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# TEST REPORT FOR SAR TESTING

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Report No.: SRTC2022-9004(F)-22030905(H)

Product Name: LTE/WCDMA/GSM(GPRS) Multi-Mode

Digital Mobile Phone

Product Model: Z2335CC

Applicant: ZTE Corporation.

Manufacturer: ZTE Corporation.

Specification: Part 2.1093

IEEE Std 1528

KDB Procedures

FCC ID: SRQ-Z2335CC

The State Radio\_monitoring\_center Testing Center (SRTC)

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## **1. GENERAL INFORMATION**

### **1.1 Notes of the test report**

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio\_monitoring\_center Testing Center (SRTC).

The test results relate only to individual items of the samples which have been tested.

The certification and accreditation identifiers used in this report shall not be applicable to the tested or calibrated samples thereof. The manufacturer shall not mark the tested samples or items (or a separate part of the item) with the identifiers of certification and accreditation to mislead relevant parties about the tested samples or items.

### **1.2 Information about the testing laboratory**

Company:	The State Radio_monitoring_center Testing Center (SRTC)
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City:	Shenzhen
Country or Region:	P.R. China
Contacted person:	Gong Yu
Tel:	021-68895397
Fax:	---
Email:	gongyu@zte.com.cn

## 1.5 Test Environment

Date of Receipt of test sample at SRTC:	2022.03.10
Testing Start Date:	2022.03.11
Testing End Date:	2022.03.12

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	40

Normal Supply Voltage (Vdc.):	3.8
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## 2. DESCRIPTION OF THE DEVICE UNDER TEST

### 2.1 Final Equipment Build Status

Wireless Technology and Frequency Bands	<input checked="" type="checkbox"/> GSM Band: GSM850/PCS1900 <input checked="" type="checkbox"/> WCDMA Band: FDD2/4/5 <input checked="" type="checkbox"/> LTE Band: 2/4/5/12/25/41/66/71 <input checked="" type="checkbox"/> Bluetooth Band: 2.4GHz
Mode	GSM <input checked="" type="checkbox"/> Voice (GMSK) <input checked="" type="checkbox"/> GPRS (GMSK) <input checked="" type="checkbox"/> EGPRS (GMSK/8PSK) WCDMA <input checked="" type="checkbox"/> UMTS Rel. 99 (Voice & Data) <input checked="" type="checkbox"/> HSDPA (Rel. 5) <input checked="" type="checkbox"/> HSUPA (Rel. 6) <input type="checkbox"/> HSPA+ (Rel.7 ) <input type="checkbox"/> DC-HSDPA (Rel.8 ) Bluetooth <input checked="" type="checkbox"/> BR(GFSK) <input checked="" type="checkbox"/> EDR( $\pi/4$ DQPSK , 8-DPSK) <input checked="" type="checkbox"/> BLE(GFSK) LTE <input checked="" type="checkbox"/> QPSK <input checked="" type="checkbox"/> 16QAM <input checked="" type="checkbox"/> 64QAM
Duty Cycle*	GPRS: 12.5% (1 Slot), 25% (2 Slots), 37.5% (3 Slots), 50% (4 Slots) EDGE(GMSK/8PSK) 12.5% (1 Slot), 25% (2 Slots), 37.5% (3 Slots), 50% (4 Slots) WCDMA: 100% LTE(FDD): 100% LTE(TDD): maximum63.3% BT BR 1M:46.1% BT EDR 2M:46.1% BT EDR 3M:46.0% BLE:61.8%
Multi-Slot Class for GPRS/EDGE	<input type="checkbox"/> Class 8 - One Up <input type="checkbox"/> Class 10 - Two Up <input checked="" type="checkbox"/> Class 12 - Four Up <input type="checkbox"/> Class 33- Four Up
Mobile Phone Capability	<input type="checkbox"/> Class A - Mobile phones can be connected to both GPRS and GSM services simultaneously. <input checked="" type="checkbox"/> Class B - Mobile phones can be attached to both GPRS and GSM services, using one service at a time. <input type="checkbox"/> Class C - Mobile phones are attached to either GPRS or GSM voice service. You need to switch manually between services
DTM	Not Supported
Note	For licensed cellular network duty cycle is inherent. This device not support Hotspot mode.

## 2.2 Support Equipment

The following support equipment was used to exercise the DUT during testing:

State of sample	Normal
Batteries	Battery1:Li3816T43P4h604550/Jiada Energy Technolog Co.,Ltd Battery2:Li3816T43P4h604550/Shanghai BYD Company Ltd.
H/W Version	Z2335CCHW1.0
S/W Version	Z2335CCV1.0.0B01
IMEI	862674048697626
Notes	We verified the results of the two batteries and selected battery 1 as the worst case to perform the test.

## 3. REFERENCE SPECIFICATION

Specification	Version	Title
Part 2.1093	2019	Radiofrequency radiation exposure evaluation: portable devices.
IEEE Std 1528	2013	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 447498 D01	v06	General RF Exposure Guidance
KDB 447498 D02	v02r01	SAR MEASUREMENT PROCEDURES FOR USB DONGLE TRANSMITTERS
KDB 648474 D04	v01r03	Handset SAR
KDB 941225 D01	v03r01	3G SAR Procedures
KDB 248227 D01	v02r02	SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS
KDB 865664 D01	v01r04	SAR Measurement from 100 MHz to 6 GHz
KDB 865664 D02	v01r02	RF Exposure Reporting
KDB 941225 D05	v02r05	SAR for LTE Devices

## **4. TEST CONDITIONS**

### **4.1 Picture to demonstrate the required liquid depth**

The liquid depth is large than 15cm in the used SAM phantoms in flat section, and the depth of the tissue simulant was  $15.0 \pm 0.5$  cm measured from the ear reference point during system checking and device measurements.



Liquid depth for SAR Measurement

### **4.2 Test Signal, Frequencies and Output Power**

The device was put into operation by using a call tester. Communication between the device and the call tester was established by air link.

The device output power was set to maximum power level for all tests; a fully charged battery was used for every test sequence.

In all operating bands the measurements were performed on middle channel, and few of them were also performed on lowest and highest channels.

### **4.3 SAR Measurement Set-up**

The system is based on a high precision robot (working range greater than 0.9m), which positions the probes with a positional repeatability of better than  $\pm 0.02$ mm. Special E-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length =300mm) to the data acquisition unit. A cell controller system contains the power supply, robot controller, teaches pendant (Joystick), and remote control, is used to drive the robot motors.

The PC consists of the Micron Pentium IV computer with Win7 system and SAR Measurement Software DASY5 Professional, A/D interface card, monitor, mouse, and keyboard. The Stäubli Robot is connected to the cell controller to allow software manipulation of the robot.

A data acquisition electronic (DAE) circuit performs the signal amplification; signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card. The DAE consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines.

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

The robot uses its own controller with a built in VME-bus computer.

#### **4.4 Phantoms**

The phantom used for all tests i.e. for both system checks and device testing, was the twin headed "SAM Phantom", manufactured by SPEAG. The phantom conforms to the requirements of IEEE 1528.

System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

The SPEAG device holder was used to position the device in all tests whilst a tripod was used to position the validation dipoles against the flat section of phantom.

#### **4.5 Tissue Simulants**

Recommended values for the dielectric parameters of the tissue simulants are given in IEEE 1528. All tests were carried out using simulants whose dielectric parameters were within  $\pm 10\%$  below 3GHz and  $\pm 5\%$  above 3GHz of the recommended values when use DASY system according to KDB865664D01. All tests were carried out within 24 hours of measuring the dielectric parameters.



<b>Tissue Stimulant Recipes</b>	
Name	Broadband tissue-equivalent liquid
Type	HBBL600-6000V6 Simulating Liquid
Note: The stimulant could be the same for head and body.	

## 4.6 DESCRIPTION OF THE TEST PROCEDURE

### 4.6.1 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the Dasy system.



**Device holder supplied by SPEAG**

## 4.6.2 Test Exposure Conditions

### 4.6.2.1 Head Configuration

Measurements were made in “cheek” and “tilt” positions on both the left hand and right-hand sides of the phantom.

The positions used in the measurements were according to IEEE 1528 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

### 4.6.2.2 Body Worn Configuration

The device was placed in the SPEAG holder below the flat section of the phantom. The distance between the device and the phantom was kept at the separation distance using a separate flat spacer that was removed before the start of the measurements. And the distance is normally determined according to the actual scene which might be the worst use condition for general exposure. The device's front and rear were oriented facing the phantom since these orientations give higher results for most regular portable devices.

### 4.6.2.3 Hotspot Configuration

Hotspot mode SAR is measured for all edges and surfaces of the device with a transmitting antenna located within 25 mm from that surface or edge; for the data modes, wireless technologies and frequency bands supporting hotspot mode.

## 4.6.3 Scan Procedure

First, area scans were used for determination of the field distribution and the approximate location of the local peak SAR values. The SAR distribution is scanned along the inside surface, at least for an area larger than the projection of the handset and antenna. The angle between the probe axis and the surface normal line is recommended but not required to be less than 30°. The SAR distribution is first measured on a 2-D coarse grid. The scan region should cover all areas that are exposed and encompassed by the projection of the handset. There are 15 mm × 15 mm (equal or less than 2GHz), 12 mm × 12 mm (from 2GHz~4GHz) and 10mm x 10mm (from 4GHz~6GHz) measurement grid used when two staggered one-dimensional cubic splines are used to estimate the maximum SAR location.

When the reported 1g-SAR estimated by area scan is less than 1.40 w/kg.

Zoom scan was performed by using the configuration mentioned below or more conservative scan area and step to determine the averaged SAR value. Drift was determined by measuring the same point at the start of the area scan and again at the end of the zoom scan.

Below 3GHz: 32mmX32mmX30mm scan area with 8 mm X8 mm X5 mm steps

2GHz-3GHz: 32mmX32mmX30mm scan area with 8 mm X8 mm X5 mm steps

3GHz-4GHz: 28mmX28mmX28mm scan area with 7 mm X7 mm X4 mm steps

4GHz-5GHz: 25mmX25mmX24mm scan area with 5 mm X5 mm X3 mm steps

5GHz-6GHz: 25mmX25mmX22mm scan area with 5 mm X5 mm X2 mm steps

#### **4.6.4 SAR Averaging Methods**

The maximum SAR value was averaged over a cube of tissue using interpolation and extrapolation.

The interpolation, extrapolation and maximum search routines within DASY5 are all based on the modified Quadratic Shepard's method (Robert J. Renka, "Multivariate Interpolation of Large Sets of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988, pp. 139-148).

The interpolation scheme combines a least-square fitted function method with a weighted average method. A trivariate 3-D / bivariate 2-D quadratic function is computed for each measurement point and fitted to neighboring points by a least-square method. For the zoom scan, inverse distance weighting is incorporated to fit distant points more accurately. The interpolating function is finally calculated as a weighted average of the quadratics.

In the zoom scan, the interpolation function is used to extrapolate the Peak SAR from the deepest measurement points to the inner surface of the phantom.

## 5 RESULT SUMMAR

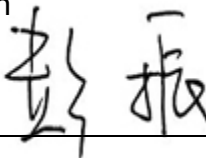


The maximum reported SAR values for Head configuration and Body Worn configuration are given as follows. The device conforms to the requirements of the standard(s) when the maximum reported SAR value is less than or equal to the limit.

Exposure Position	Frequency Band	1g-SAR Reported Result (W/kg)	Highest 1g-SAR Reported Result (W/kg)	Limit 1g-SAR (W/kg)	Result
Head	GSM 850	0.13	0.29	1.60	PASS
	GSM 1900	0.05			
	WCDMA Band 2	0.10			
	WCDMA Band 4	0.06			
	WCDMA Band 5	0.15			
	LTE Band 2	0.08			
	LTE Band 4	0.07			
	LTE Band 5	0.21			
	LTE Band 12	0.29			
	LTE Band 25	0.08			
	LTE Band 41	0.07			
	LTE Band 66	0.06			
	LTE Band 71	0.21			
	BT/BLE 2.4GHz Band	0.23			
Body-Worn	GSM 850	0.98	1.31	1.60	PASS
	GSM 1900	1.08			
	WCDMA Band 2	0.86			
	WCDMA Band 4	0.54			
	WCDMA Band 5	0.64			
	LTE Band 2	0.97			
	LTE Band 4	1.00			
	LTE Band 5	0.69			
	LTE Band 12	0.30			
	LTE Band 25	0.97			
	LTE Band 41	1.31			
	LTE Band 41 <sup>Note1</sup>	1.29			
	LTE Band 66	0.96			
	LTE Band 71	0.35			
BT/BLE 2.4GHz Band	0.12				

Note1: The worst-case spot test results for modified product.

Simultaneous Transmission Summary

Exposure Position	Frequency Band	1g-SAR Reported Result (W/kg)	Highest 1g-SAR Reported Result (W/kg)		Limit 1g-SAR (W/kg)	Result
Head	GSM & BT/BLE	0.37	0.52	1.43	1.60	PASS
	WCDMA & BT/BLE	0.38				
	LTE & BT/BLE	0.52				
Body-Worn	GSM & BT/BLE	1.20	1.43	1.43	1.60	PASS
	WCDMA & BT/BLE	0.97				
	LTE & BT/BLE	1.43				

This Test Report Is Issued by: Mr. Peng Zhen 	Checked by: Mr. Li Bin 
Tested by: Ms. Li Jin 	Issued date:  20220315

## 6 TEST RESULT

### 6.1 Manufacturing Tolerance

#### GSM

##### GSM850

Carrier frequency (MHz)	Channel No.	Tolerance (dBm)
824.2	128	29.1~33.1
836.4	189	
848.8	251	

##### GPRS/EGPRS (GMSK):

Carrier frequency (MHz)	Channel No.	TX Mode	Tolerance (dBm)
824.2	128	4Downlink1uplink	29.1~33.1
836.4	189		
848.8	251		
824.2	128	3Downlink2uplink	26.0~30.0
836.4	189		
848.8	251		
824.2	128	2Downlink3uplink	24.5~28.5
836.4	189		
848.8	251		
824.2	128	1Downlink4uplink	23.0~27.0
836.4	189		
848.8	251		

##### EGPRS (8PSK):

Carrier frequency (MHz)	Channel No.	TX Mode	Tolerance (dBm)
824.2	128	8PSK 4Downlink1uplink	23.1~27.1
836.4	189		
848.8	251		
824.2	128	8PSK 3Downlink2uplink	20.5~24.5
836.4	189		
848.8	251		
824.2	128	8PSK 2Downlink3uplink	19.0~23.0
836.4	189		
848.8	251		
824.2	128	8PSK 1Downlink4uplink	17.5~21.5
836.4	189		
848.8	251		

PCS1900:

Carrier frequency (MHz)	Channel No.	Tolerance (dBm)
1850.2	512	26.0~30.0
1880.0	661	
1909.8	810	

GPRS/EGPRS (GMSK):

Carrier frequency (MHz)	Channel No.	TX Mode	Tolerance (dBm)
1850.2	512	4Downlink1uplink	27.3~31.3
1880.0	661		
1909.8	810		
1850.2	512	3Downlink2uplink	24.5~28.5
1880.0	661		
1909.8	810		
1850.2	512	2Downlink3uplink	23.0~27.0
1880.0	661		
1909.8	810		
1850.2	512	1Downlink4uplink	21.5~25.5
1880.0	661		
1909.8	810		

EGPRS (8PSK):

Carrier frequency (MHz)	Channel No.	TX Mode	Tolerance (dBm)
1850.2	512	8PSK 4Downlink1uplink	23.0~27.0
1880.0	661		
1909.8	810		
1850.2	512	8PSK 3Downlink2uplink	21.0~25.0
1880.0	661		
1909.8	810		
1850.2	512	8PSK 2Downlink3uplink	18.5~22.5
1880.0	661		
1909.8	810		
1850.2	512	8PSK 1Downlink4uplink	17.5~21.5
1880.0	661		
1909.8	810		

### WCDMA

#### WCDMA band II

Mode		Carrier frequency (MHz)	Channel No.	Tolerance (dBm)
Release 99	RMC,12.2kbps	1852.4	9262	16.7~20.7
		1880.0	9400	
		1907.6	9538	
	RMC,64kbps	1852.4	9262	
		1880.0	9400	
		1907.6	9538	
	RMC,144kbps	1852.4	9262	
		1880.0	9400	
		1907.6	9538	
	RMC,384kbps	1852.4	9262	
		1880.0	9400	
		1907.6	9538	
AMR,12.2kbps	1852.4	9262		
	1880.0	9400		
	1907.6	9538		
HSDPA	Subtest 1	1852.4	9262	16.0~20.0
		1880.0	9400	
		1907.6	9538	
	Subtest 2	1852.4	9262	
		1880.0	9400	
		1907.6	9538	
	Subtest 3	1852.4	9262	
		1880.0	9400	
		1907.6	9538	
	Subtest 4	1852.4	9262	
		1880.0	9400	
		1907.6	9538	
HSUPA	Subtest 1	1852.4	9262	16.0~20.0
		1880.0	9400	
		1907.6	9538	
	Subtest 2	1852.4	9262	
		1880.0	9400	
		1907.6	9538	
	Subtest 3	1852.4	9262	
		1880.0	9400	
		1907.6	9538	
	Subtest 4	1852.4	9262	
		1880.0	9400	
		1907.6	9538	
	Subtest 5	1852.4	9262	
		1880.0	9400	
		1907.6	9538	



WCDMA band IV

Mode		Carrier frequency (MHz)	Channel No.	Tolerance (dBm)
Release 99	RMC,12.2kbps	1712.4	1312	18.8~22.8
		1732.4	1412	
		1752.6	1513	
	RMC,64kbps	1712.4	1312	
		1732.4	1412	
		1752.6	1513	
	RMC,144kbps	1712.4	1312	
		1732.4	1412	
		1752.6	1513	
	RMC,384kbps	1712.4	1312	
		1732.4	1412	
		1752.6	1513	
AMR,12.2kbps	1712.4	1312		
	1732.4	1412		
	1752.6	1513		
HSDPA	Subtest 1	1712.4	1312	18.0~22.0
		1732.4	1412	
		1752.6	1513	
	Subtest 2	1712.4	1312	
		1732.4	1412	
		1752.6	1513	
	Subtest 3	1712.4	1312	
		1732.4	1412	
		1752.6	1513	
	Subtest 4	1712.4	1312	
		1732.4	1412	
		1752.6	1513	
HSUPA	Subtest 1	1712.4	1312	18.0~22.0
		1732.4	1412	
		1752.6	1513	
	Subtest 2	1712.4	1312	
		1732.4	1412	
		1752.6	1513	
	Subtest 3	1712.4	1312	
		1732.4	1412	
		1752.6	1513	
	Subtest 4	1712.4	1312	
		1732.4	1412	
		1752.6	1513	
	Subtest 5	1712.4	1312	
		1732.4	1412	
		1752.6	1513	

