



FCC SAR Compliance Test Report

Product Name: Smart Phone

Model: HUAWEI RIO-L03, RIO-L03

Report No.: SYBH(Z-SAR)013062015-2

FCC ID: QISRIO-L03

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DATE	2015-08-03	2015-08-03

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※ ※ **Modified History** ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release	2015-08-03	Gong Zhong

1 General Information

1.1 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for HUAWEI RIO-L03, RIO-L03 are as below Table 1.

Band	Max Reported SAR(W/kg)			
	1-g Head	1-g Body-worn (15mm) *	1-g Hotspot (10mm)	10-g Extremity (0mm)**
GSM850	0.58	0.26	0.32	/
GSM1900	0.97	0.43	1.13	1.91
UMTS Band II	0.78	0.84	0.62	3.28
UMTS Band IV	0.68	0.86	1.40	3.47
UMTS Band V	0.82	0.25	0.19	/
LTE Band II	0.73	0.63	0.91	2.49
LTE Band IV	0.63	0.53	1.25	2.52
LTE Band V	0.37	0.19	0.26	/
LTE Band VII	0.92	0.30	0.53	/
LTE Band XII	0.76	0.14	0.23	/
LTE Band XVII	0.75	0.16	0.28	/
WiFi 2.4G	1.18	0.20	0.76	/
The highest simultaneous SAR value is 1.52 W/kg per KDB690783 D01				

Table 1:Summary of test result

Note:

1)* For body worn operation, this device has been tested and meets FCC RF exposure guidelines when used with any accessory that contains no metal and that positions the handset a minimum of 15mm from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

2)** For 10-g Extremity operation, this device has been tested and meets the 10-g SAR limits of 4.0 W/kg for general population/ uncontrolled exposure according to ANSI C95.1:1992/IEEE C95.1:1991 and Industry Canada Radio Standards Specification RSS-102.

The device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits according to the FCC rule §2.1093, the ANSI C95.1:1992/IEEE C95.1:1991, the NCRP Report Number 86 for uncontrolled environment, according to the Industry Canada Radio Standards Specification RSS-102 for General Population/Uncontrolled exposure, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2003 & IEEE Std 1528a-2005.

1.2 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain/Body/Arms/Legs)	1.60 W/kg	8.00 W/kg
Spatial Average SAR** (Whole Body)	0.08 W/kg	0.40 W/kg
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 W/kg	20.00 W/kg

Table 2: RF exposure limits

The limit applied in this test report is shown in **bold** letters

Notes:

- * The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
- ** The Spatial Average value of the SAR averaged over the whole body.
- *** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

1.3 EUT Description

Device Information:			
Product Name:	Smart Phone		
Model:	HUAWEI RIO-L03, RIO-L03		
FCC ID :	QISRIO-L03		
SN No.:	CPE0115510000047(Battery 1#) CPE0115510000381(Battery 2#)		
Device Type :	Portable device		
Device Phase:	Identical Prototype		
Exposure Category:	Uncontrolled environment / general population		
Hardware Version :	HL1RIOL03M		
Software Version :	RIO-L03 C00B040		
Antenna Type :	Internal antenna		
Others Accessories	Headset		
Device Operating Configurations:			
Supporting Mode(s)	GSM850/1900, UMTS Band II/IV/V, LTE Band II/IV/V/VII/XII/XVII, WiFi 2.4G(Tested);BT(Untested)		
Test Modulation	GSM(GMSK/8PSK),UMTS(QPSK),LTE(QPSK/16QAM), WiFi(DSSS/OFDM),BT(GFSK)		
Device Class	B		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	GSM850	824-849	869-894
	GSM1900	1850-1910	1930-1990
	UMTS Band II	1850-1910	1930-1990
	UMTS Band IV	1710-1755	1930-1990
	UMTS Band V	824-849	869-894
	LTE Band II	1850-1910	1930-1990
	LTE Band IV	1710-1755	1930-1990
	LTE Band V	824-849	869-894
	LTE Band VII	2500-2570	2620-2690
	LTE Band XII	699-716	729-746
	LTE Band XVII	704-716	734-746
	BT	2402-2480	
	WiFi 2.4G	2412-2462	
GPRS Multislot Class(12)	Max Number of Timeslots in Uplink:	4	
	Max Number of Timeslots in Downlink:	4	
	Max Total Timeslot:	5	
EGPRS Multislot Class(12)	Max Number of Timeslots in Uplink:	4	
	Max Number of Timeslots in Downlink:	4	
	Max Total Timeslot:	5	
HSDPA UE Category	14		
HSUPA UE Category	6		
DC-HSDPA UE Category	24		
Power Class:	4,tested with power level 5(GSM850)		
	1,tested with power level 0(GSM1900)		
	3, tested with power control “all 1”(UMTS Band II)		
	3, tested with power control “all 1”(UMTS Band IV)		
	3, tested with power control “all 1”(UMTS Band V)		
	3, tested with power control all Max.(LTE Band II)		
	3, tested with power control all Max.(LTE Band IV)		

