n8_Ant 0	20M	QPSK	50	25	Right Cheek	0mm	Sample 2	180000	900	0.03	0.079
	FR1 n28_Ant 0	30M	QPSK	80	40	Right Cheek	0mm	Sample 1	145100	725.5	0.04	0.096
	FR1 n28_Ant 0	30M	QPSK	80	40	Right Tilted	0mm	Sample 1	145100	725.5	-0.1	0.060
	FR1 n28_Ant 0	30M	QPSK	80	40	Left Cheek	0mm	Sample 1	145100	725.5	-0.16	0.068
	FR1 n28_Ant 0	30M	QPSK	80	40	Left Tilted	0mm	Sample 1	145100	725.5	0.17	0.049
	FR1 n28_Ant 0	30M	QPSK	80	40	Right Cheek	0mm	Sample 1	143600	718	0.08	0.090
	FR1 n28_Ant 0	30M	QPSK	80	40	Right Cheek	0mm	Sample 1	146600	733	-0.1	0.094
	FR1 n28_Ant 0	30M	QPSK	80	40	Right Cheek	0mm	Sample 2	145100	725.5	-0.12	0.081
	FR1 n28_Ant 1	30M	QPSK	80	40	Right Cheek	0mm	Sample 1	145100	725.5	0.08	0.321
	FR1 n28_Ant 1	30M	QPSK	80	40	Right Tilted	0mm	Sample 1	145100	725.5	0.09	0.283
	FR1 n28_Ant 1	30M	QPSK	80	40	Left Cheek	0mm	Sample 1	145100	725.5	-0.18	0.471
	FR1 n28_Ant 1	30M	QPSK	80	40	Left Tilted	0mm	Sample 1	145100	725.5	-0.17	0.379
15	FR1 n28_Ant 1	30M	QPSK	80	40	Left Cheek	0mm	Sample 1	143600	718	0.01	0.532
	FR1 n28_Ant 1	30M	QPSK	80	40	Left Cheek	0mm	Sample 1	146600	733	0.04	0.436
	FR1 n28_Ant 1	30M	QPSK	80	40	Left Cheek	0mm	Sample 2	143600	718	-0.13	0.196

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Sample	Ch.	Freq. (MHz)	Power Drift (dB)	Measured 10g SAR (W/kg)
	FR1 n38_Ant 1	40M	QPSK	50	25	Right Cheek	0mm	Sample 1	519000	2595	0.01	0.414
	FR1 n38_Ant 1	40M	QPSK	50	25	Right Tilted	0mm	Sample 1	519000	2595	-0.05	0.432
	FR1 n38_Ant 1	40M	QPSK	50	25	Left Cheek	0mm	Sample 1	519000	2595	0.13	0.498
	FR1 n38_Ant 1	40M	QPSK	50	25	Left Tilted	0mm	Sample 1	519000	2595	-0.02	0.681
	FR1 n38_Ant 1	40M	QPSK	50	25	Left Tilted	0mm	Sample 1	518004	2590.02	0.12	0.671
16	FR1 n38_Ant 1	40M	QPSK	50	25	Left Tilted	0mm	Sample 1	519996	2599.98	-0.06	0.684
	FR1 n38_Ant 1	40M	QPSK	50	25	Left Tilted	0mm	Sample 2	519996	2599.98	-0.08	0.522
	FR1 n41_Ant 0	100M	QPSK	135	67	Right Cheek	0mm	Sample 1	519000	2595	-0.04	0.029
	FR1 n41_Ant 0	100M	QPSK	135	67	Right Tilted	0mm	Sample 1	519000	2595	0.15	0.006
	FR1 n41_Ant 0	100M	QPSK	135	67	Left Cheek	0mm	Sample 1	519000	2595	-0.05	0.019
	FR1 n41_Ant 0	100M	QPSK	135	67	Left Tilted	0mm	Sample 1	519000	2595	0.13	0.015
	FR1 n41_Ant 0	100M	QPSK	135	67	Right Cheek	0mm	Sample 1	510000	2550	-0.06	0.030
17	FR1 n41_Ant 0	100M	QPSK	135	67	Right Cheek	0mm	Sample 1	528000	2640	0.06	0.033
	FR1 n41_Ant 0	100M	QPSK	135	67	Right Cheek	0mm	Sample 2	528000	2640	0.02	0.031
	FR1 n78_HPUE_Ant 2	100M	QPSK	135	67	Right Cheek	0mm	Sample 1	629000	3435	0.07	0.470
	FR1 n78_HPUE_Ant 2	100M	QPSK	135	67	Right Tilted	0mm	Sample 1	629000	3435	0.07	0.408
	FR1 n78_HPUE_Ant 2	100M	QPSK	135	67	Left Cheek	0mm	Sample 1	629000	3435	-0.06	0.240
	FR1 n78_HPUE_Ant 2	100M	QPSK	135	67	Left Tilted	0mm	Sample 1	629000	3435	-0.05	0.180
18	FR1 n78_HPUE_Ant 2	100M	QPSK	135	67	Right Cheek	0mm	Sample 1	623334	3350.01	-0.07	0.574
	FR1 n78_HPUE_Ant 2	100M	QPSK	135	67	Right Cheek	0mm	Sample 1	634666	3519.99	-0.03	0.569
	FR1 n78_HPUE_Ant 2	100M	QPSK	135	67	Right Cheek	0mm	Sample 2	629000	3435	-0.06	0.547
	FR1 n78_Ant 3	100M	QPSK	135	67	Right Cheek	0mm	Sample 1	629000	3435	-0.03	0.007
	FR1 n78_Ant 3	100M	QPSK	135	67	Right Tilted	0mm	Sample 1	629000	3435	-0.03	0.006
	FR1 n78_Ant 3	100M	QPSK	135	67	Left Cheek	0mm	Sample 1	629000	3435	0	0.010
	FR1 n78_Ant 3	100M	QPSK	135	67	Left Tilted	0mm	Sample 1	629000	3435	-0.14	0.005
	FR1 n78_Ant 3	100M	QPSK	135	67	Left Cheek	0mm	Sample 1	623334	3350.01	-0.07	0.005
	FR1 n78_Ant 3	100M	QPSK	135	67	Left Cheek	0mm	Sample 1	634666	3519.99	-0.19	0.017
	FR1 n78_Ant 3	100M	QPSK	135	67	Left Cheek	0mm	Sample 2	634666	3519.99	-0.15	0.011
	FR1 n78_HPUE_Ant 7	100M	QPSK	135	67	Right Cheek	0mm	Sample 1	629000	3435	-0.08	0.129
	FR1 n78_HPUE_Ant 7	100M	QPSK	135	67	Right Tilted	0mm	Sample 1	629000	3435	-0.05	0.122
	FR1 n78_HPUE_Ant 7	100M	QPSK	135	67	Left Cheek	0mm	Sample 1	629000	3435	-0.04	0.113
	FR1 n78_HPUE_Ant 7	100M	QPSK	135	67	Left Tilted	0mm	Sample 1	629000	3435	-0.1	0.102
	FR1 n78_HPUE_Ant 7	100M	QPSK	135	67	Right Cheek	0mm	Sample 1	623334	3350.01	-0.19	0.095
	FR1 n78_HPUE_Ant 7	100M	QPSK	135	67	Right Cheek	0mm	Sample 1	634666	3519.99	-0.05	0.110
	FR1 n78_HPUE_Ant 7	100M	QPSK	135	67	Right Cheek	0mm	Sample 2	629000	3435	0.09	0.115
	FR1 n78_Ant 8	100M	QPSK	135	67	Right Cheek	0mm	Sample 1	629000	3435	-0.07	0.002
	FR1 n78_Ant 8	100M	QPSK	135	67	Right Tilted	0mm	Sample 1	629000	3435	-0.07	0.003
	FR1 n78_Ant 8	100M	QPSK	135	67	Left Cheek	0mm	Sample 1	629000	3435	-0.15	0.005
	FR1 n78_Ant 8	100M	QPSK	135	67	Left Tilted	0mm	Sample 1	629000	3435	-0.01	0.004
	FR1 n78_Ant 8	100M	QPSK	135	67	Left Cheek	0mm	Sample 1	623334	3350.01	-0.05	0.002
	FR1 n78_Ant 8	100M	QPSK	135	67	Left Cheek	0mm	Sample 1	634666	3519.99	-0.05	0.006
	FR1 n78_Ant 8	100M	QPSK	135	67	Left Cheek	0mm	Sample 2	634666	3519.99	-0.04	0.002

Test Engineer : Ken Li and Murphy Lee

14 Uncertainty Assessment

The component of uncertainty may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainty by the statistical analysis of a series of observations is termed a Type A evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in Table below

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor ^(a)	$1/k^{(b)}$	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) k is the coverage factor

Table of Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is showed in Table 11.2.

The judgment of conformity in the report is based on the measurement results excluding the measurement uncertainty.