WCDMA band V

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
Release 99	RMC,12.2kbps	826.4	4132	18.8~22.8
		836.6	4183	
		846.6	4233	
	RMC,64kbps	826.4	4132	
		836.6	4183	
		846.6	4233	
	RMC,144kbps	826.4	4132	
		836.6	4183	
		846.6	4233	
	RMC,384kbps	826.4	4132	
		836.6	4183	
		846.6	4233	
AMR,12.2kbps	826.4	4132		
	836.6	4183		
	846.6	4233		
HSDPA	Subtest 1	826.4	4132	18.0~22.0
		836.6	4183	
		846.6	4233	
	Subtest 2	826.4	4132	
		836.6	4183	
		846.6	4233	
	Subtest 3	826.4	4132	
		836.6	4183	
		846.6	4233	
	Subtest 4	826.4	4132	
		836.6	4183	
		846.6	4233	
HSUPA	Subtest 1	826.4	4132	18.0~22.0
		836.6	4183	
		846.6	4233	
	Subtest 2	826.4	4132	
		836.6	4183	
		846.6	4233	
	Subtest 3	826.4	4132	
		836.6	4183	
		846.6	4233	
	Subtest 4	826.4	4132	
		836.6	4183	
		846.6	4233	
	Subtest 5	826.4	4132	
		836.6	4183	
		846.6	4233	

### LTE

Note: RB allocation mentioned below is for all Bandwidths, and the Frequency Range are divided to 3 ranges (Low, Mid, High)

### Band 2

BW	Modulation	RB allocation with different offset	Frequency range	Tolerance (dBm)
All Bandwidth	QPSK	1	Low	18.7~22.7
			Mid	
			High	
		50%	Low	17.6~21.6
			Mid	
			High	
		100%	Low	17.7~21.7
			Mid	
			High	
	16QAM	1	Low	17.3~21.3
			Mid	
			High	
		50%	Low	17.0~21.0
			Mid	
			High	
		100%	Low	17.0~21.0
			Mid	
			High	
	64QAM	1	Low	17.3~21.3
			Mid	
			High	
		50%	Low	17.0~21.0
			Mid	
			High	
100%		Low	17.0~21.0	
		Mid		
		High		

**Band 4**

BW	Modulation	RB allocation with different offset	Frequency range	Tolerance (dBm)
All Bandwidth	QPSK	1	Low	19.5~23.5
			Mid	
			High	
		50%	Low	18.6~22.6
			Mid	
			High	
		100%	Low	18.6~22.6
			Mid	
			High	
	16QAM	1	Low	18.6~22.6
			Mid	
			High	
		50%	Low	18.0~22.0
			Mid	
			High	
		100%	Low	18.0~22.0
			Mid	
			High	
	64QAM	1	Low	18.6~22.6
			Mid	
			High	
		50%	Low	18.0~22.0
			Mid	
			High	
100%		Low	18.0~22.0	
		Mid		
		High		

**Band 5**

BW	Modulation	RB allocation with different offset	Frequency range	Tolerance (dBm)
All Bandwidth	QPSK	1	Low	19.5~23.5
			Mid	
			High	
		50%	Low	18.5~22.5
			Mid	
			High	
		100%	Low	18.5~22.5
			Mid	
			High	
	16QAM	1	Low	18.5~22.5
			Mid	
			High	
		50%	Low	18.0~22.0
			Mid	
			High	
		100%	Low	18.0~22.0
			Mid	
			High	
	64QAM	1	Low	18.5~22.5
			Mid	
			High	
		50%	Low	18.0~22.0
			Mid	
			High	
100%		Low	18.0~22.0	
		Mid		
		High		

## Band 12

BW	Modulation	RB allocation with different offset	Frequency range	Tolerance (dBm)
All Bandwidth	QPSK	1	Low	19.0~23.0
			Mid	
			High	
		50%	Low	18.0~22.0
			Mid	
			High	
		100%	Low	18.0~22.0
			Mid	
			High	
	16QAM	1	Low	18.0~22.0
			Mid	
			High	
		50%	Low	18.0~21.0
			Mid	
			High	
		100%	Low	18.2~21.2
			Mid	
			High	
	64QAM	1	Low	18.0~22.0
			Mid	
			High	
		50%	Low	18.0~21.0
			Mid	
			High	
100%		Low	18.2~21.2	
		Mid		
		High		

**Band 25**

BW	Modulation	RB allocation with different offset	Frequency range	Tolerance (dBm)
All Bandwidth	QPSK	1	Low	19.0~23.0
			Mid	
			High	
		50%	Low	18.0~22.0
			Mid	
			High	
		100%	Low	18.0~22.0
			Mid	
			High	
	16QAM	1	Low	18.0~22.0
			Mid	
			High	
		50%	Low	17.0~21.0
			Mid	
			High	
		100%	Low	17.0~21.0
			Mid	
			High	
	64QAM	1	Low	18.0~22.0
			Mid	
			High	
		50%	Low	17.0~21.0
			Mid	
			High	
100%		Low	17.0~21.0	
		Mid		
		High		

**Band 41**

BW	Modulation	RB allocation with different offset	Frequency range	Tolerance (dBm)
All Bandwidth	QPSK	1	Low	20.0~24.0
			Mid	
			High	
		50%	Low	19.0~23.0
			Mid	
			High	
		100%	Low	19.1~23.1
			Mid	
			High	
	16QAM	1	Low	19.0~23.0
			Mid	
			High	
		50%	Low	18.0~22.0
			Mid	
			High	
		100%	Low	18.0~22.0
			Mid	
			High	
	64QAM	1	Low	19.0~23.0
			Mid	
			High	
		50%	Low	18.0~22.0
			Mid	
			High	
100%		Low	18.0~22.0	
		Mid		
		High		



**Band 66**

BW	Modulation	RB allocation with different offset	Frequency range	Tolerance (dBm)
All Bandwidth	QPSK	1	Low	19.5~23.5
			Mid	
			High	
		50%	Low	19.0~23.0
			Mid	
			High	
		100%	Low	19.0~23.0
			Mid	
			High	
	16QAM	1	Low	18.0~22.0
			Mid	
			High	
		50%	Low	18.0~22.0
			Mid	
			High	
		100%	Low	18.0~22.0
			Mid	
			High	
	64QAM	1	Low	18.0~22.0
			Mid	
			High	
		50%	Low	18.0~22.0
			Mid	
			High	
100%		Low	18.0~22.0	
		Mid		
		High		

**Band 71**

BW	Modulation	RB allocation with different offset	Frequency range	Tolerance (dBm)
All Bandwidth	QPSK	1	Low	20.0~24.0
			Mid	
			High	
		50%	Low	19.0~23.0
			Mid	
			High	
		100%	Low	19.0~23.0
			Mid	
			High	
	16QAM	1	Low	19.5~23.5
			Mid	
			High	
		50%	Low	18.0~22.0
			Mid	
			High	
		100%	Low	18.0~22.0
			Mid	
			High	
	64QAM	1	Low	19.5~23.5
			Mid	
			High	
		50%	Low	18.0~22.0
			Mid	
			High	
100%		Low	18.0~22.0	
		Mid		
		High		

**Bluetooth**

Modulation type	Tolerance (dBm)		
	2402MHz(Ch0)	2441MHz(Ch39)	2480MHz(Ch78)
GFSK	3.4~7.4		
$\pi/4$ DQPSK	2.6~6.6		
8DPSK	2.1~6.1		

**Bluetooth (BLE)**

Modulation type	Average Power Output (dBm)		
	2402MHz (Ch0)	2440MHz (Ch19)	2480MHz (Ch39)
GFSK (LE 1Mbps)	-1.0~3.0		

## 6.2 GSM Measurement result

GSM850

GSM Measured Power:

Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)	Frame average power(dBm)
824.2	128	33.02	23.99
836.4	189	32.79	23.76
848.8	251	32.85	23.82

GPRS/EGPRS (GMSK) Measured Power:

Carrier frequency (MHz)	Channel No.	TX Mode	RF Power Output (dBm)	Frame average power(dBm)
824.2	128	4Downlink1uplink	33.02	23.99
836.4	189		32.79	23.76
848.8	251		32.85	23.82
824.2	128	3Downlink2uplink	29.85	23.83
836.4	189		29.88	23.86
848.8	251		29.83	23.81
824.2	128	2Downlink3uplink	28.23	<b>23.97</b>
836.4	189		28.31	<b>24.05</b>
848.8	251		28.22	<b>23.96</b>
824.2	128	1Downlink4uplink	26.57	23.56
836.4	189		26.71	23.70
848.8	251		26.51	23.50

EGPRS (8PSK) Measured Power:

Carrier frequency (MHz)	Channel No.	TX Mode	RF Power Output (dBm)	Frame average power(dBm)
824.2	128	8PSK 4Downlink1uplink	27.06	18.03
836.4	189		27.08	18.05
848.8	251		26.93	17.90
824.2	128	8PSK 3Downlink2uplink	24.31	18.29
836.4	189		24.36	18.34
848.8	251		24.28	18.26
824.2	128	8PSK 2Downlink3uplink	22.56	18.30
836.4	189		22.63	18.37
848.8	251		22.57	18.31
824.2	128	8PSK 1Downlink4uplink	21.30	18.29
836.4	189		21.32	18.31
848.8	251		21.26	18.25

PCS1900

GSM Measured Power:

Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)	Frame average power(dBm)
1850.2	512	29.82	20.79
1880.0	661	29.75	20.72
1909.8	810	29.84	20.81

GPRS/EGPRS (GMSK) Measured Power:

Carrier frequency (MHz)	Channel No.	TX Mode	RF Power Output (dBm)	Frame average power(dBm)
1850.2	512	4Downlink1uplink	31.14	22.11
1880.0	661		30.95	21.92
1909.8	810		31.23	22.20
1850.2	512	3Downlink2uplink	28.17	22.15
1880.0	661		27.76	21.74
1909.8	810		28.43	22.41
1850.2	512	2Downlink3uplink	26.70	<b>22.44</b>
1880.0	661		26.32	<b>22.06</b>
1909.8	810		26.82	<b>22.56</b>
1850.2	512	1Downlink4uplink	25.45	22.44
1880.0	661		24.67	21.66
1909.8	810		25.37	22.36

EGPRS (8PSK) Measured Power:

Carrier frequency (MHz)	Channel No.	TX Mode	RF Power Output (dBm)	Frame average power(dBm)
1850.2	512	8PSK 4Downlink1uplink	26.68	17.65
1880.0	661		26.07	17.04
1909.8	810		26.50	17.47
1850.2	512	8PSK 3Downlink2uplink	24.08	18.06
1880.0	661		24.53	18.51
1909.8	810		23.91	17.89
1850.2	512	8PSK 2Downlink3uplink	22.42	18.16
1880.0	661		21.76	17.50
1909.8	810		22.32	18.06
1850.2	512	8PSK 1Downlink4uplink	21.22	18.21
1880.0	661		20.89	17.88
1909.8	810		21.04	18.03

**Division Factors (for Measured Power and Frame Average Power):**

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

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

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

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

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

According to the frame average conducted power, the SAR measurements are performed with **3Txslots (3uplink)** of GPRS850 (GMSK) and **3Txslots (3uplink)** of GPRS1900 (GMSK).

### 6.3 WCDMA Measurement result

#### Release 99

The following procedures are according to FCC KDB Publication 941225 D01.

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 1
	RMC mode AMR mode	12.2kbps RMC 12.2kbps RMC in 3.4 kbps SRB
	Power Control Algorithm	Algorithm2
	$\beta_c/\beta_d$	8/15

#### Release 5

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121.

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{hs}^{(1)}$	CM(dB) <sup>(2)</sup>
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 <sup>(3)</sup>	15/15 <sup>(3)</sup>	64	12/15 <sup>(3)</sup>	24/15	1.0
3	15/15	8/15	64	15/18	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$ .

Note2: CM=1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ .

Note3: For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1,TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ .

### Release 6

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121.

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (S F)	$\beta_c/\beta_d$	$\beta_{hs}^{(1)}$	$\beta_{ec}$	$\beta_{ed}$	$\beta_{ed}$ (S F)	$\beta_{ed}$ (code s)	CM <sup>(2)</sup> (dB)	MP R (d B)	AG <sup>(4)</sup> Index	E-TF CI
1	11/15 <sup>(3)</sup>	15/15 <sup>(3)</sup>	64	11/15 <sup>(3)</sup>	22/15	209/25	1039/25	4	1	1.0	2.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}:47/15$ $\beta_{ed2}:47/15$	4	2	2.0	2.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 <sup>(4)</sup>	15/15 <sup>(4)</sup>	64	15/15 <sup>(4)</sup>	30/15	24/15	134/15	4	1	1.0	2.0	21	81

Note1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$ .

Note2: CM=1 for  $\beta_c/\beta_d = 12/15, \beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note3: For subtest 1 the  $\beta_c/\beta_d$  ratio of 11/15 for the TFC during the measurement period(TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1, TF1) to  $\beta_c = 10/15$  and  $\beta_d = 15/15$ .

Note4: For subtest 5 the  $\beta_c/\beta_d$  ratio of 15/15 for the TFC during the measurement period(TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC(TF1, TF1) to  $\beta_c = 14/15$  and  $\beta_d = 15/15$ .

NOTE5: Testing UE using E-DPDCH Physical layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.

NOTE6:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

### Release 7

The following 1 Sub-test was completed according to Release 7 procedures in section 5.2 of 3GPP TS34.121.

Table C.11.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	$\beta_c$ (Note3)	$\beta_d$	$\beta_{HS}$ (Note1)	$\beta_{ec}$	$\beta_{ed}$ (2xSF2) (Note 4)	$\beta_{ed}$ (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TF CI (Note 5)	E-TF CI (boost)
1	1	0	30/15	30/15	$\beta_{ed1}: 30/15$ $\beta_{ed2}: 30/15$	$\beta_{ed3}: 24/15$ $\beta_{ed4}: 24/15$	3.5	2.5	14	105	105

Note 1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ .

Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).

Note 3: DPDCH is not configured, therefore the  $\beta_c$  is set to 1 and  $\beta_d = 0$  by default.

Note 4:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.



Release 8

**Table E.5.0: Levels for HSDPA connection setup**

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

**Table C.8.1.12: Fixed Reference Channel H-Set 12**

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload ( $N_{INF}$ )	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

Inf. Bit Payload

CRC Addition   CRC

Code Block Segmentation

Turbo-Encoding (R=1/3)   Tail Bits

1st Rate Matching

RV Selection

Physical Channel Segmentation

**Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)**

The following 4 Sub-tests for

HSDPA were completed according to Release 8 procedures in section 5.2 of 3GPP TS34.121.

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{hs}^{(1)}$	CM(dB) <sup>(2)</sup>
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 <sup>(3)</sup>	15/15 <sup>(3)</sup>	64	12/15 <sup>(3)</sup>	24/15	1.0
3	15/15	8/15	64	15/18	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$ .

Note2: CM=1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ .

Note3: For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ .

WCDMA band II

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
Release 99	RMC,12.2kbps	1852.4	9262	20.62
		1880.0	9400	20.44
		1907.6	9538	20.45
	RMC,64kbps	1852.4	9262	20.34
		1880.0	9400	20.28
		1907.6	9538	20.37
	RMC,144kbps	1852.4	9262	20.57
		1880.0	9400	20.41
		1907.6	9538	20.43
	RMC,384kbps	1852.4	9262	20.58
		1880.0	9400	20.28
		1907.6	9538	20.39
	AMR,12.2kbps	1852.4	9262	20.62
		1880.0	9400	20.44
		1907.6	9538	20.45
HSDPA	Subtest 1	1852.4	9262	19.49
		1880.0	9400	19.55
		1907.6	9538	19.54
	Subtest 2	1852.4	9262	19.48
		1880.0	9400	19.53
		1907.6	9538	19.50
	Subtest 3	1852.4	9262	19.38
		1880.0	9400	19.50
		1907.6	9538	19.34
	Subtest 4	1852.4	9262	19.41
		1880.0	9400	19.40
		1907.6	9538	19.39
HSUPA	Subtest 1	1852.4	9262	19.40
		1880.0	9400	19.58
		1907.6	9538	19.35
	Subtest 2	1852.4	9262	19.46
		1880.0	9400	19.55
		1907.6	9538	19.43
	Subtest 3	1852.4	9262	19.52
		1880.0	9400	19.52
		1907.6	9538	19.40
	Subtest 4	1852.4	9262	19.54
		1880.0	9400	19.63
		1907.6	9538	19.39
	Subtest 5	1852.4	9262	19.38
		1880.0	9400	19.48
		1907.6	9538	19.32

WCDMA band IV

Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
Release 99	RMC,12.2kbps	1712.4	1312	22.65
		1732.4	1412	22.72
		1752.6	1513	22.70
	RMC,64kbps	1712.4	1312	22.58
		1732.4	1412	22.68
		1752.6	1513	22.51
	RMC,144kbps	1712.4	1312	22.54
		1732.4	1412	22.61
		1752.6	1513	22.54
	RMC,384kbps	1712.4	1312	22.58
		1732.4	1412	22.64
		1752.6	1513	22.57
	AMR,12.2kbps	1712.4	1312	22.65
		1732.4	1412	22.72
		1752.6	1513	22.70
HSDPA	Subtest 1	1712.4	1312	21.77
		1732.4	1412	21.85
		1752.6	1513	21.82
	Subtest 2	1712.4	1312	21.84
		1732.4	1412	21.69
		1752.6	1513	21.70
	Subtest 3	1712.4	1312	21.70
		1732.4	1412	21.68
		1752.6	1513	21.85
	Subtest 4	1712.4	1312	21.77
		1732.4	1412	21.64
		1752.6	1513	21.84
HSUPA	Subtest 1	1712.4	1312	21.77
		1732.4	1412	21.69
		1752.6	1513	21.66
	Subtest 2	1712.4	1312	21.61
		1732.4	1412	21.62
		1752.6	1513	21.73
	Subtest 3	1712.4	1312	21.70
		1732.4	1412	21.64
		1752.6	1513	21.67
	Subtest 4	1712.4	1312	21.53
		1732.4	1412	21.71
		1752.6	1513	21.58
	Subtest 5	1712.4	1312	21.25
		1732.4	1412	21.29
		1752.6	1513	21.20

