

# TEST REPORT FOR SAR TESTING

Report No.: SRTC2020-9004(F)-20062303(H)

Product Name: WCDMA/LTE Multi-mode Digital Mobile Phone

Product Model: ZTE 8010

Marketing Name: ZTE Blade V2020 Smart

Applicant: ZTE CORPORATION

Manufacturer: ZTE CORPORATION

Specification: Part 2.1093/IEEE Std 1528/KDB Procedures

FCC ID: SRQ-ZTE8010

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)
Address:	15th Building, No.30 Shixing Street, Shijingshan District, Beijing P.R. China
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### **1.3 Applicant's details**

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### **1.4 Manufacturer's details**

Company:	ZTE CORPORATION
Address:	Electronic Testing Building, No. 43 Shahe Road, Xili street,Nanshan District
City:	Shenzhen
Country or Region:	China
Contacted person:	Ren Shijia
Tel:	13709193069
Fax:	---
Email:	ren.shijia@zte.com.cn

### 1.5 Test Environment

Date of Receipt of test sample at SRTC:	2020.06.23
Testing Start Date:	2020.06.23
Testing End Date:	2020.07.03

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

Normal Supply Voltage (Vdc.):	3.85
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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/GSM1900 <input checked="" type="checkbox"/> WCDMA Band: FDD II/IV/V <input checked="" type="checkbox"/> LTE Band: 2/4/5/7/26/66 <input checked="" type="checkbox"/> Wi-Fi Band: 2.4GHz <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 <input checked="" type="checkbox"/> HSDPA (Rel. 5) <input checked="" type="checkbox"/> HSUPA (Rel. 6) <input checked="" type="checkbox"/> HSPA+ (Rel.7) LTE <input checked="" type="checkbox"/> QPSK <input checked="" type="checkbox"/> 16QAM <input checked="" type="checkbox"/> 64QAM Wi-Fi 2.4GHz <input checked="" type="checkbox"/> 802.11b <input checked="" type="checkbox"/> 802.11g <input checked="" type="checkbox"/> 802.11n HT20 Bluetooth <input checked="" type="checkbox"/> BR(GFSK) <input checked="" type="checkbox"/> EDR( $\pi/4$ DQPSK , 8-DPSK) <input checked="" type="checkbox"/> BLE(GFSK)
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% Wi-Fi 2.4GHz:802.11b: 99.6%/11g: 97.1%/11n 20: 97.2% Bluetooth:GFSK:77.2%/ $\pi/4$ DQPSK:47.01%/8DPSK:48.99% BLE:84.7%
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. For unlicensed network WLAN Duty cycle are depend on the data traffic, and the traffic allocation in operating mode could be the most conservative condition which with 100% duty cycle. SAR measurement also use non signalling mode, so the duty factor shall be taken into consideration.

## 2.2 Support Equipment

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

State of sample	Normal
Battery	Li-Lon/Li3949T44P8h906450/SCUD (Fujian) Electronics Co., Ltd.
H/W Version	z10A
S/W Version	TEL_MX_ZTE_8010V1.0
IMEI	867805050001696
Notes	As the information described above, we use test sample offered by the customer. The relevant tests have been performed in order to verify in which combination case the EUT would have the worst features.

### **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 x 15 mm (equal or less than 2GHz), 12 mm x 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 DASYS 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.


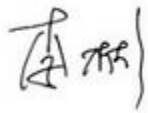
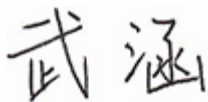
## 5 RESULT SUMMAR

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 Result(W/kg)	Highest 1g-SAR Result(W/kg)		Limit (W/kg)/1g	Result
Head	GSM 850	0.25	1.13			
	GSM 1900	0.06				
	WCDMA Band II	0.13				
	WCDMA Band IV	0.22				
	WCDMA Band V	0.35				
	LTE Band 2	0.16				
	LTE Band 4	0.23				
	LTE Band 5	0.20				
	LTE Band 7	0.36				
	LTE Band 26	0.25				
	LTE Band 66	0.27				
WLAN 2.4GHz Band	1.13					
Body-Worn (10mm Gap)	GSM 850	0.41	0.92	1.13	1.6	pass
	GSM 1900	0.33				
	WCDMA Band II	0.74				
	WCDMA Band IV	0.92				
	WCDMA Band V	0.64				
	LTE Band 2	0.48				
	LTE Band 4	0.55				
	LTE Band 5	0.50				
	LTE Band 7	0.57				
	LTE Band 26	0.62				
	LTE Band 66	0.67				
WLAN 2.4GHz Band	0.34					
Hotspot (10mm Gap)	GSM 850	0.41	0.92			
	GSM 1900	0.33				
	WCDMA Band II	0.74				
	WCDMA Band IV	0.92				
	WCDMA Band V	0.64				
	LTE Band 2	0.48				
	LTE Band 4	0.55				
	LTE Band 5	0.50				
	LTE Band 7	0.57				
	LTE Band 26	0.62				
	LTE Band 66	0.49				
WLAN 2.4GHz Band	0.34					

Simultaneous Transmission Summary

Exposure Position	Frequency Band	1g-SAR Result (W/kg)	Highest 1g-SAR Result(W/kg)	Limit (W/kg)/ 1g	Result
Head	GSM & Wi-Fi 2.4GHz	1.26	1.34	1.6	pass
	WCDMA & Wi-Fi 2.4GHz	1.34			
	LTE & Wi-Fi 2.4GHz	1.33			
	GSM & Bluetooth/BLE	0.48			
	WCDMA & Bluetooth/BLE	0.58			
	LTE & Bluetooth/BLE	0.59			
Body-Worn (10mm Gap)	GSM & Wi-Fi 2.4GHz	0.74	1.26	1.6	pass
	WCDMA & Wi-Fi 2.4GHz	1.26			
	LTE & Wi-Fi 2.4GHz	1.00			
	GSM & Bluetooth/BLE	0.52			
	WCDMA & Bluetooth/BLE	1.03			
	LTE & Bluetooth/BLE	0.78			
hotspot (10mm Gap)	GSM & Wi-Fi 2.4GHz	0.74	1.26	1.6	pass
	WCDMA & Wi-Fi 2.4GHz	1.26			
	LTE & Wi-Fi 2.4GHz	1.00			

This Test Report Is Approved by: Mr. Peng Zhen 	Review by: Mr. Li Bin 
Tested and issued by: Miss Wu Han 	Approved date:  20200706

## 6 TEST RESULT

### 6.1 Manufacturing Tolerance

#### GSM

GSM 850			
Channel	Channel 128	Channel 189	Channel 251
Tolerance (dBm)	29.0~33.0	29.0~33.0	29.0~33.0

GSM 850 GPRS				
Channel		128	189	251
1 Txslot	Tolerance (dBm)	29.0~33.0	29.0~33.0	29.0~33.0
2 Txslot	Tolerance (dBm)	27.0~31.0	27.0~31.0	27.0~31.0
3 Txslot	Tolerance (dBm)	25.0~29.0	25.0~29.0	25.0~29.0
4 Txslot	Tolerance (dBm)	23.0~27.0	23.0~27.0	23.0~27.0

GSM 850 EGPRS(GMSK)				
Channel		128	189	251
1 Txslot	Tolerance (dBm)	29.0~33.0	29.0~33.0	29.0~33.0
2 Txslot	Tolerance (dBm)	27.0~31.0	27.0~31.0	27.0~31.0
3 Txslot	Tolerance (dBm)	25.0~29.0	25.0~29.0	25.0~29.0
4 Txslot	Tolerance (dBm)	23.0~27.0	23.0~27.0	23.0~27.0

GSM 850 EGPRS(8PSK)				
Channel		128	189	251
1 Txslot	Tolerance (dBm)	22.5~26.5	22.5~26.5	22.5~26.5
2 Txslot	Tolerance (dBm)	22.0~26.0	22.0~26.0	22.0~26.0
3 Txslot	Tolerance (dBm)	19.0~23.0	19.0~23.0	19.0~23.0
4 Txslot	Tolerance (dBm)	16.5~20.5	16.5~20.5	16.5~20.5

GSM 1900			
Channel	Channel 512	Channel 661	Channel 810
Tolerance (dBm)	26.0~30.0	26.0~30.0	26.0~30.0

GSM 1900 GPRS				
Channel		512	661	810
1 Txslot	Tolerance (dBm)	25.5~29.5	25.5~29.5	25.5~29.5
2 Txslot	Tolerance (dBm)	23.5~27.5	23.5~27.5	23.5~27.5
3 Txslot	Tolerance (dBm)	22.0~26.0	22.0~26.0	22.0~26.0
4 Txslot	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

GSM 1900 EGPRS(GMSK)				
Channel		512	661	810
1 Txslot	Tolerance (dBm)	25.5~29.5	25.5~29.5	25.5~29.5
2 Txslot	Tolerance (dBm)	23.5~27.5	23.5~27.5	23.5~27.5
3 Txslot	Tolerance (dBm)	22.0~26.0	22.0~26.0	22.0~26.0
4 Txslot	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

GSM 1900 EGPRS(8PSK)				
Channel		512	661	810
1 Txslot	Tolerance (dBm)	23.0~27.0	23.0~27.0	23.0~27.0
2 Txslot	Tolerance (dBm)	22.0~26.0	22.0~26.0	22.0~26.0
3 Txslot	Tolerance (dBm)	18.5~22.5	18.5~22.5	18.5~22.5
4 Txslot	Tolerance (dBm)	15.5~19.5	15.5~19.5	15.5~19.5



**WCDMA**

WCDMA Band II			
Channel	9262	9400	9538
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

HSDPA Band II				
Channel		9262	9400	9538
Sub test 1	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 2	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 3	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 4	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

HSUPA Band II				
Channel		9262	9400	9538
Sub test 1	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 2	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 3	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 4	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 5	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

HSPA+ Band II				
Channel		9262	9400	9538
QPSK	Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
16QAM	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

WCDMA Band V			
Channel	4132	4183	4233
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

HSDPA Band V				
Channel		4132	4183	4233
Sub test 1	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 2	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 3	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 4	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

HSUPA Band V				
Channel		4132	4183	4233
Sub test 1	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 2	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 3	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 4	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 5	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

HSPA+ Band V				
Channel		4132	4183	4233
QPSK	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
16QAM	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

WCDMA Band IV			
Channel	1312	1412	1513
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

HSDPA Band IV				
Channel		1312	1412	1513
Sub test 1	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 2	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 3	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 4	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

HSUPA Band IV				
Channel		1312	1412	1513
Sub test 1	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 2	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 3	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 4	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
Sub test 5	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

HSPA+ Band IV				
Channel		1312	1412	1513
QPSK	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
16QAM	Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

### LTE

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

#### Band 2

##### QPSK

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.7~24.7	20.7~24.7	20.7~24.7

##### 16QAM

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.7~24.7	20.7~24.7	20.7~24.7

##### 64QAM

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.7~24.7	20.7~24.7	20.7~24.7

**Band 4**

**QPSK**

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	21.0~25.0	21.0~25.0	21.0~25.0

**16QAM**

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	21.0~25.0	21.0~25.0	21.0~25.0

**64QAM**

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	21.0~25.0	21.0~25.0	21.0~25.0

## Band 5

### QPSK

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.7~24.7	20.7~24.7	20.7~24.7

### 16QAM

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.7~24.7	20.7~24.7	20.7~24.7

### 64QAM

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.7~24.7	20.7~24.7	20.7~24.7

## Band 7

### QPSK

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

### 16QAM

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

### 64QAM

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0

**Band 26**

**QPSK**

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	21.5~25.5	21.5~25.5	21.5~25.5

**16QAM**

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	21.5~25.5	21.5~25.5	21.5~25.5

**64QAM**

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.0~24.0	20.0~24.0	20.0~24.0
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	21.5~25.5	21.5~25.5	21.5~25.5



**Band 66**

**QPK**

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.7~24.7	20.7~24.7	20.7~24.7

**16QAM**

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.7~24.7	20.7~24.7	20.7~24.7

**64QAM**

100%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
50%RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	19.5~23.5	19.5~23.5	19.5~23.5
1RB			
Frequency Range	Low	Mid	High
Tolerance (dBm)	20.7~24.7	20.7~24.7	20.7~24.7

**Bluetooth**

GFSK			
Channel	0	39	78
Tolerance (dBm)	4.0~8.0	4.0~8.0	4.0~8.0
π/4DQPSK			
Channel	0	39	78
Tolerance (dBm)	-0.5~3.5	-0.5~3.5	-0.5~3.5
8DPSK			
Channel	0	39	78
Tolerance (dBm)	-2.0~2.0	-2.0~2.0	-2.0~2.0

**Bluetooth (BLE)**

GFSK			
Channel	0	19	39
Tolerance (dBm)	3.5~7.5	3.5~7.5	3.5~7.5

**WLAN 2.4GHz**

802.11b			
Channel	1	6	11
Tolerance (dBm)	16.0~20.0	16.0~20.0	16.0~20.0
802.11g			
Channel	1	6	11
Tolerance (dBm)	15.5~19.5	15.5~19.5	15.5~19.5
802.11n HT20			
Channel	1	6	11
Tolerance (dBm)	14.0~18.0	14.0~18.0	14.0~18.0

## 6.2 GSM Measurement result

### GSM mode

Mode	GPRS850			GPRS1900		
Channel	128	189	251	512	661	810
Frequency(MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
Measured Power(dBm)	32.95	32.82	32.82	29.41	29.36	29.31
Frame Average Power (dBm)	23.92	23.79	23.79	20.38	20.33	20.28

### GPRS Measured Power

Mode	GPRS850			GPRS1900		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
4Downlink1uplinkPower(dBm)	32.96	32.77	32.80	29.42	29.34	29.31
3Downlink2uplinkPower(dBm)	<b>30.83</b>	<b>30.66</b>	<b>30.59</b>	27.37	27.11	26.94
2Downlink3uplinkPower(dBm)	28.95	28.85	28.78	<b>25.88</b>	<b>25.6</b>	<b>25.34</b>
1Downlink4uplinkPower(dBm)	26.65	26.67	26.55	23.77	23.55	23.27

### GPRS Frame Average Power

Mode	GPRS850			GPRS1900		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
4Downlink1uplinkPower(dBm)	23.93	23.74	23.77	20.39	20.31	20.28
3Downlink2uplinkPower(dBm)	24.81	24.64	24.57	21.35	21.09	20.92
2Downlink3uplinkPower(dBm)	24.69	24.59	24.52	21.62	21.34	21.08
1Downlink4uplinkPower(dBm)	23.64	23.66	23.54	20.76	20.54	20.26