Power Class:	3, tested with power control all Max.(LTE Band V)
	3, tested with power control all Max.(LTE Band VII)
	3, tested with power control all Max.(LTE Band XII)
	3, tested with power control all Max.(LTE Band XVII)
Test Channels (low-mid-high):	128-190-251(GSM850)
	512-661-810(GSM1900)
	9262-9400-9538(UMTS Band II)
	1312-1413-1513(UMTS Band IV)
	4132-4182-4233(UMTS Band V)
	18607-18900-19193(LTE Band II BW=1.4MHz)
	18615-18900-19185(LTE Band II BW=3MHz)
	18625-18900-19175(LTE Band II BW=5MHz)
	18650-18900-19150(LTE Band II BW=10MHz)
	18675-18900-19125(LTE Band II BW=15MHz)
	18700-18900-19100(LTE Band II BW=20MHz)
	19957-20175-20393(LTE Band IV BW=1.4MHz)
	19965-20175-20385(LTE Band IV BW=3MHz)
	19975-20175-20375(LTE Band IV BW=5MHz)
	20000-20175-20350(LTE Band IV BW=10MHz)
	20025-20175-20325(LTE Band IV BW=15MHz)
	20050-20175-20300(LTE Band IV BW=20MHz)
	20407-20525-20643(LTE Band V BW=1.4MHz)
	20415-20525-20635(LTE Band V BW=3MHz)
	20425-20525-20625(LTE Band V BW=5MHz)
	20450-20525-20600(LTE Band V BW=10MHz)
	20775-21100-21425(LTE Band VII BW=5MHz)
	20800-21100-21400(LTE Band VII BW=10MHz)
	20825-21100-21375(LTE Band VII BW=15MHz)
	20850-21100-21350(LTE Band VII BW=20MHz)
	23017-23095-23173(LTE Band XII BW=1.4MHz)
	23025-23095-23165(LTE Band XII BW=3MHz)
	23035-23095-23155(LTE Band XII BW=5MHz)
	23060-23095-23130(LTE Band XII BW=10MHz)
	23755-23790-23825(LTE Band XVII BW=5MHz)
	23780-23790-23800(LTE Band XVII BW=10MHz)
	802.11b/g/n 20M:1-6-11 (WiFi 2.4G)

Table 3:Device information and operating configuration

1.3.1 General Description

HUAWEI RIO-L03, RIO-L03 is subscriber equipment in the LTE/WCDMA/GSM system. The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900. The HSPA+/UMTS frequency band is Band I and Band II and Band IV and Band V. The LTE frequency band is B2 and B4 and B5 and B7 and B12 and B17 and B28. But only GSM850 and GSM1900MHz and WCDMA Band II and Band IV and Band V and LTE B2 and LTE B4 and LTE B5 and LTE B7 and LTE B12 and LTE B17 bands test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, LTE/HSPA/UMTS and GSM/GPRS/EDGE protocol processing, voice, video MMS service, GPS, AGPS and WIFI etc. Externally it provides micro SD card interface (it can also used as micro SD card interface), earphone port (to provide voice service) and USIM card interface. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

Battery information:

Name	Manufacture	Serials number	Description
Rechargeable Li-ion	Huawei Technologies Co., Ltd.	NA	Battery Model: HB396481EBC Rated capacity: 3000mAh NominalVoltage:  +3.8V Charging Voltage:  +4.35V

The mobile phone RIO-L01 and RIO-L03 are LTE/UMTS mobile phone with Bluetooth
The differences between RIO-L01 and RIO-L03 are showed in the following table. Other parts of the mobile phone are the same, including the appearance, the antenna, Chipset, Bluetooth mode, Wifi mode, Adapter, Battery, Mainboard and so on.

	RIO-L01	RIO-L03
GSM four bands	the same	the same(SIM Card2 only support four GSM)
WCDMA bands	B1/B8	B1/B2/B4/B5
LTE bands	B1/B3/B7/ B8/B20	B2/B4/B5/B7/B12/B17/B28
FCC bands	GSM850/1900 LTE B7	GSM850/1900 W850 W1700 W1900 LTE B2/B4/B5/B7/B12/B17
SIM card interface	ONE	TWO
External camera	the same	the same
internal camera	the same	the same
FLASH	the same	the same
Mainboard	the same	the same
PCB layout	the same	the same
Appearance	the same	the same
Bluetooth mode	the same	the same
WLAN mode	the same	the same
BT/ WLAN antenna	the same	the same
GSM/ WCDMA /LTE antenna	the same	Change the matching of the antenna in GSM and LTE
Adapter	the same	the same
Battery	the same	the same
Chipset	the same	the same
Memory	the same	the same
RF Parameter	The same RF Parameter in the same band	The same RF Parameter in the same band
Dimension	the same	the same
Main Frequency NV	The same NV in the same band	The same NV in the same band

Note: According to the difference description above, for 2.4G WiFi, RIO-L03 is tested at the worst position of the RIO-L01(report No.: SYBH(Z-SAR)004052015-2); for the other frequency bands, full SAR test is performed on RIO-L03.