WCDMA band V

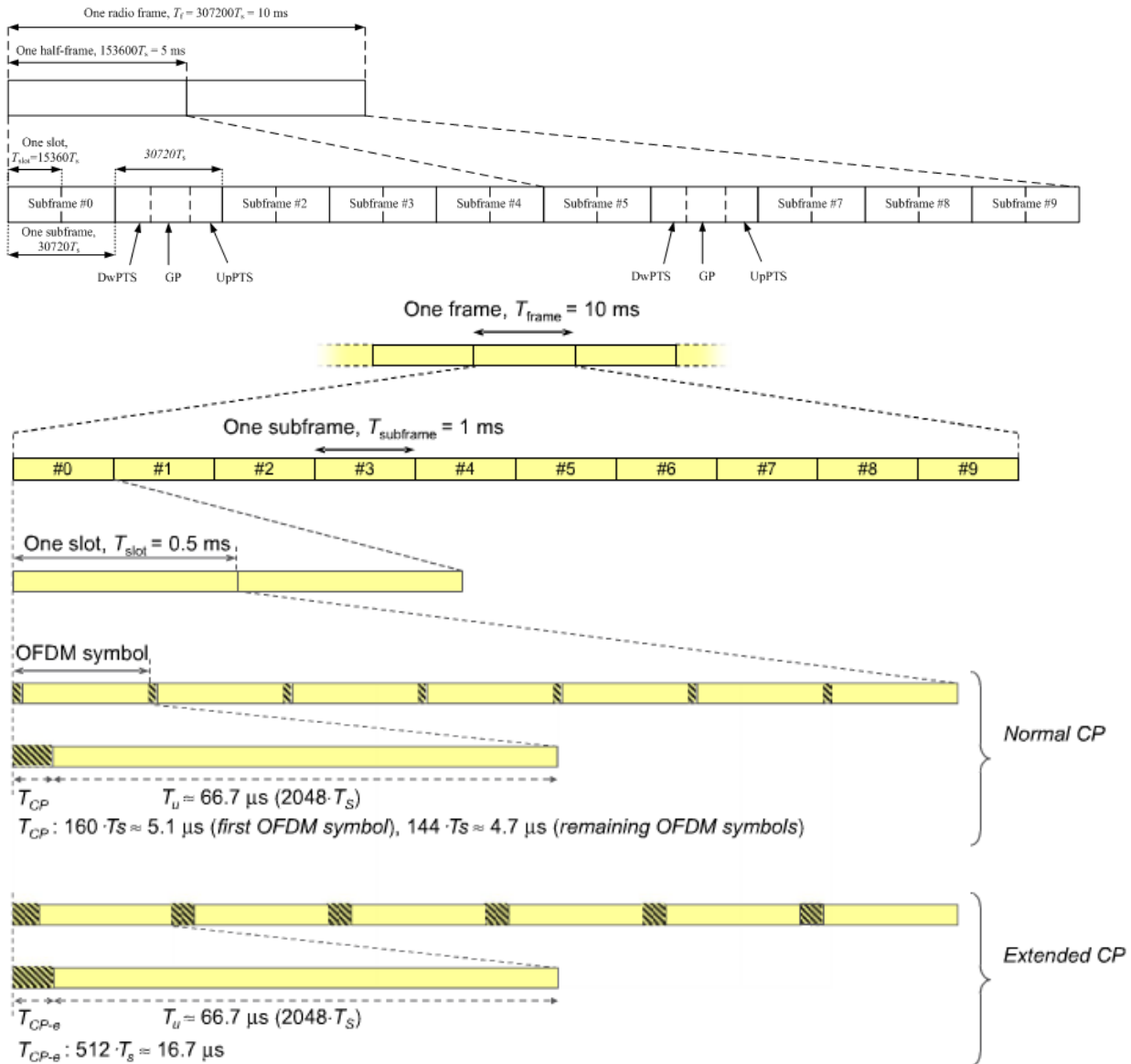
Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
Release 99	RMC,12.2kbps	826.4	4132	22.68
		836.6	4183	22.70
		846.6	4233	22.69
	RMC,64kbps	826.4	4132	22.54
		836.6	4183	22.64
		846.6	4233	22.58
	RMC,144kbps	826.4	4132	22.57
		836.6	4183	22.62
		846.6	4233	22.63
	RMC,384kbps	826.4	4132	22.59
		836.6	4183	22.54
		846.6	4233	22.62
	AMR,12.2kbps	826.4	4132	22.68
		836.6	4183	22.70
		846.6	4233	22.69
HSDPA	Subtest 1	826.4	4132	21.43
		836.6	4183	21.50
		846.6	4233	21.54
	Subtest 2	826.4	4132	21.45
		836.6	4183	21.37
		846.6	4233	21.58
	Subtest 3	826.4	4132	21.38
		836.6	4183	21.49
		846.6	4233	21.54
	Subtest 4	826.4	4132	21.31
		836.6	4183	21.31
		846.6	4233	21.45
HSUPA	Subtest 1	826.4	4132	21.38
		836.6	4183	21.43
		846.6	4233	21.43
	Subtest 2	826.4	4132	21.36
		836.6	4183	21.42
		846.6	4233	21.45
	Subtest 3	826.4	4132	21.35
		836.6	4183	21.30
		846.6	4233	21.31
	Subtest 4	826.4	4132	21.25
		836.6	4183	21.28
		846.6	4233	21.47
	Subtest 5	826.4	4132	21.36
		836.6	4183	21.31
		846.6	4233	21.44

Note: UMTS SAR was tested under Rel.99 RMC 12.2kbps mode per KDB Publication 941225 D01.for other higher release configuration, SAR was not required since any average output power was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg with RMC mode.

## 6.4 LTE Measurement result

### General description:

#### TDD-LTE frame structure



### Uplink-downlink configuration

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

### Special sub-frame configuration

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

### Special sub-frame with cyclic prefix uplink

Special sub-frame configuration	Duty factor with normal cyclic prefix in uplink	Duty factor with extended cyclic prefix in uplink
Normal cyclic prefix in downlink	0~4	7.13%
	5~9	14.3%
Extended cyclic prefix in downlink	0~3	7.13%
	4~7	14.3%

So we perform SAR test with maximum duty factor equal to 63.3% by using uplink-downlink configuration 0.

Note: One sub-frame is  $30720T_s=1\text{ms}$ , when UpPTS(uplink) in special sub-frame with extended cyclic prefix, duty factor =  $5120/30720=0.167$ . There are 5 sub-frames in half frame(3up link), so the final duty factor is  $(30720 \cdot 3 + 5120) / (30720 \cdot 5) = 63.3\%$  which we used to evaluate the SAR compliance (worst case)

### LTE Band 2

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1850.7	18607	1.4	1	0	22.29
				1	5	21.84
				3	2	21.17
				6	0	21.36
	1880	18900		1	0	22.10
				1	5	22.00
				3	2	21.17
				6	0	21.02
	1909.3	19193		1	0	21.92
				1	5	22.38
				3	2	21.25
				6	0	21.08
16QAM	1850.7	18607	1.4	1	0	20.95
				1	5	20.48
				3	2	20.48
				6	0	20.15
	1880	18900		1	0	20.60
				1	5	20.48
				3	2	19.94
				6	0	20.18
	1909.3	19193		1	0	20.29
				1	5	20.71
				3	2	20.25
				6	0	20.07
64QAM	1850.7	18607	1.4	1	0	20.37
				1	5	20.46
				3	2	20.38
				6	0	20.02
	1880	18900		1	0	20.39
				1	5	20.38
				3	2	20.05
				6	0	20.05
	1909.3	19193		1	0	20.10
				1	5	20.40
				3	2	20.36
				6	0	20.00

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1851.5	18615	3	1	0	22.43
				1	14	21.96
				8	4	21.42
				15	0	21.29
	1880	18900		1	0	21.85
				1	14	21.90
				8	4	21.26
				15	0	20.95
	1908.5	19185		1	0	22.01
				1	14	22.15
				8	4	21.05
				15	0	21.10
16QAM	1851.5	18615	3	1	0	21.15
				1	14	20.47
				8	4	20.41
				15	0	20.26
	1880	18900		1	0	20.43
				1	14	20.57
				8	4	20.14
				15	0	20.00
	1908.5	19185		1	0	20.47
				1	14	20.67
				8	4	20.11
				15	0	20.03
64QAM	1851.5	18615	3	1	0	20.51
				1	14	20.43
				8	4	20.43
				15	0	19.99
	1880	18900		1	0	20.47
				1	14	20.27
				8	4	20.18
				15	0	20.00
	1908.5	19185		1	0	20.27
				1	14	20.52
				8	4	20.33
				15	0	20.02



Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1852.5	18625	5	1	0	22.53
				1	24	21.79
				12	6	21.39
				25	0	21.49
	1880	18900		1	0	22.07
				1	24	21.76
				12	6	21.25
				25	0	21.02
	1907.5	19175		1	0	21.91
				1	24	22.40
				12	6	21.05
				25	0	21.12
16QAM	1852.5	18625	5	1	0	20.95
				1	24	20.53
				12	6	20.34
				25	0	20.25
	1880	18900		1	0	20.54
				1	24	20.37
				12	6	20.00
				25	0	19.91
	1907.5	19175		1	0	20.37
				1	24	20.70
				12	6	20.17
				25	0	20.16
64QAM	1852.5	18625	5	1	0	20.32
				1	24	20.43
				12	6	20.25
				25	0	20.16
	1880	18900		1	0	20.51
				1	24	20.21
				12	6	20.12
				25	0	19.99
	1907.5	19175		1	0	20.33
				1	24	20.40
				12	6	20.36
				25	0	20.15

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1855	18650	10	1	0	22.54
				1	49	21.77
				24	12	21.39
				50	0	21.36
	1880	18900		1	0	21.86
				1	49	21.80
				24	12	21.24
				50	0	20.92
	1905	19150		1	0	22.05
				1	49	22.19
				24	12	21.25
				50	0	21.00
16QAM	1855	18650	10	1	0	21.06
				1	49	20.72
				24	12	20.44
				50	0	20.29
	1880	18900		1	0	20.52
				1	49	20.39
				24	12	20.01
				50	0	19.91
	1905	19150		1	0	20.25
				1	49	20.70
				24	12	20.28
				50	0	20.03
64QAM	1855	18650	10	1	0	20.53
				1	49	20.21
				24	12	20.41
				50	0	20.12
	1880	18900		1	0	20.48
				1	49	20.32
				24	12	20.19
				50	0	20.14
	1905	19150		1	0	20.31
				1	49	20.47
				24	12	20.32
				50	0	20.10

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1857.5	18675	15	1	0	22.40
				1	74	22.01
				40	18	21.38
				75	0	21.35
	1880	18900		1	0	22.10
				1	74	21.88
				40	18	21.18
				75	0	21.12
	1902.5	19125		1	0	22.14
				1	74	22.43
				40	18	21.12
				75	0	21.21
16QAM	1857.5	18675	15	1	0	21.03
				1	74	20.62
				40	18	20.53
				75	0	20.28
	1880	18900		1	0	20.59
				1	74	20.45
				40	18	20.10
				75	0	20.14
	1902.5	19125		1	0	20.39
				1	74	20.56
				40	18	20.13
				75	0	20.14
64QAM	1857.5	18675	15	1	0	20.47
				1	74	20.32
				40	18	20.33
				75	0	20.21
	1880	18900		1	0	20.58
				1	74	20.31
				40	18	20.23
				75	0	20.07
	1902.5	19125		1	0	20.30
				1	74	20.46
				40	18	20.35
				75	0	20.10

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1860	18700	20	1	0	22.66
				1	99	22.13
				50	25	21.54
				100	0	21.64
	1880	18900		1	0	22.24
				1	99	22.15
				50	25	21.41
				100	0	21.28
	1900	19100		1	0	22.30
				1	99	22.54
				50	25	21.38
				100	0	21.36
16QAM	1860	18700	20	1	0	21.27
				1	99	20.84
				50	25	20.69
				100	0	20.51
	1880	18900		1	0	20.75
				1	99	20.74
				50	25	20.32
				100	0	20.29
	1900	19100		1	0	20.64
				1	99	20.82
				50	25	20.42
				100	0	20.39
64QAM	1860	18700	20	1	0	20.69
				1	99	20.57
				50	25	20.56
				100	0	20.38
	1880	18900		1	0	20.73
				1	99	20.56
				50	25	20.41
				100	0	20.28
	1900	19100		1	0	20.45
				1	99	20.65
				50	25	20.48
				100	0	20.33

### LTE Band 4

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1710.7	19957	1.4	1	0	23.09
				1	5	22.97
				3	2	22.03
				6	0	22.02
	1732.5	20175		1	0	23.02
				1	5	22.85
				3	2	22.17
				6	0	21.98
	1754.3	20393		1	0	23.30
				1	5	23.16
				3	2	22.35
				6	0	22.30
16QAM	1710.7	19957	1.4	1	0	22.21
				1	5	21.77
				3	2	21.04
				6	0	20.93
	1732.5	20175		1	0	22.26
				1	5	21.37
				3	2	20.99
				6	0	20.98
	1754.3	20393		1	0	21.74
				1	5	21.43
				3	2	21.46
				6	0	21.06
64QAM	1710.7	19957	1.4	1	0	21.64
				1	5	21.59
				3	2	20.99
				6	0	20.95
	1732.5	20175		1	0	21.79
				1	5	21.77
				3	2	21.07
				6	0	21.02
	1754.3	20393		1	0	21.54
				1	5	21.69
				3	2	21.35
				6	0	21.14

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1711.5	19965	3	1	0	22.87
				1	14	22.70
				8	4	21.92
				15	0	22.11
	1732.5	20175		1	0	22.95
				1	14	22.89
				8	4	22.11
				15	0	22.17
	1753.5	20385		1	0	23.08
				1	14	23.00
				8	4	22.37
				15	0	22.18
16QAM	1711.5	19965	3	1	0	21.94
				1	14	21.82
				8	4	20.90
				15	0	21.11
	1732.5	20175		1	0	22.23
				1	14	21.42
				8	4	21.13
				15	0	20.92
	1753.5	20385		1	0	21.69
				1	14	21.63
				8	4	21.38
				15	0	21.13
64QAM	1711.5	19965	3	1	0	21.43
				1	14	21.47
				8	4	20.93
				15	0	21.15
	1732.5	20175		1	0	21.82
				1	14	21.74
				8	4	21.24
				15	0	21.00
	1753.5	20385		1	0	21.63
				1	14	21.84
				8	4	21.20
				15	0	21.08

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1712.5	19975	5	1	0	22.92
				1	24	22.96
				12	6	21.93
				25	0	22.09
	1732.5	20175		1	0	23.13
				1	24	22.89
				12	6	22.32
				25	0	22.05
	1752.5	20375		1	0	23.27
				1	24	23.23
				12	6	22.22
				25	0	22.23
16QAM	1712.5	19975	5	1	0	22.14
				1	24	21.82
				12	6	21.00
				25	0	21.06
	1732.5	20175		1	0	22.24
				1	24	21.46
				12	6	20.91
				25	0	21.02
	1752.5	20375		1	0	21.72
				1	24	21.62
				12	6	21.28
				25	0	21.03
64QAM	1712.5	19975	5	1	0	21.64
				1	24	21.56
				12	6	20.84
				25	0	21.14
	1732.5	20175		1	0	21.79
				1	24	21.55
				12	6	21.03
				25	0	20.91
	1752.5	20375		1	0	21.49
				1	24	21.76
				12	6	21.42
				25	0	21.28

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1715	20000	10	1	0	22.89
				1	49	22.91
				24	12	21.88
				50	0	22.12
	1732.5	20175		1	0	22.98
				1	49	23.12
				24	12	22.22
				50	0	21.97
	1750	20350		1	0	23.21
				1	49	23.02
				24	12	22.41
				50	0	22.32
16QAM	1715	20000	10	1	0	21.94
				1	49	21.91
				24	12	21.03
				50	0	20.95
	1732.5	20175		1	0	22.38
				1	49	21.58
				24	12	21.04
				50	0	21.07
	1750	20350		1	0	21.58
				1	49	21.46
				24	12	21.42
				50	0	21.06
64QAM	1715	20000	10	1	0	21.66
				1	49	21.66
				24	12	20.91
				50	0	21.13
	1732.5	20175		1	0	21.68
				1	49	21.52
				24	12	21.23
				50	0	21.10
	1750	20350		1	0	21.69
				1	49	21.70
				24	12	21.24
				50	0	21.32



Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1717.5	20025	15	1	0	23.00
				1	74	22.87
				40	18	21.99
				75	0	22.04
	1732.5	20175		1	0	23.14
				1	74	22.86
				40	18	22.11
				75	0	22.07
	1747.5	20325		1	0	23.11
				1	74	23.19
				40	18	22.38
				75	0	22.13
16QAM	1717.5	20025	15	1	0	22.13
				1	74	21.89
				40	18	21.01
				75	0	20.93
	1732.5	20175		1	0	22.41
				1	74	21.44
				40	18	21.12
				75	0	20.98
	1747.5	20325		1	0	21.79
				1	74	21.60
				40	18	21.26
				75	0	21.09
64QAM	1717.5	20025	15	1	0	21.66
				1	74	21.62
				40	18	21.05
				75	0	21.06
	1732.5	20175		1	0	21.79
				1	74	21.57
				40	18	21.27
				75	0	21.11
	1747.5	20325		1	0	21.75
				1	74	21.73
				40	18	21.44
				75	0	21.30

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1720	20050	20	1	0	23.24
				1	99	23.08
				50	25	22.25
				100	0	22.23
	1732.5	20175		1	0	23.30
				1	99	23.23
				50	25	22.43
				100	0	22.29
	1745	20300		1	0	23.42
				1	99	23.34
				50	25	22.59
				100	0	22.51
16QAM	1720	20050	20	1	0	22.32
				1	99	22.06
				50	25	21.15
				100	0	21.24
	1732.5	20175		1	0	22.57
				1	99	21.70
				50	25	21.28
				100	0	21.26
	1745	20300		1	0	21.90
				1	99	21.77
				50	25	21.57
				100	0	21.37
64QAM	1720	20050	20	1	0	21.82
				1	99	21.83
				50	25	21.16
				100	0	21.27
	1732.5	20175		1	0	22.00
				1	99	21.91
				50	25	21.40
				100	0	21.25
	1745	20300		1	0	21.86
				1	99	21.97
				50	25	21.56
				100	0	21.46

### LTE Band 5

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	824.7	20407	1.4	1	0	23.11
				1	5	22.84
				3	2	22.00
				6	0	22.05
	836.5	20525		1	0	22.94
				1	5	23.02
				3	2	22.03
				6	0	22.03
	848.3	20643		1	0	23.23
				1	5	22.83
				3	2	21.88
				6	0	21.91
16QAM	824.7	20407	1.4	1	0	21.16
				1	5	21.21
				3	2	20.80
				6	0	21.01
	836.5	20525		1	0	21.72
				1	5	21.89
				3	2	20.89
				6	0	20.77
	848.3	20643		1	0	21.46
				1	5	21.42
				3	2	20.86
				6	0	21.12
64QAM	824.7	20407	1.4	1	0	21.56
				1	5	21.26
				3	2	20.92
				6	0	20.75
	836.5	20525		1	0	21.36
				1	5	21.16
				3	2	20.98
				6	0	20.86
	848.3	20643		1	0	21.41
				1	5	21.24
				3	2	20.91
				6	0	20.77

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	825.5	20415	3	1	0	23.09
				1	14	22.92
				8	4	22.12
				15	0	21.93
	836.5	20525		1	0	22.95
				1	14	22.83
				8	4	22.07
				15	0	22.13
	847.5	20635		1	0	23.15
				1	14	22.82
				8	4	21.89
				15	0	21.91
16QAM	825.5	20415	3	1	0	21.05
				1	14	21.07
				8	4	20.93
				15	0	20.99
	836.5	20525		1	0	21.63
				1	14	21.65
				8	4	21.02
				15	0	20.77
	847.5	20635		1	0	21.30
				1	14	21.41
				8	4	20.95
				15	0	21.12
64QAM	825.5	20415	3	1	0	21.48
				1	14	21.21
				8	4	21.03
				15	0	20.84
	836.5	20525		1	0	21.20
				1	14	20.98
				8	4	21.00
				15	0	21.06
	847.5	20635		1	0	21.46
				1	14	21.22
				8	4	21.12
				15	0	20.96