### EGPRS Measured Power

Mode	EGPRS850(GMSK)			EGPRS1900(GMSK)		
	EGPRS850 (8PSK)			EGPRS1900 (8PSK)		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
1uplinkPower(dBm)	32.96	32.77	32.8	29.42	29.34	29.31
	25.71	26.23	26.04	26.33	26.71	26.07
2uplinkPower(dBm)	30.83	30.66	30.59	27.37	27.11	26.94
	24.66	25.54	24.78	25.52	25.72	25.19
3uplinkPower(dBm)	28.95	28.85	28.78	25.88	25.60	25.34
	21.12	22.92	22.21	21.92	22.18	21.29
4uplinkPower(dBm)	26.65	26.67	26.55	23.77	23.55	23.27
	20.02	20.1	20.01	18.57	19.13	18.70

### EGPRS Frame Average Power

Mode	EGPRS850(GMSK)			EGPRS1900(GMSK)		
	EGPRS850 (8PSK)			EGPRS1900 (8PSK)		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
1uplinkPower(dBm)	23.93	23.74	23.77	20.39	20.31	20.28
	16.68	17.20	17.01	17.30	17.68	17.04
2uplinkPower(dBm)	24.81	24.64	24.57	21.35	21.09	20.92
	18.64	19.52	18.76	19.50	19.70	19.17
3uplinkPower(dBm)	24.69	24.59	24.52	21.62	21.34	21.08
	16.86	18.66	17.95	17.66	17.92	17.03
4uplinkPower(dBm)	23.64	23.66	23.54	20.76	20.54	20.26
	17.01	17.09	17.00	15.56	16.12	15.69

### 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 **2Txslots (2uplink)** 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

#### Measured Results

Mode	Band II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880	1907.6
RB test mode1+64kRMC(dBm)	23.28	23.45	23.51
<b>RB test mode1+12.2kRMC(dBm)</b>	<b>23.67</b>	<b>23.60</b>	<b>23.66</b>
RB test mode1+12.2k AMR in 3.4 kbps SRB (dBm)	23.17	23.40	23.55
RB test mode1+144kRMC(dBm)	23.12	23.37	23.51
RB test mode1+384kRMC(dBm)	23.14	23.52	23.53

Mode	Band V		
Channel	4132	4183	4233
Frequency(MHz)	826.4	836.4	846.6
RB test mode1+64kRMC(dBm)	22.86	22.81	22.75
<b>RB test mode1+12.2kRMC(dBm)</b>	<b>23.75</b>	<b>23.74</b>	<b>23.71</b>
RB test mode1+12.2k AMR in 3.4 kbps SRB (dBm)	22.89	22.80	22.83
RB test mode1+144kRMC(dBm)	22.87	22.82	22.75
RB test mode1+384kRMC(dBm)	22.71	22.88	22.74

Mode	Band IV		
Channel	1312	1412	1513
Frequency(MHz)	1712.4	1732.4	1752.6
RB test mode1+64kRMC(dBm)	23.56	23.51	23.55
<b>RB test mode1+12.2kRMC(dBm)</b>	<b>23.76</b>	<b>23.78</b>	<b>23.79</b>
RB test mode1+12.2k AMR in 3.4 kbps SRB (dBm)	23.69	23.70	23.63
RB test mode1+144kRMC(dBm)	23.57	23.62	23.75
RB test mode1+384kRMC(dBm)	23.71	23.58	23.64

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  $\beta_d = 15/15$ .

**Measured Results**

WCDMA Band II				
Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSDPA	Subtest 1	1852.4	9262	23.35
		1880.0	9400	23.39
		1907.6	9538	23.53
	Subtest 2	1852.4	9262	23.66
		1880.0	9400	23.57
		1907.6	9538	23.26
	Subtest 3	1852.4	9262	23.29
		1880.0	9400	23.47
		1907.6	9538	23.44
	Subtest 4	1852.4	9262	23.34
		1880.0	9400	23.57
		1907.6	9538	23.26

WCDMA Band V				
Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSDPA	Subtest 1	826.4	4132	23.65
		836.6	4183	23.72
		846.6	4233	23.68
	Subtest 2	826.4	4132	23.37
		836.6	4183	23.42
		846.6	4233	23.71
	Subtest 3	826.4	4132	23.41
		836.6	4183	23.55
		846.6	4233	23.63
	Subtest 4	826.4	4132	23.45
		836.6	4183	23.48
		846.6	4233	23.43

WCDMA Band IV				
Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSDPA	Subtest 1	1712.4	1312	23.59
		1732.4	1412	23.52
		1752.6	1513	23.55
	Subtest 2	1712.4	1312	23.45
		1732.4	1412	23.43
		1752.6	1513	23.39
	Subtest 3	1712.4	1312	23.33
		1732.4	1412	23.76
		1752.6	1513	23.40
	Subtest 4	1712.4	1312	23.48
		1732.4	1412	23.41
		1752.6	1513	23.40

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 (dB)	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.

**Measured Results**

WCDMA Band II				
Mode	Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)	
HSPA	Subtest 1	1852.4	9262	23.40
		1880.0	9400	23.14
		1907.6	9538	23.63
	Subtest 2	1852.4	9262	23.34
		1880.0	9400	23.15
		1907.6	9538	23.22
	Subtest 3	1852.4	9262	23.50
		1880.0	9400	23.15
		1907.6	9538	23.63
	Subtest 4	1852.4	9262	23.65
		1880.0	9400	23.12
		1907.6	9538	23.64
	Subtest 5	1852.4	9262	23.18
		1880.0	9400	23.17
		1907.6	9538	23.27



WCDMA Band V				
Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSPA	Subtest 1	826.4	4132	23.66
		836.6	4183	23.36
		846.6	4233	23.32
	Subtest 2	826.4	4132	23.44
		836.6	4183	23.57
		846.6	4233	23.43
	Subtest 3	826.4	4132	23.47
		836.6	4183	23.31
		846.6	4233	23.28
	Subtest 4	826.4	4132	23.27
		836.6	4183	23.39
		846.6	4233	23.48
	Subtest 5	826.4	4132	23.57
		836.6	4183	23.24
		846.6	4233	23.61

WCDMA Band IV				
Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSPA	Subtest 1	1712.4	1312	23.30
		1732.4	1412	23.53
		1752.6	1513	23.61
	Subtest 2	1712.4	1312	23.42
		1732.4	1412	23.39
		1752.6	1513	23.67
	Subtest 3	1712.4	1312	23.55
		1732.4	1412	23.73
		1752.6	1513	23.33
	Subtest 4	1712.4	1312	23.51
		1732.4	1412	23.48
		1752.6	1513	23.35
	Subtest 5	1712.4	1312	23.61
		1732.4	1412	23.56
		1752.6	1513	23.66

Release 7

**HSPA+**

WCDMA Band II				
Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSPA+	QPSK	1852.4	9262	23.17
		1880.0	9400	23.38
		1907.6	9538	23.19
	16QAM	1852.4	9262	23.57
		1880.0	9400	23.15
		1907.6	9538	23.39

WCDMA Band V				
Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSPA+	QPSK	826.4	4132	23.45
		836.6	4183	23.38
		846.6	4233	23.50
	16QAM	826.4	4132	23.45
		836.6	4183	23.61
		846.6	4233	23.23

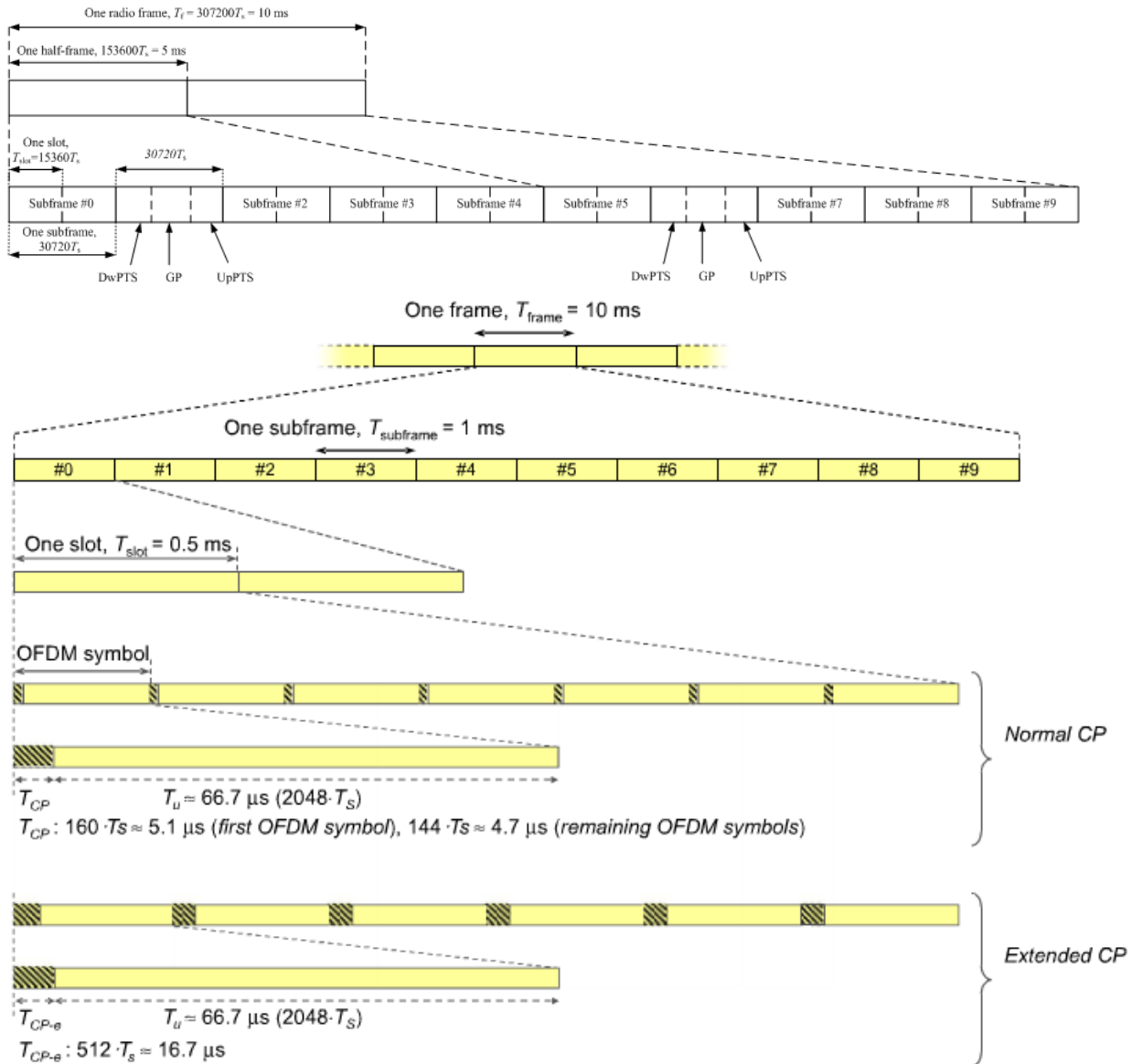
WCDMA Band IV				
Mode		Carrier frequency (MHz)	Channel No.	RF Power Output (dBm)
HSPA+	QPSK	1712.4	1312	23.43
		1732.4	1412	23.39
		1752.6	1513	23.44
	16QAM	1712.4	1312	23.31
		1732.4	1412	23.68
		1752.6	1513	23.56

Note: UMTS SAR was tested with 12.2 RMC kbps mode per KDB Publication 941225 D01.HSPA SAR was not required since the average output power of the HSDPA and HSPA subtests 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	$26336 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$			$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			-		
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**  
**1 RF Power Output**

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1850.7	18607	1.4	1	0	24.20
				1	5	24.02
				3	2	23.02
				6	0	23.22
	1880	18900		1	0	24.48
				1	5	24.01
				3	2	23.47
				6	0	22.98
	1909.3	19193		1	0	24.07
				1	5	23.80
				3	2	23.14
				6	0	23.37
16QAM	1850.7	18607	1.4	1	0	23.88
				1	5	23.76
				3	2	21.84
				6	0	22.30
	1880	18900		1	0	23.42
				1	5	23.18
				3	2	22.05
				6	0	22.39
	1909.3	19193		1	0	23.40
				1	5	23.62
				3	2	22.14
				6	0	22.27
64QAM	1850.7	18607	1.4	1	0	23.34
				1	5	23.61
				3	2	22.20
				6	0	22.04
	1880	18900		1	0	22.77
				1	5	23.08
				3	2	21.95
				6	0	21.99
	1909.3	19193		1	0	23.13
				1	5	23.47
				3	2	21.92
				6	0	22.03

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1851.5	18615	3	1	0	24.36

				1	14	23.97
				8	4	23.21
				15	0	22.95
	1880	18900		1	0	24.13
				1	14	24.26
				8	4	23.44
	1908.5	19185		15	0	23.05
				1	0	24.13
				1	14	24.17
			8	4	23.30	
			15	0	23.35	
			1	0	23.80	
16QAM	1851.5	18615	3	1	14	23.81
				8	4	22.20
				15	0	22.24
	1880	18900		1	0	23.52
				1	14	23.43
				8	4	22.26
	1908.5	19185		15	0	21.94
				1	0	23.47
				1	14	23.42
			8	4	22.20	
			15	0	21.92	
			1	0	23.37	
64QAM	1851.5	18615	3	1	14	23.18
				8	4	22.11
				15	0	22.31
	1880	18900		1	0	22.81
				1	14	23.20
				8	4	21.90
	1908.5	19185		15	0	22.28
				1	0	23.14
				1	14	23.49
			8	4	22.12	
			15	0	22.01	

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1852.5	18625	5	1	0	23.96
				1	24	24.40
				12	6	22.91
				25	0	23.23
	1880	18900		1	0	24.22
				1	24	24.10
				12	6	23.20
				25	0	23.25
	1907.5	19175		1	0	24.22
				1	24	24.17
				12	6	23.27
				25	0	23.26
16QAM	1852.5	18625	5	1	0	23.94
				1	24	23.75
				12	6	22.32
				25	0	22.05
	1880	18900		1	0	23.33
				1	24	23.30
				12	6	22.31
				25	0	21.98
	1907.5	19175		1	0	23.49
				1	24	23.64
				12	6	22.00
				25	0	22.27
64QAM	1852.5	18625	5	1	0	23.30
				1	24	23.57
				12	6	22.11
				25	0	22.11
	1880	18900		1	0	22.88
				1	24	23.07
				12	6	21.88
				25	0	22.21
	1907.5	19175		1	0	23.05
				1	24	23.05
				12	6	22.23
				25	0	22.28