1.3.2 Power reduction additional specification

The device uses a single fixed level of power reduction through static table look-up for SAR compliance and it is triggered by a single event or operation:

1) A fixed level power reduction is applied for some frequency bands and antennas when hotspot mode becomes active. When the hotspot is disabled, the power value will be recovered.

Item	Description
Supporting power reduction or not	Yes
Frequency Band(s) using power reduction	GSM850/1900,UMTS Band II/IV, LTE Band II/IV/ VII (Main antenna)
Power reduction feature	A fixed power reduction is applied when hotspot mode becomes active. When the hotspot is disabled, the power value will be recovered.
Triggering conditions	Only hotspot mode (wireless routing) and nothing else is used to trigger this power reduction.
Full power and reduced power specifications	Refer to Section 7.1 for details
All simultaneous voice and data transmissions combinations and considerations	Refer to Section 7.3 for details

2) A fixed level power reduction is applied for WiFi band when simultaneously transmitting with the GSM/UMTS/LTE Second antenna in simultaneous transmission conditions. The standalone SAR compliance still uses the standalone SAR results tested at the maximum output power level without any power reduction.

Band\Config.	Power Reduciton (dB)	
	Full Power	GSM/UMTS/LTE Second antenna +WiFi antenna Simultaneous Transmission
WiFi 802.11b	0	2.5
WiFi 802.11g	0	0
WiFi 802.11n	0	0

The detailed full power and reduced tune-up specifications and conducted power measurement results are provided in Section 7.1 of this report.

1.4 Test specification(s)

ANSI Std C95.1-1992	Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.(IEEE Std C95.1-1991)
IEEE Std 1528-2003	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
IEEE Std 1528a-2005	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques Amendment 1: CAD File for Human Head Model (SAM Phantom)
RSS-102	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands (Issue 5 of March 2015)
KDB941225 D01	3G SAR Procedures v03
KDB941225 D05	SAR for LTE Devices v02r03
KDB941225 D06	Hotspot SAR v02
KDB447498 D01	General RF Exposure Guidance v05r02
KDB648474 D04	Handsets SAR v01r02
KDB248227 D01	SAR Guidance for IEEE 802 11 Wi-Fi SAR v02r01
KDB865664 D01	SAR measurement 100 MHz to 6 GHz v01r03
KDB865664 D02	SAR Reporting v01r01
KDB690783 D01	SAR Listings on Grants v01r03

1.5 Testing laboratory

Test Site	The Reliability Laboratory of Huawei Technologies Co., Ltd.
Test Location	Zone G1,Huawei Industrial Base, Bantian Industry Area, Longgang District, Shenzhen, Guangdong, China
Telephone	+86 755 28780808
Fax	+86 755 89652518
State of accreditation	The Test laboratory (area of testing) is accredited according to ISO/IEC 17025. CNAS Registration number: L0310 A2LA TESTING CERT #2174.01

1.6 Applicant and Manufacturer

Company Name	HUAWEI TECHNOLOGIES CO., LTD
Address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

1.7 Application details

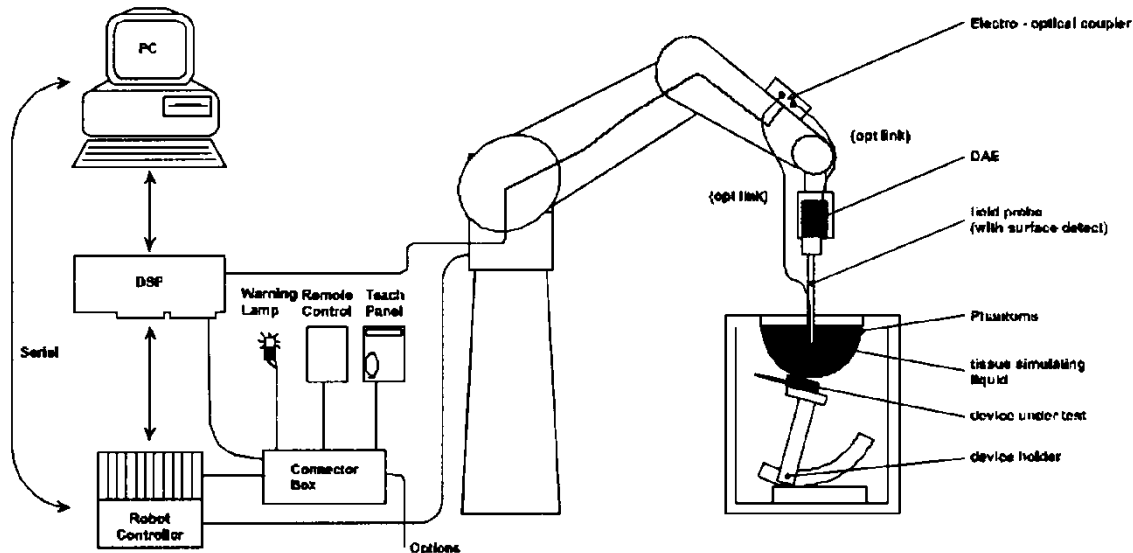
Start Date of test	2015-06-21
End Date of test	2015-07-20