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	826.5	20425	5	1	0	23.00
				1	24	22.84
				12	6	22.05
				25	0	21.95
	836.5	20525		1	0	23.09
				1	24	23.03
				12	6	21.88
				25	0	21.91
	846.5	20625		1	0	23.21
				1	24	22.92
				12	6	21.95
				25	0	21.82
16QAM	826.5	20425	5	1	0	20.96
				1	24	21.25
				12	6	20.73
				25	0	20.84
	836.5	20525		1	0	21.76
				1	24	21.83
				12	6	20.92
				25	0	20.75
	846.5	20625		1	0	21.33
				1	24	21.32
				12	6	20.73
				25	0	20.92
64QAM	826.5	20425	5	1	0	21.58
				1	24	21.21
				12	6	21.00
				25	0	20.97
	836.5	20525		1	0	21.19
				1	24	21.06
				12	6	20.91
				25	0	20.89
	846.5	20625		1	0	21.45
				1	24	21.20
				12	6	21.02
				25	0	20.92

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	829	20450	10	1	0	23.24
				1	49	23.18
				24	12	22.28
				50	0	22.20
	836.5	20525		1	0	23.31
				1	49	23.18
				24	12	22.22
				50	0	22.28
	844	20600		1	0	23.40
				1	49	23.10
				24	12	22.21
				50	0	22.15
16QAM	829	20450	10	1	0	21.29
				1	49	21.42
				24	12	21.08
				50	0	21.17
	836.5	20525		1	0	22.00
				1	49	22.02
				24	12	21.28
				50	0	21.12
	844	20600		1	0	21.64
				1	49	21.55
				24	12	21.12
				50	0	21.26
64QAM	829	20450	10	1	0	21.71
				1	49	21.52
				24	12	21.28
				50	0	21.11
	836.5	20525		1	0	21.48
				1	49	21.35
				24	12	21.26
				50	0	21.22
	844	20600		1	0	21.73
				1	49	21.47
				24	12	21.23
				50	0	21.10

### LTE Band 12

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	699.7	23017	1.4	1	0	22.56
				1	5	22.40
				3	2	21.64
				6	0	21.54
	707.5	23095		1	0	22.41
				1	5	22.61
				3	2	21.40
				6	0	21.40
	715.3	23173		1	0	22.11
				1	5	22.18
				3	2	21.48
				6	0	21.37
16QAM	699.7	23017	1.4	1	0	21.19
				1	5	21.13
				3	2	20.62
				6	0	20.67
	707.5	23095		1	0	20.79
				1	5	21.13
				3	2	20.23
				6	0	20.71
	715.3	23173		1	0	20.96
				1	5	21.65
				3	2	20.62
				6	0	20.64
64QAM	699.7	23017	1.4	1	0	21.17
				1	5	21.04
				3	2	20.49
				6	0	20.68
	707.5	23095		1	0	20.73
				1	5	21.25
				3	2	20.26
				6	0	20.53
	715.3	23173		1	0	20.78
				1	5	21.10
				3	2	20.81
				6	0	20.64

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	700.5	23025	3	1	0	22.48
				1	14	22.47
				8	4	21.53
				15	0	21.57
	707.5	23095		1	0	22.44
				1	14	22.47
				8	4	21.46
				15	0	21.62
	714.5	23165		1	0	22.10
				1	14	22.20
				8	4	21.40
				15	0	21.57
16QAM	700.5	23025	3	1	0	20.97
				1	14	21.31
				8	4	20.62
				15	0	20.76
	707.5	23095		1	0	20.81
				1	14	21.04
				8	4	20.19
				15	0	20.56
	714.5	23165		1	0	20.91
				1	14	21.61
				8	4	20.44
				15	0	20.63
64QAM	700.5	23025	3	1	0	21.04
				1	14	21.20
				8	4	20.38
				15	0	20.63
	707.5	23095		1	0	20.75
				1	14	21.33
				8	4	20.50
				15	0	20.55
	714.5	23165		1	0	20.86
				1	14	21.01
				8	4	20.95
				15	0	20.54



Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	701.5	23035	5	1	0	22.41
				1	24	22.50
				12	6	21.47
				25	0	21.62
	707.5	23095		1	0	22.40
				1	24	22.51
				12	6	21.48
				25	0	21.35
	713.5	23155		1	0	22.10
				1	24	22.15
				12	6	21.50
				25	0	21.59
16QAM	701.5	23035	5	1	0	21.23
				1	24	21.20
				12	6	20.59
				25	0	20.71
	707.5	23095		1	0	20.90
				1	24	21.26
				12	6	20.40
				25	0	20.47
	713.5	23155		1	0	20.98
				1	24	21.52
				12	6	20.48
				25	0	20.45
64QAM	701.5	23035	5	1	0	21.02
				1	24	21.16
				12	6	20.40
				25	0	20.72
	707.5	23095		1	0	20.82
				1	24	21.16
				12	6	20.40
				25	0	20.57
	713.5	23155		1	0	20.97
				1	24	21.25
				12	6	20.78
				25	0	20.71

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	704	23060	10	1	0	22.69
				1	49	22.73
				24	12	21.86
				50	0	21.83
	707.5	23095		1	0	22.69
				1	49	22.80
				24	12	21.74
				50	0	21.73
	711	23130		1	0	22.28
				1	49	22.54
				24	12	21.74
				50	0	21.73
16QAM	704	23060	10	1	0	21.35
				1	49	21.47
				24	12	20.84
				50	0	20.95
	707.5	23095		1	0	21.15
				1	49	21.39
				24	12	20.55
				50	0	20.82
	711	23130		1	0	21.17
				1	49	21.84
				24	12	20.79
				50	0	20.77
64QAM	704	23060	10	1	0	21.40
				1	49	21.37
				24	12	20.66
				50	0	20.85
	707.5	23095		1	0	21.01
				1	49	21.48
				24	12	20.63
				50	0	20.82
	711	23130		1	0	21.11
				1	49	21.36
				24	12	21.13
				50	0	20.82

**LTE Band 25**

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1850.7	26047	1.4	1	0	22.55
				1	5	22.21
				3	2	21.71
				6	0	21.70
	1882.5	26365		1	0	22.29
				1	5	22.41
				3	2	21.29
				6	0	21.50
	1914.3	26683		1	0	22.22
				1	5	22.40
				3	2	21.79
				6	0	21.48
16QAM	1850.7	26047	1.4	1	0	20.77
				1	5	21.23
				3	2	20.54
				6	0	20.65
	1882.5	26365		1	0	20.94
				1	5	20.79
				3	2	20.38
				6	0	20.31
	1914.3	26683		1	0	21.60
				1	5	21.49
				3	2	20.57
				6	0	20.41
64QAM	1850.7	26047	1.4	1	0	21.00
				1	5	21.05
				3	2	20.48
				6	0	20.72
	1882.5	26365		1	0	20.54
				1	5	20.43
				3	2	20.46
				6	0	20.34
	1914.3	26683		1	0	20.94
				1	5	20.91
				3	2	20.57
				6	0	20.32

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1851.5	26055	3	1	0	22.47
				1	14	22.31
				8	4	21.63
				15	0	21.80
	1882.5	26365		1	0	22.19
				1	14	22.50
				8	4	21.35
				15	0	21.24
	1913.5	26675		1	0	22.26
				1	14	22.49
				8	4	21.61
				15	0	21.56
16QAM	1851.5	26055	3	1	0	20.92
				1	14	21.28
				8	4	20.62
				15	0	20.59
	1882.5	26365		1	0	20.94
				1	14	20.65
				8	4	20.29
				15	0	20.34
	1913.5	26675		1	0	21.64
				1	14	21.72
				8	4	20.48
				15	0	20.30
64QAM	1851.5	26055	3	1	0	20.86
				1	14	21.15
				8	4	20.58
				15	0	20.64
	1882.5	26365		1	0	20.60
				1	14	20.47
				8	4	20.45
				15	0	20.26
	1913.5	26675		1	0	20.91
				1	14	20.68
				8	4	20.63
				15	0	20.27

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1852.5	26065	5	1	0	22.73
				1	24	22.16
				12	6	21.49
				25	0	21.76
	1882.5	26365		1	0	22.34
				1	24	22.30
				12	6	21.48
				25	0	21.25
	1912.5	26665		1	0	22.26
				1	24	22.33
				12	6	21.54
				25	0	21.55
16QAM	1852.5	26065	5	1	0	20.69
				1	24	21.24
				12	6	20.52
				25	0	20.57
	1882.5	26365		1	0	20.84
				1	24	20.55
				12	6	20.41
				25	0	20.11
	1912.5	26665		1	0	21.71
				1	24	21.48
				12	6	20.57
				25	0	20.34
64QAM	1852.5	26065	5	1	0	20.95
				1	24	21.05
				12	6	20.48
				25	0	20.77
	1882.5	26365		1	0	20.50
				1	24	20.59
				12	6	20.36
				25	0	20.27
	1912.5	26665		1	0	20.82
				1	24	20.81
				12	6	20.37
				25	0	20.47

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1855	26090	10	1	0	22.68
				1	49	22.15
				24	12	21.69
				50	0	21.79
	1882.5	26365		1	0	22.32
				1	49	22.27
				24	12	21.40
				50	0	21.26
	1910	26640		1	0	22.10
				1	49	22.41
				24	12	21.54
				50	0	21.47
16QAM	1855	26090	10	1	0	20.75
				1	49	21.27
				24	12	20.40
				50	0	20.67
	1882.5	26365		1	0	20.70
				1	49	20.68
				24	12	20.25
				50	0	20.11
	1910	26640		1	0	21.57
				1	49	21.75
				24	12	20.50
				50	0	20.25
64QAM	1855	26090	10	1	0	21.02
				1	49	21.18
				24	12	20.52
				50	0	20.67
	1882.5	26365		1	0	20.67
				1	49	20.46
				24	12	20.56
				50	0	20.18
	1910	26640		1	0	21.02
				1	49	20.76
				24	12	20.44
				50	0	20.34

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1857.5	26115	15	1	0	22.50
				1	74	22.19
				40	18	21.66
				75	0	21.64
	1882.5	26365		1	0	22.25
				1	74	22.44
				40	18	21.53
				75	0	21.36
	1907.5	26615		1	0	22.13
				1	74	22.33
				40	18	21.60
				75	0	21.53
16QAM	1857.5	26115	15	1	0	20.77
				1	74	21.49
				40	18	20.39
				75	0	20.67
	1882.5	26365		1	0	20.72
				1	74	20.75
				40	18	20.18
				75	0	20.27
	1907.5	26615		1	0	21.82
				1	74	21.61
				40	18	20.49
				75	0	20.14
64QAM	1857.5	26115	15	1	0	20.99
				1	74	20.96
				40	18	20.50
				75	0	20.62
	1882.5	26365		1	0	20.62
				1	74	20.66
				40	18	20.51
				75	0	20.12
	1907.5	26615		1	0	20.84
				1	74	20.83
				40	18	20.51
				75	0	20.35

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1860	26140	20	1	0	22.87
				1	99	22.51
				50	25	21.87
				100	0	21.95
	1882.5	26365		1	0	22.46
				1	99	22.66
				50	25	21.64
				100	0	21.63
	1905	26590		1	0	22.41
				1	99	22.62
				50	25	21.93
				100	0	21.69
16QAM	1860	26140	20	1	0	21.04
				1	99	21.60
				50	25	20.73
				100	0	20.82
	1882.5	26365		1	0	21.07
				1	99	20.93
				50	25	20.54
				100	0	20.48
	1905	26590		1	0	21.93
				1	99	21.87
				50	25	20.71
				100	0	20.53
64QAM	1860	26140	20	1	0	21.21
				1	99	21.34
				50	25	20.84
				100	0	20.90
	1882.5	26365		1	0	20.86
				1	99	20.80
				50	25	20.67
				100	0	20.51
	1905	26590		1	0	21.20
				1	99	21.05
				50	25	20.75
				100	0	20.61



### LTE Band 41

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	2537.5	40065	5	1	0	23.42
				1	24	23.27
				12	6	22.67
				25	0	22.77
	2593	40620		1	0	23.19
				1	24	23.27
				12	6	22.71
				25	0	22.86
	2652.5	41215		1	0	23.04
				1	24	23.30
				12	6	22.49
				25	0	22.58
16QAM	2537.5	40065	5	1	0	21.91
				1	24	21.99
				12	6	21.70
				25	0	21.51
	2593	40620		1	0	21.98
				1	24	22.10
				12	6	21.49
				25	0	21.57
	2652.5	41215		1	0	22.11
				1	24	21.89
				12	6	21.52
				25	0	21.50
64QAM	2537.5	40065	5	1	0	21.41
				1	24	22.03
				12	6	21.60
				25	0	21.62
	2593	40620		1	0	21.62
				1	24	21.73
				12	6	21.76
				25	0	21.62
	2652.5	41215		1	0	21.60
				1	24	21.81
				12	6	21.69
				25	0	21.56

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	2540	40090	10	1	0	23.31
				1	49	23.55
				24	12	22.58
				50	0	22.80
	2593	40620		1	0	23.34
				1	49	23.11
				24	12	22.80
				50	0	22.93
	2650	41190		1	0	23.09
				1	49	23.47
				24	12	22.54
				50	0	22.57
16QAM	2540	40090	10	1	0	21.73
				1	49	22.03
				24	12	21.69
				50	0	21.70
	2593	40620		1	0	21.85
				1	49	22.06
				24	12	21.60
				50	0	21.54
	2650	41190		1	0	22.00
				1	49	22.00
				24	12	21.55
				50	0	21.39
64QAM	2540	40090	10	1	0	21.54
				1	49	21.94
				24	12	21.60
				50	0	21.68
	2593	40620		1	0	21.72
				1	49	21.73
				24	12	21.74
				50	0	21.57
	2650	41190		1	0	21.58
				1	49	21.82
				24	12	21.48
				50	0	21.54

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	2542.5	40115	15	1	0	23.25
				1	74	23.43
				40	18	22.47
				75	0	22.83
	2593	40620		1	0	23.31
				1	74	23.13
				40	18	22.85
				75	0	22.82
	2647.5	41165		1	0	23.00
				1	74	23.29
				40	18	22.31
				75	0	22.59
16QAM	2542.5	40115	15	1	0	21.71
				1	74	21.90
				40	18	21.52
				75	0	21.76
	2593	40620		1	0	21.78
				1	74	21.98
				40	18	21.47
				75	0	21.70
	2647.5	41165		1	0	21.91
				1	74	21.89
				40	18	21.50
				75	0	21.62
64QAM	2542.5	40115	15	1	0	21.37
				1	74	21.91
				40	18	21.53
				75	0	21.68
	2593	40620		1	0	21.62
				1	74	21.71
				40	18	21.71
				75	0	21.71
	2647.5	41165		1	0	21.74
				1	74	21.77
				40	18	21.62
				75	0	21.54

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted Average (dBm)
QPSK	2545	40140	20	1	0	23.58
				1	99	23.67
				50	25	22.83
				100	0	22.98
	2593	40620		1	0	23.47
				1	99	23.46
				50	25	22.99
				100	0	23.07
	2645	41140		1	0	23.28
				1	99	23.63
				50	25	22.70
				100	0	22.71
16QAM	2545	40140	20	1	0	22.10
				1	99	22.26
				50	25	21.83
				100	0	21.88
	2593	40620		1	0	22.09
				1	99	22.35
				50	25	21.83
				100	0	21.91
	2645	41140		1	0	22.28
				1	99	22.23
				50	25	21.77
				100	0	21.75
64QAM	2545	40140	20	1	0	21.70
				1	99	22.29
				50	25	21.78
				100	0	21.91
	2593	40620		1	0	21.90
				1	99	21.89
				50	25	21.89
				100	0	21.94
	2645	41140		1	0	21.97
				1	99	22.04
				50	25	21.85
				100	0	21.68

**LTE Band 66**

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1710.7	131979	1.4	1	0	22.96
				1	5	23.22
				3	2	22.03
				6	0	21.93
	1745	132322		1	0	22.86
				1	5	23.28
				3	2	22.12
				6	0	22.00
	1779.3	132665		1	0	22.76
				1	5	23.18
				3	2	22.46
				6	0	22.27
16QAM	1710.7	131979	1.4	1	0	21.02
				1	5	21.21
				3	2	21.16
				6	0	21.01
	1745	132322		1	0	21.62
				1	5	21.57
				3	2	20.94
				6	0	20.95
	1779.3	132665		1	0	21.35
				1	5	21.84
				3	2	21.21
				6	0	21.10
64QAM	1710.7	131979	1.4	1	0	21.18
				1	5	21.35
				3	2	21.03
				6	0	20.93
	1745	132322		1	0	21.05
				1	5	20.92
				3	2	20.86
				6	0	20.82
	1779.3	132665		1	0	21.52
				1	5	21.02
				3	2	21.37
				6	0	21.11

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1711.5	131987	3	1	0	22.83
				1	14	23.16
				8	4	21.92
				15	0	22.03
	1745	132322		1	0	22.86
				1	14	23.03
				8	4	22.26
				15	0	22.17
	1778.5	132657		1	0	22.91
				1	14	23.11
				8	4	22.50
				15	0	22.35
16QAM	1711.5	131987	3	1	0	21.14
				1	14	21.09
				8	4	21.13
				15	0	21.02
	1745	132322		1	0	21.78
				1	14	21.78
				8	4	20.91
				15	0	21.01
	1778.5	132657		1	0	21.56
				1	14	21.72
				8	4	21.20
				15	0	21.11
64QAM	1711.5	131987	3	1	0	21.19
				1	14	21.19
				8	4	20.88
				15	0	20.98
	1745	132322		1	0	21.13
				1	14	21.13
				8	4	20.91
				15	0	20.71
	1778.5	132657		1	0	21.39
				1	14	21.11
				8	4	21.38
				15	0	21.15

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1712.5	131997	5	1	0	22.89
				1	24	23.22
				12	6	21.94
				25	0	22.06
	1745	132322		1	0	22.86
				1	24	23.16
				12	6	22.25
				25	0	22.04
	1777.5	132647		1	0	22.96
				1	24	23.14
				12	6	22.35
				25	0	22.14
16QAM	1712.5	131997	5	1	0	21.14
				1	24	21.02
				12	6	21.02
				25	0	20.94
	1745	132322		1	0	21.71
				1	24	21.68
				12	6	21.07
				25	0	20.93
	1777.5	132647		1	0	21.30
				1	24	21.81
				12	6	21.20
				25	0	21.30
64QAM	1712.5	131997	5	1	0	21.09
				1	24	21.14
				12	6	20.89
				25	0	21.06
	1745	132322		1	0	21.05
				1	24	21.06
				12	6	21.05
				25	0	20.74
	1777.5	132647		1	0	21.57
				1	24	21.10
				12	6	21.36
				25	0	21.26