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (10g)	Standard Uncertainty (10g)
Measurement System					
Probe Calibration	6.0	Normal	1	1	± 6.0 %
Axial Isotropy	4.7	Rectangular	$\sqrt{3}$	0.7	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	$\sqrt{3}$	0.7	± 3.9 %
Boundary Effects	1.0	Rectangular	$\sqrt{3}$	1	± 0.6 %
Linearity	4.7	Rectangular	$\sqrt{3}$	1	± 2.7 %
System Detection Limits	1.0	Rectangular	$\sqrt{3}$	1	± 0.6 %
Readout Electronics	0.3	Normal	1	1	± 0.3 %
Response Time	0.8	Rectangular	$\sqrt{3}$	1	± 0.5 %
Integration Time	2.6	Rectangular	$\sqrt{3}$	1	± 1.5 %
RF Ambient Noise	3.0	Rectangular	$\sqrt{3}$	1	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	$\sqrt{3}$	1	± 1.7 %
Probe Positioner	0.4	Rectangular	$\sqrt{3}$	1	± 0.2 %
Probe Positioning	2.9	Rectangular	$\sqrt{3}$	1	± 1.7 %
Max. SAR Eval.	1.0	Rectangular	$\sqrt{3}$	1	± 0.6 %
Test Sample Related					
Device Positioning	2.9	Normal	1	1	± 2.9 %
Device Holder	3.6	Normal	1	1	± 3.6 %
Power Drift	5.0	Rectangular	$\sqrt{3}$	1	± 2.9 %
Phantom and Setup					
Phantom Uncertainty	4.0	Rectangular	$\sqrt{3}$	1	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	$\sqrt{3}$	0.43	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.43	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	$\sqrt{3}$	0.49	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.49	± 1.2 %
Combined Standard Uncertainty					± 10.8 %
Coverage Factor for 95 %					K = 2
Expanded Uncertainty					± 21.5 %

Table of Uncertainty Budget of DASY

15 References

- [1] CNS 14959, "Limits for exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz)", December 2005
- [2] CNS 14958-1, "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Human models, instrumentation, and procedures - Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", December 2005
- [3] IEC 62209-1:2016, "Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Devices used next to the ear (Frequency range of 300 MHz to 6 GHz)".
- [4] SPEAG DASY System Handbook

Appendix A. Plots of System Performance Check

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/14

System Check_Head_750MHz

DUT: D750V3-1107

Communication System: CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: HSL_750_211214 Medium parameters used: $f = 750$ MHz; $\sigma = 0.901$ S/m; $\epsilon_r = 42.988$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C; Liquid Temperature : 22.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(9.09, 9.09, 9.09) @ 750 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.85 W/kg

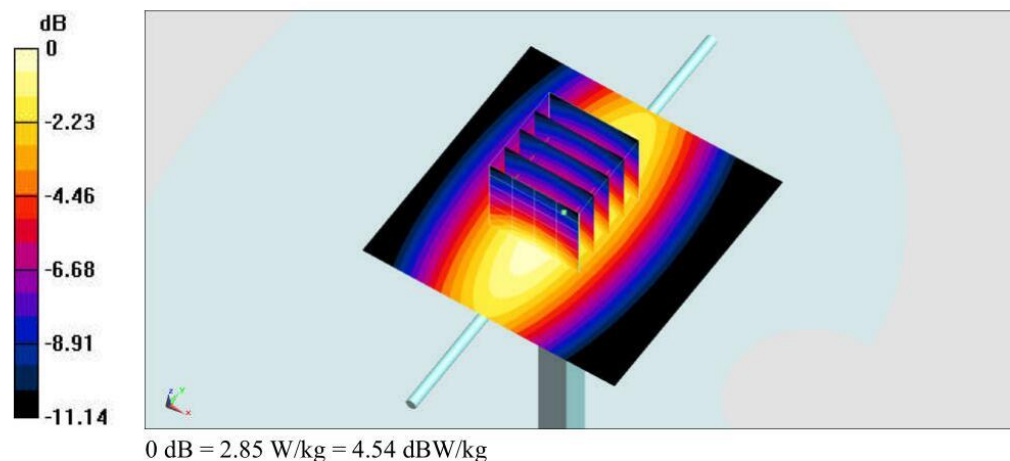
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 58.53 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.25 W/kg

SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.36 W/kg

Maximum value of SAR (measured) = 2.87 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/14

System Check_Head_900MHz

DUT: D900V2-190

Communication System: CW; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: HSL_900_211214 Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 0.965 \text{ S/m}$; $\epsilon_r = 42.405$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.5°C ; Liquid Temperature : 22.5°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(8.74, 8.74, 8.74) @ 900 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=50mW/Area Scan (61x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.664 W/kg

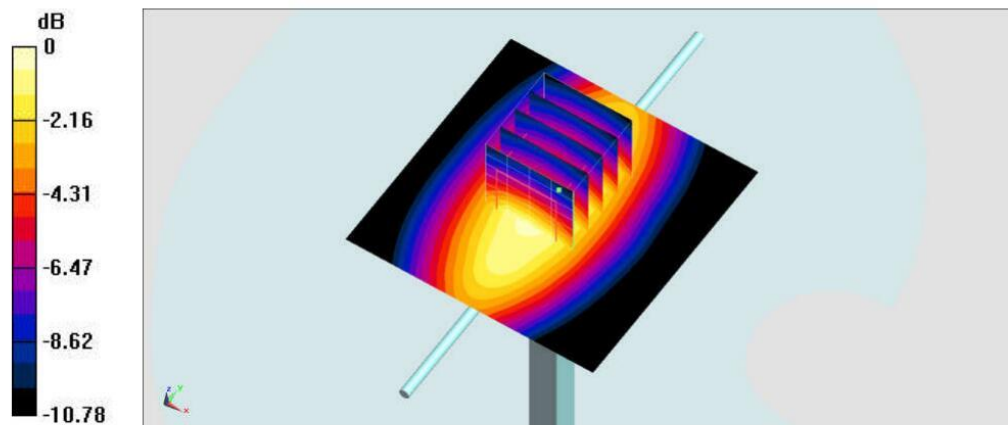
Pin=50mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 27.03 V/m ; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.774 W/kg

SAR(1 g) = 0.498 W/kg ; SAR(10 g) = 0.334 W/kg

Maximum value of SAR (measured) = 0.677 W/kg



0 dB = 0.677 W/kg = -1.69 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2022/1/9

System Check_Head_900MHz

DUT: D900V2-190

Communication System: CW; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: HSL_900_220109 Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 0.95 \text{ S/m}$; $\epsilon_r = 42.664$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.4°C ; Liquid Temperature : 22.4°C

DASY5 Configuration:

- Probe: ES3DV3 - SN3115; ConvF(6.03, 6.03, 6.03) @ 900 MHz; Calibrated: 2021/11/23
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 2021/11/22
- Phantom: Twin-SAM V5.0 (30deg probe tilt) Right; Type: QD 000 P40 CD; Serial: TP-1479
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Pin=50mW/Area Scan (61x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 0.614 W/kg

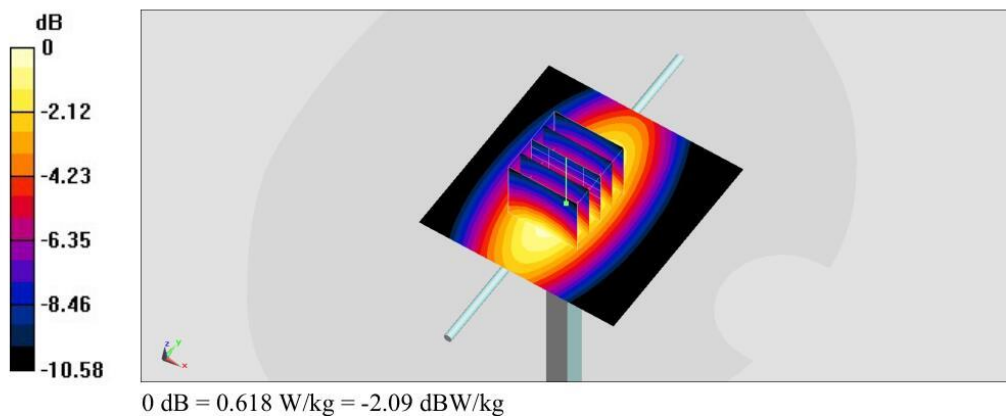
Pin=50mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 25.74 V/m ; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.775 W/kg

SAR(1 g) = 0.528 W/kg ; SAR(10 g) = 0.346 W/kg

Maximum value of SAR (measured) = 0.618 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/14

System Check_Head_1800MHz

DUT: D1800V2-2d076

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: HSL_1800_211214 Medium parameters used: $f = 1800$ MHz; $\sigma = 1.446$ S/m; $\epsilon_r = 40.313$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(8.21, 8.21, 8.21) @ 1800 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=50mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.72 W/kg