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1855	18650	10	1	0	24.22
				1	49	24.35
				24	12	23.15
				50	0	23.33
	1880	18900		1	0	24.31
				1	49	24.07
				24	12	23.21
				50	0	23.12
	1905	19150		1	0	24.03
				1	49	23.82
				24	12	23.06
				50	0	23.30
16QAM	1855	18650	10	1	0	23.45
				1	49	23.64
				24	12	22.15
				50	0	22.19
	1880	18900		1	0	23.23
				1	49	23.11
				24	12	22.34
				50	0	22.20
	1905	19150		1	0	23.68
				1	49	23.48
				24	12	21.88
				50	0	22.04
64QAM	1855	18650	10	1	0	23.61
				1	49	23.30
				24	12	22.33
				50	0	21.99
	1880	18900		1	0	22.92
				1	49	22.77
				24	12	22.28
				50	0	21.85
	1905	19150		1	0	23.00
				1	49	23.43
				24	12	21.96
				50	0	21.90



Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1857.5	18675	15	1	0	23.99
				1	74	24.04
				40	18	23.00
				75	0	23.40
	1880	18900		1	0	24.01
				1	74	24.26
				40	18	23.20
				75	0	23.12
	1902.5	19125		1	0	24.13
				1	74	24.08
				40	18	22.90
				75	0	23.29
16QAM	1857.5	18675	15	1	0	23.75
				1	74	23.60
				40	18	22.06
				75	0	22.28
	1880	18900		1	0	23.32
				1	74	23.25
				40	18	22.30
				75	0	22.34
	1902.5	19125		1	0	23.68
				1	74	23.38
				40	18	21.83
				75	0	22.21
64QAM	1857.5	18675	15	1	0	23.57
				1	74	23.48
				40	18	21.96
				75	0	22.21
	1880	18900		1	0	23.10
				1	74	23.21
				40	18	22.18
				75	0	22.17
	1902.5	19125		1	0	23.28
				1	74	23.21
				40	18	22.26
				75	0	21.94

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1860	18700	20	1	0	24.44
				1	99	24.44
				50	25	23.40
				100	0	23.41
	1880	18900		1	0	24.50
				1	99	24.50
				50	25	23.49
				100	0	23.38
	1900	19100		1	0	24.28
				1	99	24.28
				50	25	23.37
				100	0	23.42
16QAM	1860	18700	20	1	0	23.95
				1	99	23.95
				50	25	22.33
				100	0	22.40
	1880	18900		1	0	23.52
				1	99	23.52
				50	25	22.36
				100	0	22.39
	1900	19100		1	0	23.81
				1	99	23.81
				50	25	22.28
				100	0	22.34
64QAM	1860	18700	20	1	0	23.64
				1	99	23.64
				50	25	22.35
				100	0	22.32
	1880	18900		1	0	23.26
				1	99	23.26
				50	25	22.38
				100	0	22.31
	1900	19100		1	0	23.50
				1	99	23.50
				50	25	22.38
				100	0	22.30

**LTE Band 4**  
**1 RF Power Output**

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1710.7	19957	1.4	1	0	24.27
				1	5	24.44
				3	2	23.10
				6	0	23.07
	1732.5	20175		1	0	24.71
				1	5	24.31
				3	2	23.36
				6	0	23.15
	1754.3	20393		1	0	24.13
				1	5	24.34
				3	2	23.35
				6	0	23.26
16QAM	1710.7	19957	1.4	1	0	23.11
				1	5	23.16
				3	2	22.07
				6	0	22.36
	1732.5	20175		1	0	23.51
				1	5	23.81
				3	2	22.28
				6	0	21.90
	1754.3	20393		1	0	23.41
				1	5	23.44
				3	2	22.03
				6	0	22.34
64QAM	1710.7	19957	1.4	1	0	23.38
				1	5	23.40
				3	2	22.23
				6	0	22.25
	1732.5	20175		1	0	23.07
				1	5	23.11
				3	2	22.35
				6	0	22.31
	1754.3	20393		1	0	23.38
				1	5	23.35
				3	2	21.93
				6	0	22.25

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1711.5	19965	3	1	0	24.17
				1	14	24.17
				8	4	23.15
				15	0	23.21
	1732.5	20175		1	0	24.55
				1	14	24.37
				8	4	22.96
				15	0	22.99
	1753.5	20385		1	0	24.45
				1	14	24.21
				8	4	23.06
				15	0	23.36
16QAM	1711.5	19965	3	1	0	23.24
				1	14	23.14
				8	4	22.00
				15	0	22.02
	1732.5	20175		1	0	23.84
				1	14	23.91
				8	4	22.30
				15	0	21.94
	1753.5	20385		1	0	23.09
				1	14	23.43
				8	4	22.18
				15	0	22.22
64QAM	1711.5	19965	3	1	0	23.24
				1	14	23.52
				8	4	22.06
				15	0	22.27
	1732.5	20175		1	0	23.22
				1	14	23.38
				8	4	22.20
				15	0	22.32
	1753.5	20385		1	0	23.51
				1	14	23.46
				8	4	22.14
				15	0	22.24

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1712.5	19975	5	1	0	24.19
				1	24	24.34
				12	6	23.37
				25	0	22.95
	1732.5	20175		1	0	24.61
				1	24	24.36
				12	6	23.25
				25	0	23.24
	1752.5	20375		1	0	24.08
				1	24	24.47
				12	6	23.18
				25	0	23.34
16QAM	1712.5	19975	5	1	0	23.30
				1	24	22.90
				12	6	22.21
				25	0	22.10
	1732.5	20175		1	0	23.71
				1	24	23.83
				12	6	21.98
				25	0	22.07
	1752.5	20375		1	0	23.06
				1	24	23.19
				12	6	22.24
				25	0	22.15
64QAM	1712.5	19975	5	1	0	23.22
				1	24	23.15
				12	6	22.15
				25	0	22.01
	1732.5	20175		1	0	23.46
				1	24	23.05
				12	6	22.33
				25	0	22.39
	1752.5	20375		1	0	23.72
				1	24	23.57
				12	6	21.91
				25	0	22.15

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1715	20000	10	1	0	24.07
				1	49	24.28
				24	12	23.36
				50	0	22.99
	1732.5	20175		1	0	24.44
				1	49	24.65
				24	12	23.32
				50	0	23.19
	1750	20350		1	0	24.50
				1	49	24.32
				24	12	23.19
				50	0	23.23
16QAM	1715	20000	10	1	0	22.89
				1	49	23.20
				24	12	21.98
				50	0	22.47
	1732.5	20175		1	0	23.53
				1	49	23.80
				24	12	21.97
				50	0	22.28
	1750	20350		1	0	23.18
				1	49	23.50
				24	12	22.00
				50	0	22.40
64QAM	1715	20000	10	1	0	23.32
				1	49	23.53
				24	12	22.37
				50	0	22.14
	1732.5	20175		1	0	23.08
				1	49	22.99
				24	12	22.25
				50	0	22.22
	1750	20350		1	0	23.30
				1	49	23.27
				24	12	22.37
				50	0	22.14

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1717.5	20025	15	1	0	24.16
				1	74	24.30
				40	18	23.29
				75	0	23.26
	1732.5	20175		1	0	24.46
				1	74	24.52
				40	18	23.36
				75	0	23.07
	1747.5	20325		1	0	24.52
				1	74	24.51
				40	18	23.34
				75	0	22.90
16QAM	1717.5	20025	15	1	0	23.22
				1	74	22.86
				40	18	22.37
				75	0	22.16
	1732.5	20175		1	0	23.75
				1	74	23.64
				40	18	22.41
				75	0	22.27
	1747.5	20325		1	0	23.09
				1	74	23.32
				40	18	22.01
				75	0	22.29
64QAM	1717.5	20025	15	1	0	23.24
				1	74	23.55
				40	18	22.06
				75	0	22.23
	1732.5	20175		1	0	23.28
				1	74	23.04
				40	18	21.99
				75	0	21.97
	1747.5	20325		1	0	23.29
				1	74	23.73
				40	18	22.37
				75	0	22.31

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1720	20050	20	1	0	24.49
				1	99	24.49
				50	25	23.46
				100	0	23.40
	1732.5	20175		1	0	24.72
				1	99	24.72
				50	25	23.36
				100	0	23.38
	1745	20300		1	0	24.52
				1	99	24.52
				50	25	23.44
				100	0	23.39
16QAM	1720	20050	20	1	0	23.35
				1	99	23.35
				50	25	22.45
				100	0	22.52
	1732.5	20175		1	0	23.92
				1	99	23.92
				50	25	22.41
				100	0	22.40
	1745	20300		1	0	23.50
				1	99	23.50
				50	25	22.46
				100	0	22.50
64QAM	1720	20050	20	1	0	23.58
				1	99	23.58
				50	25	22.53
				100	0	22.50
	1732.5	20175		1	0	23.49
				1	99	23.49
				50	25	22.37
				100	0	22.39
	1745	20300		1	0	23.73
				1	99	23.73
				50	25	22.41
				100	0	22.44



**LTE Band 5**  
**1 RF Power Output**

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	824.7	20407	1.4	1	0	24.57
				1	5	24.59
				3	2	23.21
				6	0	22.93
	836.5	20525		1	0	23.91
				1	5	23.94
				3	2	23.00
				6	0	23.03
	848.3	20643		1	0	24.19
				1	5	24.43
				3	2	23.30
				6	0	22.80
16QAM	824.7	20407	1.4	1	0	22.95
				1	5	22.68
				3	2	22.16
				6	0	21.87
	836.5	20525		1	0	22.89
				1	5	23.09
				3	2	22.26
				6	0	21.96
	848.3	20643		1	0	22.97
				1	5	23.06
				3	2	22.08
				6	0	21.90
64QAM	824.7	20407	1.4	1	0	23.24
				1	5	22.81
				3	2	21.91
				6	0	22.17
	836.5	20525		1	0	23.04
				1	5	22.89
				3	2	22.10
				6	0	21.99
	848.3	20643		1	0	22.78
				1	5	22.84
				3	2	22.34
				6	0	22.11

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	825.5	20415	3	1	0	24.39
				1	14	24.33
				8	4	23.12
				15	0	23.26
	836.5	20525		1	0	23.96
				1	14	24.18
				8	4	22.97
				15	0	23.02
	847.5	20635		1	0	24.46
				1	14	24.50
				8	4	23.11
				15	0	23.01
16QAM	825.5	20415	3	1	0	22.80
				1	14	23.11
				8	4	21.73
				15	0	21.85
	836.5	20525		1	0	22.91
				1	14	22.88
				8	4	22.29
				15	0	21.78
	847.5	20635		1	0	22.90
				1	14	22.90
				8	4	22.03
				15	0	22.03
64QAM	825.5	20415	3	1	0	23.03
				1	14	22.88
				8	4	22.26
				15	0	21.81
	836.5	20525		1	0	23.09
				1	14	22.97
				8	4	22.23
				15	0	21.99
	847.5	20635		1	0	23.08
				1	14	22.98
				8	4	22.12
				15	0	22.19

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	826.5	20425	5	1	0	24.12
				1	24	24.10
				12	6	22.94
				25	0	23.25
	836.5	20525		1	0	23.76
				1	24	23.88
				12	6	23.11
				25	0	23.18
	846.5	20625		1	0	24.16
				1	24	24.13
				12	6	23.18
				25	0	22.90
16QAM	826.5	20425	5	1	0	22.71
				1	24	22.71
				12	6	22.07
				25	0	22.02
	836.5	20525		1	0	22.72
				1	24	23.08
				12	6	22.13
				25	0	22.04
	846.5	20625		1	0	22.69
				1	24	23.03
				12	6	22.08
				25	0	21.86
64QAM	826.5	20425	5	1	0	23.07
				1	24	23.28
				12	6	21.97
				25	0	21.95
	836.5	20525		1	0	23.25
				1	24	23.25
				12	6	22.44
				25	0	22.20
	846.5	20625		1	0	23.10
				1	24	23.00
				12	6	22.16
				25	0	22.19

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	829	20450	10	1	0	24.60
				1	49	24.60
				24	12	23.26
				50	0	23.34
	836.5	20525		1	0	24.25
				1	49	24.25
				24	12	23.29
				50	0	23.26
	844	20600		1	0	24.50
				1	49	24.50
				24	12	23.31
				50	0	23.30
16QAM	829	20450	10	1	0	23.15
				1	49	23.15
				24	12	22.17
				50	0	22.15
	836.5	20525		1	0	23.19
				1	49	23.19
				24	12	22.36
				50	0	22.26
	844	20600		1	0	23.13
				1	49	23.13
				24	12	22.26
				50	0	22.27
64QAM	829	20450	10	1	0	23.30
				1	49	23.30
				24	12	22.34
				50	0	22.20
	836.5	20525		1	0	23.38
				1	49	23.38
				24	12	22.47
				50	0	22.22
	844	20600		1	0	23.26
				1	49	23.26
				24	12	22.36
				50	0	22.23

**LTE Band 7**  
**1 RF Power Output**

Modulation	Carrier frequency (MHz)	UL Channel	B W	RB Size	RB Offset	Conducted power (dBm)
QPSK	2502.5	20775	5	1	0	23.78
				1	24	23.71
				12	6	22.82
				25	0	22.68
	2535	21100		1	0	23.75
				1	24	23.63
				12	6	22.85
				25	0	23.02
	2567.5	21425		1	0	23.64
				1	24	23.47
				12	6	23.06
				25	0	22.93
16QAM	2502.5	20775	5	1	0	23.58
				1	24	23.16
				12	6	21.97
				25	0	21.91
	2535	21100		1	0	23.11
				1	24	23.08
				12	6	21.70
				25	0	21.76
	2567.5	21425		1	0	23.54
				1	24	23.24
				12	6	22.14
				25	0	21.85
64QAM	2502.5	20775	5	1	0	22.83
				1	24	22.58
				12	6	22.01
				25	0	21.90
	2535	21100		1	0	22.52
				1	24	22.93
				12	6	21.83
				25	0	22.07
	2567.5	21425		1	0	22.50
				1	24	22.70
				12	6	22.03
				25	0	22.07