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1715	132022	10	1	0	22.83
				1	49	22.97
				24	12	22.08
				50	0	22.02
	1745	132322		1	0	22.73
				1	49	23.01
				24	12	22.15
				50	0	22.01
	1775	132622		1	0	22.80
				1	49	23.18
				24	12	22.53
				50	0	22.24
16QAM	1715	132022	10	1	0	21.16
				1	49	21.23
				24	12	20.94
				50	0	20.94
	1745	132322		1	0	21.68
				1	49	21.59
				24	12	21.10
				50	0	20.91
	1775	132622		1	0	21.43
				1	49	21.71
				24	12	21.24
				50	0	21.13
64QAM	1715	132022	10	1	0	21.18
				1	49	21.13
				24	12	20.90
				50	0	20.82
	1745	132322		1	0	21.14
				1	49	21.11
				24	12	20.88
				50	0	20.90
	1775	132622		1	0	21.54
				1	49	21.26
				24	12	21.22
				50	0	21.06



Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1717.5	132047	15	1	0	23.01
				1	74	22.96
				40	18	22.06
				75	0	22.04
	1745	132322		1	0	22.98
				1	74	23.02
				40	18	22.07
				75	0	22.17
	1772.5	132597		1	0	22.85
				1	74	22.97
				40	18	22.46
				75	0	22.16
16QAM	1717.5	132047	15	1	0	21.14
				1	74	21.21
				40	18	21.02
				75	0	20.91
	1745	132322		1	0	21.79
				1	74	21.82
				40	18	21.12
				75	0	20.86
	1772.5	132597		1	0	21.45
				1	74	21.62
				40	18	21.09
				75	0	21.35
64QAM	1717.5	132047	15	1	0	21.21
				1	74	21.28
				40	18	20.93
				75	0	21.08
	1745	132322		1	0	20.98
				1	74	21.05
				40	18	20.89
				75	0	20.80
	1772.5	132597		1	0	21.39
				1	74	21.12
				40	18	21.38
				75	0	21.21

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1720	132072	20	1	0	23.12
				1	99	23.35
				50	25	22.22
				100	0	22.19
	1745	132322		1	0	23.09
				1	99	23.40
				50	25	22.40
				100	0	22.38
	1770	132572		1	0	23.13
				1	99	23.32
				50	25	22.68
				100	0	22.51
16QAM	1720	132072	20	1	0	21.35
				1	99	21.40
				50	25	21.29
				100	0	21.27
	1745	132322		1	0	21.90
				1	99	21.93
				50	25	21.29
				100	0	21.17
	1770	132572		1	0	21.68
				1	99	21.98
				50	25	21.43
				100	0	21.48
64QAM	1720	132072	20	1	0	21.35
				1	99	21.52
				50	25	21.27
				100	0	21.20
	1745	132322		1	0	21.31
				1	99	21.29
				50	25	21.24
				100	0	21.07
	1770	132572		1	0	21.76
				1	99	21.38
				50	25	21.55
				100	0	21.42

### LTE Band 71

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	665.5	133147	5	1	0	22.71
				1	24	23.38
				12	6	22.04
				25	0	22.32
	680.5	133297		1	0	22.77
				1	24	23.19
				12	6	22.09
				25	0	22.37
	695.5	133447		1	0	23.27
				1	24	23.41
				12	6	22.13
				25	0	22.25
16QAM	665.5	133147	5	1	0	22.46
				1	24	23.15
				12	6	21.33
				25	0	21.30
	680.5	133297		1	0	22.41
				1	24	22.63
				12	6	21.27
				25	0	21.52
	695.5	133447		1	0	22.40
				1	24	22.12
				12	6	21.23
				25	0	21.27
64QAM	665.5	133147	5	1	0	22.26
				1	24	22.90
				12	6	21.34
				25	0	21.07
	680.5	133297		1	0	22.38
				1	24	22.60
				12	6	21.20
				25	0	21.29
	695.5	133447		1	0	22.14
				1	24	21.87
				12	6	21.24
				25	0	21.08

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	668	133172	10	1	0	22.87
				1	49	23.58
				24	12	21.91
				50	0	22.20
	680.5	133297		1	0	22.90
				1	49	23.23
				24	12	22.11
				50	0	22.43
	693	133422		1	0	23.42
				1	49	23.35
				24	12	22.12
				50	0	22.37
16QAM	668	133172	10	1	0	22.52
				1	49	23.08
				24	12	21.45
				50	0	21.10
	680.5	133297		1	0	22.35
				1	49	22.72
				24	12	21.28
				50	0	21.31
	693	133422		1	0	22.19
				1	49	22.26
				24	12	21.18
				50	0	21.35
64QAM	668	133172	10	1	0	22.16
				1	49	22.76
				24	12	21.09
				50	0	21.11
	680.5	133297		1	0	22.23
				1	49	22.47
				24	12	20.99
				50	0	21.35
	693	133422		1	0	22.02
				1	49	21.86
				24	12	21.14
				50	0	21.07

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	670.5	133197	15	1	0	22.91
				1	74	23.40
				40	18	21.89
				75	0	22.40
	680.5	133297		1	0	22.92
				1	74	23.24
				40	18	22.18
				75	0	22.38
	690.5	133397		1	0	23.41
				1	74	23.55
				40	18	22.27
				75	0	22.16
16QAM	670.5	133197	15	1	0	22.40
				1	74	22.91
				40	18	21.39
				75	0	21.31
	680.5	133297		1	0	22.54
				1	74	22.67
				40	18	21.27
				75	0	21.41
	690.5	133397		1	0	22.27
				1	74	22.20
				40	18	21.28
				75	0	21.31
64QAM	670.5	133197	15	1	0	22.35
				1	74	22.80
				40	18	21.18
				75	0	20.99
	680.5	133297		1	0	22.24
				1	74	22.47
				40	18	20.98
				75	0	21.24
	690.5	133397		1	0	22.08
				1	74	21.90
				40	18	21.07
				75	0	21.05

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	673	133222	20	1	0	23.06
				1	99	23.72
				50	25	22.20
				100	0	22.53
	683	133322		1	0	23.15
				1	99	23.48
				50	25	22.45
				100	0	22.65
	688	133372		1	0	23.56
				1	99	23.66
				50	25	22.48
				100	0	22.49
16QAM	673	133222	20	1	0	22.64
				1	99	23.26
				50	25	21.72
				100	0	21.46
	683	133322		1	0	22.72
				1	99	23.01
				50	25	21.55
				100	0	21.67
	688	133372		1	0	22.53
				1	99	22.45
				50	25	21.52
				100	0	21.53
64QAM	673	133222	20	1	0	22.53
				1	99	23.14
				50	25	21.46
				100	0	21.35
	683	133322		1	0	22.57
				1	99	22.78
				50	25	21.31
				100	0	21.50
	688	133372		1	0	22.25
				1	99	22.22
				50	25	21.36
				100	0	21.29

## 6.5 Bluetooth Measurement result

### BT

Modulation type	Average Power Output (dBm)		
	2402MHz(Ch0)	2441MHz(Ch39)	2480MHz(Ch78)
GFSK	6.81	7.36	6.36
$\pi/4$ DQPSK	5.93	6.59	4.82
8DPSK	5.36	6.05	4.25

### BLE

Modulation type	Average Power Output (dBm)		
	2402MHz (Ch0)	2440MHz (Ch19)	2480MHz (Ch39)
GFSK (LE 1Mbps)	-0.02	0.44	-0.95

## 6.6 Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

### SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and $\leq 50$ mm

#### Method1:

According to the KDB447498 4.3.1 (1)

For 100 MHz to 6 GHz and test separation distances  $\leq 50$  mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f} \text{ (GHz)}] \leq 3.0$  for 1-g SAR, where

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

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion.

This is equivalent to  $[(\text{max. power of channel, including tune-up tolerance, mW}) / (60 / \sqrt{f} \text{ (GHz)})] \cdot [20 \text{ mm} / (\text{min. test separation distance, mm})] \leq 1.0$  for 1-g SAR; also see Appendix A for approximate exclusion threshold values at selected frequencies and distances.



**Method2:**

According to the KDB447498 appendix A

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

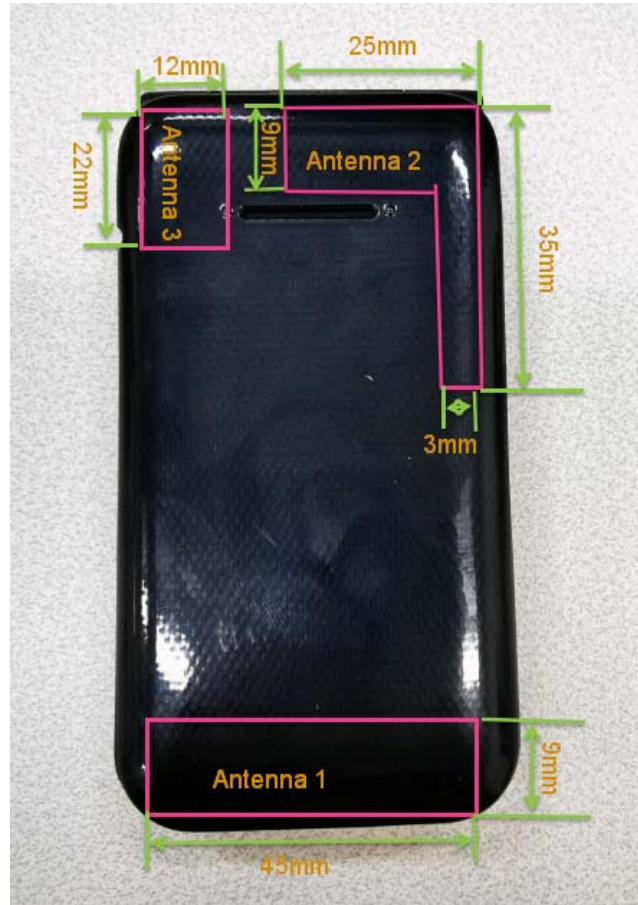
MHz	5	10	15	20	25	mm
150	39	77	116	155	194	<i>SAR Test Exclusion Threshold (mW)</i>
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

**Summary of Transmitters**

Band/Mode	Max conducted power adjusted for tune-up tolerance(mW)	Position	SAR test exclusion threshold (mW)	Standalone SAR Required
2.4GHz BT/BLE	5.5	Head	10	No
		Body	19	No

## 6.7 RF exposure conditions

Refer to the follow picture “Antenna information” for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.



- Antenna1: LTE B2/4/5/12/25/41/66/71 RX&TX  
GSM850/1900 RX&TX WCDMA B2/B4 RX&TX
- Antenna 2: LTE B2/4/5/12/25/41/66/71 RX  
GSM850/1900 RX WCDMA B2/B4 RX
- Antenna 3: GPS&2.4GHz BT

**Note: we defined these position when we face the screen of EUT, the reason why we perform SAR test for these edges is that the structures of antennas is close to our body, and for the other edges do not necessary cause we already consider the worst case.**

### 6.7.1 Head Exposure Conditions For WWAN

Test Configurations	SAR Required	Note
Left Touch	Yes	/
Left Tilt (15°)	Yes	/
Right Touch	Yes	/
Right Tilt (15°)	Yes	/

#### For WLAN

Test Configurations	SAR Required	Note
Left Touch	Yes	/
Left Tilt (15°)	Yes	/
Right Touch	Yes	/
Right Tilt (15°)	Yes	/

#### For BT/BLE

Test Configurations	Estimated SAR	Note
Left Touch	Yes	Excluded from SAR test
Left Tilt (15°)	Yes	
Right Touch	Yes	
Right Tilt (15°)	Yes	

### 6.7.2 Body Exposure conditions

#### For WWAN

Test Configurations	SAR Required	Note
Back	Yes	/
Front	Yes	/

#### For WLAN

Test Configurations	SAR Required	Note
Back	Yes	/
Front	Yes	/

#### For BT/BLE

Test Configurations	Estimated SAR	Note
Back	Yes	Excluded from SAR test
Front	Yes	

## 6.8 System Checking

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants were measured every day using the dielectric probe kit and the network analyser. For the measurement of the following parameters the SPEAG DAKS-3.5 dielectric parameter probe is used, representing the open-ended coaxial probe measurement procedure.

Date Tested	Freq. (MHz)	Liquid parameters	measured	Target	Delta (%)	Tolerance (%)
2020.06.24	750	$\epsilon_r$	41.352	41.90	-1.3	$\pm 10$
		$\sigma$ [S/m]	0.923	0.89	3.7	$\pm 10$
2020.06.28	835	$\epsilon_r$	40.266	41.50	-3.0	$\pm 10$
		$\sigma$ [S/m]	0.911	0.90	1.2	$\pm 10$
2019.06.29	1800	$\epsilon_r$	40.688	40.00	1.7	$\pm 10$
		$\sigma$ [S/m]	1.418	1.40	1.3	$\pm 10$
2020.06.30	2000	$\epsilon_r$	39.844	40.00	-0.4	$\pm 10$
		$\sigma$ [S/m]	1.427	1.40	1.9	$\pm 10$
2020.07.01	2450	$\epsilon_r$	38.343	39.20	-2.2	$\pm 10$
		$\sigma$ [S/m]	1.866	1.80	3.7	$\pm 10$
2020.07.04	2600	$\epsilon_r$	39.672	39.00	1.7	$\pm 10$
		$\sigma$ [S/m]	1.951	1.96	-0.5	$\pm 10$
2022.03.11	2600	$\epsilon_r$	39.673	39	1.73	$\pm 10$
		$\sigma$ [S/m]	1.949	1.96	-0.58	$\pm 10$

**Note: For DASY system, the conservative tolerance 5% could expand to 10% when the frequency under 3GHz.**

A system check measurement was made following once the determination of the dielectric parameters of the simulant, using the dipole validation kit. The system checking results (dielectric parameters and SAR values) are given in the table below.

Date Tested	System dipole	T.S. Liquid	SAR measured (normalized to 1W)		Target (Ref. Value)	Delta (%)	Tolerance (%)
2020.06.24	D750V3	Head	1g	8.24	8.26	-0.2	$\pm 10$
2020.06.28	D835V2	Head	1g	9.56	9.37	2.0	$\pm 10$
2020.06.29	D1800V2	Head	1g	37.96	38.9	-2.4	$\pm 10$
2020.06.30	D2000V2	Head	1g	39.28	40.3	-2.5	$\pm 10$
2020.07.01	D2450V2	Head	1g	54.0	52.4	3.1	$\pm 10$
2020.07.02	D2600V2	Head	1g	56.4	56.6	-0.4	$\pm 10$
2022.03.11	D2600V2	Head	1g	58.4	56.5	3.36	$\pm 10$

## 6.9 SAR TEST RESULT

In order to determine the largest value of the peak spatial-average SAR of a handset, all device positions, configurations, and operational modes should be tested for each frequency band according to Steps 1 to 3 below.

Step 1: The tests should be performed at the channel that is closest to the center of the transmit frequency band.

a) All device positions (cheek and tilt, for both left and right sides of the SAM phantom),  
b) All configurations for each device position in a), e.g., antenna extended and retracted, and  
c) All operational modes for each device position in item a) and configuration in item b) in each frequency band, e.g., analog and digital, If more than three frequencies need to be tested (i.e.,  $N_c > 3$ ), then all frequencies, configurations and modes shall be tested for all of the above test conditions.

Step 2: For the condition providing the highest peak spatial-average SAR determined in Step 1 for each frequency, perform all tests at all other test frequency channels, e.g., lowest and highest frequencies. In addition, for all other conditions (device position, configuration, and operational mode) where the peak spatial-average SAR value determined in Step 1 is within 3 dB of the applicable SAR limit, it is recommended that all other test frequencies should be tested as well.

Step 3: Examine all data to determine the largest value of the peak.

Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.

Scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.

Duty Factor = 1 / Duty Cycle(%)

For cellular network:

Reported SAR (W/kg) = Measured SAR (W/kg) \* Scaling Factor

For WLAN

Reported SAR (W/kg) = Measured SAR (W/kg) \* Scaling Factor \* Duty factor

2. Per KDB 447498 D01v06, for each exposure position, if the highest output channel reported SAR  $\leq 0.8$ W/kg, other channels SAR testing are not necessary.