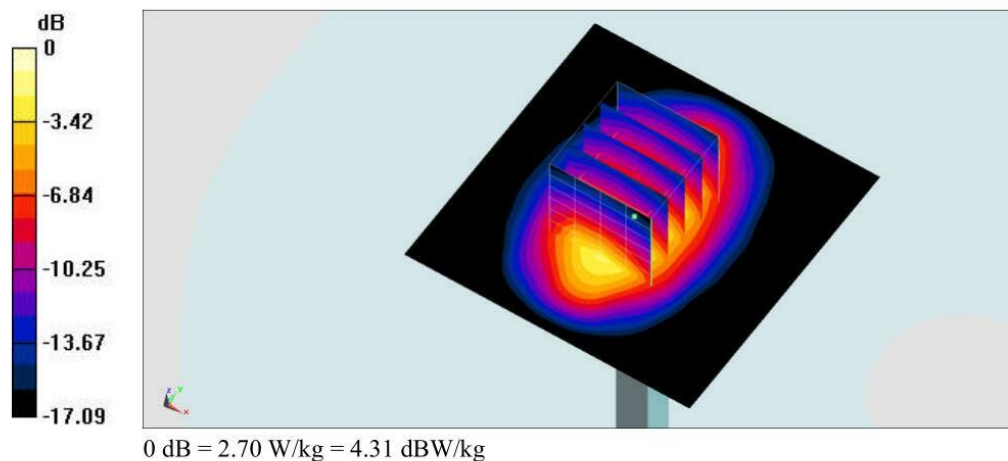
Pin=50mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 44.66 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 3.25 W/kg

SAR(1 g) = 1.77 W/kg; SAR(10 g) = 0.968 W/kg

Maximum value of SAR (measured) = 2.70 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2022/1/9

System Check_Head_1800MHz

DUT: D1800V2-2d076

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: HSL_1800_220109 Medium parameters used: $f = 1800 \text{ MHz}$; $\sigma = 1.406 \text{ S/m}$; $\epsilon_r = 40.284$;

$\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : $23.4 \text{ }^\circ\text{C}$; Liquid Temperature : $22.4 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: ES3DV3 - SN3115; ConvF(5.3, 5.3, 5.3) @ 1800 MHz; Calibrated: 2021/11/23
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 2021/11/22
- Phantom: Twin-SAM V5.0 (30deg probe tilt)_Right; Type: QD 000 P40 CD; Serial: TP-1479
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Pin=50mW/Area Scan (61x61x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 2.38 W/kg

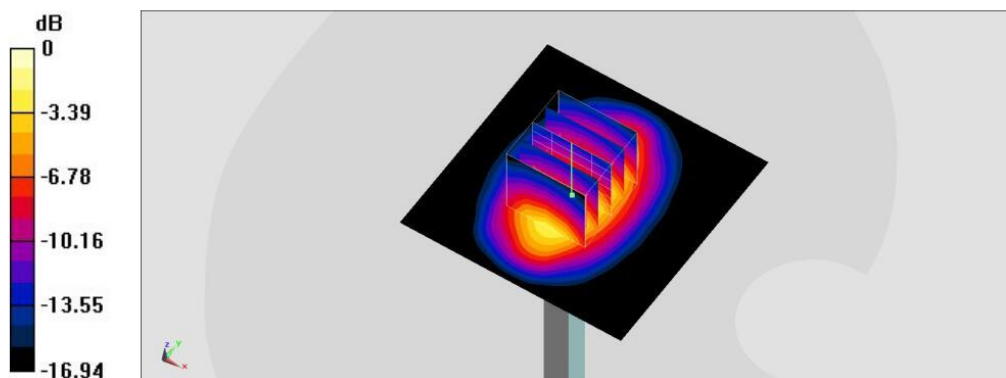
Pin=50mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 41.52 V/m ; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 3.33 W/kg

SAR(1 g) = 1.87 W/kg ; SAR(10 g) = 0.994 W/kg

Maximum value of SAR (measured) = 2.34 W/kg



0 dB = 2.34 W/kg = 3.69 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/15

System Check_Head_2000MHz

DUT: D2000V2-1010

Communication System: CW; Frequency: 2000 MHz; Duty Cycle: 1:1

Medium: HSL_2000_211215 Medium parameters used: $f = 2000$ MHz; $\sigma = 1.398$ S/m; $\epsilon_r = 39.976$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(7.82, 7.82, 7.82) @ 2000 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=50mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.93 W/kg

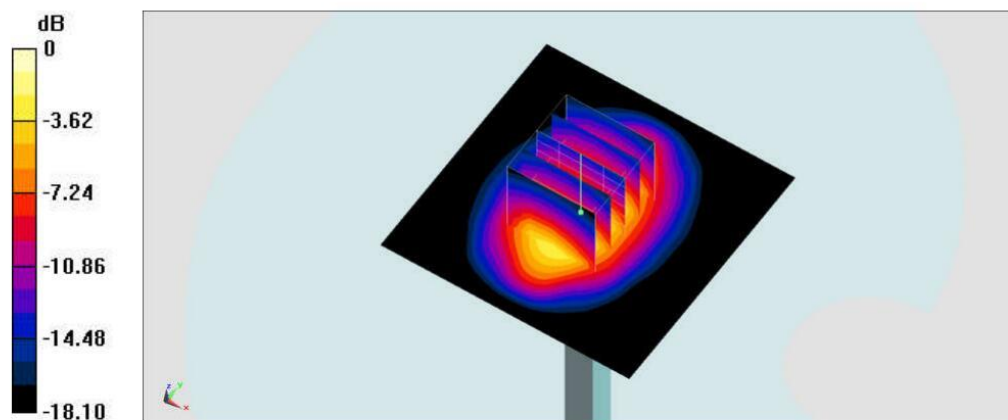
Pin=50mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 46.94 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 3.46 W/kg

SAR(1 g) = 1.86 W/kg; SAR(10 g) = 0.984 W/kg

Maximum value of SAR (measured) = 2.86 W/kg



0 dB = 2.86 W/kg = 4.56 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2022/1/9

System Check_Head_2000MHz

DUT: D2000V2-1010

Communication System: CW; Frequency: 2000 MHz; Duty Cycle: 1:1

Medium: HSL_2000_220109 Medium parameters used: $f = 2000$ MHz; $\sigma = 1.422$ S/m; $\epsilon_r = 39.363$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C; Liquid Temperature : 22.4 °C

DASY5 Configuration:

- Probe: ES3DV3 - SN3115; ConvF(5.02, 5.02, 5.02) @ 2000 MHz; Calibrated: 2021/11/23
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 2021/11/22
- Phantom: Twin-SAM V5.0 (30deg probe tilt) Right; Type: QD 000 P40 CD; Serial: TP-1479
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Pin=50mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.46 W/kg

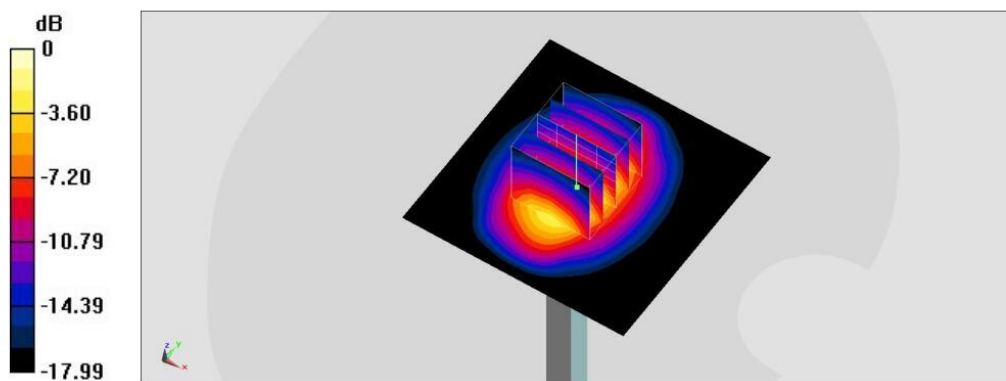
Pin=50mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 41.36 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 3.55 W/kg

SAR(1 g) = 1.94 W/kg; SAR(10 g) = 0.998 W/kg

Maximum value of SAR (measured) = 2.47 W/kg



0 dB = 2.47 W/kg = 3.93 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/15

System Check_Head_2600MHz

DUT: D2600V2-1008

Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: HSL_2600_211215 Medium parameters used: $f = 2600$ MHz; $\sigma = 1.983$ S/m; $\epsilon_r = 39.332$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C ; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(7.13, 7.13, 7.13) @ 2600 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4);SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 23.3 W/kg

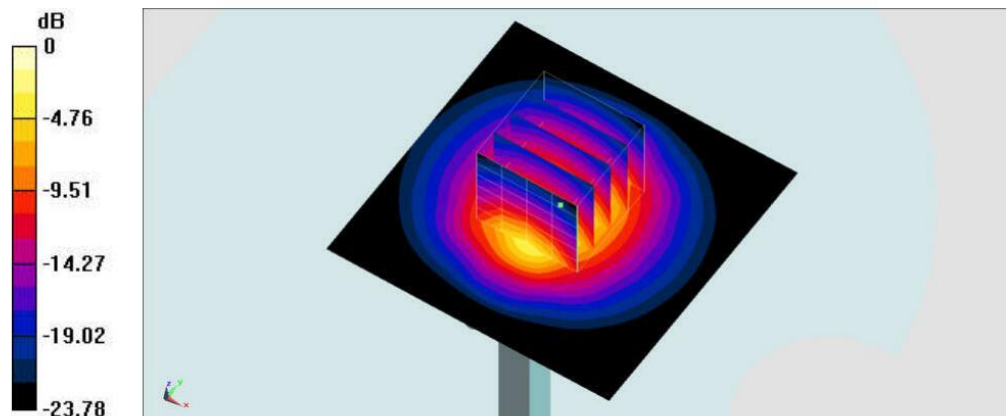
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 112.3 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 29.5 W/kg