1.8 Ambient Condition

Ambient temperature	20°C – 24°C
Relative Humidity	30% – 70%

2 SAR Measurement System

2.1 SAR Measurement Set-up



The DASY5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- A unit to operate the optical surface detector which is connected to the EOC.
- The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
- The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 7.
- DASY5 software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The generic twin phantom enabling the testing of left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- System check dipoles allowing to validate the proper functioning of the system.

2.2 Test environment

The DASY5 measurement system is placed at the head end of a room with dimensions: 5 x 2.5 x 3 m³, the SAM phantom is placed in a distance of 75 cm from the side walls and 1.1m from the rear wall. Above the test system a 1.5 x 1.5 m² array of pyramid absorbers is installed to reduce reflections from the ceiling.

Picture 1 of the photo documentation shows a complete view of the test environment.

The system allows the measurement of SAR values larger than 0.005 mW/g.

2.3 Data Acquisition Electronics description

The data acquisition electronics (DAE) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converte and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

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

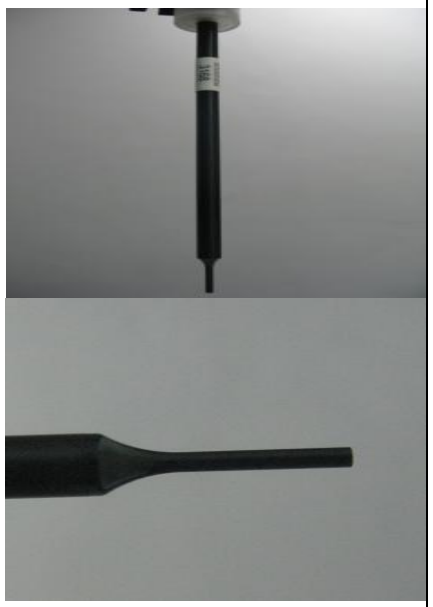
DAE4

Input Impedance	200MOhm	
The Inputs	symmetrical and floating	
Common mode rejection	above 80 dB	

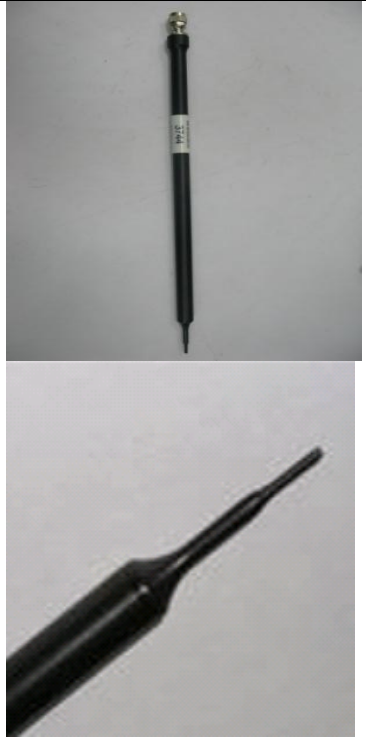
2.4 Probe description

These probes are specially designed and calibrated for use in liquids with high permittivities. They should not be used in air, since the spherical isotropy in air is poor (± 2 dB). The dosimetric probes have special calibrations in various liquids at different frequencies.

Isotropic E-Field Probe ES3DV3 for Dosimetric Measurements

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	ISO/IEC 17025 calibration service available.	
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)	
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)	
Dynamic range	5 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB	
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	
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones	