Modulation	Carrier frequency (MHz)	UL Channel	B W	RB Size	RB Offset	Conducted power (dBm)
QPSK	2505	20800	10	1	0	23.75
				1	49	23.73
				24	12	22.94
				50	0	22.86
	2535	21100		1	0	23.76
				1	49	23.57
				24	12	22.62
				50	0	22.92
	2565	21400		1	0	23.47
				1	49	23.69
				24	12	22.72
				50	0	22.99
16QAM	2505	20800	10	1	0	23.53
				1	49	23.33
				24	12	21.76
				50	0	21.72
	2535	21100		1	0	22.94
				1	49	23.10
				24	12	21.87
				50	0	22.16
	2565	21400		1	0	23.63
				1	49	23.68
				24	12	21.72
				50	0	22.04
64QAM	2505	20800	10	1	0	22.54
				1	49	22.99
				24	12	22.02
				50	0	21.99
	2535	21100		1	0	22.94
				1	49	22.67
				24	12	21.89
				50	0	21.75
	2565	21400		1	0	22.57
				1	49	22.64
				24	12	21.82
				50	0	21.90

Modulation	Carrier frequency (MHz)	UL Channel	B W	RB Size	RB Offset	Conducted power (dBm)
QPSK	2507.5	20825	15	1	0	23.93
				1	74	23.77
				40	18	22.62
	2535	21100		75	0	22.85
				1	0	23.69
				1	74	23.45
				40	18	22.76
				75	0	22.96
				2562.5	21375	1
1	74	23.64				
40	18	22.97				
16QAM	2507.5	20825	15	75	0	22.92
				1	0	23.18
				1	74	23.41
	2535	21100		40	18	21.92
				75	0	22.12
				1	0	22.84
				1	74	22.96
				40	18	21.91
				75	0	22.06
2562.5	21375	1	0	23.63		
		1	74	23.70		
		40	18	21.95		
64QAM	2507.5	20825	15	75	0	22.12
				1	0	22.65
				1	74	22.55
	2535	21100		40	18	21.84
				75	0	22.07
				1	0	22.89
				1	74	22.66
				40	18	22.24
				75	0	21.76
2562.5	21375	1	0	22.83		
		1	74	22.56		
		40	18	22.04		
				75	0	21.74

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	2510	20850	20	1	0	<b>23.94</b>
				1	99	<b>23.94</b>
				50	25	23.04
				100	0	22.99
	2535	21100		1	0	<b>23.83</b>
				1	99	<b>23.83</b>
				50	25	23.06
				100	0	23.15
	2560	21350		1	0	<b>23.90</b>
				1	99	<b>23.90</b>
				50	25	23.11
				100	0	23.00
16QAM	2510	20850	20	1	0	23.61
				1	99	23.61
				50	25	22.14
				100	0	22.15
	2535	21100		1	0	23.13
				1	99	23.13
				50	25	22.18
				100	0	22.18
	2560	21350		1	0	23.71
				1	99	23.71
				50	25	22.21
				100	0	22.22
64QAM	2510	20850	20	1	0	23.01
				1	99	23.01
				50	25	22.12
				100	0	22.14
	2535	21100		1	0	22.97
				1	99	22.97
				50	25	22.29
				100	0	22.20
	2560	21350		1	0	22.91
				1	99	22.91
				50	25	22.28
				100	0	22.22



**LTE Band 26**  
**1 RF Power Output**

Modulation	Carrier frequency (MHz)	UL Channel	B W	RB Size	RB Offset	Conducted power (dBm)
QPSK	814.7	26697	1.4	1	0	24.98
				1	5	24.98
				3	2	23.89
				6	0	23.85
	819	26740		1	0	25.09
				1	5	25.07
				3	2	23.73
				6	0	23.80
	823.3	26783		1	0	24.79
				1	5	24.81
				3	2	23.79
				6	0	23.74
16QAM	814.7	26697	1.4	1	0	24.41
				1	5	24.36
				3	2	22.90
				6	0	22.83
	819	26740		1	0	24.37
				1	5	24.36
				3	2	22.86
				6	0	22.84
	823.3	26783		1	0	24.31
				1	5	24.23
				3	2	22.81
				6	0	22.76
64QAM	814.7	26697	1.4	1	0	24.00
				1	5	23.93
				3	2	22.82
				6	0	22.89
	819	26740		1	0	23.90
				1	5	23.92
				3	2	22.83
				6	0	22.79
	823.3	26783		1	0	23.71
				1	5	23.74
				3	2	22.80
				6	0	22.92

Modulation	Carrier frequency (MHz)	UL Channel	B W	RB Size	RB Offset	Conducted power (dBm)
QPSK	815.5	26705	3	1	0	24.91
				1	14	24.94
				8	4	23.87
				15	0	23.82
	819	26740		1	0	25.07
				1	14	25.12
				8	4	23.76
				15	0	23.88
	822.5	26775		1	0	24.88
				1	14	24.93
				8	4	23.82
				15	0	23.67
16QAM	815.5	26705	3	1	0	24.36
				1	14	24.28
				8	4	23.02
				15	0	22.86
	819	26740		1	0	24.34
				1	14	24.25
				8	4	22.92
				15	0	22.86
	822.5	26775		1	0	24.23
				1	14	24.29
				8	4	22.81
				15	0	22.78
64QAM	815.5	26705	3	1	0	23.92
				1	14	23.94
				8	4	22.82
				15	0	22.91
	819	26740		1	0	23.96
				1	14	23.84
				8	4	22.85
				15	0	22.76
	822.5	26775		1	0	23.82
				1	14	23.69
				8	4	22.78
				15	0	22.91

Modulation	Carrier frequency (MHz)	UL Channel	B W	RB Size	RB Offset	Conducted power (dBm)
QPSK	816.5	26715	5	1	0	25.04
				1	24	25.05
				12	6	23.93
				25	0	23.90
	819	26740		1	0	25.21
				1	24	25.16
				12	6	23.84
				25	0	23.91
	821.5	26765		1	0	24.91
				1	24	24.94
				12	6	23.90
				25	0	23.82
16QAM	816.5	26715	5	1	0	24.49
				1	24	24.41
				12	6	23.03
				25	0	22.93
	819	26740		1	0	24.41
				1	24	24.38
				12	6	23.01
				25	0	22.88
	821.5	26765		1	0	24.34
				1	24	24.31
				12	6	22.92
				25	0	22.80
64QAM	816.5	26715	5	1	0	24.06
				1	24	23.97
				12	6	22.88
				25	0	23.02
	819	26740		1	0	23.98
				1	24	23.97
				12	6	22.89
				25	0	22.90
	821.5	26765		1	0	23.86
				1	24	23.84
				12	6	22.81
				25	0	23.03

Modulation	Carrier frequency (MHz)	UL Channel	B W	RB Size	RB Offset	Conducted power (dBm)
QPSK	819	26740	10	1	0	25.21
				1	49	25.16
				24	12	23.84
				50	0	23.91
16QAM	819	26740	10	1	0	24.41
				1	49	24.38
				24	12	23.01
				50	0	22.88
64QAM	819	26740	10	1	0	23.98
				1	49	23.97
				24	12	22.89
				50	0	22.90

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	824.7	26797	1.4	1	0	23.82
				1	5	24.28
				3	2	22.72
				6	0	22.78
	836.5	26915		1	0	24.03
				1	5	23.95
				3	2	22.59
				6	0	22.73
	848.3	27033		1	0	23.77
				1	5	23.89
				3	2	22.53
				6	0	22.81
16QAM	824.7	26797	1.4	1	0	22.77
				1	5	22.82
				3	2	21.69
				6	0	21.55
	836.5	26915		1	0	23.00
				1	5	23.05
				3	2	21.77
				6	0	21.65
	848.3	27033		1	0	22.85
				1	5	22.65
				3	2	21.56
				6	0	21.71
64QAM	824.7	26797	1.4	1	0	22.79
				1	5	23.05
				3	2	21.93
				6	0	21.84
	836.5	26915		1	0	22.47
				1	5	22.96
				3	2	21.89
				6	0	21.51
	848.3	27033		1	0	22.71
				1	5	22.89
				3	2	21.64
				6	0	21.82

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	825.5	26805	3	1	0	24.25
				1	14	24.01
				8	4	22.59
				15	0	22.80
	836.5	26915		1	0	23.93
				1	14	23.79
				8	4	22.61
				15	0	22.68
	847.5	27025		1	0	24.03
				1	14	23.99
				8	4	22.66
				15	0	22.49
16QAM	825.5	26805	3	1	0	22.84
				1	14	22.89
				8	4	21.72
				15	0	21.47
	836.5	26915		1	0	22.98
				1	14	22.96
				8	4	21.63
				15	0	21.66
	847.5	27025		1	0	22.53
				1	14	22.69
				8	4	21.51
				15	0	21.66
64QAM	825.5	26805	3	1	0	23.00
				1	14	23.02
				8	4	21.55
				15	0	21.83
	836.5	26915		1	0	22.69
				1	14	22.73
				8	4	21.59
				15	0	21.45
	847.5	27025		1	0	23.12
				1	14	22.79
				8	4	21.68
				15	0	21.61

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	826.5	26815	5	1	0	24.12
				1	24	23.88
				12	6	22.70
				25	0	22.53
	836.5	26915		1	0	23.95
				1	24	23.62
				12	6	22.69
				25	0	22.48
	846.5	27015		1	0	23.84
				1	24	23.80
				12	6	22.69
				25	0	22.62
16QAM	826.5	26815	5	1	0	22.92
				1	24	22.71
				12	6	21.61
				25	0	21.62
	836.5	26915		1	0	23.34
				1	24	23.36
				12	6	21.58
				25	0	21.40
	846.5	27015		1	0	22.80
				1	24	22.84
				12	6	21.64
				25	0	21.74
64QAM	826.5	26815	5	1	0	22.96
				1	24	22.97
				12	6	21.52
				25	0	21.57
	836.5	26915		1	0	22.82
				1	24	22.55
				12	6	21.58
				25	0	21.67
	846.5	27015		1	0	22.96
				1	24	22.97
				12	6	21.79
				25	0	21.41

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	829	26840	10	1	0	24.08
				1	49	24.29
				24	12	22.86
				50	0	22.72
	836.5	26915		1	0	23.65
				1	49	24.01
				24	12	22.61
				50	0	22.57
	844	26990		1	0	23.98
				1	49	24.20
				24	12	22.69
				50	0	22.71
16QAM	829	26840	10	1	0	22.90
				1	49	22.50
				24	12	21.72
				50	0	21.77
	836.5	26915		1	0	23.27
				1	49	23.02
				24	12	21.84
				50	0	21.64
	844	26990		1	0	22.71
				1	49	22.69
				24	12	21.81
				50	0	21.65
64QAM	829	26840	10	1	0	22.79
				1	49	22.96
				24	12	21.66
				50	0	21.83
	836.5	26915		1	0	22.67
				1	49	22.83
				24	12	21.68
				50	0	21.42
	844	26990		1	0	23.18
				1	49	22.90
				24	12	21.59
				50	0	21.34



Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	831.5	26865	15	1	0	24.31
				1	74	24.31
				40	18	22.94
				75	0	22.98
	836.5	26915		1	0	24.09
				1	74	24.09
				40	18	22.92
				75	0	22.93
	841.5	26965		1	0	24.27
				1	74	24.27
				40	18	22.87
				75	0	22.91
16QAM	831.5	26865	15	1	0	23.00
				1	74	23.00
				40	18	21.94
				75	0	21.87
	836.5	26915		1	0	23.43
				1	74	23.43
				40	18	21.87
				75	0	21.89
	841.5	26965		1	0	22.98
				1	74	22.98
				40	18	21.86
				75	0	21.84
64QAM	831.5	26865	15	1	0	23.19
				1	74	23.19
				40	18	21.99
				75	0	21.92
	836.5	26915		1	0	22.97
				1	74	22.97
				40	18	22.03
				75	0	21.88
	841.5	26965		1	0	23.18
				1	74	23.18
				40	18	21.94
				75	0	21.84

**LTE Band 66**  
**1 RF Power Output**

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1710.7	131979	1.4	1	0	24.48
				1	5	24.38
				3	2	22.80
				6	0	23.00
	1745	132322		1	0	24.44
				1	5	24.17
				3	2	22.83
				6	0	24.98
	1779.3	132665		1	0	24.33
				1	5	24.29
				3	2	22.82
				6	0	22.77
16QAM	1710.7	131979	1.4	1	0	23.44
				1	5	23.49
				3	2	21.88
				6	0	22.02
	1745	132322		1	0	23.67
				1	5	23.82
				3	2	21.81
				6	0	22.33
	1779.3	132665		1	0	23.29
				1	5	23.51
				3	2	22.04
				6	0	21.88
64QAM	1710.7	131979	1.4	1	0	23.20
				1	5	22.87
				3	2	22.23
				6	0	22.01
	1745	132322		1	0	23.60
				1	5	23.20
				3	2	22.00
				6	0	22.17
	1779.3	132665		1	0	23.11
				1	5	23.04
				3	2	21.96
				6	0	21.93

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
------------	-------------------------	------------	----	---------	-----------	-----------------------

QPSK	1711.5	131987	3	1	0	24.25
				1	14	24.24
				8	4	23.25
				15	0	23.01
	1745	132322		1	0	24.37
				1	14	24.51
				8	4	22.91
				15	0	24.97
	1778.5	132657		1	0	24.32
				1	14	24.27
				8	4	23.07
				15	0	23.23
16QAM	1711.5	131987	3	1	0	23.27
				1	14	23.71
				8	4	22.00
				15	0	21.91
	1745	132322		1	0	23.49
				1	14	23.73
				8	4	22.25
				15	0	22.31
	1778.5	132657		1	0	23.28
				1	14	23.44
				8	4	22.22
				15	0	21.96
64QAM	1711.5	131987	3	1	0	22.76
				1	14	22.98
				8	4	22.15
				15	0	22.14
	1745	132322		1	0	23.36
				1	14	23.36
				8	4	22.14
				15	0	22.23
	1778.5	132657		1	0	22.93
				1	14	22.88
				8	4	22.10
				15	0	21.86