SAR(1 g) = 14 W/kg; SAR(10 g) = 6.29 W/kg

Maximum value of SAR (measured) = 23.9 W/kg



0 dB = 23.9 W/kg = 13.78 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/16

System Check_Head_2600MHz

DUT: D2600V2-1008

Communication System: CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: HSL_2600_211216 Medium parameters used: $f = 2600$ MHz; $\sigma = 1.94$ S/m; $\epsilon_r = 37.954$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C ; Liquid Temperature : 22.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(7.13, 7.13, 7.13) @ 2600 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 22.8 W/kg

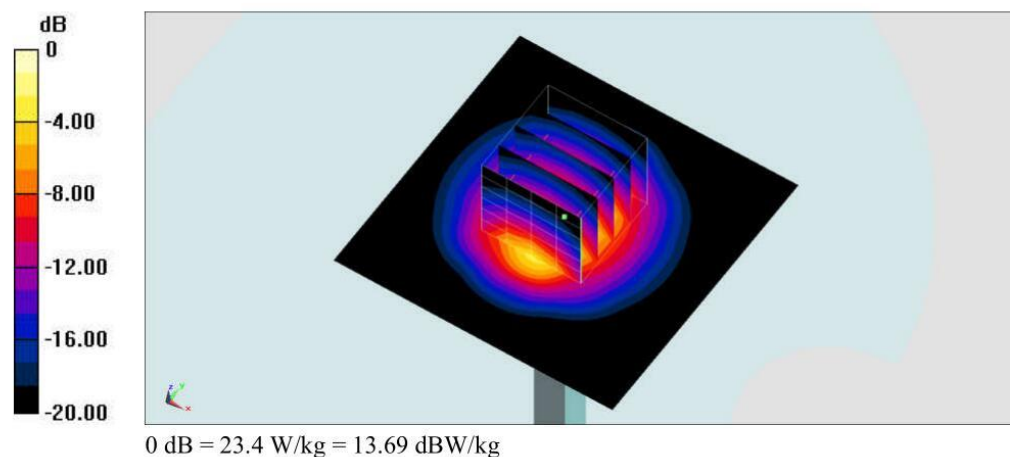
Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 112.3 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 28.8 W/kg

SAR(1 g) = 13.7 W/kg; SAR(10 g) = 6.15 W/kg

Maximum value of SAR (measured) = 23.4 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/16

System Check_Head_3300MHz

DUT: D3300V2-1005

Communication System: CW; Frequency: 3300 MHz; Duty Cycle: 1:1

Medium: HSL_3300-4200_211216 Medium parameters used: $f = 3300$ MHz; $\sigma = 2.818$ S/m; $\epsilon_r =$

38.533; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C ; Liquid Temperature : 22.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(6.87, 6.87, 6.87) @ 3300 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 14.0 W/kg

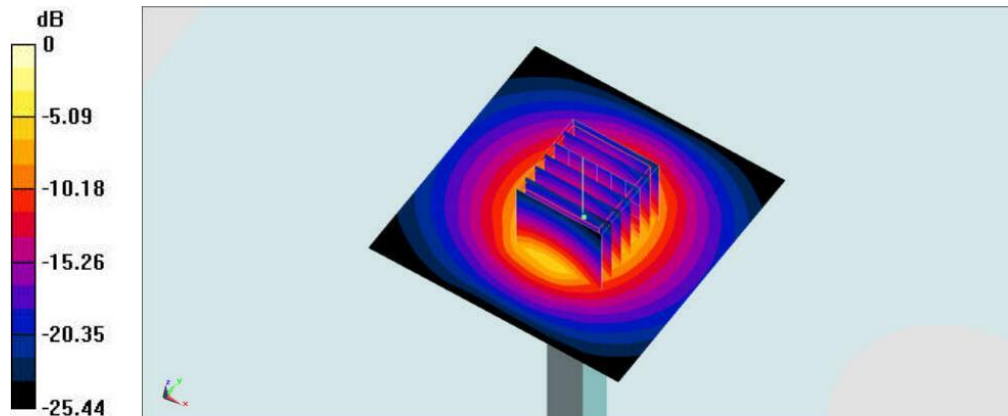
Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 71.80 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 18.4 W/kg

SAR(1 g) = 6.89 W/kg; SAR(10 g) = 2.51 W/kg

Maximum value of SAR (measured) = 13.5 W/kg



0 dB = 13.5 W/kg = 11.30 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/16

System Check_Head_3500MHz

DUT: D3500V2-1014

Communication System: CW; Frequency: 3500 MHz; Duty Cycle: 1:1

Medium: HSL_3300-4200_211216 Medium parameters used: $f = 3500 \text{ MHz}$; $\sigma = 3.006 \text{ S/m}$; $\epsilon_r = 38.298$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 23.2 °C ; Liquid Temperature : 22.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(6.8, 6.8, 6.8) @ 3500 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 13.9 W/kg

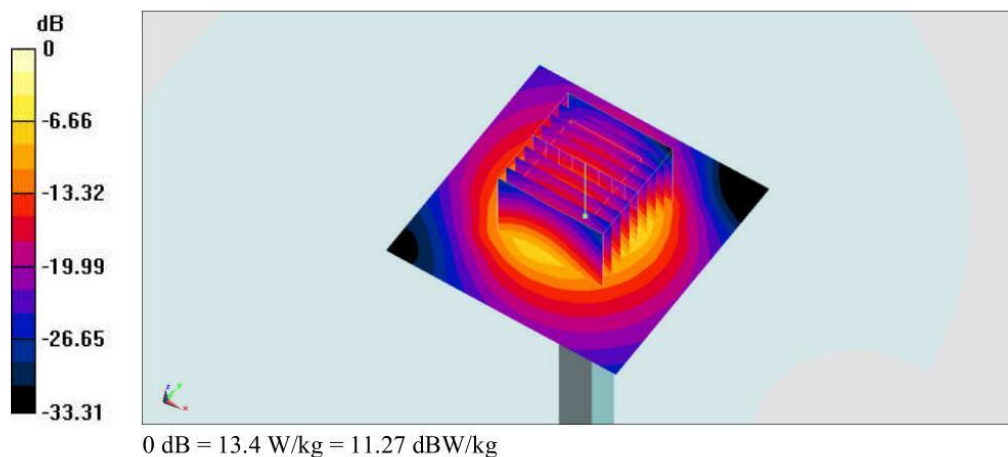
Pin=100mW/Zoom Scan (9x9x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 75.96 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 18.5 W/kg

SAR(1 g) = 6.83 W/kg; SAR(10 g) = 2.55 W/kg

Maximum value of SAR (measured) = 13.4 W/kg



Appendix B. Plots of SAR Measurement

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/14

#01_GSM900_GSM Voice_Left Cheek_Ch1

Communication System: EGSM; Frequency: 890.2 MHz; Duty Cycle: 1:8.3

Medium: HSL_900_211214 Medium parameters used: $f = 890.2$ MHz; $\sigma = 0.957$ S/m; $\epsilon_r = 42.545$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C; Liquid Temperature : 22.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(8.74, 8.74, 8.74) @ 890.2 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4);SEMCAD X Version 14.6.14 (7483)

Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.78 W/kg

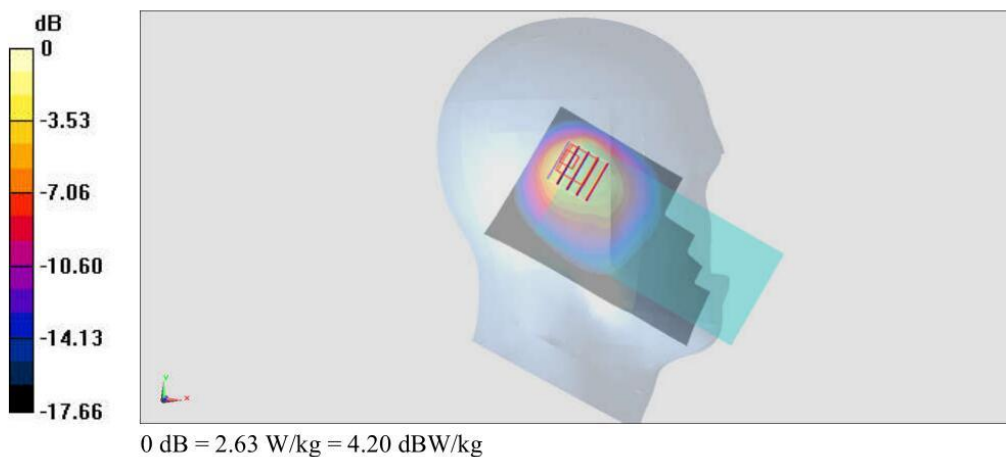
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 41.72 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 3.70 W/kg

SAR(1 g) = 1.32 W/kg; SAR(10 g) = 0.658 W/kg

Maximum value of SAR (measured) = 2.63 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/15