3. The distance between the EUT and the phantom bottom is 10mm.

Mode	Duty cycle	Duty factor	Note
Licensed Frequency	GSM Band	Depends on UP slots	According to the theory, we configured duty cycle with relevant value on the communication tester, so correction factor do not need such as "duty factor"
	WCDMA Band	100%	
	FDD-LTE Band	100%	
	TDD-LTE Band	63.3%	

The measured and reported Head/body SAR values for the test device are tabulated below:

Mode: GSM 850

fL(MHz)=824.2MHz

fM(MHz)=836.5MHz

fH(MHz)= 848.8MHz

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
GSM	Head	Left touch	L	33.02	33.10	1.02	---	---
			M	32.79	33.10	1.07	0.118	0.126
			H	32.85	33.10	1.06	---	---
		Left tilt	L	33.02	33.10	1.02	---	---
			M	32.79	33.10	1.07	0.052	0.056
			H	32.85	33.10	1.06	---	---
		Right touch	L	33.02	33.10	1.02	---	---
			M	32.79	33.10	1.07	0.126	0.135
			H	32.85	33.10	1.06	---	---
		Right tilt	L	33.02	33.10	1.02	---	---
			M	32.79	33.10	1.07	0.057	0.061
			H	32.85	33.10	1.06	---	---
GPRS 3TX	Body worn	Back	L1	28.23	28.50	1.06	0.831	0.881
			M1	28.31	28.50	1.04	0.913	0.950
			H1	28.22	28.50	1.07	0.914	0.978
			L2	28.23	28.50	1.06	0.824	0.873
			M2	28.31	28.50	1.04	0.908	0.944
			H2	28.22	28.50	1.07	0.912	0.976
		Front	L	28.23	28.50	1.06	---	---
			M	28.31	28.50	1.04	0.101	0.105
			H	28.22	28.50	1.07	---	---

**Mode: GSM1900**

fL (MHz)=1850.2MHz      fM (MHz)=1880.0MHz      fH (MHz)=1909.8MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
GSM	Head	Left touch	L	29.82	30.00	1.04	---	---
			M	29.75	30.00	1.06	0.040	0.042
			H	29.84	30.00	1.04	---	---
		Left tilt	L	29.82	30.00	1.04	---	---
			M	29.75	30.00	1.06	0.027	0.029
			H	29.84	30.00	1.04	---	---
		Right touch	L	29.82	30.00	1.04	---	---
			M	29.75	30.00	1.06	0.051	0.054
			H	29.84	30.00	1.04	---	---
		Right tilt	L	29.82	30.00	1.04	---	---
			M	29.75	30.00	1.06	0.028	0.030
			H	29.84	30.00	1.04	---	---
GPRS 3TX	Body worn	Back	L1	26.70	27.00	1.07	1.010	1.081
			M1	26.32	27.00	1.17	0.915	1.071
			H1	26.82	27.00	1.04	0.924	0.961
			L2	26.70	27.00	1.07	1.000	1.070
			M2	26.32	27.00	1.17	0.907	1.061
			H2	26.82	27.00	1.04	0.916	0.953
		Front	L	26.70	27.00	1.07	---	---
			M	26.32	27.00	1.17	0.239	0.280
			H	26.82	27.00	1.04	---	---

**Mode: WCDMA BAND II**

fL (MHz)= 1852.4MHz      fM (MHz)= 1880.0MHz      fH (MHz)= 1907.6MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
Rel.99	Head	Left touch	L	20.62	20.70	1.02	---	---
			M	20.44	20.70	1.06	0.094	0.099
			H	20.45	20.70	1.06	---	---
		Left tilt	L	20.62	20.70	1.02	---	---
			M	20.44	20.70	1.06	0.032	0.034
			H	20.45	20.70	1.06	---	---
		Right touch	L	20.62	20.70	1.02	---	---
			M	20.44	20.70	1.06	0.043	0.046
			H	20.45	20.70	1.06	---	---
		Right tilt	L	20.62	20.70	1.02	---	---
			M	20.44	20.70	1.06	0.036	0.038
			H	20.45	20.70	1.06	---	---
	Body worn	Back	L1	20.62	20.70	1.02	0.587	0.599
			M1	20.44	20.70	1.06	0.660	0.700
			H1	20.45	20.70	1.06	0.810	0.859
			L2	20.62	20.70	1.02	0.574	0.585
			M2	20.44	20.70	1.06	0.657	0.696
			H2	20.45	20.70	1.06	0.804	0.852
		Front	L	20.62	20.70	1.02	---	---
			M	20.44	20.70	1.06	0.190	0.201
			H	20.45	20.70	1.06	---	---



**Mode: WCDMA BAND IV**

fL (MHz)=1712.4MHz      fM (MHz)=1732.4MHz      fH (MHz)= 1752.6MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
Rel.99	Head	Left touch	L	22.65	22.80	1.04	---	---
			M	22.72	22.80	1.02	0.060	0.061
			H	22.70	22.80	1.02	---	---
		Left tilt	L	22.65	22.80	1.04	---	---
			M	22.72	22.80	1.02	0.044	0.045
			H	22.70	22.80	1.02	---	---
		Right touch	L	22.65	22.80	1.04	---	---
			M	22.72	22.80	1.02	0.038	0.039
			H	22.70	22.80	1.02	---	---
		Right tilt	L	22.65	22.80	1.04	---	---
			M	22.72	22.80	1.02	0.062	0.063
			H	22.70	22.80	1.02	---	---
	Body worn	Back	L	22.65	22.80	1.04	---	---
			M	22.72	22.80	1.02	0.532	0.543
			H	22.70	22.80	1.02	---	---
		Front	L	22.65	22.80	1.04	---	---
			M	22.72	22.80	1.02	0.193	0.197
			H	22.70	22.80	1.02	---	---

**Mode: WCDMA BAND V**

fL (MHz)=826.4MHz

fM (MHz)=836.4MHz

fH (MHz)= 846.6MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
Rel.99	Head	Left touch	L	22.68	22.80	1.03	---	---
			M	22.70	22.80	1.02	0.120	0.122
			H	22.69	22.80	1.03	---	---
		Left tilt	L	22.68	22.80	1.03	---	---
			M	22.70	22.80	1.02	0.062	0.063
			H	22.69	22.80	1.03	---	---
		Right touch	L	22.68	22.80	1.03	---	---
			M	22.70	22.80	1.02	0.143	0.146
			H	22.69	22.80	1.03	---	---
		Right tilt	L	22.68	22.80	1.03	---	---
			M	22.70	22.80	1.02	0.062	0.063
			H	22.69	22.80	1.03	---	---
	Body worn	Back	L	22.68	22.80	1.03	---	---
			M	22.70	22.80	1.02	0.630	0.643
			H	22.69	22.80	1.03	---	---
		Front	L	22.68	22.80	1.03	---	---
			M	22.70	22.80	1.02	0.068	0.069
			H	22.69	22.80	1.03	---	---

**Mode: LTE Band 2**

fL (MHz)= 1860MHz

fM (MHz)= 1880MHz

fH (MHz)= 1900MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=20MHz QPSK 1%RB	Head	Left touch	L	22.66	22.70	1.01	---	---
			M	22.24	22.70	1.11	0.065	0.072
			H	22.54	22.70	1.04	---	---
		Left tilt	L	22.66	22.70	1.01	---	---
			M	22.24	22.70	1.11	0.039	0.043
			H	22.54	22.70	1.04	---	---
		Right touch	L	22.66	22.70	1.01	---	---
			M	22.24	22.70	1.11	0.070	0.078
			H	22.54	22.70	1.04	---	---
		Right tilt	L	22.66	22.70	1.01	---	---
			M	22.24	22.70	1.11	0.042	0.047
			H	22.54	22.70	1.04	---	---
	Body worn	Back	L1	22.66	22.70	1.01	0.788	0.796
			M1	22.24	22.70	1.11	0.768	0.852
			H1	22.54	22.70	1.04	0.932	0.969
			L2	22.66	22.70	1.01	0.779	0.787
			M2	22.24	22.70	1.11	0.754	0.837
			H2	22.54	22.70	1.04	0.927	0.964
		Front	L	22.66	22.70	1.01	---	---
			M	22.24	22.70	1.11	0.188	0.209
			H	22.54	22.70	1.04	---	---

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=20MHz QPSK 50%RB	Head	Left touch	L	21.54	21.60	1.01	---	---
			M	21.41	21.60	1.04	0.056	0.058
			H	21.38	21.60	1.05	---	---
		Left tilt	L	21.54	21.60	1.01	---	---
			M	21.41	21.60	1.04	0.031	0.032
			H	21.38	21.60	1.05	---	---
		Right touch	L	21.54	21.60	1.01	---	---
			M	21.41	21.60	1.04	0.051	0.053
			H	21.38	21.60	1.05	---	---
		Right tilt	L	21.54	21.60	1.01	---	---
			M	21.41	21.60	1.04	0.030	0.031
			H	21.38	21.60	1.05	---	---
	Body worn	Back	L	21.54	21.60	1.01	---	---
			M	21.41	21.60	1.04	0.758	0.788
			H	21.38	21.60	1.05	---	---
		Front	L	21.54	21.60	1.01	---	---
			M	21.41	21.60	1.04	0.214	0.223
			H	21.38	21.60	1.05	---	---
Body worn	Back	L	21.64	21.70	1.01	---	---	
		M	21.28	21.70	1.10	0.532	0.585	
		H	21.36	21.70	1.08	---	---	

**Mode: LTE Band 4 fL (MHz)=1720MHz fM (MHz)= 1732.5MHz fH (MHz)= 1745MHz**  
**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=20MHz QPSK 1%RB	Head	Left touch	L	23.24	23.50	1.06	---	---
			M	23.30	23.50	1.05	0.061	0.064
			H	23.42	23.50	1.02	---	---
		Left tilt	L	23.24	23.50	1.06	---	---
			M	23.30	23.50	1.05	0.064	0.067
			H	23.42	23.50	1.02	---	---
		Right touch	L	23.24	23.50	1.06	---	---
			M	23.30	23.50	1.05	0.066	0.070
			H	23.42	23.50	1.02	---	---
		Right tilt	L	23.24	23.50	1.06	---	---
			M	23.30	23.50	1.05	0.064	0.067
			H	23.42	23.50	1.02	---	---
	Body worn	Back	L1	23.24	23.50	1.06	0.651	0.690
			M1	23.30	23.50	1.05	0.820	0.861
			H1	23.42	23.50	1.02	0.981	1.001
			L2	23.24	23.50	1.06	0.634	0.672
			M2	23.30	23.50	1.05	0.817	0.858
			H2	23.42	23.50	1.02	0.965	0.984
		Front	L	23.24	23.50	1.06	---	---
			M	23.30	23.50	1.05	0.203	0.213
			H	23.42	23.50	1.02	---	---

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=20MHz QPSK 50%RB	Head	Left touch	L	22.25	22.60	1.08	---	---
			M	22.43	22.60	1.04	0.041	0.043
			H	22.59	22.60	1.00	---	---
		Left tilt	L	22.25	22.60	1.08	---	---
			M	22.43	22.60	1.04	0.043	0.045
			H	22.59	22.60	1.00	---	---
		Right touch	L	22.25	22.60	1.08	---	---
			M	22.43	22.60	1.04	0.054	0.056
			H	22.59	22.60	1.00	---	---
		Right tilt	L	22.25	22.60	1.08	---	---
			M	22.43	22.60	1.04	0.048	0.050
			H	22.59	22.60	1.00	---	---
Body worn	Back	L	22.25	22.60	1.08	---	---	
		M	22.43	22.60	1.04	0.682	0.709	
		H	22.59	22.60	1.00	---	---	
	Front	L	22.25	22.60	1.08	---	---	
		M	22.43	22.60	1.04	0.174	0.181	
		H	22.59	22.60	1.00	---	---	
BW=20MHz QPSK 100%RB	Body worn	Back	L	22.23	22.60	1.09	---	---
			M	22.29	22.60	1.07	0.519	0.555
			H	22.51	22.60	1.02	---	---

**Mode: LTE Band 5**

fL (MHz)=829 MHz      fM (MHz)=836.5MHz      fH (MHz)= 844MHz

**Limit of SAR (W/kg) : <1.6W/kg (1g Average)**

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=10MHz QPSK 1%RB	Head	Left touch	L	23.24	23.50	1.06	---	---
			M	23.31	23.50	1.04	0.132	0.137
			H	23.40	23.50	1.02	---	---
		Left tilt	L	23.24	23.50	1.06	---	---
			M	23.31	23.50	1.04	0.068	0.071
			H	23.40	23.50	1.02	---	---
		Right touch	L	23.24	23.50	1.06	---	---
			M	23.31	23.50	1.04	0.202	0.210
			H	23.40	23.50	1.02	---	---
		Right tilt	L	23.24	23.50	1.06	---	---
			M	23.31	23.50	1.04	0.069	0.072
			H	23.40	23.50	1.02	---	---
	Body worn	Back	L	23.24	23.50	1.06	---	---
			M	23.31	23.50	1.04	0.666	0.693
			H	23.40	23.50	1.02	---	---
		Front	L	23.24	23.50	1.06	---	---
			M	23.31	23.50	1.04	0.075	0.078
			H	23.40	23.50	1.02	---	---

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=10MHz QPSK 50%RB	Head	Left touch	L	22.28	22.50	1.05	---	---
			M	22.22	22.50	1.07	0.105	0.112
			H	22.21	22.50	1.07	---	---
		Left tilt	L	22.28	22.50	1.05	---	---
			M	22.22	22.50	1.07	0.053	0.057
			H	22.21	22.50	1.07	---	---
		Right touch	L	22.28	22.50	1.05	---	---
			M	22.22	22.50	1.07	0.144	0.154
			H	22.21	22.50	1.07	---	---
		Right tilt	L	22.28	22.50	1.05	---	---
			M	22.22	22.50	1.07	0.053	0.057
			H	22.21	22.50	1.07	---	---
	Body worn	Back	L	22.28	22.50	1.05	---	---
			M	22.22	22.50	1.07	0.507	0.542
			H	22.21	22.50	1.07	---	---
		Front	L	22.28	22.50	1.05	---	---
			M	22.22	22.50	1.07	0.062	0.066
			H	22.21	22.50	1.07	---	---



**Mode: LTE Band 12**

fL (MHz)=704MHz      fM (MHz)=707.5MHz      fH (MHz)= 711MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=10MHz QPSK 1%RB	Head	Left touch	L	22.73	23.00	1.06	---	---
			M	22.80	23.00	1.05	0.222	0.233
			H	22.54	23.00	1.11	---	---
		Left tilt	L	22.73	23.00	1.06	---	---
			M	22.80	23.00	1.05	0.120	0.126
			H	22.54	23.00	1.11	---	---
		Right touch	L	22.73	23.00	1.06	---	---
			M	22.80	23.00	1.05	0.276	0.290
			H	22.54	23.00	1.11	---	---
		Right tilt	L	22.73	23.00	1.06	---	---
			M	22.80	23.00	1.05	0.100	0.105
			H	22.54	23.00	1.11	---	---
	Body worn	Back	L	22.73	23.00	1.06	---	---
			M	22.80	23.00	1.05	0.284	0.298
			H	22.54	23.00	1.11	---	---
		Front	L	22.73	23.00	1.06	---	---
			M	22.80	23.00	1.05	0.075	0.079
			H	22.54	23.00	1.11	---	---

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=10MHz QPSK 50%RB	Head	Left touch	L	21.86	22.00	1.03	---	---
			M	21.74	22.00	1.06	0.196	0.208
			H	21.74	22.00	1.06	---	---
		Left tilt	L	21.86	22.00	1.03	---	---
			M	21.74	22.00	1.06	0.097	0.103
			H	21.74	22.00	1.06	---	---
		Right touch	L	21.86	22.00	1.03	---	---
			M	21.74	22.00	1.06	0.219	0.232
			H	21.74	22.00	1.06	---	---
		Right tilt	L	21.86	22.00	1.03	---	---
			M	21.74	22.00	1.06	0.077	0.082
			H	21.74	22.00	1.06	---	---
	Body worn	Back	L	21.86	22.00	1.03	---	---
			M	21.74	22.00	1.06	0.225	0.239
			H	21.74	22.00	1.06	---	---
		Front	L	21.86	22.00	1.03	---	---
			M	21.74	22.00	1.06	0.064	0.068
			H	21.74	22.00	1.06	---	---

**Mode: LTE Band 25**

fL (MHz)=1860MHz    fM (MHz)=1882.5MHz    fH (MHz)= 1905MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=20MHz QPSK 1%RB	Head	Left touch	L	22.87	23.00	1.03	---	---
			M	22.66	23.00	1.08	0.065	0.070
			H	22.62	23.00	1.09	---	---
		Left tilt	L	22.87	23.00	1.03	---	---
			M	22.66	23.00	1.08	0.037	0.040
			H	22.62	23.00	1.09	---	---
		Right touch	L	22.87	23.00	1.03	---	---
			M	22.66	23.00	1.08	0.073	0.079
			H	22.62	23.00	1.09	---	---
		Right tilt	L	22.87	23.00	1.03	---	---
			M	22.66	23.00	1.08	0.034	0.037
			H	22.62	23.00	1.09	---	---
	Body worn	Back	L1	22.87	23.00	1.03	0.778	0.801
			M1	22.66	23.00	1.08	0.853	0.921
			H1	22.62	23.00	1.09	0.890	0.970
			L2	22.87	23.00	1.03	0.762	0.785
			M2	22.66	23.00	1.08	0.852	0.920
			H2	22.62	23.00	1.09	0.874	0.953
		Front	L	22.87	23.00	1.03	---	---
			M	22.66	23.00	1.08	0.196	0.212
			H	22.62	23.00	1.09	---	---

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=20MHz QPSK 50%RB	Head	Left touch	L	21.87	22.00	1.03	---	---
			M	21.64	22.00	1.09	0.053	0.058
			H	21.93	22.00	1.02	---	---
		Left tilt	L	21.87	22.00	1.03	---	---
			M	21.64	22.00	1.09	0.030	0.033
			H	21.93	22.00	1.02	---	---
		Right touch	L	21.87	22.00	1.03	---	---
			M	21.64	22.00	1.09	0.049	0.053
			H	21.93	22.00	1.02	---	---
		Right tilt	L	21.87	22.00	1.03	---	---
			M	21.64	22.00	1.09	0.026	0.028
			H	21.93	22.00	1.02	---	---
	Body worn	Back	L	21.87	22.00	1.03	---	---
			M	21.64	22.00	1.09	0.713	0.777
			H	21.93	22.00	1.02	---	---
		Front	L	21.87	22.00	1.03	---	---
			M	21.64	22.00	1.09	0.192	0.209
			H	21.93	22.00	1.02	---	---
BW=20MHz QPSK 100%RB	Body worn	Back	L	21.95	22.00	1.01	---	---
			M	21.63	22.00	1.09	0.492	0.536
			H	21.69	22.00	1.07	---	---

**Mode: LTE Band 41**

fL (MHz)=2506MHz fM (MHz)=2593MHz fH (MHz)= 2680MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=20MHz QPSK 1%RB	Head	Left touch	L	23.67	24.00	1.08	---	---
			M	23.47	24.00	1.13	0.038	0.043
			H	23.63	24.00	1.09	---	---
		Left tilt	L	23.67	24.00	1.08	---	---
			M	23.47	24.00	1.13	0.030	0.034
			H	23.63	24.00	1.09	---	---
		Right touch	L	23.67	24.00	1.08	---	---
			M	23.47	24.00	1.13	0.058	0.066
			H	23.63	24.00	1.09	---	---
		Right tilt	L	23.67	24.00	1.08	---	---
			M	23.47	24.00	1.13	0.014	0.016
			H	23.63	24.00	1.09	---	---
	Body worn	Back	L1	23.67	24.00	1.08	0.691	0.746
			M1	23.47	24.00	1.13	1.160	1.311
			H1	23.63	24.00	1.09	0.843	0.919
			L2	23.67	24.00	1.08	0.684	0.739
			M2	23.47	24.00	1.13	1.150	1.300
			H2	23.63	24.00	1.09	0.839	0.915
			L <sup>Note1</sup>	23.67	24.00	1.08	0.687	0.742
			M <sup>Note1</sup>	23.47	24.00	1.13	1.140	1.289
			H <sup>Note1</sup>	23.63	24.00	1.09	0.827	0.901
			L <sup>Note2</sup>	23.67	24.00	1.08	0.753	0.813
			M <sup>Note2</sup>	23.47	24.00	1.13	1.143	1.292
			H <sup>Note2</sup>	23.63	24.00	1.09	0.774	0.844
		Front	L	23.67	24.00	1.08	---	---
			M	23.47	24.00	1.13	0.080	0.090
			H	23.63	24.00	1.09	---	---

Note1:The worst-case spot test results for battery 2.

Note2:The worst-case spot test results for modified product.