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1712.5	131997	5	1	0	24.22
				1	24	24.45
				12	6	22.92
				25	0	22.90
	1745	132322		1	0	24.33
				1	24	24.18
				12	6	23.07
				25	0	24.91
	1777.5	132647		1	0	24.15
				1	24	24.21
				12	6	22.93
				25	0	22.77
16QAM	1712.5	131997	5	1	0	23.50
				1	24	23.54
				12	6	21.78
				25	0	22.15
	1745	132322		1	0	23.61
				1	24	23.84
				12	6	21.81
				25	0	21.91
	1777.5	132647		1	0	23.71
				1	24	23.64
				12	6	21.96
				25	0	22.27
64QAM	1712.5	131997	5	1	0	23.00
				1	24	23.31
				12	6	22.11
				25	0	22.16
	1745	132322		1	0	23.33
				1	24	23.17
				12	6	21.85
				25	0	21.92
	1777.5	132647		1	0	22.94
				1	24	23.33
				12	6	21.99
				25	0	21.92

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1715	132022	10	1	0	24.13
				1	49	24.21
				24	12	22.89
				50	0	22.83
	1745	132322		1	0	24.31
				1	49	24.43
				24	12	22.80
				50	0	24.99
	1775	132622		1	0	24.08
				1	49	24.37
				24	12	23.07
				50	0	22.94
16QAM	1715	132022	10	1	0	23.49
				1	49	23.71
				24	12	22.17
				50	0	21.92
	1745	132322		1	0	23.62
				1	49	23.90
				24	12	21.92
				50	0	22.14
	1775	132622		1	0	23.56
				1	49	23.63
				24	12	21.97
				50	0	21.99
64QAM	1715	132022	10	1	0	22.95
				1	49	23.14
				24	12	21.88
				50	0	22.20
	1745	132322		1	0	23.47
				1	49	23.60
				24	12	22.11
				50	0	22.02
	1775	132622		1	0	23.26
				1	49	23.02
				24	12	21.94
				50	0	21.96

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1717.5	132047	15	1	0	24.14
				1	74	24.15
				40	18	22.80
				75	0	23.03
	1745	132322		1	0	24.06
				1	74	24.37
				40	18	23.10
				75	0	25.16
	1772.5	132597		1	0	24.09
				1	74	24.18
				40	18	23.16
				75	0	22.84
16QAM	1717.5	132047	15	1	0	23.63
				1	74	23.37
				40	18	21.95
				75	0	22.02
	1745	132322		1	0	23.57
				1	74	23.53
				40	18	22.05
				75	0	22.28
	1772.5	132597		1	0	23.30
				1	74	23.27
				40	18	22.26
				75	0	21.91
64QAM	1717.5	132047	15	1	0	22.99
				1	74	23.13
				40	18	21.85
				75	0	22.03
	1745	132322		1	0	23.59
				1	74	23.41
				40	18	22.31
				75	0	22.26
	1772.5	132597		1	0	23.26
				1	74	23.09
				40	18	21.87
				75	0	22.10

Modulation	Carrier frequency (MHz)	UL Channel	BW	RB Size	RB Offset	Conducted power (dBm)
QPSK	1720	132072	20	1	0	24.52
				1	99	24.52
				50	25	23.29
				100	0	23.20
	1745	132322		1	0	24.52
				1	99	24.52
				50	25	23.16
				100	0	25.22
	1770	132572		1	0	24.51
				1	99	24.51
				50	25	23.25
				100	0	23.24
16QAM	1720	132072	20	1	0	23.74
				1	99	23.74
				50	25	22.22
				100	0	22.27
	1745	132322		1	0	23.93
				1	99	23.93
				50	25	22.30
				100	0	22.34
	1770	132572		1	0	23.77
				1	99	23.77
				50	25	22.29
				100	0	22.31
64QAM	1720	132072	20	1	0	23.25
				1	99	23.35
				50	25	22.31
				100	0	22.28
	1745	132322		1	0	23.63
				1	99	23.63
				50	25	22.34
				100	0	22.29
	1770	132572		1	0	23.38
				1	99	23.38
				50	25	22.26
				100	0	22.36

## 6.5 Bluetooth Measurement result

### Bluetooth

Modulation type	Conducted power(dBm)		
	2402MHz (Ch0)	2441MHz (Ch39)	2480MHz (Ch78)
GFSK	6.84	7.65	6.76
$\pi/4$ DQPSK	2.95	3.19	2.93
8DPSK	1.33	1.67	1.30

### BLE

Modulation type	Conducted power(dBm)		
	2402MHz (Ch0)	2440MHz (Ch19)	2480MHz (Ch39)
LE-1Mbps	6.59	7.01	6.72

## 6.6 Wi-Fi Measurement result

### WIFI 2.4GHz

Modulation type	Average power output (dBm)		
	2412MHz	2437MHz	2462MHz
802.11b	18.99	19.91	19.25
802.11g	17.81	19.11	16.93
802.11n HT20	16.40	17.87	17.35



## 6.7 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	Position	SAR test exclusion threshold (mW)	Max conducted power adjusted for tune-up tolerance(mW)	Standalone SAR Required
2.4GHz BT/BLE	Head	10	5.82	No
	Body	19	5.82	No
2.4GHz Wi-Fi	Head	10	97.95	Yes
	Body	19	97.95	Yes

### 6.8 RF exposure conditions

Refer to the follow picture “Antenna-to-antenna and antenna-to-body”



Refer to the details of the

All of Implementation antenna

Main antenna: LTE FDD B2/4/5/7/2666 WCDMA B1/2/4/8/AWS GSM 850/900/DCS/PCS;  
Wi-Fi antenna: 2400MHz~2500MHz;

**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.**

## 6.8.1 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	/

## 6.8.2 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	/

## 6.8.3 Hotspot Exposure conditions

### For WWAN

Test Configurations	Antenna-to-edge/surface	SAR Required
Back	<25 mm	Yes
Front	<25 mm	Yes
Top	>25 mm	No
Bottom	<25 mm	Yes
Left	<25 mm	Yes
Right	<25 mm	Yes

### For WLAN

Test Configurations	Antenna-to-edge/surface	SAR Required
Back	<25 mm	Yes
Front	<25 mm	Yes
Top	<25 mm	Yes
Bottom	>25 mm	No
Left	<25 mm	Yes
Right	<25 mm	Yes

## 6.9 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 (%)
2020.06.23	835	$\epsilon_r$	40.266	41.50	-3.0	$\pm 10$
		$\sigma$ [S/m]	0.911	0.90	1.2	$\pm 10$
2020.06.23	1800	$\epsilon_r$	40.688	40.00	1.7	$\pm 10$
		$\sigma$ [S/m]	1.418	1.40	1.3	$\pm 10$
2020.06.27	1800	$\epsilon_r$	40.722	40.00	1.8	$\pm 10$
		$\sigma$ [S/m]	1.427	1.40	1.9	$\pm 10$
2020.06.28	2000	$\epsilon_r$	39.844	40.00	-0.4	$\pm 10$
		$\sigma$ [S/m]	1.427	1.40	1.9	$\pm 10$
2020.06.29	2000	$\epsilon_r$	40.355	40.00	0.9	$\pm 10$
		$\sigma$ [S/m]	1.377	1.40	-1.6	$\pm 10$
2020.06.30	2450	$\epsilon_r$	38.343	39.20	-2.2	$\pm 10$
		$\sigma$ [S/m]	1.866	1.80	3.7	$\pm 10$
2020.07.01	2450	$\epsilon_r$	39.672	39.20	1.2	$\pm 10$
		$\sigma$ [S/m]	1.851	1.80	2.8	$\pm 10$
2020.07.03	2600	$\epsilon_r$	38.67	39.00	-0.8	$\pm 10$
		$\sigma$ [S/m]	1.93	1.96	-1.5	$\pm 10$

**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 (%)
			1g	9.56			
2020.06.23	D835V2	Head	1g	9.56	9.37	2.0	±10
2020.06.23	D1800V2	Head	1g	37.96	38.9	-2.4	±10
2020.06.27	D1800V2	Head	1g	38.12	38.9	-2.0	±10
2020.06.28	D2000V2	Head	1g	39.28	40.3	-2.5	±10
2020.06.29	D2000V2	Head	1g	39.92	40.3	-0.9	±10
2020.06.30	D2450V2	Head	1g	54.0	52.4	3.1	±10
2020.07.01	D2450V2	Head	1g	52.8	52.4	0.8	±10
2020.07.03	D2600V2	Head	1g	59.6	56.5	5.5	±10

## 6.10 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 5mm.

Mode		Duty cycle	Duty factor	Note
Licensed Frequency	GSM Band	Depends on UP slots	NA	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%		
Unlicensed Frequency	WIFI 2.4GHz 802.11b	99.7%	1.00	SRTC perform SAR test with non-signaling mode, and duty factor shall be considered because of the uncertainty of data traffic.

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

Mode: GSM 850(GPRS)

fL(MHz)=824.2MHz

fM(MHz)=836.5MHz

fH(MHz)= 848.8MHz

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

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Left cheek	GPRS 2TX (head)	L	30.83	31.00	1.04	---	---
		M	30.66	31.00	1.08	0.209	0.226
		H	30.59	31.00	1.10	---	---
Left Tilted		L	30.83	31.00	1.04	---	---
		M	30.66	31.00	1.08	0.122	0.132
		H	30.59	31.00	1.10	---	---
Right cheek		L	30.83	31.00	1.04	---	---
		M	30.66	31.00	1.08	<b>0.236</b>	<b>0.255</b>
		H	30.59	31.00	1.10	---	---
Right Tilted	L	30.83	31.00	1.04	---	---	
	M	30.66	31.00	1.08	0.168	0.181	
	H	30.59	31.00	1.10	---	---	
Back	GPRS 2TX (body-worn)	L	30.83	31.00	1.04	---	---
		M	30.66	31.00	1.08	<b>0.377</b>	<b>0.407</b>
		H	30.59	31.00	1.10	---	---
Front		L	30.83	31.00	1.04	---	---
		M	30.66	31.00	1.08	0.219	0.237
		H	30.59	31.00	1.10	---	---
Bottom		L	30.83	31.00	1.04	---	---
		M	30.66	31.00	1.08	0.180	0.194
		H	30.59	31.00	1.10	---	---
Left	GPRS 2TX (hotspot)	L	30.83	31.00	1.04	---	---
		M	30.66	31.00	1.08	0.088	0.095
		H	30.59	31.00	1.10	---	---
Right		L	30.83	31.00	1.04	---	---
		M	30.66	31.00	1.08	0.205	0.221
		H	30.59	31.00	1.10	---	---



**Mode: GSM1900(GPRS)**

fL (MHz)=1850.2MHz

fM (MHz)=1880.0MHz

fH (MHz)=1909.8MHz

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

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Left cheek	GPRS 3TX (head)	L	25.88	26.00	1.03	---	---
		M	25.60	26.00	1.10	0.052	0.057
		H	25.34	26.00	1.16	---	---
Left Tilted		L	25.88	26.00	1.03	---	---
		M	25.60	26.00	1.10	0.051	0.056
		H	25.34	26.00	1.16	---	---
Right cheek		L	25.88	26.00	1.03	---	---
		M	25.60	26.00	1.10	<b>0.057</b>	<b>0.062</b>
		H	25.34	26.00	1.16	---	---
Right Tilted	L	25.88	26.00	1.03	---	---	
	M	25.60	26.00	1.10	0.052	0.057	
	H	25.34	26.00	1.16	---	---	
Back	GPRS 3TX (body-worn)	L	25.88	26.00	1.03	---	---
		M	25.60	26.00	1.10	<b>0.297</b>	<b>0.327</b>
		H	25.34	26.00	1.16	---	---
Front		L	25.88	26.00	1.03	---	---
		M	25.60	26.00	1.10	0.118	0.130
		H	25.34	26.00	1.16	---	---
Bottom		L	25.88	26.00	1.03	---	---
		M	25.60	26.00	1.10	0.204	0.224
		H	25.34	26.00	1.16	---	---
Left	GPRS 3TX (hotspot)	L	25.88	26.00	1.03	---	---
		M	25.60	26.00	1.10	0.084	0.092
		H	25.34	26.00	1.16	---	---
Right		L	25.88	26.00	1.03	---	---
		M	25.60	26.00	1.10	0.105	0.116
		H	25.34	26.00	1.16	---	---

**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		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Left cheek	12.2KRMC (head)	L	23.67	24.00	1.08	---	---
		M	23.60	24.00	1.10	<b>0.121</b>	<b>0.133</b>
		H	23.66	24.00	1.08	---	---
Left Tilted		L	23.67	24.00	1.08	---	---
		M	23.60	24.00	1.10	0.119	0.131
		H	23.66	24.00	1.08	---	---
Right cheek		L	23.67	24.00	1.08	---	---
		M	23.60	24.00	1.10	0.068	0.075
		H	23.66	24.00	1.08	---	---
Right Tilted	L	23.67	24.00	1.08	---	---	
	M	23.60	24.00	1.10	0.064	0.070	
	H	23.66	24.00	1.08	---	---	
Back	12.2KRMC (body-worn)	L	23.67	24.00	1.08	---	---
		M	23.60	24.00	1.10	<b>0.675</b>	<b>0.743</b>
		H	23.66	24.00	1.08	---	---
Front		L	23.67	24.00	1.08	---	---
		M	23.60	24.00	1.10	0.284	0.312
		H	23.66	24.00	1.08	---	---
Bottom		L	23.67	24.00	1.08	---	---
		M	23.60	24.00	1.10	0.335	0.369
		H	23.66	24.00	1.08	---	---
Left	12.2KRMC (hotspot)	L	23.67	24.00	1.08	---	---
		M	23.60	24.00	1.10	0.161	0.177
		H	23.66	24.00	1.08	---	---
Right		L	23.67	24.00	1.08	---	---
		M	23.60	24.00	1.10	0.128	0.141
		H	23.66	24.00	1.08	---	---