Isotropic E-Field Probe EX3DV4 for Dosimetric Measurements

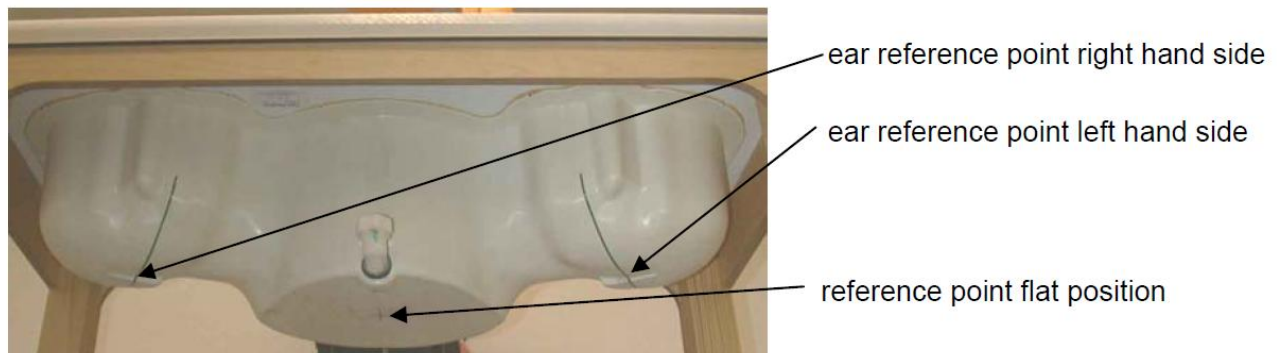
Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Calibration	ISO/IEC 17025 calibration service available.	
Frequency	10 MHz to >6 GHz; Linearity: ± 0.2 dB (30 MHz to 6 GHz)	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic range	10 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)	
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	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%	

2.5 Phantom description

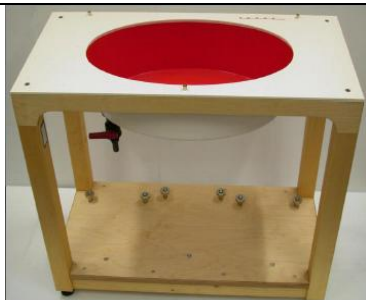
SAM Twin Phantom

Shell Thickness	2mm±0.2mm;The ear region:6.0±0.2mm	
Filling Volume	Approximately 25 liters	
Dimensions	Length:1000mm; Width:500mm; Height: adjustable feet	
Measurement Areas	Left hand Right hand Flat phantom	
The bottom plate contains three pairs of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to cover the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. Free space scans of devices on top of this phantom cover are possible. Three reference marks are provided on the phantom counter. These reference marks are used to teach the absolute phantom position relative to the robot.		

The following figure shows the definition of reference point:



ELI4 Phantom

ELI4 Phantom		
Shell Thickness	2mm±0.2mm	
Filling Volume	Approximately 30 liters	
Dimensions	Major axis:600mm; Minor axis:400mm;	
Measurement Areas	Flat phantom	
The ELI4 phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30MHz to 6GHz. ELI4 is fully compatible with the latest draft of the standard IEC 62209-2 and all known tissue simulating liquids.		

The phantom shell material is resistant to all ingredients used in the tissue-equivalent liquid recipes. The shell of the phantom including ear spacers is constructed from low permittivity and low loss material, with a relative permittivity $2 \leq \epsilon_r \leq 5$ at ≤ 3 GHz, $3 \leq \epsilon_r \leq 4$ at > 3 GHz and a loss tangent ≤ 0.05 .

2.6 Device holder description

The DASY5 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65° . The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. This device holder is used for standard mobile phones or PDA's only. If necessary an additional support of polystyrene material is used.



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

The device holder permits the device to be positioned with a tolerance of $\pm 1^\circ$ in the tilt angle.

Larger DUT's (e.g. notebooks) cannot be tested using this device holder. Instead a support of bigger polystyrene cubes and thin polystyrene plates is used to position the DUT in all relevant positions to find and measure spots with maximum SAR values.

Therefore those devices are normally only tested at the flat part of the SAM.

2.7 Test Equipment List

This table gives a complete overview of the SAR measurement equipment.

Devices used during the test described are marked ☒

	Manufacturer	Device	Type	Serial number	Date of last calibration	Valid period
☒	SPEAG	Dosimetric E-Field Probe	ES3DV3	3168	2014-09-24	One year
☒	SPEAG	750 MHz Dipole	D750V3	1044	2014-09-19	Three years
☒	SPEAG	835 MHz Dipole	D835V2	4d059	2013-05-02	Three years
☒	SPEAG	1750 MHz Dipole	D1750V2	1123	2014-07-08	Three years
☒	SPEAG	1900 MHz Dipole	D1900V2	5d143	2014-09-23	Three years
☐	SPEAG	2300 MHz Dipole	D2300V2	1016	2014-11-19	Three years
☒	SPEAG	2450 MHz Dipole	D2450V2	860	2014-11-19	Three years
☒	SPEAG	2600 MHz Dipole	D2600V2	1021	2014-07-16	Three years
☒	SPEAG	Data acquisition electronics	DAE4	1236	2014-11-13	One year
☒	SPEAG	Software	DASY 5	N/A	NCR	NCR
☐	SPEAG	Twin Phantom	SAM1	TP-1475	NCR	NCR
☐	SPEAG	Twin Phantom	SAM2	TP-1474	NCR	NCR
☒	SPEAG	Twin Phantom	SAM3	TP-1597	NCR	NCR
☒	SPEAG	Twin Phantom	SAM4	TP-1620	NCR	NCR
☐	SPEAG	Flat Phantom	ELI 4.0	TP-1038	NCR	NCR
☐	SPEAG	Flat Phantom	ELI 4.0	TP-1111	NCR	NCR
☒	R & S	Universal Radio Communication Tester	CMU 200	113989	2015-05-18	One year
☒	R & S	Universal Radio Communication Tester	CMW 500	126854	2015-02-13	One year
☒	Agilent	Network Analyser	E5071C	MY46213349	2015-02-13	One year
☒	Agilent	Dielectric Probe Kit	85070E	2484	NCR	NCR
☒	Agilent	Signal Generator	N5181A	MY47420989	2015-01-07	One year
☒	MINI-CIRCUITS	Amplifier	ZHL-42W	QA1402001	NCR	NCR
☒	AR	Directional Coupler	DC7144M1	0423264	2015-03-31	One year
☒	Agilent	Power Meter	E4417A	MY54100027	2015-03-31	One year
☒	Agilent	Power Meter Sensor	E9321A	MY54130001	2015-05-05	One year
☒	Agilent	Power Meter Sensor	E9321A	MY54130007	2015-05-05	One year