#02_WCDMA I_RMC 12.2Kbps_Left Cheek_Ch9750

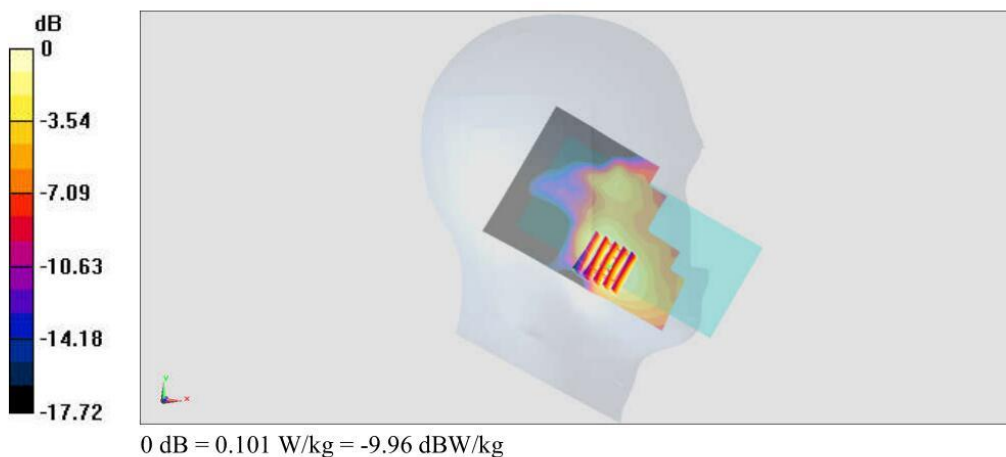
Communication System: WCDMA ; Frequency: 1950 MHz;Duty Cycle: 1:1
 Medium: HSL_2000_211215 Medium parameters used: $f = 1950$ MHz; $\sigma = 1.355$ S/m; $\epsilon_r = 40.167$;
 $\rho = 1000$ kg/m³
 Ambient Temperature : 23.6 °C; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(7.82, 7.82, 7.82) @ 1950 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4);SEMCAD X Version 14.6.14 (7483)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 0.103 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 7.835 V/m; Power Drift = -0.08 dB
 Peak SAR (extrapolated) = 0.119 W/kg
SAR(1 g) = 0.072 W/kg; SAR(10 g) = 0.045 W/kg
 Maximum value of SAR (measured) = 0.101 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/14

#03_WCDMA VIII_RMC 12.2Kbps_Left Cheek_Ch2800

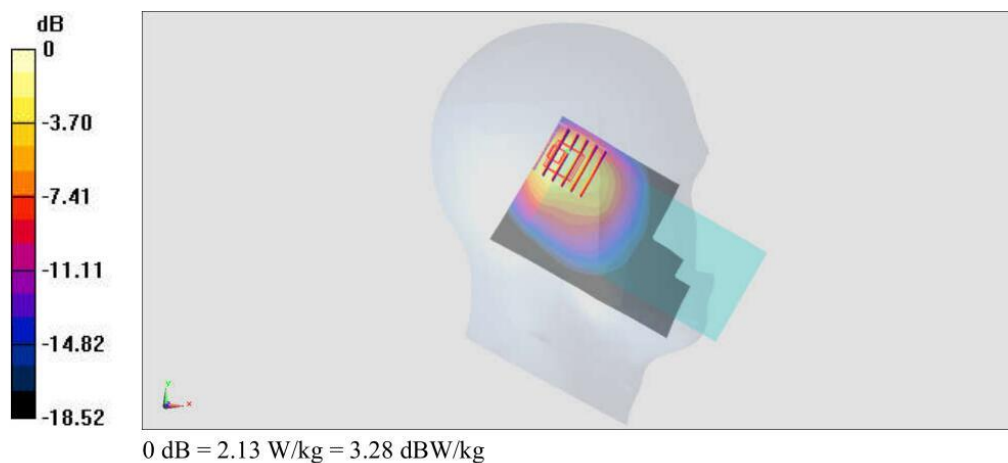
Communication System: WCDMA Frequency: 900 MHz; Duty Cycle: 1:1
 Medium: HSL_900_211214 Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 0.965 \text{ S/m}$; $\epsilon_r = 42.405$; $\rho = 1000 \text{ kg/m}^3$
 Ambient Temperature : 23.5°C ; Liquid Temperature : 22.5°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(8.74, 8.74, 8.74) @ 900 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (71x131x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$
 Maximum value of SAR (interpolated) = 1.73 W/kg

Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 37.31 V/m ; Power Drift = -0.01 dB
 Peak SAR (extrapolated) = 2.84 W/kg
SAR(1 g) = 1.17 W/kg ; SAR(10 g) = 0.644 W/kg
 Maximum value of SAR (measured) = 2.13 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2022/1/9

#04_LTE Band 1_20M_QPSK_1_0_Left Tilted_Ch18500

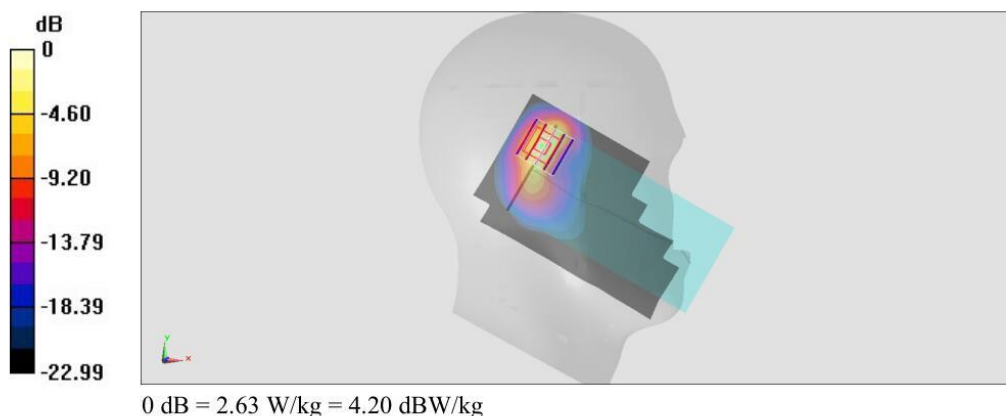
Communication System: LTE; Frequency: 1970 MHz; Duty Cycle: 1:1
 Medium: HSL_2000_220109 Medium parameters used: $f = 1970$ MHz; $\sigma = 1.399$ S/m; $\epsilon_r = 39.461$;
 $\rho = 1000$ kg/m³
 Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.4 °C

DASY5 Configuration:

- Probe: ES3DV3 - SN3115; ConvF(5.02, 5.02, 5.02) @ 1970 MHz; Calibrated: 2021/11/23
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 2021/11/22
- Phantom: Twin-SAM V5.0 (30deg probe tilt)_Right; Type: QD 000 P40 CD; Serial: TP-1479
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 2.60 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 41.75 V/m; Power Drift = -0.15 dB
 Peak SAR (extrapolated) = 3.91 W/kg
SAR(1 g) = 1.87 W/kg; SAR(10 g) = 0.807 W/kg
 Maximum value of SAR (measured) = 2.63 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2022/1/9

#05_LTE Band 3_20M_QPSK_1_0_Left Tilted_Ch19850

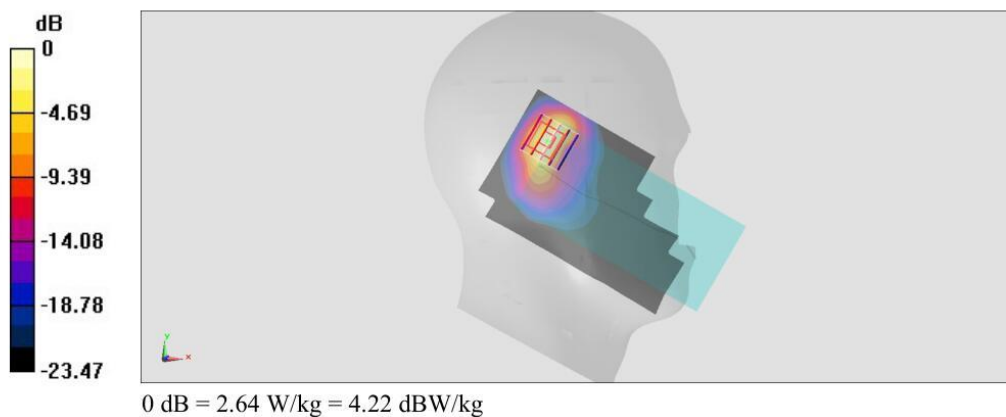
Communication System: LTE; Frequency: 1775 MHz; Duty Cycle: 1:1
 Medium: HSL_1800_220109 Medium parameters used: $f = 1775$ MHz; $\sigma = 1.381$ S/m; $\epsilon_r = 40.41$; $\rho = 1000$ kg/m³
 Ambient Temperature : 23.4 °C; Liquid Temperature : 22.4 °C

DASY5 Configuration:

- Probe: ES3DV3 - SN3115; ConvF(5.3, 5.3, 5.3) @ 1775 MHz; Calibrated: 2021/11/23
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 2021/11/22
- Phantom: Twin-SAM V5.0 (30deg probe tilt)_Right; Type: QD 000 P40 CD; Serial: TP-1479
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 2.54 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 41.57 V/m; Power Drift = -0.11 dB
 Peak SAR (extrapolated) = 3.82 W/kg
SAR(1 g) = 1.86 W/kg; SAR(10 g) = 0.813 W/kg
 Maximum value of SAR (measured) = 2.64 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/15