**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		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Left cheek	12.2KR MC (head)	L	23.76	24.00	1.06	---	---
		M	23.78	24.00	1.05	<b>0.207</b>	<b>0.217</b>
		H	23.79	24.00	1.05	---	---
Left Tilted		L	23.76	24.00	1.06	---	---
		M	23.78	24.00	1.05	0.177	0.186
		H	23.79	24.00	1.05	---	---
Right cheek		L	23.76	24.00	1.06	---	---
		M	23.78	24.00	1.05	0.122	0.128
		H	23.79	24.00	1.05	---	---
Right Tilted	L	23.76	24.00	1.06	---	---	
	M	23.78	24.00	1.05	0.106	0.111	
	H	23.79	24.00	1.05	---	---	
Back	12.2KR MC (body-worn)	L1	23.76	24.00	1.06	0.793	0.841
		M1	23.78	24.00	1.05	<b>0.876</b>	<b>0.920</b>
		H1	23.79	24.00	1.05	0.805	0.845
		L2	23.76	24.00	1.06	0.790	0.837
		M2	23.78	24.00	1.05	0.873	0.917
		H2	23.79	24.00	1.05	0.807	0.847
Front		L	23.76	24.00	1.06	---	---
		M	23.78	24.00	1.05	0.484	0.508
		H	23.79	24.00	1.05	---	---
Bottom		L	23.76	24.00	1.06	---	---
		M	23.78	24.00	1.05	0.475	0.499
		H	23.79	24.00	1.05	---	---
Left	12.2KR MC (hotspot)	L	23.76	24.00	1.06	---	---
		M	23.78	24.00	1.05	0.332	0.349
		H	23.79	24.00	1.05	---	---
Right		L	23.76	24.00	1.06	---	---
		M	23.78	24.00	1.05	0.228	0.239
		H	23.79	24.00	1.05	---	---

**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		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Left cheek	12.2KRMC (head)	L	23.75	24.00	1.06	---	---
		M	23.74	24.00	1.06	0.305	0.323
		H	23.71	24.00	1.07	---	---
Left Tilted		L	23.75	24.00	1.06	---	---
		M	23.74	24.00	1.06	0.196	0.208
		H	23.71	24.00	1.07	---	---
Right cheek		L	23.75	24.00	1.06	---	---
		M	23.74	24.00	1.06	<b>0.332</b>	<b>0.352</b>
		H	23.71	24.00	1.07	---	---
Right Tilted	L	23.75	24.00	1.06	---	---	
	M	23.74	24.00	1.06	0.331	0.351	
	H	23.71	24.00	1.07	---	---	
Back	12.2KRMC (body-worn)	L	23.75	24.00	1.06	---	---
		M	23.74	24.00	1.06	<b>0.606</b>	<b>0.642</b>
		H	23.71	24.00	1.07	---	---
Front		L	23.75	24.00	1.06	---	---
		M	23.74	24.00	1.06	0.345	0.366
		H	23.71	24.00	1.07	---	---
Bottom	L	23.75	24.00	1.06	---	---	
	M	23.74	24.00	1.06	0.305	0.323	
	H	23.71	24.00	1.07	---	---	
Left	12.2KRMC (hotspot)	L	23.75	24.00	1.06	---	---
		M	23.74	24.00	1.06	0.096	0.102
		H	23.71	24.00	1.07	---	---
Right		L	23.75	24.00	1.06	---	---
		M	23.74	24.00	1.06	0.293	0.311
		H	23.71	24.00	1.07	---	---

**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		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	position					1g Average	1g Average
Left cheek	20BW 1RB (head)	L	24.44	24.70	1.06	---	---
		M	24.50	24.70	1.05	<b>0.149</b>	<b>0.156</b>
		H	24.28	24.70	1.10	---	---
Left Tilted		L	24.44	24.70	1.06	---	---
		M	24.50	24.70	1.05	0.112	0.118
		H	24.28	24.70	1.10	---	---
Right cheek		L	24.44	24.70	1.06	---	---
		M	24.50	24.70	1.05	0.089	0.093
		H	24.28	24.70	1.10	---	---
Right Tilted	L	24.44	24.70	1.06	---	---	
	M	24.50	24.70	1.05	0.096	0.101	
	H	24.28	24.70	1.10	---	---	
Back	20BW 1RB (body-worn)	L	24.44	24.70	1.06	---	---
		M	24.50	24.70	1.05	<b>0.459</b>	<b>0.482</b>
		H	24.28	24.70	1.10	---	---
Front		L	24.44	24.70	1.06	---	---
		M	24.50	24.70	1.05	0.339	0.356
		H	24.28	24.70	1.10	---	---
Bottom		L1	24.44	24.70	1.06	---	---
		M1	24.50	24.70	1.05	0.357	0.375
		H1	24.28	24.70	1.10	---	---
Left	20BW 1RB (hotspot)	L	24.44	24.70	1.06	---	---
		M	24.50	24.70	1.05	0.142	0.149
		H	24.28	24.70	1.10	---	---
Right		L	24.44	24.70	1.06	---	---
		M	24.50	24.70	1.05	0.131	0.138
		H	24.28	24.70	1.10	---	---

Left cheek	20BW 50%RB (head)	L	23.40	23.50	1.02	---	---
		M	23.49	23.50	1.00	0.104	0.104
		H	23.37	23.50	1.03	---	---
Left Tilted		L	23.40	23.50	1.02	---	---
		M	23.49	23.50	1.00	0.106	0.106
		H	23.37	23.50	1.03	---	---
Right cheek		L	23.40	23.50	1.02	---	---
		M	23.49	23.50	1.00	0.080	0.080
		H	23.37	23.50	1.03	---	---
Right Tilted	L	23.40	23.50	1.02	---	---	
	M	23.49	23.50	1.00	0.091	0.091	
	H	23.37	23.50	1.03	---	---	
Back	20BW 50%RB (body-worn)	L	23.40	23.50	1.02	---	---
		M	23.49	23.50	1.00	0.390	0.390
		H	23.37	23.50	1.03	---	---
Front		L	23.40	23.50	1.02	---	---
		M	23.49	23.50	1.00	0.265	0.265
		H	23.37	23.50	1.03	---	---
Bottom		L	23.40	23.50	1.02	---	---
		M	23.49	23.50	1.00	0.188	0.188
		H	23.37	23.50	1.03	---	---
Left	20BW 50%RB (hotspot)	L	23.40	23.50	1.02	---	---
		M	23.49	23.50	1.00	0.054	0.054
		H	23.37	23.50	1.03	---	---
Right		L	23.40	23.50	1.02	---	---
		M	23.49	23.50	1.00	0.085	0.085
		H	23.37	23.50	1.03	---	---

**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		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	position					1g Average	1g Average
Left cheek	20BW 1RB (head)	L	24.49	25.00	1.12	---	---
		M	24.72	25.00	1.07	<b>0.213</b>	<b>0.228</b>
		H	24.52	25.00	1.12	---	---
Left Tilted		L	24.49	25.00	1.12	---	---
		M	24.72	25.00	1.07	0.165	0.177
		H	24.52	25.00	1.12	---	---
Right cheek		L	24.49	25.00	1.12	---	---
		M	24.72	25.00	1.07	0.131	0.140
		H	24.52	25.00	1.12	---	---
Right Tilted	L	24.49	25.00	1.12	---	---	
	M	24.72	25.00	1.07	0.156	0.167	
	H	24.52	25.00	1.12	---	---	
Back	20BW 1RB (body-worn)	L	24.49	25.00	1.12	---	---
		M	24.72	25.00	1.07	<b>0.511</b>	<b>0.547</b>
		H	24.52	25.00	1.12	---	---
Front		L	24.49	25.00	1.12	---	---
		M	24.72	25.00	1.07	0.427	0.457
		H	24.52	25.00	1.12	---	---
Bottom	L1	24.49	25.00	1.12	---	---	
	M1	24.72	25.00	1.07	0.400	0.428	
	H1	24.52	25.00	1.12	---	---	
Left	20BW 1RB (hotspot)	L	24.49	25.00	1.12	---	---
		M	24.72	25.00	1.07	0.282	0.302
		H	24.52	25.00	1.12	---	---
Right		L	24.49	25.00	1.12	---	---
		M	24.72	25.00	1.07	0.169	0.181
		H	24.52	25.00	1.12	---	---

Left cheek	20BW 50%RB (head)	L	23.46	23.50	1.01	---	---	
		M	23.36	23.50	1.03	0.183	0.188	
		H	23.44	23.50	1.01	---	---	
Left Tilted		L	23.46	23.50	1.01	---	---	
		M	23.36	23.50	1.03	0.159	0.164	
		H	23.44	23.50	1.01	---	---	
Right cheek		L	23.46	23.50	1.01	---	---	
		M	23.36	23.50	1.03	0.102	0.105	
		H	23.44	23.50	1.01	---	---	
Right Tilted		L	23.46	23.50	1.01	---	---	
		M	23.36	23.50	1.03	0.118	0.122	
		H	23.44	23.50	1.01	---	---	
Back	20BW 50%RB (body-worn)	L	23.46	23.50	1.01	---	---	
		M	23.36	23.50	1.03	0.458	0.472	
		H	23.44	23.50	1.01	---	---	
Front		L	23.46	23.50	1.01	---	---	
		M	23.36	23.50	1.03	0.304	0.313	
		H	23.44	23.50	1.01	---	---	
Bottom		L	23.46	23.50	1.01	---	---	
		M	23.36	23.50	1.03	0.359	0.370	
		H	23.44	23.50	1.01	---	---	
Left		20BW 50%RB (hotspot)	L	23.46	23.50	1.01	---	---
			M	23.36	23.50	1.03	0.216	0.222
			H	23.44	23.50	1.01	---	---
Right	L		23.46	23.50	1.01	---	---	
	M		23.36	23.50	1.03	0.153	0.158	
	H		23.44	23.50	1.01	---	---	



**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		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	position					1g Average	1g Average
Left cheek	10BW 1RB (head)	L	24.60	24.70	1.02	---	---
		M	24.25	24.70	1.11	0.035	0.039
		H	24.50	24.70	1.05	---	---
Left Tilted		L	24.60	24.70	1.02	---	---
		M	24.25	24.70	1.11	0.151	0.168
		H	24.50	24.70	1.05	---	---
Right cheek		L	24.60	24.70	1.02	---	---
		M	24.25	24.70	1.11	0.047	0.052
		H	24.50	24.70	1.05	---	---
Right Tilted	L	24.60	24.70	1.02	---	---	
	M	24.25	24.70	1.11	<b>0.176</b>	<b>0.195</b>	
	H	24.50	24.70	1.05	---	---	
Back	10BW 1RB (body-worn)	L	24.60	24.70	1.02	---	---
		M	24.25	24.70	1.11	<b>0.448</b>	<b>0.497</b>
		H	24.50	24.70	1.05	---	---
Front		L	24.60	24.70	1.02	---	---
		M	24.25	24.70	1.11	0.332	0.369
		H	24.50	24.70	1.05	---	---
Bottom		L	24.60	24.70	1.02	---	---
		M	24.25	24.70	1.11	0.288	0.320
		H	24.50	24.70	1.05	---	---
Left	10BW 1RB (hotspot)	L	24.60	24.70	1.02	---	---
		M	24.25	24.70	1.11	0.112	0.124
		H	24.50	24.70	1.05	---	---
Right		L	24.60	24.70	1.02	---	---
		M	24.25	24.70	1.11	0.294	0.326
		H	24.50	24.70	1.05	---	---

Left cheek	10BW 50%RB (head)	L	23.26	23.50	1.06	---	---
		M	23.29	23.50	1.05	0.031	0.033
		H	23.31	23.50	1.04	---	---
Left Tilted		L	23.26	23.50	1.06	---	---
		M	23.29	23.50	1.05	0.142	0.149
		H	23.31	23.50	1.04	---	---
Right cheek		L	23.26	23.50	1.06	---	---
		M	23.29	23.50	1.05	0.043	0.045
		H	23.31	23.50	1.04	---	---
Right Tilted	L	23.26	23.50	1.06	---	---	
	M	23.29	23.50	1.05	0.158	0.166	
	H	23.31	23.50	1.04	---	---	
Back	10BW 50%RB (body-worn)	L	23.26	23.50	1.06	---	---
		M	23.29	23.50	1.05	0.434	0.456
		H	23.31	23.50	1.04	---	---
Front		L	23.26	23.50	1.06	---	---
		M	23.29	23.50	1.05	0.258	0.271
		H	23.31	23.50	1.04	---	---
Bottom		L	23.26	23.50	1.06	---	---
		M	23.29	23.50	1.05	0.259	0.272
		H	23.31	23.50	1.04	---	---
Left	10BW 50%RB (hotspot)	L	23.26	23.50	1.06	---	---
		M	23.29	23.50	1.05	0.091	0.096
		H	23.31	23.50	1.04	---	---
Right		L	23.26	23.50	1.06	---	---
		M	23.29	23.50	1.05	0.203	0.213
		H	23.31	23.50	1.04	---	---

**Mode: LTE Band 7**

fL (MHz)=2510 MHz

fM (MHz)=2535MHz

fH (MHz)= 2560MHz

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

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	position					1g Average	1g Average
Left cheek	20BW 1RB (head)	L	23.94	24.00	1.01	---	---
		M	23.83	24.00	1.04	<b>0.348</b>	<b>0.362</b>
		H	23.90	24.00	1.02	---	---
Left Tilted		L	23.94	24.00	1.01	---	---
		M	23.83	24.00	1.04	0.173	0.180
		H	23.90	24.00	1.02	---	---
Right cheek		L	23.94	24.00	1.01	---	---
		M	23.83	24.00	1.04	0.127	0.132
		H	23.90	24.00	1.02	---	---
Right Tilted	L	23.94	24.00	1.01	---	---	
	M	23.83	24.00	1.04	0.191	0.199	
	H	23.90	24.00	1.02	---	---	
Back	20BW 1RB (body-worn)	L	23.94	24.00	1.01	---	---
		M	23.83	24.00	1.04	<b>0.550</b>	<b>0.572</b>
		H	23.90	24.00	1.02	---	---
Front		L	23.94	24.00	1.01	---	---
		M	23.83	24.00	1.04	0.503	0.523
		H	23.90	24.00	1.02	---	---
Bottom		L	23.94	24.00	1.01	---	---
		M	23.83	24.00	1.04	0.461	0.479
		H	23.90	24.00	1.02	---	---
Left	20BW 1RB (hotspot)	L	23.94	24.00	1.01	---	---
		M	23.83	24.00	1.04	0.256	0.266
		H	23.90	24.00	1.02	---	---
Right		L	23.94	24.00	1.01	---	---
		M	23.83	24.00	1.04	0.084	0.087
		H	23.90	24.00	1.02	---	---