Note:

1) Per KDB865664D01 requirements for dipole calibration, the test laboratory has adopted three-year extended calibration interval. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

a) There is no physical damage on the dipole;

System check with specific dipole is within 10% of calibrated value;

The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement.

The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5Ω from the previous measurement.

2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

3 SAR Measurement Procedure

3.1 Scanning procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and system check. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

- The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. +/- 5 %.
- The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above $\pm 0.1\text{mm}$). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within $\pm 30^\circ$.)
- The “area scan” measures the SAR above the DUT or verification dipole on a parallel plane to the surface. It is used to locate the approximate location of the peak SAR with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical field strength is measured by the probe. The probe is touching the surface of the SAM during acquisition of measurement values. The standard scan uses large grid spacing for faster measurement. Standard grid spacing for head measurements is 15 mm in x- and y- dimension ($\leq 2\text{GHz}$), 12 mm in x- and y- dimension (2-4 GHz) and 10mm in x- and y- dimension (4-6GHz). If a finer resolution is needed, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result. For special applications where the standard scan method does not find the peak SAR within the grid, e.g. mobile phones with flip cover, the grid can be adapted in orientation. Results of this coarse scan are shown in Appendix B.
- A “zoom scan” measures the field in a volume around the 2D peak SAR value acquired in the previous “coarse” scan. This is a fine grid with maximum scan spatial resolution: $\Delta x_{\text{zoom}}, \Delta y_{\text{zoom}} \leq 2\text{GHz} - \leq 8\text{mm}$, 2-4GHz - $\leq 5\text{ mm}$ and 4-6 GHz- $\leq 4\text{mm}$; $\Delta z_{\text{zoom}} \leq 3\text{GHz} - \leq 5\text{ mm}$, 3-4 GHz- $\leq 4\text{mm}$ and 4-6GHz- $\leq 2\text{mm}$ where the robot additionally moves the probe along the z-axis away from the bottom of the Phantom. DASY is also able to perform repeated zoom scans if more than 1 peak is found during area scan. In this document, the evaluated peak 1g and 10g averaged SAR values are shown in the 2D-graphics in Appendix B. Test results relevant for the specified standard (see chapter 1.4.) are shown in table form in chapter 7.2.
- A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 2 mm steps. This measurement shows the continuity of the liquid and can - depending in the field strength – also show the liquid depth. A z-axis scan of the measurement with maximum SAR value is shown in Appendix B.

The following table summarizes the area scan and zoom scan resolutions per FCC KDB 865664D01:

Frequency	Maximun Area Scan resolution ($\Delta x_{\text{area}}, \Delta y_{\text{area}}$)	Maximun Zoom Scan spatial resolution ($\Delta x_{\text{zoom}}, \Delta y_{\text{zoom}}$)	Maximun Zoom Scan spatial resolution			Minimum zoom scan volume (x,y,z)
			Uniform Grid	Graded Grad		
			$\Delta z_{\text{Zoom}}(n)$	$\Delta z_{\text{Zoom}}(1)^*$	$\Delta z_{\text{Zoom}}(n>1)^*$	
≤2GHz	≤15mm	≤8mm	≤5mm	≤4mm	≤1.5* $\Delta z_{\text{Zoom}}(n-1)$	≥30mm
2-3GHz	≤12mm	≤5mm	≤5mm	≤4mm	≤1.5* $\Delta z_{\text{Zoom}}(n-1)$	≥30mm
3-4GHz	≤12mm	≤5mm	≤4mm	≤3mm	≤1.5* $\Delta z_{\text{Zoom}}(n-1)$	≥28mm
4-5GHz	≤10mm	≤4mm	≤3mm	≤2.5mm	≤1.5* $\Delta z_{\text{Zoom}}(n-1)$	≥25mm
5-6GHz	≤10mm	≤4mm	≤2mm	≤2mm	≤1.5* $\Delta z_{\text{Zoom}}(n-1)$	≥22mm

3.2 Spatial Peak SAR Evaluation

The spatial peak SAR - value for 1 and 10 g is evaluated after the Cube measurements have been done. The basis of the evaluation are the SAR values measured at the points of the fine cube grid consisting of 5 x 5 x 7 points(with 8mm horizontal resolution) or 7 x 7 x 7 points(with 5mm horizontal resolution) or 8 x 8 x 7 points(with 4mm horizontal resolution). The algorithm that finds the maximal averaged volume is separated into three different stages.