#06_LTE Band 7_20M_QPSK_1_0_Left Tilted_Ch20850

Communication System: LTE; Frequency: 2510 MHz; Duty Cycle: 1:1

Medium: HSL_2600_211215 Medium parameters used: $f = 2510$ MHz; $\sigma = 1.877$ S/m; $\epsilon_r = 39.754$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(7.13, 7.13, 7.13) @ 2510 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (71x121x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 1.50 W/kg

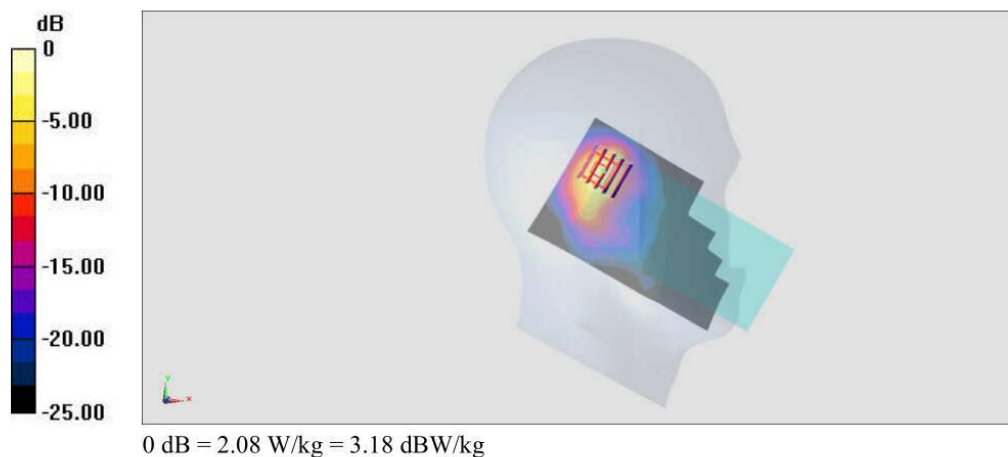
Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 30.26 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 2.72 W/kg

SAR(1 g) = 1.25 W/kg; SAR(10 g) = 0.511 W/kg

Maximum value of SAR (measured) = 2.08 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/14

#07_LTE Band 8_10M_QPSK_1_0_Left Tilted_Ch21550

Communication System: LTE; Frequency: 890 MHz; Duty Cycle: 1:1

Medium: HSL_900_211214 Medium parameters used: $f = 890$ MHz; $\sigma = 0.957$ S/m; $\epsilon_r = 42.543$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C; Liquid Temperature : 22.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(8.74, 8.74, 8.74) @ 890 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.95 W/kg

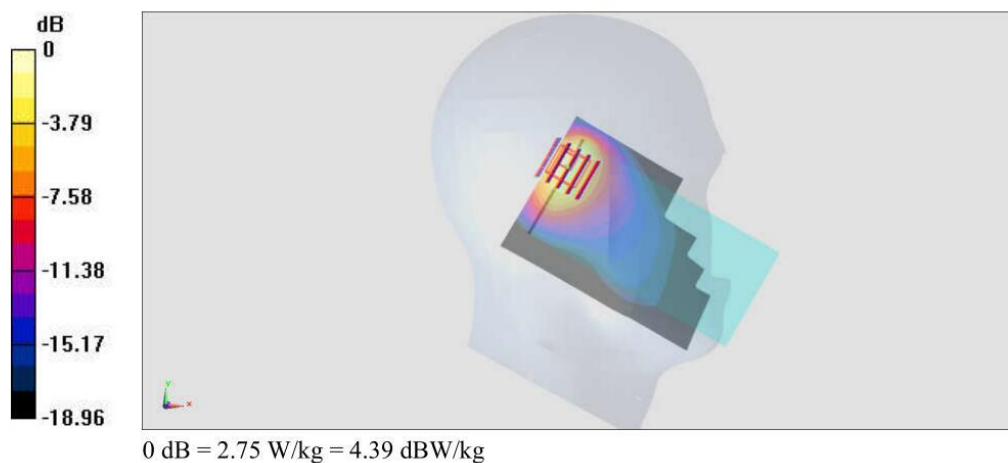
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 38.37 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 3.81 W/kg

SAR(1 g) = 1.43 W/kg; SAR(10 g) = 0.711 W/kg

Maximum value of SAR (measured) = 2.75 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/14

#08_LTE Band 28_20M_QPSK_1_0_Left Cheek_Ch27435

Communication System: LTE ; Frequency: 725.5 MHz;Duty Cycle: 1:1

Medium: HSL_750_211214 Medium parameters used : $f = 725.5$ MHz; $\sigma = 0.885$ S/m; $\epsilon_r = 43.243$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(9.09, 9.09, 9.09) @ 725.5 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4);SEMCAD X Version 14.6.14 (7483)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.64 W/kg

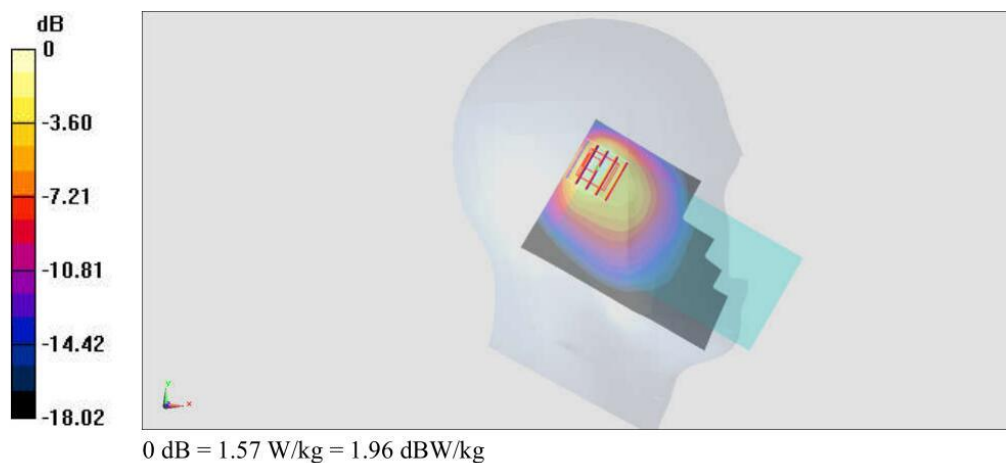
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 33.96 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 2.37 W/kg

SAR(1 g) = 0.901 W/kg; SAR(10 g) = 0.495 W/kg

Maximum value of SAR (measured) = 1.57 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/16

#09_LTE Band 38_20M_QPSK_1_0_Left Tilted _Ch38150

Communication System: LTE; Frequency: 2610 MHz; Duty Cycle: 1:1.59

Medium: HSL_2600_211216 Medium parameters used: $f = 2610$ MHz; $\sigma = 1.952$ S/m; $\epsilon_r = 37.916$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(7.13, 7.13, 7.13) @ 2610 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.13 W/kg

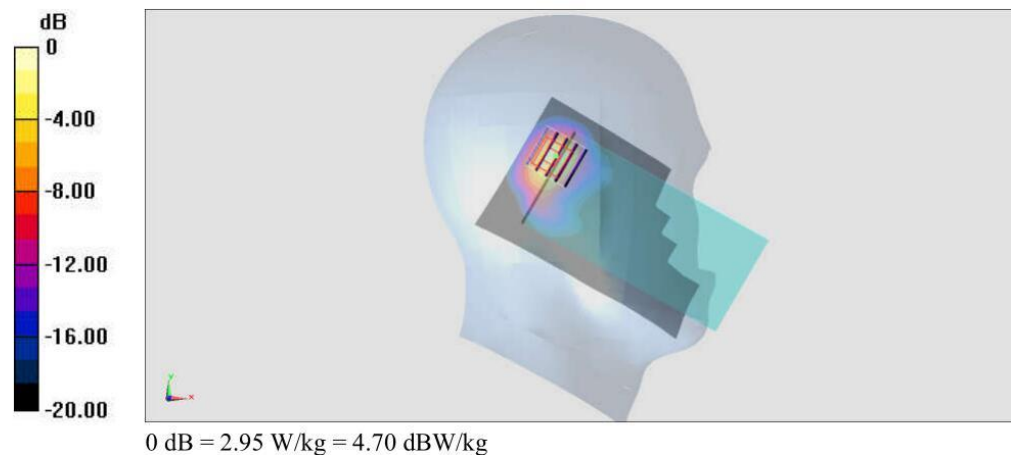
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 39.92 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 3.56 W/kg

SAR(1 g) = 1.62 W/kg; SAR(10 g) = 0.664 W/kg

Maximum value of SAR (measured) = 2.95 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/16

#10_LTE Band 41_20M_QPSK_1_0_Left Tilted_Ch41490

Communication System: LTE ; Frequency: 2680 MHz;Duty Cycle: 1:1.59

Medium: HSL_2600_211216 Medium parameters used: $f = 2680$ MHz; $\sigma = 2.01$ S/m; $\epsilon_r = 37.644$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(7.13, 7.13, 7.13) @ 2680 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4);SEMCAD X Version 14.6.14 (7483)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.96 W/kg