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=20MHz QPSK 50%RB	Head	Left touch	L	22.83	23.00	1.04	---	---
			M	22.99	23.00	1.00	0.028	0.028
			H	22.70	23.00	1.07	---	---
		Left tilt	L	22.83	23.00	1.04	---	---
			M	22.99	23.00	1.00	0.023	0.023
			H	22.70	23.00	1.07	---	---
		Right touch	L	22.83	23.00	1.04	---	---
			M	22.99	23.00	1.00	0.033	0.033
			H	22.70	23.00	1.07	---	---
		Right tilt	L	22.83	23.00	1.04	---	---
			M	22.99	23.00	1.00	0.007	0.007
			H	22.70	23.00	1.07	---	---
	Body worn	Back	L	22.83	23.00	1.04	---	---
			M	22.99	23.00	1.00	0.751	0.751
			H	22.70	23.00	1.07	---	---
		Front	L	22.83	23.00	1.04	---	---
			M	22.99	23.00	1.00	0.071	0.071
			H	22.70	23.00	1.07	---	---
BW=20MHz QPSK 100%RB	Body worn	Back	L	22.98	23.10	1.03	---	---
			M	23.07	23.10	1.01	0.624	0.630
			H	22.71	23.10	1.09	---	---

**Mode: LTE Band 66**

fL (MHz)=1720MHz fM (MHz)=1745MHz fH (MHz)= 1770MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=20MHz QPSK 1%RB	Head	Left touch	L	23.35	23.50	1.04	---	---
			M	23.40	23.50	1.02	0.054	0.055
			H	23.32	23.50	1.04	---	---
		Left tilt	L	23.35	23.50	1.04	---	---
			M	23.40	23.50	1.02	0.048	0.049
			H	23.32	23.50	1.04	---	---
		Right touch	L	23.35	23.50	1.04	---	---
			M	23.40	23.50	1.02	0.061	0.062
			H	23.32	23.50	1.04	---	---
		Right tilt	L	23.35	23.50	1.04	---	---
			M	23.40	23.50	1.02	0.060	0.061
			H	23.32	23.50	1.04	---	---
	Body worn	Back	L1	23.35	23.50	1.04	0.602	0.626
			M1	23.40	23.50	1.02	0.856	0.873
			H1	23.32	23.50	1.04	0.922	0.959
			L2	23.35	23.50	1.04	0.589	0.613
			M2	23.40	23.50	1.02	0.847	0.864
			H2	23.32	23.50	1.04	0.918	0.955
		Front	L	23.35	23.50	1.04	---	---
			M	23.40	23.50	1.02	0.214	0.218
			H	23.32	23.50	1.04	---	---

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=20MHz QPSK 50%RB	Head	Left touch	L	22.22	23.00	1.20	---	---
			M	22.40	23.00	1.15	0.037	0.043
			H	22.68	23.00	1.08	---	---
		Left tilt	L	22.22	23.00	1.20	---	---
			M	22.40	23.00	1.15	0.034	0.039
			H	22.68	23.00	1.08	---	---
		Right touch	L	22.22	23.00	1.20	---	---
			M	22.40	23.00	1.15	0.050	0.058
			H	22.68	23.00	1.08	---	---
		Right tilt	L	22.22	23.00	1.20	---	---
			M	22.40	23.00	1.15	0.045	0.052
			H	22.68	23.00	1.08	---	---
Body worn	Back	L	22.22	23.00	1.20	---	---	
		M	22.40	23.00	1.15	0.649	0.746	
		H	22.68	23.00	1.08	---	---	
	Front	L	22.22	23.00	1.20	---	---	
		M	22.40	23.00	1.15	0.183	0.210	
		H	22.68	23.00	1.08	---	---	
BW=20MHz QPSK 100%RB	Body worn	Back	L	22.19	23.00	1.21	---	---
			M	22.38	23.00	1.15	0.513	0.590
			H	22.51	23.00	1.12	---	---



**Mode: LTE Band 71**

fL (MHz)=673MHz      fM (MHz)=683MHz      fH (MHz)= 688MHz

**Limit of SAR (W/kg): <1.6W/kg (1g Average)**

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=20MHz QPSK 1%RB	Head	Left touch	L	23.72	24.00	1.07	---	---
			M	23.48	24.00	1.13	0.102	0.115
			H	23.66	24.00	1.08	---	---
		Left tilt	L	23.72	24.00	1.07	---	---
			M	23.48	24.00	1.13	0.058	0.066
			H	23.66	24.00	1.08	---	---
		Right touch	L	23.72	24.00	1.07	---	---
			M	23.48	24.00	1.13	0.109	0.123
			H	23.66	24.00	1.08	---	---
		Right tilt	L	23.72	24.00	1.07	---	---
			M	23.48	24.00	1.13	0.048	0.054
			H	23.66	24.00	1.08	---	---
	Body worn	Back	L	23.72	24.00	1.07	---	---
			M	23.48	24.00	1.13	0.124	0.140
			H	23.66	24.00	1.08	---	---
		Front	L	23.72	24.00	1.07	---	---
			M	23.48	24.00	1.13	0.029	0.033
			H	23.66	24.00	1.08	---	---

Test case				Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg) 1g Average	Reported Results (W/kg) 1g Average
Mode	Exposure condition	Position	CH					
BW=20MHz QPSK 50%RB	Head	Left touch	L	22.20	23.00	1.20	---	---
			M	22.45	23.00	1.14	0.168	0.192
			H	22.48	23.00	1.13	---	---
		Left tilt	L	22.20	23.00	1.20	---	---
			M	22.45	23.00	1.14	0.089	0.101
			H	22.48	23.00	1.13	---	---
		Right touch	L	22.20	23.00	1.20	---	---
			M	22.45	23.00	1.14	0.186	0.212
			H	22.48	23.00	1.13	---	---
		Right tilt	L	22.20	23.00	1.20	---	---
			M	22.45	23.00	1.14	0.079	0.090
			H	22.48	23.00	1.13	---	---
	Body worn	Back	L	22.20	23.00	1.20	---	---
			M	22.45	23.00	1.14	0.309	0.352
			H	22.48	23.00	1.13	---	---
		Front	L	22.20	23.00	1.20	---	---
			M	22.45	23.00	1.14	0.066	0.075
			H	22.48	23.00	1.13	---	---

**Mode: BT**

Limit of SAR (W/kg): <1.6W/kg (1g Average)

Estimated SAR					
MAX power		Head distance	Body-worn distance	Head SAR	Body-worn SAR
dBm	mw	mm	mm	w/kg	w/kg
7.4	5.495	5	10	0.231	0.115

- $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f_{\text{GHz}}/x}] \text{ W/kg}$  for test separation distances  $\leq 50 \text{ mm}$ ;  
 where  $x = 7.5$  for 1-g SAR, and  $x = 18.75$  for 10-g SAR.

## 6.10 SAR Measurement Variability

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

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

- 1) Repeated measurement is not required when the original highest measured SAR is  $< 0.80$  W/kg; steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is  $\geq 0.80$  W/kg, repeat that measurement once.
- 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is  $> 1.20$  or when the original or repeated measurement is  $\geq 1.45$  W/kg ( $\sim 10\%$  from the 1-g SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is  $\geq 1.5$  W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is  $> 1.20$ .

The Highest Reported/Estimated SAR configuration in Each Frequency Band

Frequency band	Air interface	Head SAR(w/kg)	Body-worn SAR(w/kg)
Below 1GHz	GSM850 WCDMA BANDV LTE BAND5 LTE BAND12 LTE BAND71	$<0.8$	$>0.8$
1GHz-2GHz	GSM1900 WCDMA BANDII WCDMA BANDIV LTE BAND2 LTE BAND4 LTE BAND25 LTE BAND66	$<0.8$	$>0.8$
2GHz-3GHz	BT/BLE LTE BAND41	$<0.8$	$>0.8$

## 6.11 Simultaneous Transmission SAR Analysis

Antenna numbers of Simultaneous Transmission	Antennas of Simultaneous Transmission	Simultaneous Transmission Modes
2	MAIN ANT+ BT ANT	Celluar2/3/4G+BT

### Head exposure

Position of worst case	Licensed band	Unlicensed band	Simultaneous SAR(w/kg)
Right Cheek	LTE Band12	BT	0.521

### Body-worn exposure

Position of worst case	Licensed band	Unlicensed band	Simultaneous SAR(w/kg)
Back	LTE Band 41	BT	1.426

According to the above tables, all the exposure condition of SAR values < 1.6W/kg.

## 7 MEASUREMENT UNCERTAINTY

(0.3 - 3 GHz range)								
Error Description	Uncert. value	Prob. Dist.	Div.	( $c_i$ ) 1g	( $c_i$ ) 10g	Std. Unc. (1g)	Std. Unc. (10g)	( $v_i$ ) $v_{eff}$
<b>Measurement System</b>								
Probe Calibration	±6.0 %	N	1	1	1	±6.0 %	±6.0 %	∞
Axial Isotropy	±4.7 %	R	√3	0.7	0.7	±1.9 %	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	R	√3	0.7	0.7	±3.9 %	±3.9 %	∞
Boundary Effects	±1.0 %	R	√3	1	1	±0.6 %	±0.6 %	∞
Linearity	±4.7 %	R	√3	1	1	±2.7 %	±2.7 %	∞
System Detection Limits	±1.0 %	R	√3	1	1	±0.6 %	±0.6 %	∞
Modulation Response <sup>m</sup>	±2.4 %	R	√3	1	1	±1.4 %	±1.4 %	∞
Readout Electronics	±0.3 %	N	1	1	1	±0.3 %	±0.3 %	∞
Response Time	±0.8 %	R	√3	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	√3	1	1	±1.5 %	±1.5 %	∞
RF Ambient Noise	±3.0 %	R	√3	1	1	±1.7 %	±1.7 %	∞
RF Ambient Reflections	±3.0 %	R	√3	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.4 %	R	√3	1	1	±0.2 %	±0.2 %	∞
Probe Positioning	±2.9 %	R	√3	1	1	±1.7 %	±1.7 %	∞
Max. SAR Eval.	±2.0 %	R	√3	1	1	±1.2 %	±1.2 %	∞
<b>Test Sample Related</b>								
Device Positioning	±2.9 %	N	1	1	1	±2.9 %	±2.9 %	145
Device Holder	±3.6 %	N	1	1	1	±3.6 %	±3.6 %	5
Power Drift	±5.0 %	R	√3	1	1	±2.9 %	±2.9 %	∞
Power Scaling <sup>p</sup>	±0 %	R	√3	1	1	±0.0 %	±0.0 %	∞
<b>Phantom and Setup</b>								
Phantom Uncertainty	±6.1 %	R	√3	1	1	±3.5 %	±3.5 %	∞
SAR correction	±1.9 %	R	√3	1	0.84	±1.1 %	±0.9 %	∞
Liquid Conductivity (mea.) <sup>DAK</sup>	±2.5 %	R	√3	0.78	0.71	±1.1 %	±1.0 %	∞
Liquid Permittivity (mea.) <sup>DAK</sup>	±2.5 %	R	√3	0.26	0.26	±0.3 %	±0.4 %	∞
Temp. unc. - Conductivity <sup>BB</sup>	±3.4 %	R	√3	0.78	0.71	±1.5 %	±1.4 %	∞
Temp. unc. - Permittivity <sup>BB</sup>	±0.4 %	R	√3	0.23	0.26	±0.1 %	±0.1 %	∞
Combined Std. Uncertainty						±11.2 %	±11.1 %	361
Expanded STD Uncertainty						±22.3 %	±22.2 %	

(3 - 6 GHz range)

Error Description	Uncert. value	Prob. Dist.	Div.	( $c_i$ ) 1g	( $c_i$ ) 10g	Std. Unc. (1g)	Std. Unc. (10g)	( $v_i$ ) $v_{eff}$
<b>Measurement System</b>								
Probe Calibration	±6.55 %	N	1	1	1	±6.55 %	±6.55 %	∞
Axial Isotropy	±4.7 %	R	$\sqrt{3}$	0.7	0.7	±1.9 %	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	R	$\sqrt{3}$	0.7	0.7	±3.9 %	±3.9 %	∞
Boundary Effects	±2.0 %	R	$\sqrt{3}$	1	1	±1.2 %	±1.2 %	∞
Linearity	±4.7 %	R	$\sqrt{3}$	1	1	±2.7 %	±2.7 %	∞
System Detection Limits	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Modulation Response <sup>m</sup>	±2.4 %	R	$\sqrt{3}$	1	1	±1.4 %	±1.4 %	∞
Readout Electronics	±0.3 %	N	1	1	1	±0.3 %	±0.3 %	∞
Response Time	±0.8 %	R	$\sqrt{3}$	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	$\sqrt{3}$	1	1	±1.5 %	±1.5 %	∞
RF Ambient Noise	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
RF Ambient Reflections	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.8 %	R	$\sqrt{3}$	1	1	±0.5 %	±0.5 %	∞
Probe Positioning	±6.7 %	R	$\sqrt{3}$	1	1	±3.9 %	±3.9 %	∞
Max. SAR Eval.	±4.0 %	R	$\sqrt{3}$	1	1	±2.3 %	±2.3 %	∞
<b>Test Sample Related</b>								
Device Positioning	±2.9 %	N	1	1	1	±2.9 %	±2.9 %	145
Device Holder	±3.6 %	N	1	1	1	±3.6 %	±3.6 %	5
Power Drift	±5.0 %	R	$\sqrt{3}$	1	1	±2.9 %	±2.9 %	∞
Power Scaling <sup>P</sup>	±0 %	R	$\sqrt{3}$	1	1	±0.0 %	±0.0 %	∞
<b>Phantom and Setup</b>								
Phantom Uncertainty	±6.6 %	R	$\sqrt{3}$	1	1	±3.8 %	±3.8 %	∞
SAR correction	±1.9 %	R	$\sqrt{3}$	1	0.84	±1.1 %	±0.9 %	∞
Liquid Conductivity (mea.) <sup>DAK</sup>	±2.5 %	R	$\sqrt{3}$	0.78	0.71	±1.1 %	±1.0 %	∞
Liquid Permittivity (mea.) <sup>DAK</sup>	±2.5 %	R	$\sqrt{3}$	0.26	0.26	±0.3 %	±0.4 %	∞
Temp. unc. - Conductivity <sup>BB</sup>	±3.4 %	R	$\sqrt{3}$	0.78	0.71	±1.5 %	±1.4 %	∞
Temp. unc. - Permittivity <sup>BB</sup>	±0.4 %	R	$\sqrt{3}$	0.23	0.26	±0.1 %	±0.1 %	∞
Combined Std. Uncertainty						±12.3 %	±12.2 %	748
Expanded STD Uncertainty						±24.6 %	±24.5 %	

## **8 TEST EQUIPMENTS**

The measurements were performed using an automated near-field scanning system, DASY5, manufactured by Schmid & Partner Engineering AG (SPEAG) in Switzerland. The SAR extrapolation algorithm used in all measurements was the ‘advanced extrapolation’ algorithm.

The following table lists calibration dates of SPEAG components:

Test Equipment	Model	Serial Number	Calibration date	Calibration Due data
DAE	DAE4	720	2019.10.02	2020.10.01
Dosimetric E-field Probe	EX4DV3	3708	2019.09.26	2020.09.25
DAE	DAE4	720	2021.10.08	2022.10.07
Dosimetric E-field Probe	EX4DV3	3708	2021.10.20	2022.10.19
Dipole Validation Kit	D750V3	4d023	2017.09.13	2020.09.12
Dipole Validation Kit	D835V2	4d023	2017.09.13	2020.09.12
Dipole Validation Kit	D1800V2	2d084	2017.09.15	2020.09.14
Dipole Validation Kit	D2000V2	1009	2018.02.01	2021.01.31
Dipole Validation Kit	D2450V2	738	2017.09.18	2020.09.17
Dipole Validation Kit	D2600V2	1166	2019.11.08	2022.11.08

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration date	Calibration Due data
Signal Generator	E4428C	MY45280865	2019.08.20	2020.08.19
Signal Generator	SML 03	103514	2019.08.20	2020.08.19
Power meter	E4417A	MY45101182	2019.08.20	2020.08.19
Power Sensor	E4412A	MY41502214	2019.08.20	2020.08.19
Power Sensor	E4412A	MY41502130	2019.08.20	2020.08.19
Power meter	E4417A	MY45101004	2019.08.20	2020.08.19
Power Sensor	E9300B	MY41496001	2019.08.20	2020.08.19
Power Sensor	E9300B	MY41496003	2019.08.20	2020.08.19
Communication Tester	E5515C	MY48367401	2019.08.20	2020.08.19
Communication Tester	CMU500	114666	2019.08.20	2020.08.19
Communication Tester	MT8820C	6201300660	2019.08.20	2020.08.19
Communication Tester	MT8821C	6201547819	2019.08.20	2020.08.19
Vector Network Analyzer	VNA R140	0011213	2019.09.18	2020.09.17
Dielectric Parameter Probe	DAKS-3.5	1042	2019.09.17	2020.09.16



Detailed information of Isotropic E-field Probe Type ES3DV3

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Calibration certificate in Appendix C
Frequency	10 MHz to 4 GHz; Linearity: $\pm 0.2$ dB (30 MHz to 4 GHz)
Optical Surface Detection	$\pm 0.2$ mm repeatability in air and clear liquids over diffuse reflecting surfaces
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Dynamic Range	5 $\mu$ W/g to > 100 W/kg; Linearity: $\pm 0.2$ dB
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones

Detailed information of Isotropic E-field Probe Type EX3DV4

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Calibration certificate in Appendix C
Frequency	10 MHz to > 6 GHz Linearity: $\pm 0.2$ dB (30 MHz to 6 GHz)
Optical Surface Detection	$\pm 0.3$ mm repeatability in air and clear liquids over diffuse reflecting surfaces
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Dynamic Range	10 $\mu$ W/g to > 100 W/kg Linearity: $\pm 0.2$ dB (noise: typically < 1 $\mu$ W/g)
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.

According to KDB 865664 D01 section 3.2.2, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the **SAR target, impedance and return loss** of a dipole have remain stable according to the following requirements.

- 1) The test laboratory must ensure that the required supporting information and documentation are included in the SAR report to qualify for the three-year extended calibration interval; otherwise, the IEEE Std 1528-2013 recommended annual calibration applies.
- 2) Immediate re-calibration is required for the following conditions.
  - a) After a dipole is damaged and properly repaired to meet required specifications.
  - b) When the measured SAR deviates from the calibrated SAR value by more than 10% due to changes in physical, mechanical, electrical or other relevant dipole conditions; i.e., the error is not introduced by incorrect measurement procedures or other issues relating to the SAR measurement system.
  - c) When the most recent return-loss result, measured at least annually, deviates by more than 20% from the previous measurement (i.e. value in dB $\times$ 0.2) or not meeting the required 20 dB minimum return-loss requirement.
  - d) When the most recent measurement of the real or imaginary parts of the impedance, measured at least annually, deviates by more than 5  $\Omega$  from the previous measurement.