- The data between the dipole center of the probe and the surface of the phantom are extrapolated. This data cannot be measured since the center of the dipole is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is about 1 mm (see probe calibration sheet). The extrapolated data from a cube measurement can be visualized by selecting 'Graph Evaluated'.
- The maximum interpolated value is searched with a straight-forward algorithm. Around this maximum the SAR - values averaged over the spatial volumes (1g or 10 g) are computed using the 3d-spline interpolation algorithm. If the volume cannot be evaluated (i.e., if a part of the grid was cut off by the boundary of the measurement area) the evaluation will be started on the corners of the bottom plane of the cube.
- All neighboring volumes are evaluated until no neighboring volume with a higher average value is found.

Extrapolation

The extrapolation is based on a least square algorithm [W. Gander, Computermathematik, p.168-180]. Through the points in the first 3 cm along the z-axis, polynomials of order four are calculated. These polynomials are then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from each other.

Interpolation

The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot"-condition [W. Gander, Computermathematik, p.141-150] (x, y and z -direction) [Numerical Recipes in C, Second Edition, p.123ff].

Volume Averaging

At First the size of the cube is calculated. Then the volume is integrated with the trapezoidal algorithm. 8000 points (20x20x20) are interpolated to calculate the average.

Advanced Extrapolation

DASY5 uses the advanced extrapolation option which is able to compensates boundary effects on E-field probes.

3.3 Data Storage and Evaluation

Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension "DAE4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	- Sensitivity	Norm _i , a _{i0} , a _{i1} , a _{i2}
- Conversion factor	ConvF _i	
- Diode compression point	Dcpi	
Device parameters:	- Frequency	f
- Crest factor	cf	
Media parameters:	- Conductivity	σ
- Density	ρ	

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf/dcpi$$

with V_i = compensated signal of channel i (i = x, y, z)
 U_i = input signal of channel i (i = x, y, z)
 cf = crest factor of exciting field (DASY parameter)
 dcpi = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

$$\begin{aligned} \text{E-field probes:} \quad E_i &= (V_i / \text{Norm}_i \bullet \text{ConvF})^{1/2} \\ \text{H-field probes:} \quad H_i &= (V_i)^{1/2} \bullet (a_{i0} + a_{i1}f + a_{i2}f^2)/f \end{aligned}$$

with V_i = compensated signal of channel i (i = x, y, z)
 Norm_i = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)²] for E-field Probes
ConvF = sensitivity enhancement in solution
 a_{ij} = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
 E_i = electric field strength of channel i in V/m
 H_i = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{\text{tot}} = (E_x^2 + E_y^2 + E_z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$\text{SAR} = (E_{\text{tot}}^2 \bullet \sigma) / (\rho \bullet 1000)$$

with SAR = local specific absorption rate in mW/g
 E_{tot} = total field strength in V/m
 σ = conductivity in [mho/m] or [Siemens/m]
 ρ = equivalent tissue density in g/cm³

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{\text{pwe}} = E_{\text{tot}}^2 / 3770 \quad \text{or} \quad P_{\text{pwe}} = H_{\text{tot}}^2 \bullet 37.7$$

with P_{pwe} = equivalent power density of a plane wave in mW/cm²
 E_{tot} = total electric field strength in V/m
 H_{tot} = total magnetic field strength in A/m

4 System Verification Procedure

4.1 Tissue Verification

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine if the dielectric parameters are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within $\pm 5\%$ of the target values.

The following materials are used for producing the tissue-equivalent materials.