Left cheek	20BW 50%RB (head)	L	23.04	23.50	1.11	---	---
		M	23.06	23.50	1.11	0.214	0.238
		H	23.11	23.50	1.09	---	---
Left Tilted		L	23.04	23.50	1.11	---	---
		M	23.06	23.50	1.11	0.169	0.188
		H	23.11	23.50	1.09	---	---
Right cheek		L	23.04	23.50	1.11	---	---
		M	23.06	23.50	1.11	0.097	0.108
		H	23.11	23.50	1.09	---	---
Right Tilted	L	23.04	23.50	1.11	---	---	
	M	23.06	23.50	1.11	0.139	0.154	
	H	23.11	23.50	1.09	---	---	
Back	20BW 50%RB (body- worn)	L	23.04	23.50	1.11	---	---
		M	23.06	23.50	1.11	0.513	0.569
		H	23.11	23.50	1.09	---	---
Front		L	23.04	23.50	1.11	---	---
		M	23.06	23.50	1.11	0.314	0.349
		H	23.11	23.50	1.09	---	---
Bottom		L	23.04	23.50	1.11	---	---
		M	23.06	23.50	1.11	0.276	0.306
		H	23.11	23.50	1.09	---	---
Left	20BW 50%RB (hotspot)	L	23.04	23.50	1.11	---	---
		M	23.06	23.50	1.11	0.217	0.241
		H	23.11	23.50	1.09	---	---
Right		L	23.04	23.50	1.11	---	---
		M	23.06	23.50	1.11	0.061	0.068
		H	23.11	23.50	1.09	---	---

**Mode: LTE Band 26**

fL (MHz)=821.5 MHz

fM (MHz)=831.5MHz

fH (MHz)= 841.5MHz

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

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	position					1g Average	1g Average
Left cheek	15BW 1RB (head)	L	24.94	25.50	1.14	---	---
		M	24.31	25.50	1.32	0.044	0.058
		H	24.27	25.50	1.33	---	---
Left Tilted		L	24.94	25.50	1.14	---	---
		M	24.31	25.50	1.32	0.097	0.128
		H	24.27	25.50	1.33	---	---
Right cheek		L	24.94	25.50	1.14	---	---
		M	24.31	25.50	1.32	0.065	0.086
		H	24.27	25.50	1.33	---	---
Right Tilted	L	24.94	25.50	1.14	---	---	
	M	24.31	25.50	1.32	<b>0.192</b>	<b>0.253</b>	
	H	24.27	25.50	1.33	---	---	
Back	15BW 1RB (body-worn)	L	24.94	25.50	1.14	---	---
		M	24.31	25.50	1.32	<b>0.466</b>	<b>0.615</b>
		H	24.27	25.50	1.33	---	---
Front		L	24.94	25.50	1.14	---	---
		M	24.31	25.50	1.32	0.328	0.433
		H	24.27	25.50	1.33	---	---
Bottom		L	24.94	25.50	1.14	---	---
		M	24.31	25.50	1.32	0.316	0.417
		H	24.27	25.50	1.33	---	---
Left	15BW 1RB (hotspot)	L	24.94	25.50	1.14	---	---
		M	24.31	25.50	1.32	0.155	0.205
		H	24.27	25.50	1.33	---	---
Right		L	24.94	25.50	1.14	---	---
		M	24.31	25.50	1.32	0.348	0.459
		H	24.27	25.50	1.33	---	---

Left cheek	15BW 50%RB (head)	L	23.90	24.00	1.02	---	---
		M	22.94	24.00	1.28	0.040	0.051
		H	22.87	24.00	1.30	---	---
Left Tilted		L	23.90	24.00	1.02	---	---
		M	22.94	24.00	1.28	0.091	0.116
		H	22.87	24.00	1.30	---	---
Right cheek		L	23.90	24.00	1.02	---	---
		M	22.94	24.00	1.28	0.058	0.074
		H	22.87	24.00	1.30	---	---
Right Tilted	L	23.90	24.00	1.02	---	---	
	M	22.94	24.00	1.28	0.175	0.224	
	H	22.87	24.00	1.30	---	---	
Back	15BW 50%RB (body-worn)	L	23.90	24.00	1.02	---	---
		M	22.94	24.00	1.28	0.345	0.442
		H	22.87	24.00	1.30	---	---
Front		L	23.90	24.00	1.02	---	---
		M	22.94	24.00	1.28	0.267	0.342
		H	22.87	24.00	1.30	---	---
Bottom		L	23.90	24.00	1.02	---	---
		M	22.94	24.00	1.28	0.251	0.321
		H	22.87	24.00	1.30	---	---
Left	15BW 50%RB (hotspot)	L	23.90	24.00	1.02	---	---
		M	22.94	24.00	1.28	0.103	0.132
		H	22.87	24.00	1.30	---	---
Right		L	23.90	24.00	1.02	---	---
		M	22.94	24.00	1.28	0.297	0.380
		H	22.87	24.00	1.30	---	---

**Mode: LTE Band 66**

fL (MHz)=1720 MHz

fM (MHz)=1745MHz

fH (MHz)= 1770MHz

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

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	position					1g Average	1g Average
Left cheek	20BW 1RB (head)	L	24.52	24.70	1.04	---	---
		M	24.52	24.70	1.04	<b>0.257</b>	<b>0.267</b>
		H	24.51	24.70	1.04	---	---
Left Tilted		L	24.52	24.70	1.04	---	---
		M	24.52	24.70	1.04	0.187	0.194
		H	24.51	24.70	1.04	---	---
Right cheek		L	24.52	24.70	1.04	---	---
		M	24.52	24.70	1.04	0.131	0.136
		H	24.51	24.70	1.04	---	---
Right Tilted	L	24.52	24.70	1.04	---	---	
	M	24.52	24.70	1.04	0.137	0.142	
	H	24.51	24.70	1.04	---	---	
Back	20BW 1RB (body-worn)	L	24.52	24.70	1.04	---	---
		M	24.52	24.70	1.04	<b>0.643</b>	<b>0.669</b>
		H	24.51	24.70	1.04	---	---
Front		L	24.52	24.70	1.04	---	---
		M	24.52	24.70	1.04	0.566	0.589
		H	24.51	24.70	1.04	---	---
Bottom		L	24.52	24.70	1.04	---	---
		M	24.52	24.70	1.04	0.467	0.486
		H	24.51	24.70	1.04	---	---
Left	20BW 1RB (hotspot)	L	24.52	24.70	1.04	---	---
		M	24.52	24.70	1.04	0.264	0.275
		H	24.51	24.70	1.04	---	---
Right		L	24.52	24.70	1.04	---	---
		M	24.52	24.70	1.04	0.179	0.186
		H	24.51	24.70	1.04	---	---

Left cheek	20BW 50%RB (head)	L	23.29	23.50	1.05	---	---
		M	23.16	23.50	1.08	0.205	0.221
		H	23.25	23.50	1.06	---	---
Left Tilted		L	23.29	23.50	1.05	---	---
		M	23.16	23.50	1.08	0.184	0.199
		H	23.25	23.50	1.06	---	---
Right cheek		L	23.29	23.50	1.05	---	---
		M	23.16	23.50	1.08	0.103	0.111
		H	23.25	23.50	1.06	---	---
Right Tilted		L	23.29	23.50	1.05	---	---
		M	23.16	23.50	1.08	0.113	0.122
		H	23.25	23.50	1.06	---	---
Back	20BW 50%RB (body- worn)	L	23.29	23.50	1.05	---	---
		M	23.16	23.50	1.08	0.565	0.610
		H	23.25	23.50	1.06	---	---
Front		L	23.29	23.50	1.05	---	---
		M	23.16	23.50	1.08	0.352	0.380
		H	23.25	23.50	1.06	---	---
Bottom	L	23.29	23.50	1.05	---	---	
	M	23.16	23.50	1.08	0.304	0.328	
	H	23.25	23.50	1.06	---	---	
Left	20BW 50%RB (hotspot)	L	23.29	23.50	1.05	---	---
		M	23.16	23.50	1.08	0.230	0.248
		H	23.25	23.50	1.06	---	---
Right		L	23.29	23.50	1.05	---	---
		M	23.16	23.50	1.08	0.105	0.113
		H	23.25	23.50	1.06	---	---



**Mode: Wi-Fi 2.4GHz**

fL (MHz)=2412MHz      fM (MHz)=2437MHz

fH (MHz)= 2462MHz

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

Test Case		Ch	Measure Conducted Power (dBm)	Tune-up limit (dBm)	Scaling Factor	Measure Results (W/kg)	Reported Results (W/kg)
position	mode					1g Average	1g Average
Left cheek	802.11b (head)	L	18.99	20.00	1.26	---	---
		M	19.91	20.00	1.02	0.782	0.798
		H	19.25	20.00	1.19	---	---
Left Tilted		L1	18.99	20.00	1.26	0.738	0.930
		M1	19.91	20.00	1.02	<b>1.110</b>	<b>1.132</b>
		H1	19.25	20.00	1.19	0.825	0.982
		L2	18.99	20.00	1.26	0.713	0.898
		M2	19.91	20.00	1.02	1.103	1.125
		H2	19.25	20.00	1.19	0.841	1.001
Right cheek	L	18.99	20.00	1.26	---	---	
	M	19.91	20.00	1.02	0.469	0.478	
	H	19.25	20.00	1.19	---	---	
Right Tilted	L	18.99	20.00	1.26	---	---	
	M	19.91	20.00	1.02	0.473	0.482	
	H	19.25	20.00	1.19	---	---	
Back	802.11b (body- worn)	L	18.99	20.00	1.26	---	---
		M	19.91	20.00	1.02	<b>0.329</b>	<b>0.336</b>
		H	19.25	20.00	1.19	---	---
Front		L	18.99	20.00	1.26	---	---
		M	19.91	20.00	1.02	0.214	0.218
		H	19.25	20.00	1.19	---	---
Top		L	18.99	20.00	1.26	---	---
		M	19.91	20.00	1.02	0.216	0.220
		H	19.25	20.00	1.19	---	---
Left	802.11b (hotspot)	L	18.99	20.00	1.26	---	---
		M	19.91	20.00	1.02	0.060	0.061
		H	19.25	20.00	1.19	---	---
Right		L	18.99	20.00	1.26	---	---
		M	19.91	20.00	1.02	0.086	0.088
		H	19.25	20.00	1.19	---	---

## 6.11 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 (~ 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 SAR configuration in Each Frequency Band

Frequency band	Air interface	Head(w/kg)	Body-worn(w/kg)	Hotspot(w/kg)
Below 1GHz	GSM850 WCDMA BANDV LTE BAND5 LTE BAND26	<0.8	<0.8	<0.8
1GHz-2GHz	GSM1900 WCDMA BANDII WCDMA BANDIV LTE BAND2 LTE BAND4 LTE BAND66	<0.8	>0.8	>0.8
2GHz-3GHz	Bluetooth/BLE WIFI 2.4GHz LTE BAND7	>0.8	<0.8	<0.8

## 6.12 Simultaneous Transmission SAR Analysis

### The sum of SAR values for GSM +Wi-Fi 2.4GHz

	MAXIMUM SAR VALUE FOR HEAD	MAXIMUM SAR VALUE FOR BODY WORN	MAXIMUM SAR VALUE FOR HOTSPOT
<b>GSM</b>	0.132	0.407	0.407
<b>Wi-Fi</b>	1.132	0.336	0.336
<b>Sum</b>	1.264	0.743	0.743
<b>Note</b>	Left tilt: GSM850+Wi-Fi 2.4GHz	Back: GSM850+Wi-Fi 2.4GHz	Back: GSM850+Wi-Fi 2.4GHz

### The sum of SAR values for WCDMA + Wi-Fi 2.4GHz

	MAXIMUM SAR VALUE FOR HEAD	MAXIMUM SAR VALUE FOR BODY	MAXIMUM SAR VALUE FOR HOTSPOT
<b>WCDMA</b>	0.208	0.920	0.920
<b>Wi-Fi</b>	1.132	0.336	0.336
<b>Sum</b>	1.340	1.256	1.256
<b>Note</b>	Left tilt: WCDMAV+Wi-Fi2.4GHz	Back: WCDMAIV+Wi-Fi 2.4GHz	Back: WCDMAIV+Wi-Fi 2.4GHz

### The sum of SAR values for LTE + Wi-Fi 2.4GHz

	MAXIMUM SAR VALUE FOR HEAD	MAXIMUM SAR VALUE FOR BODY	MAXIMUM SAR VALUE FOR HOTSPOT
<b>LTE</b>	0.194	0.669	0.669
<b>Wi-Fi</b>	1.132	0.336	0.336
<b>Sum</b>	1.326	1.005	1.005
<b>Note</b>	Left tilt: LTE66 +Wi-Fi 2.4GHz	Back: LTE66 +Wi-Fi 2.4GHz	Back: LTE66 +Wi-Fi 2.4GHz

**The sum of SAR values for GSM & Bluetooth**

	<b>MAXIMUM SAR VALUE FOR HEAD</b>	<b>MAXIMUM SAR VALUE FOR BODY WORN</b>
<b>GSM</b>	0.255	0.407
<b>Bluetooth</b>	0.227	0.114
<b>Sum</b>	0.482	0.521
<b>Note</b>	Right cheek: GSM850+BT	Back: GSM850+BT

**The sum of SAR values for WCDMA & Bluetooth**

	<b>MAXIMUM SAR VALUE FOR HEAD</b>	<b>MAXIMUM SAR VALUE FOR BODY WORN</b>
<b>WCDMA</b>	0.352	0.920
<b>Bluetooth</b>	0.227	0.114
<b>Sum</b>	0.579	1.034
<b>Note</b>	Right cheek: WCDMAV+BT	Back: WCDMAIV+BT

**The sum of SAR values for LTE& Bluetooth**

	<b>MAXIMUM SAR VALUE FOR HEAD</b>	<b>MAXIMUM SAR VALUE FOR BODY</b>
<b>LTE</b>	0.362	0.669
<b>Bluetooth</b>	0.227	0.114
<b>Sum</b>	0.589	0.783
<b>Note</b>	Left cheek: LTE7+BT	Back: LTE66 +BT

According to the above tables, the sum of SAR values < 1.6W/kg. So simultaneous transmission SAR are not required for WIFI transmitter.