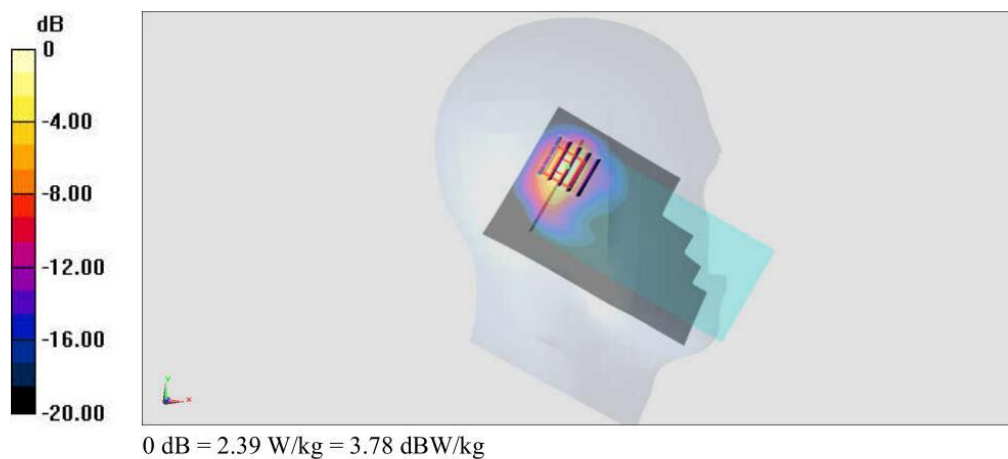
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 32.61 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 3.17 W/kg

SAR(1 g) = 1.34 W/kg; SAR(10 g) = 0.551 W/kg

Maximum value of SAR (measured) = 2.39 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/15

#11_FR1 n1_40M_QPSK_108_54_Left Tilted_Ch388000

Communication System: FR1; Frequency: 1940 MHz; Duty Cycle: 1:1

Medium: HSL_2000_211215 Medium parameters used: $f = 1940$ MHz; $\sigma = 1.345$ S/m; $\epsilon_r = 40.21$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.6 °C; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(7.82, 7.82, 7.82) @ 1940 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.95 W/kg

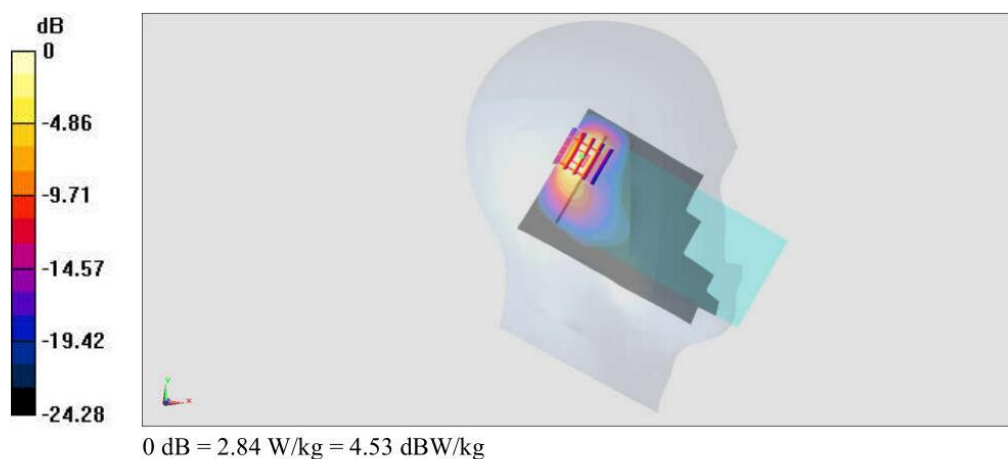
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 38.06 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.55 W/kg

SAR(1 g) = 1.67 W/kg; SAR(10 g) = 0.706 W/kg

Maximum value of SAR (measured) = 2.84 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/14

#12_FR1 n3_30M_QPSK_80_40_Left Tilted_Ch354000

Communication System: FR1; Frequency: 1770 MHz; Duty Cycle: 1:1

Medium: HSL_1800_211214 Medium parameters used: $f = 1770$ MHz; $\sigma = 1.442$ S/m; $\epsilon_r = 40.333$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(8.21, 8.21, 8.21) @ 1770 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4);SEMCAD X Version 14.6.14 (7483)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.54 W/kg

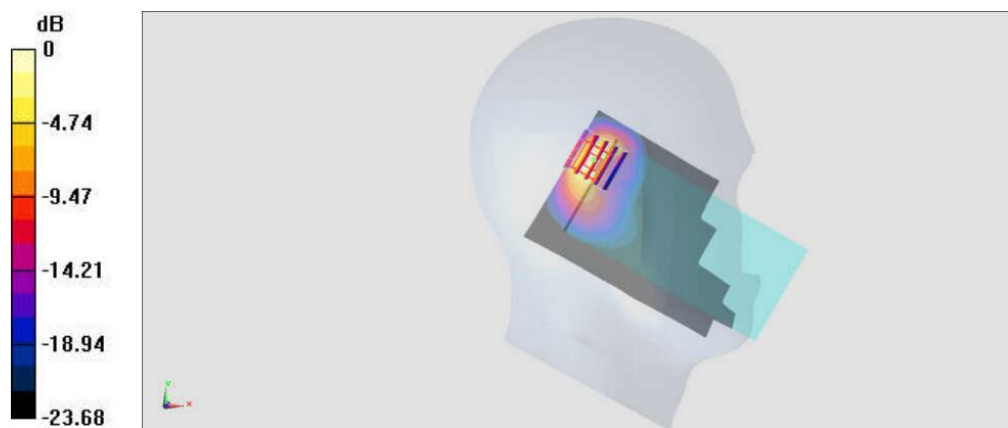
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 42.46 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 3.22 W/kg

SAR(1 g) = 1.49 W/kg; SAR(10 g) = 0.635 W/kg

Maximum value of SAR (measured) = 2.64 W/kg



0 dB = 2.64 W/kg = 4.22 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/16

#13_FR1 n7_40M_QPSK_108_54_Left Tilted_Ch510000

Communication System: FR1; Frequency: 2550 MHz; Duty Cycle: 1:1

Medium: HSL_2600_211216 Medium parameters used: $f = 2550$ MHz; $\sigma = 1.878$ S/m; $\epsilon_r = 38.141$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(7.13, 7.13, 7.13) @ 2550 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.74 W/kg

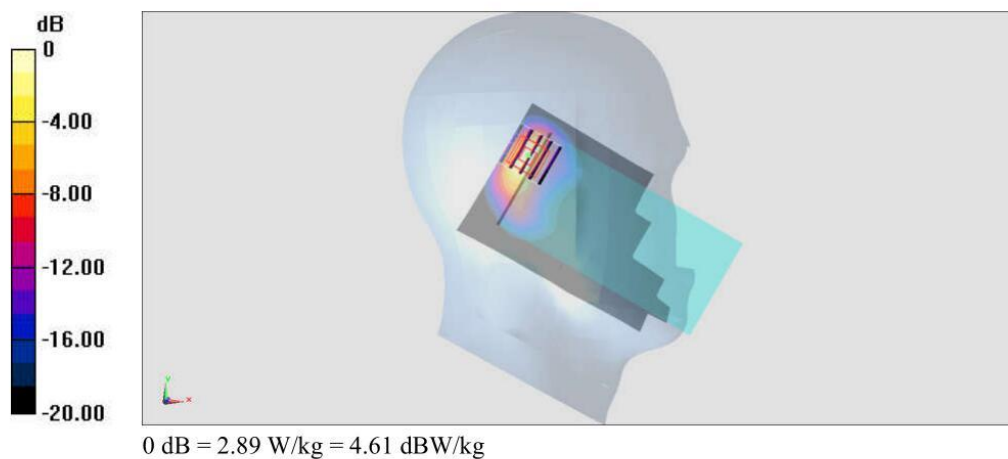
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 39.16 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 3.50 W/kg

SAR(1 g) = 1.63 W/kg; SAR(10 g) = 0.660 W/kg

Maximum value of SAR (measured) = 2.89 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/14

#14_FR1 n8_20M_QPSK_50_25_Right Cheek_Ch180000

Communication System: FR1; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: HSL_900_211214 Medium parameters used: $f = 900$ MHz; $\sigma = 0.965$ S/m; $\epsilon_r = 42.405$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C; Liquid Temperature : 22.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(8.74, 8.74, 8.74) @ 900 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.186 W/kg