### Dipole 750

#### SAR target

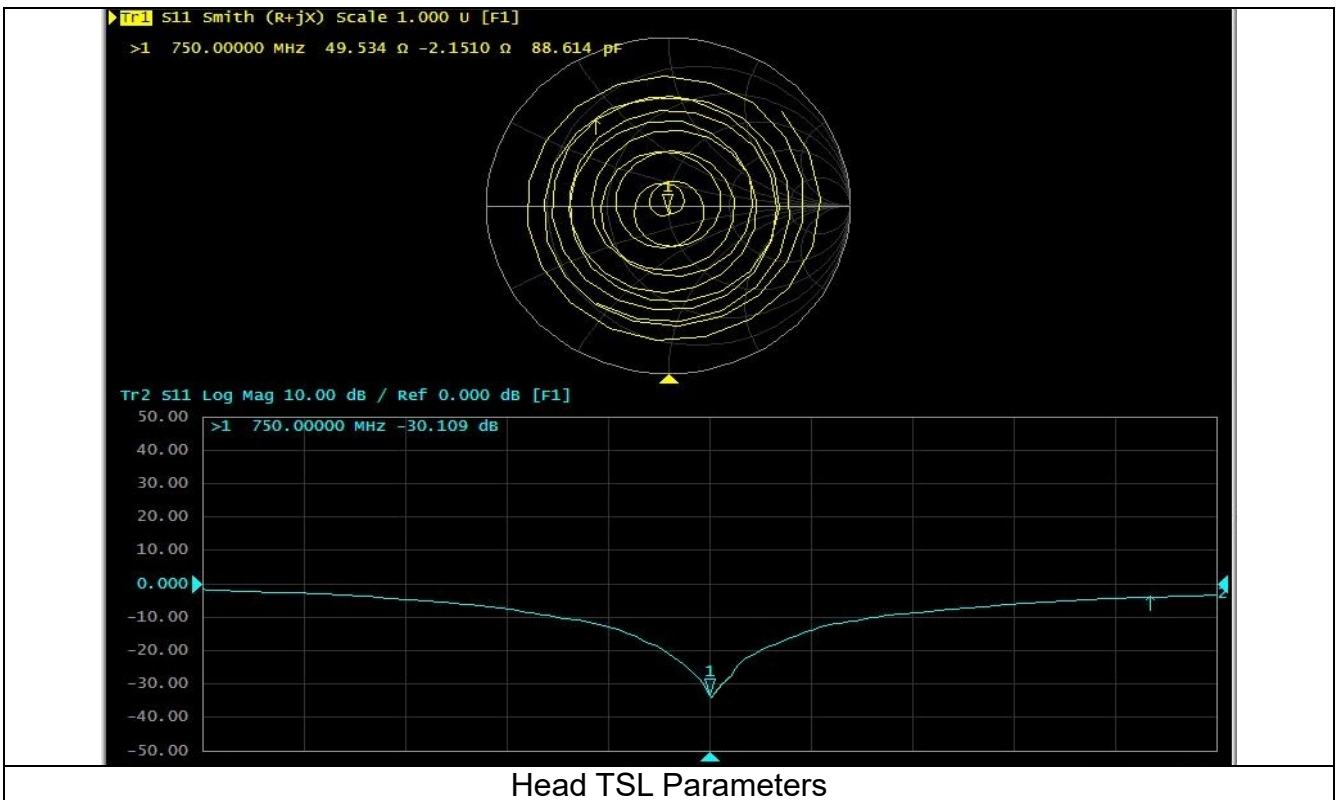
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

#### Impedance and Return loss measured by Network analyzer

The most recent measurement of the real or imaginary parts of the impedance, deviates within 5 Ω from the previous measurement. (Data from the last calibration report)

The most recent return-loss result deviates within 20% from the previous measurement. (Data from the last calibration report)

Head TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	Deviation
Impedance	53.9Ω+0.24jΩ	49.5Ω-2.15jΩ	<5Ω
Return loss	-28.4dB	-29.8dB	<20%



### Dipole 835

#### SAR target

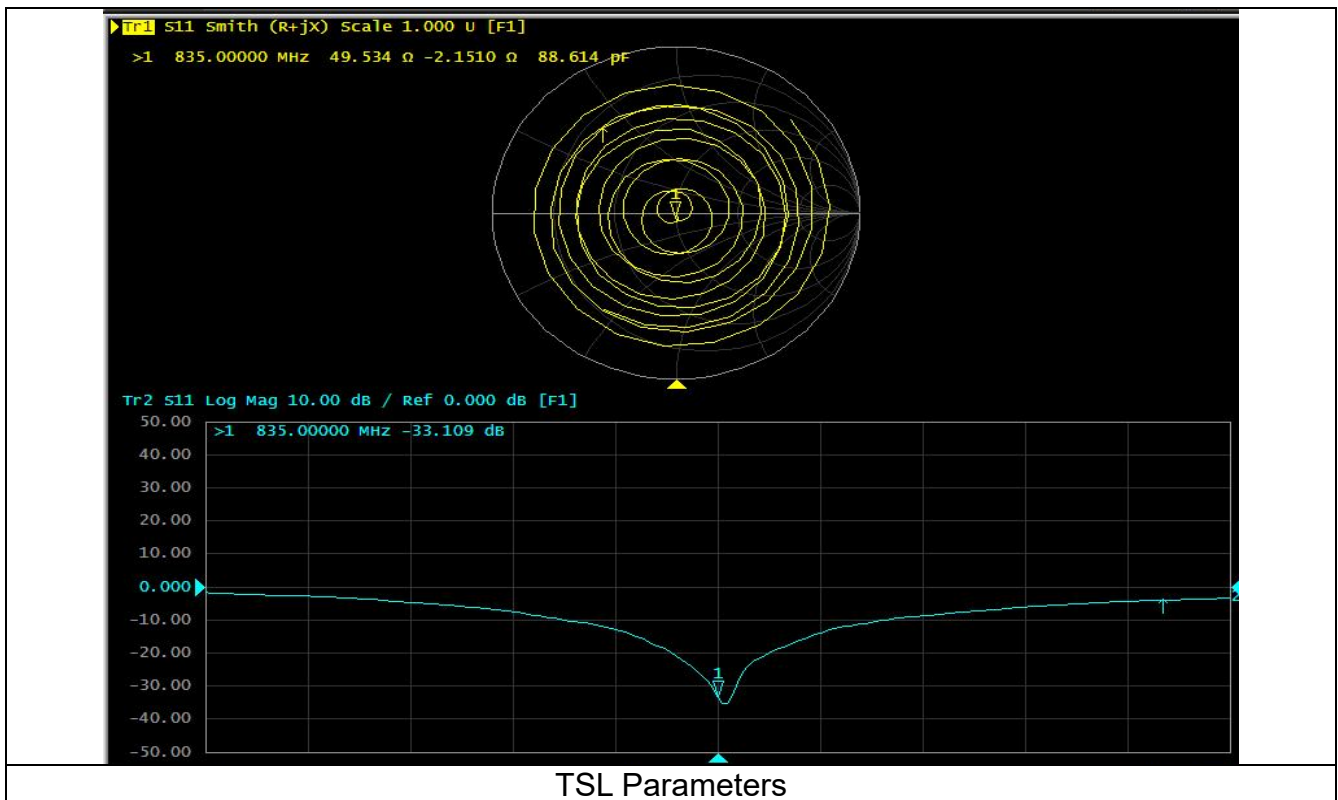
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

#### Impedance and Return loss measured by Network analyzer

The most recent measurement of the real or imaginary parts of the impedance, deviates within 5 Ω from the previous measurement. (Data from the last calibration report)

The most recent return-loss result deviates within 20% from the previous measurement. (Data from the last calibration report)

TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	Deviation
Impedance	51.0Ω-2.79jΩ	49.5Ω-2.15jΩ	<5Ω
Return loss	-30.7 dB	-33.1 dB	<20%



## Dipole1800

### SAR target

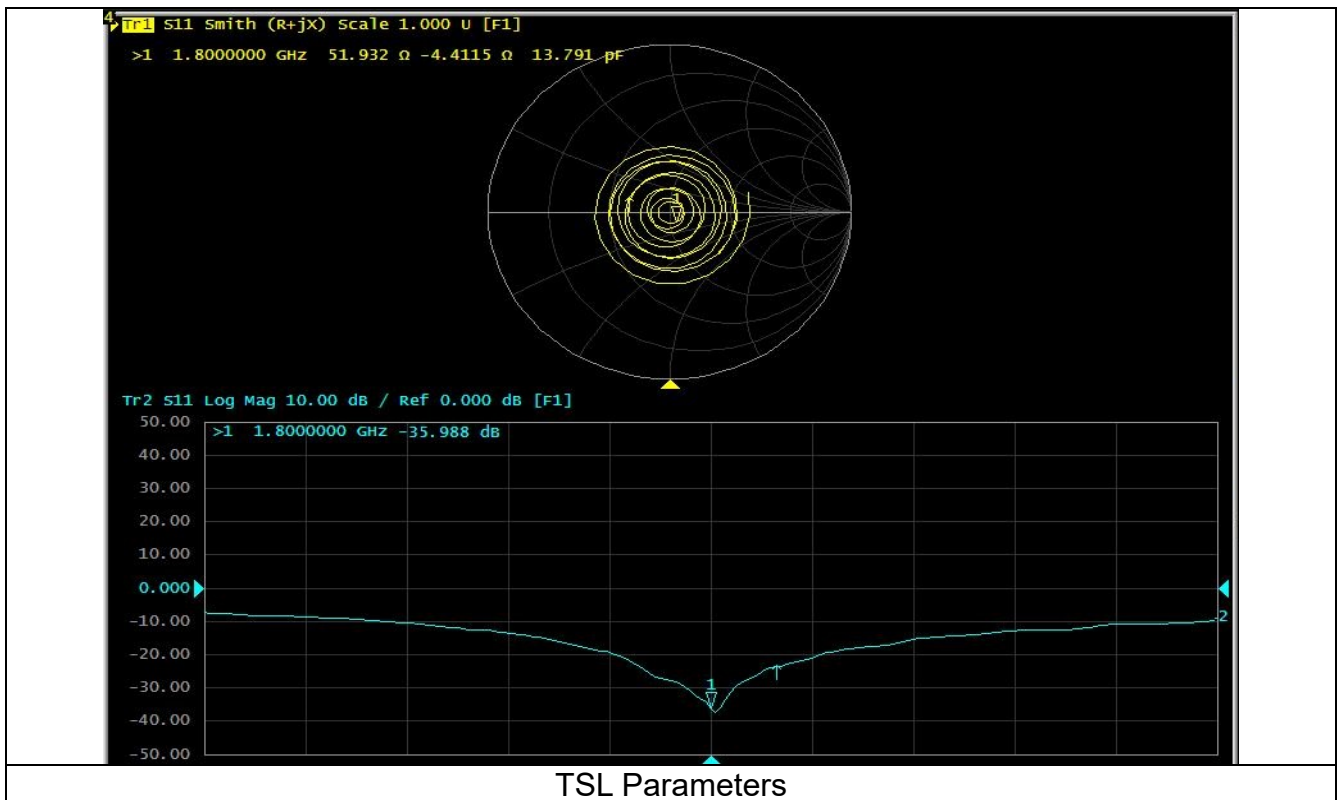
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

### Impedance and Return loss measured by Network analyzer

The most recent measurement of the real or imaginary parts of the impedance, deviates within 5  $\Omega$  from the previous measurement. (Data from the last calibration report)

The most recent return-loss result deviates within 20% from the previous measurement. (Data from the last calibration report)

TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	Deviation
Impedance	49.3 $\Omega$ -1.55j $\Omega$	51.9 $\Omega$ -4.41j $\Omega$	<5 $\Omega$
Return loss	-35.4 dB	-36.0dB	<20%



TSL Parameters

### Dipole2000

#### SAR target

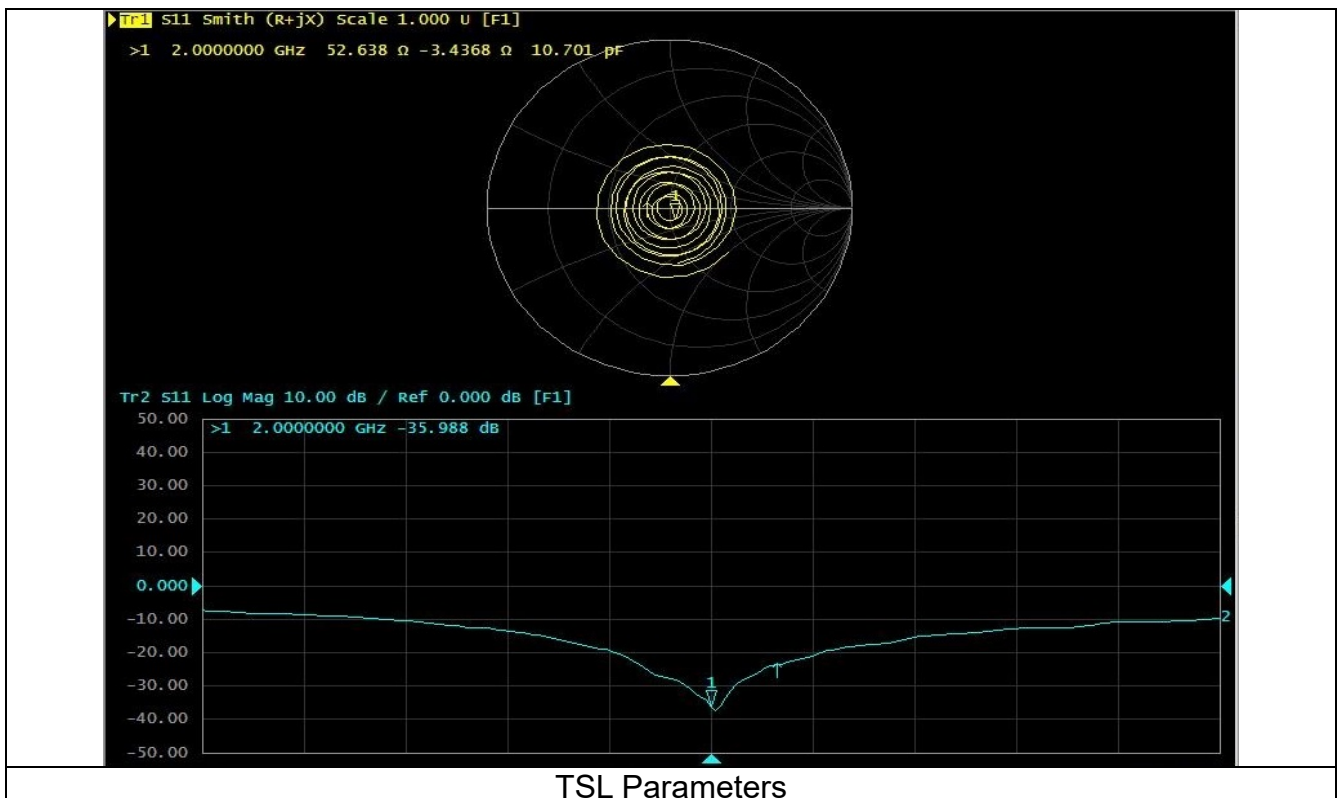
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

#### Impedance and Return loss measured by Network analyzer

The most recent measurement of the real or imaginary parts of the impedance, deviates within 5 Ω from the previous measurement. (Data from the last calibration report)

The most recent return-loss result deviates within 20% from the previous measurement. (Data from the last calibration report)

TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	Deviation
Impedance	49.8Ω-2.08jΩ	52.6Ω-3.44jΩ	<5Ω
Return loss	-33.6dB	-36.0dB	<20%



### Dipole2450

#### SAR target

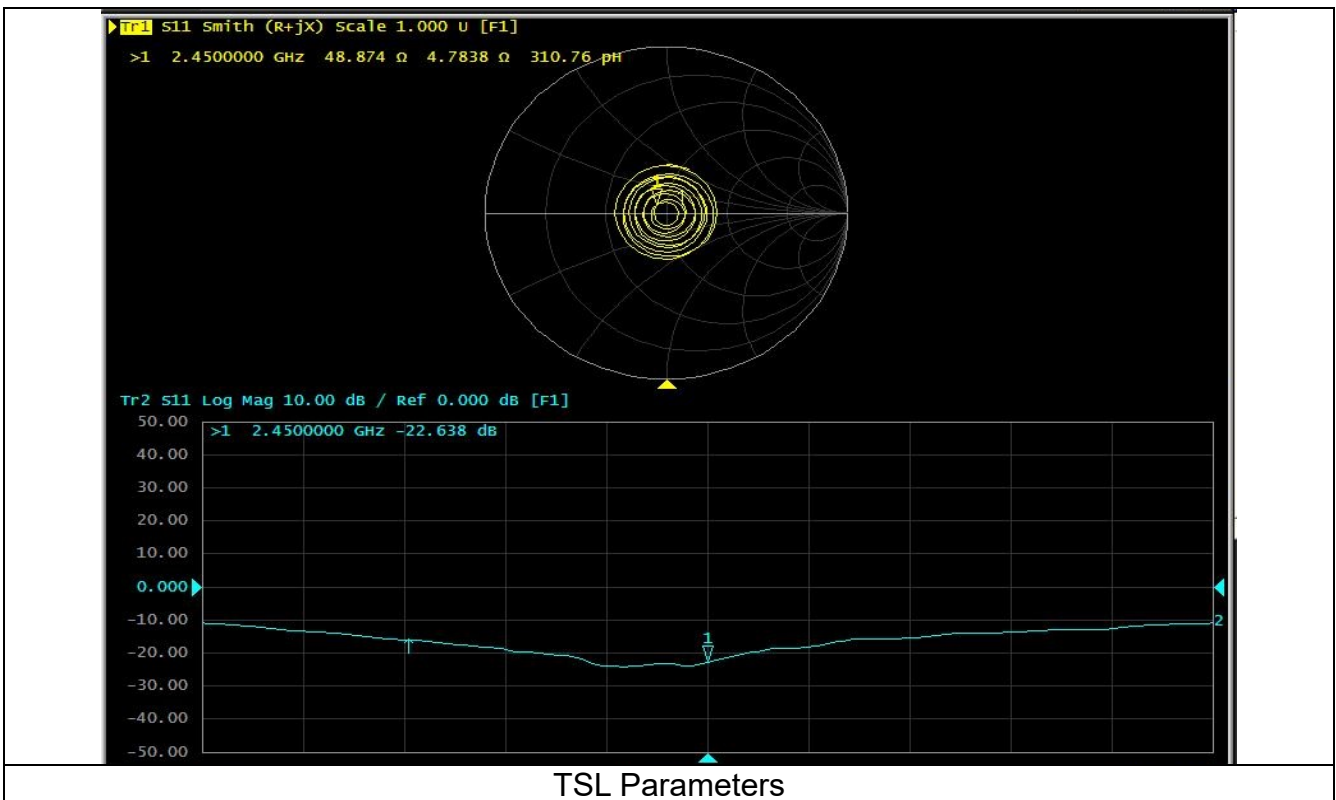
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

#### Impedance and Return loss measured by Network analyzer

The most recent measurement of the real or imaginary parts of the impedance deviates within 5 Ω from the previous measurement. (Data from the last calibration report)

The most recent return-loss result deviates within 20% from the previous measurement. (Data from the last calibration report)

TSL Parameters			
Parameters	Target (Ref. Value)	Measured data	Deviation
Impedance	51.3Ω+5.92jΩ	48.9Ω+4.78jΩ	<5Ω
Return loss	-24.5 dB	-22.6dB	<20%



#### ANNEX A – TEST PLOTS

Please refer to the attachment.

#### ANNEX B – RELEVANT PAGES FROM CALIBRATION REPORTS

Please refer to the attachment.