## 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	$\sqrt{3}$	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	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
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	±0.4 %	R	$\sqrt{3}$	1	1	±0.2 %	±0.2 %	∞
Probe Positioning	±2.9 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
Max. SAR Eval.	±2.0 %	R	$\sqrt{3}$	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	$\sqrt{3}$	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	±6.1 %	R	$\sqrt{3}$	1	1	±3.5 %	±3.5 %	∞
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						±11.2 %	±11.1 %	361
Expanded STD Uncertainty						±22.3 %	±22.2 %	

(3 - 6 GHz range)

Error Description	Uncert. value	Prob. Dist.	Div.	( $c_1$ ) 1g	( $c_2$ ) 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	546	2019.08.28	2020.08.27
Dosimetric E-field Probe	ES3DV3	3127	2019.08.27	2020.08.26
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	2020.11.07

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 835

#### SAR target

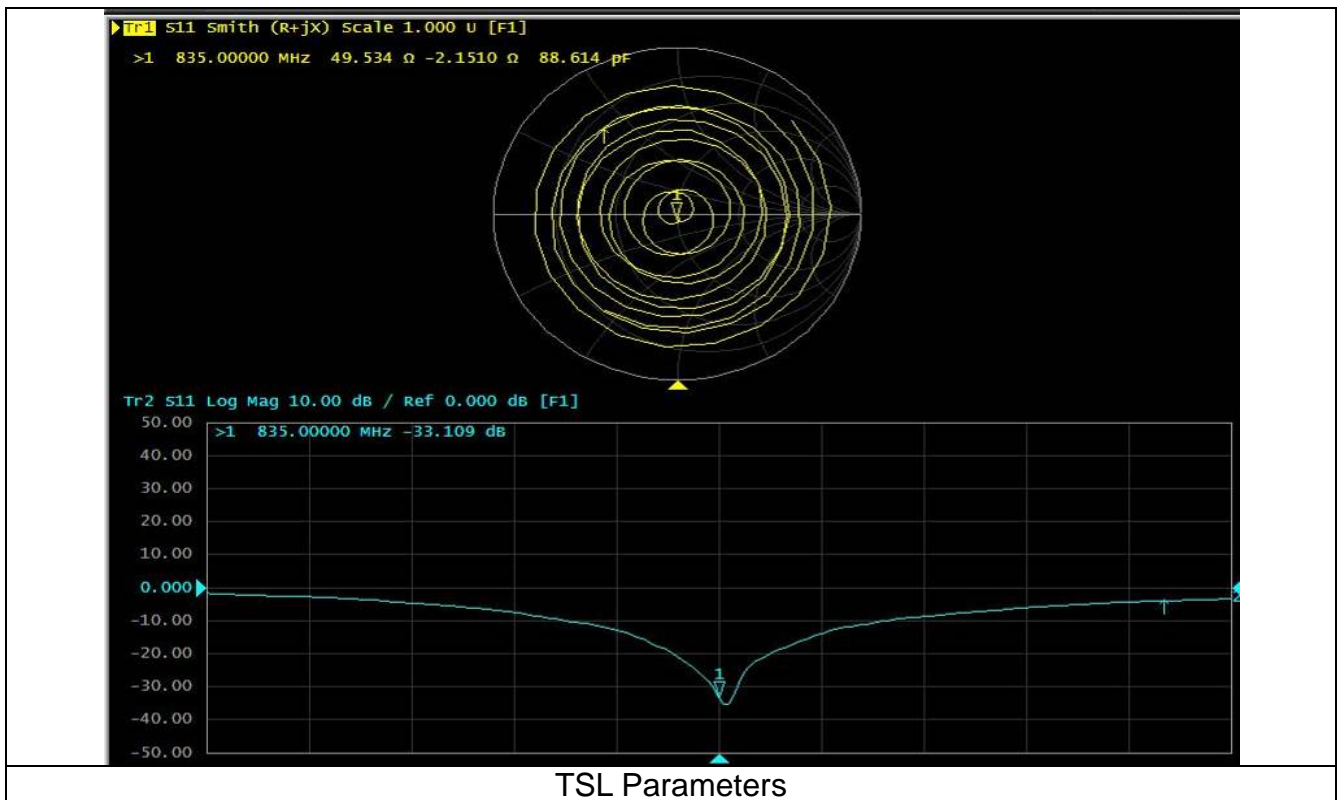
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

#### 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

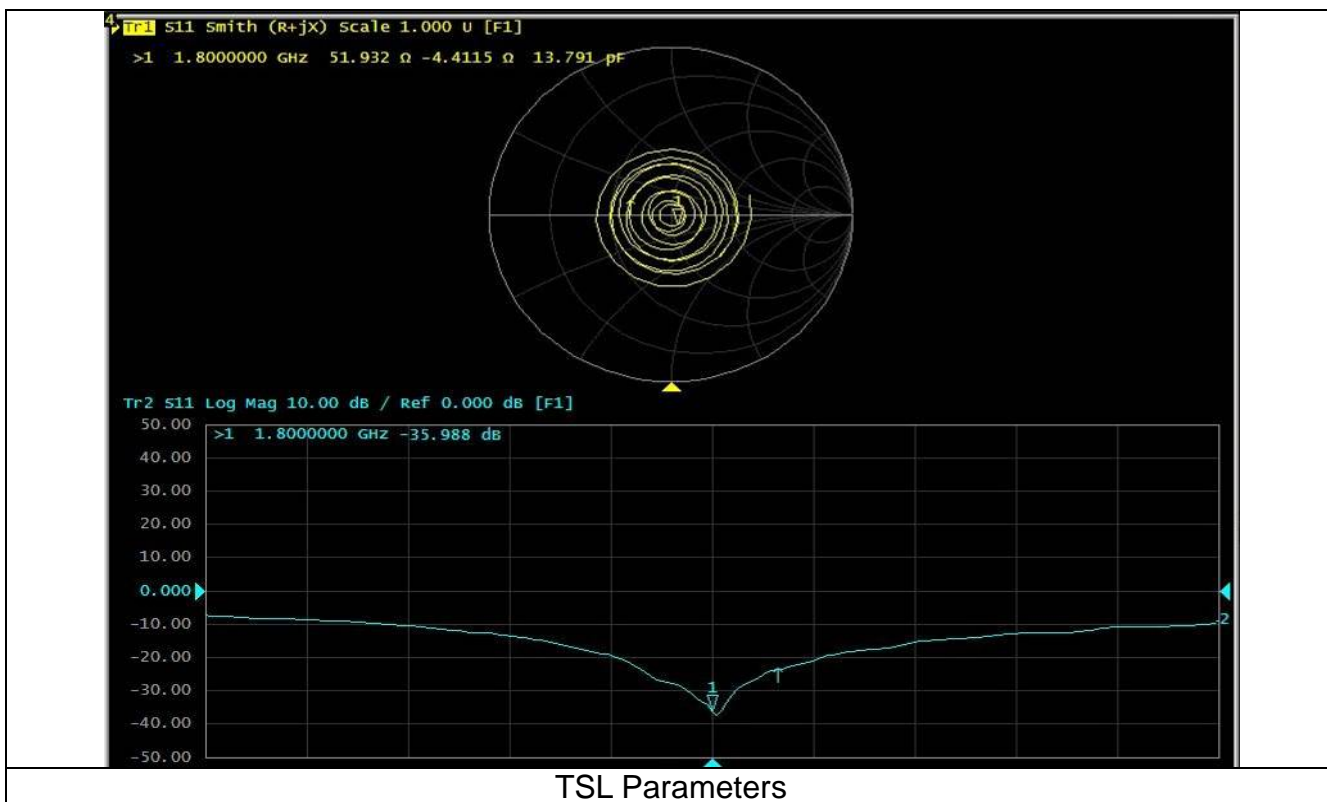
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

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

The most recent measurement of the real or imaginary parts of the impedance, deviates within 5 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	49.3Ω-1.55jΩ	51.9Ω-4.41jΩ	<5Ω
Return loss	-35.4 dB	-36.0dB	<20%



TSL Parameters

### Dipole2000

#### SAR target

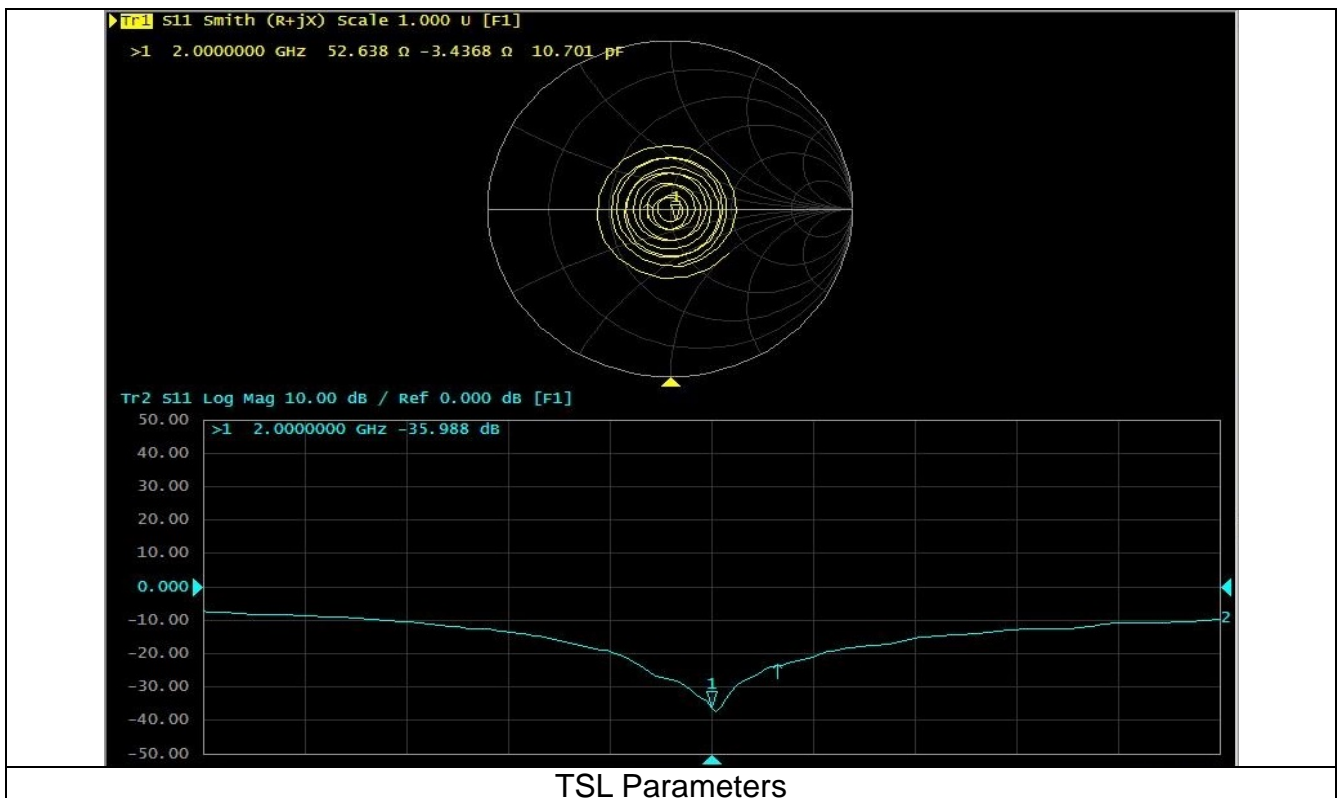
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

#### 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

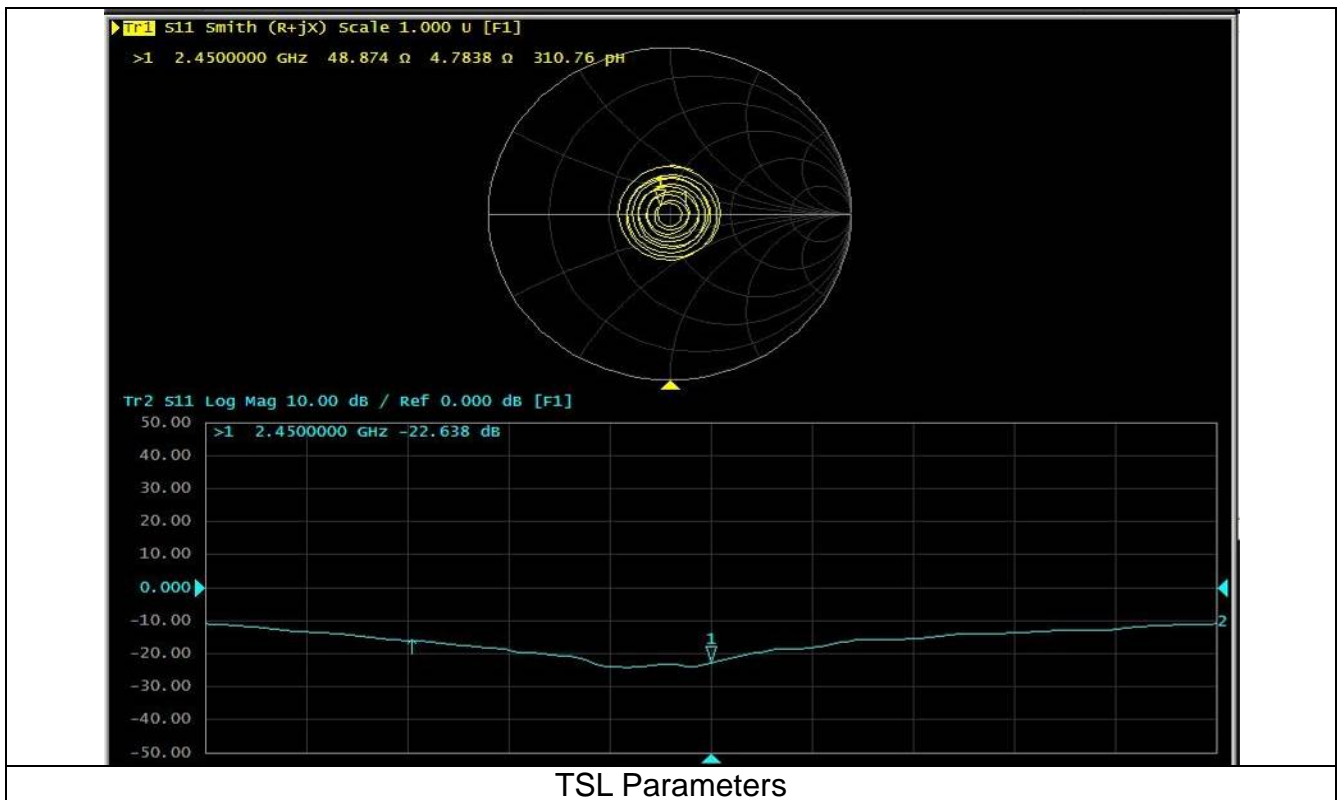
Refers to system check, measured SAR (1g and 10g) deviates from the Target SAR value of calibration report within 10%.

#### 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%



TSL Parameters

## **ANNEX A – TEST PLOTS**

Please refer to the attachment.

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

Please refer to the attachment.