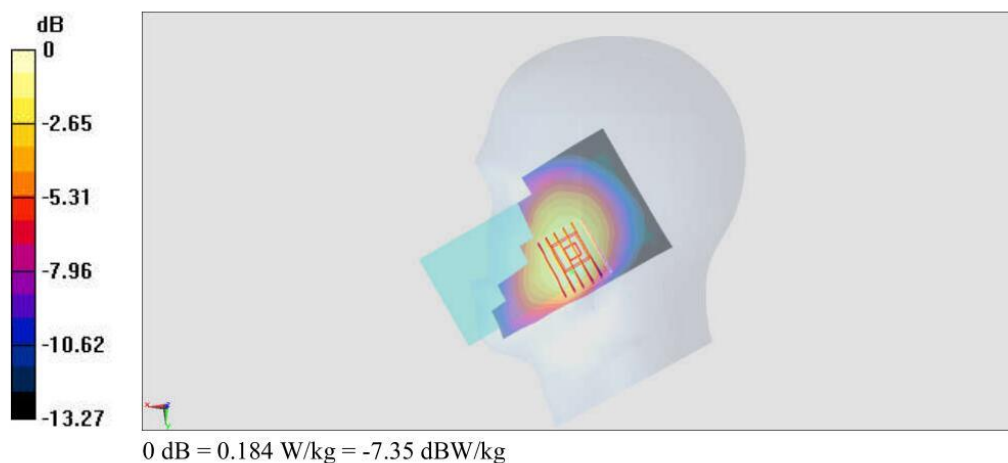
Zoom Scan (7x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.91 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.205 W/kg

SAR(1 g) = 0.144 W/kg; SAR(10 g) = 0.107 W/kg

Maximum value of SAR (measured) = 0.184 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/14

#15_FR1 n28_30M_QPSK_80_40_Left Cheek_Ch143600

Communication System: FR1; Frequency: 718 MHz; Duty Cycle: 1:1

Medium: HSL_750_211214 Medium parameters used: $f = 718 \text{ MHz}$; $\sigma = 0.873 \text{ S/m}$; $\epsilon_r = 43.279$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : $23.5 \text{ }^\circ\text{C}$; Liquid Temperature : $22.5 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(9.09, 9.09, 9.09) @ 718 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (71x121x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 1.26 W/kg

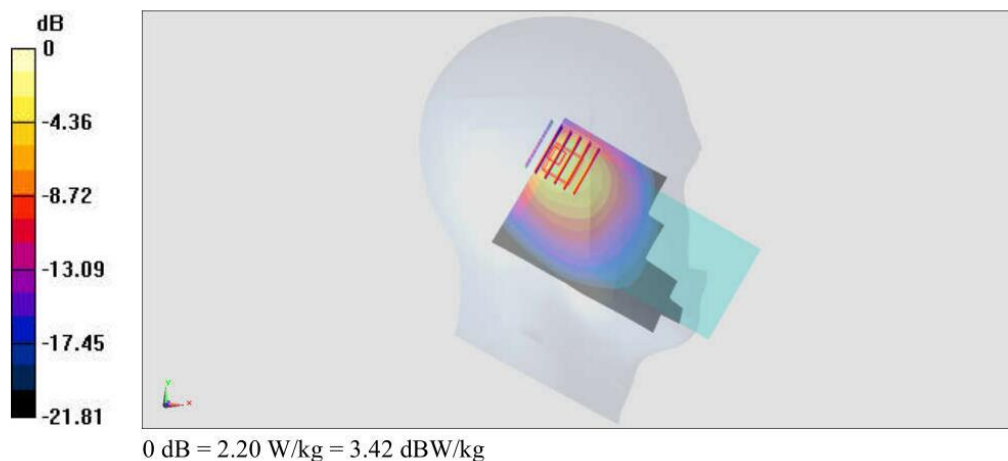
Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 36.01 V/m ; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.16 W/kg

SAR(1 g) = 1.05 W/kg ; SAR(10 g) = 0.532 W/kg

Maximum value of SAR (measured) = 2.20 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/16

#16_FR1 n38_40M_QPSK_50_25_Left Tilted_Ch519996

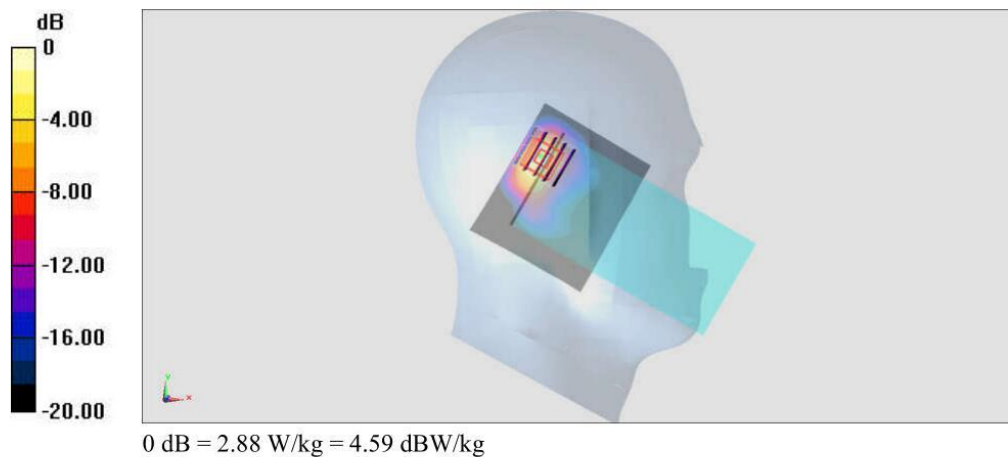
Communication System: FR1; Frequency: 2599.98 MHz; Duty Cycle: 1:1
 Medium: HSL_2600_211216 Medium parameters used: $f = 2600$ MHz; $\sigma = 1.94$ S/m; $\epsilon_r = 37.954$; $\rho = 1000$ kg/m³
 Ambient Temperature : 23.2 °C; Liquid Temperature : 22.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(7.13, 7.13, 7.13) @ 2599.98 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4);SEMCAD X Version 14.6.14 (7483)

Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 2.59 W/kg

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 38.39 V/m; Power Drift = -0.06 dB
 Peak SAR (extrapolated) = 3.55 W/kg
SAR(1 g) = 1.65 W/kg; SAR(10 g) = 0.684 W/kg
 Maximum value of SAR (measured) = 2.88 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/16

#17_FR1 n41_100M_QPSK_135_67_Right Cheek_Ch528000

Communication System: FR1; Frequency: 2640 MHz; Duty Cycle: 1:1

Medium: HSL_2600_211216 Medium parameters used: $f = 2640$ MHz; $\sigma = 1.989$ S/m; $\epsilon_r = 37.804$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(7.13, 7.13, 7.13) @ 2640 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (71x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.191 W/kg

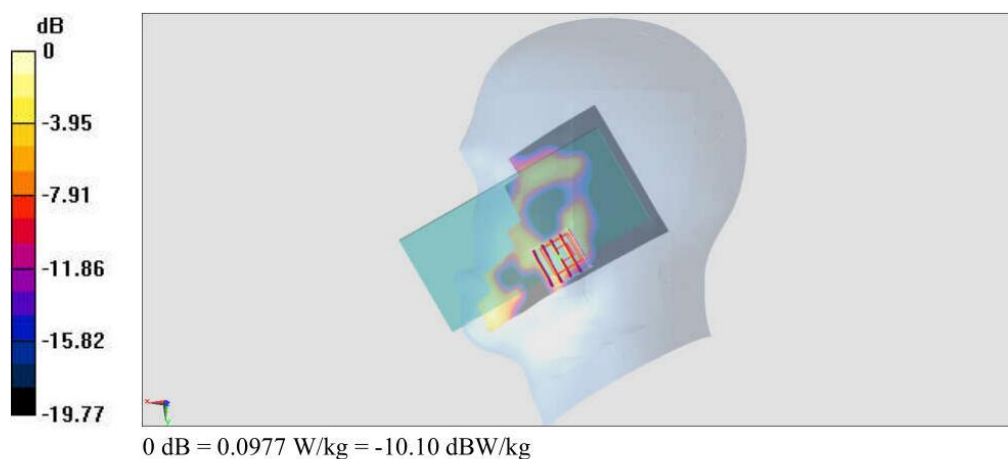
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.874 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.131 W/kg

SAR(1 g) = 0.063 W/kg; SAR(10 g) = 0.033 W/kg

Maximum value of SAR (measured) = 0.0977 W/kg



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2021/12/16

#18_FR1 n78_100M_QPSK_135_67_Right Cheek_Ch623334

Communication System: FR1; Frequency: 3350.01 MHz; Duty Cycle: 1:1
 Medium: HSL_3300-4200_211216 Medium parameters used: $f = 3350.01$ MHz; $\sigma = 2.858$
 S/m ; $\epsilon_r = 38.498$; $\rho = 1000$ kg/m³
 Ambient Temperature : 23.2 °C ; Liquid Temperature : 22.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3642; ConvF(6.87, 6.87, 6.87) @ 3350.01 MHz; Calibrated: 2021/4/26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn699; Calibrated: 2021/2/16
- Phantom: SAM_Right; Type: SAM; Serial: TP:1446
- Measurement SW: DASY52, Version52.10 (4); SEMCAD X Version 14.6.14 (7483)

Area Scan (101x181x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm
 Maximum value of SAR (interpolated) = 2.88 W/kg

Zoom Scan (9x9x7)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=1.4$ mm
 Reference Value = 25.16 V/m; Power Drift = 0.07 dB
 Peak SAR (extrapolated) = 5.53 W/kg
SAR(1 g) = 1.61 W/kg; SAR(10 g) = 0.574 W/kg
 Maximum value of SAR (measured) = 3.56 W/kg