Ingredients (% of weight)	Head Tissue					
Frequency Band (MHz)	750	835	1750	1900	2450	2600
Water	39.2	41.45	52.64	55.242	62.7	55.242
Salt (NaCl)	2.7	1.45	0.36	0.306	0.5	0.306
Sugar	57.0	56.0	0.0	0.0	0.0	0.0
HEC	0.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.0	0.1	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	47.0	44.542	36.8	44.452
Ingredients (% of weight)	Body Tissue					
Frequency Band (MHz)	750	835	1750	1900	2450	2600
Water	50.3	52.4	69.91	69.91	73.2	64.493
Salt (NaCl)	1.60	1.40	0.13	0.13	0.04	0.024
Sugar	47.0	45.0	0.0	0.0	0.0	0.0
HEC	0.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.0	0.1	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	29.96	29.96	26.7	32.252

Table 4: Tissue Dielectric Properties

Salt: 99+% Pure Sodium Chloride; Sugar: 98+% Pure Sucrose; Water: De-ionized, 16M Ω + resistivity
HEC: Hydroxyethyl Cellulose; DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]
Triton X-100(ultra pure): Polyethylene glycol mono [4-(1,1,3,3-tetramethylbutyl)phenyl]ether

Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		ϵ_r (+/-5%)	σ (S/m) (+/-5%)	ϵ_r	σ (S/m)		
750H	705	42.14 (40.03~44.24)	0.89 (0.85~0.93)	42.11	0.864	21.4°C	2015-06-24
	710	42.11 (40.00~44.21)	0.89 (0.85~0.93)	42.14	0.871		
	750	41.90 (39.81~43.99)	0.89 (0.85~0.93)	41.54	0.913		
750B	705	55.70 (52.92~58.48)	0.96 (0.92~1.008)	55.17	0.918	21.6°C	2015-06-27
	710	55.70 (52.92~58.48)	0.96 (0.92~1.008)	55.12	0.924		
	750	55.50 (52.73~58.27)	0.96 (0.92~1.008)	54.69	0.948		
835H	825	41.60 (39.52~43.68)	0.90 (0.86~0.95)	43.41	0.897	21.4°C	2015-06-26
	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	43.34	0.904		
	850	41.50 (39.43~43.58)	0.92 (0.87~0.96)	43.22	0.916		
835H	825	41.60 (39.52~43.68)	0.90 (0.86~0.95)	43.46	0.914	21.4°C	2015-07-02
	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	43.39	0.920		
	850	41.50 (39.43~43.58)	0.92 (0.87~0.96)	43.28	0.931		
835H	825	41.60 (39.52~43.68)	0.90 (0.86~0.95)	40.66	0.900	21.4°C	2015-07-13
	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	40.55	0.911		
	850	41.50 (39.43~43.58)	0.92 (0.87~0.96)	40.38	0.925		
835B	825	55.20 (52.44~57.96)	0.97 (0.92~1.02)	55.20	0.954	21.4°C	2015-06-30
	835	55.20 (52.44~57.96)	0.97 (0.92~1.02)	55.10	0.962		
	850	55.20 (52.44~57.96)	0.99 (0.94~1.04)	55.03	0.977		
835B	825	55.20 (52.44~57.96)	0.97 (0.92~1.02)	55.22	0.970	21.4°C	2015-07-16
	835	55.20 (52.44~57.96)	0.97 (0.92~1.02)	55.11	0.979		
	850	55.20 (52.44~57.96)	0.99 (0.94~1.04)	54.96	0.994		
1750H	1710	40.1 (38.10~42.11)	1.35 (1.28~1.42)	39.31	1.309	21.7°C	2015-07-04
	1730	40.1 (38.10~42.11)	1.36 (1.29~1.43)	39.26	1.327		
	1750	40.1 (38.10~42.11)	1.37 (1.30~1.44)	39.19	1.346		
	1800	40.0 (38.00~42.00)	1.40 (1.33~1.47)	38.93	1.401		

1750H	1710	40.1 (38.10~42.11)	1.35 (1.28~1.42)	38.79	1.317	21.4°C	2015-07-14
	1730	40.1 (38.10~42.11)	1.36 (1.29~1.43)	38.88	1.335		
	1750	40.1 (38.10~42.11)	1.37 (1.30~1.44)	38.79	1.353		
	1800	40.0 (38.00~42.00)	1.40 (1.33~1.47)	38.57	1.400		
1750B	1710	53.5 (50.83~56.18)	1.46 (1.39~1.53)	52.08	1.508	21.4°C	2015-07-07
	1730	53.5 (50.83~56.18)	1.48 (1.41~1.55)	52.01	1.527		
	1750	53.4 (50.73~56.07)	1.49 (1.42~1.56)	51.94	1.544		
	1800	53.3 (50.64~55.97)	1.52 (1.44~1.60)	51.78	1.590		
1750B	1710	53.5 (50.83~56.18)	1.46 (1.39~1.53)	51.19	1.492	22.3°C	2015-07-16
	1730	53.5 (50.83~56.18)	1.48 (1.41~1.55)	51.12	1.509		
	1750	53.4 (50.73~56.07)	1.49 (1.42~1.56)	51.05	1.525		
	1800	53.3 (50.64~55.97)	1.52 (1.44~1.60)	50.94	1.568		
1900H	1850	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.71	1.388	21.5°C	2015-06-21
	1880	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.55	1.421		
	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.53	1.433		
	1910	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.44	1.446		
1900H	1850	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.38	1.347	21.5°C	2015-07-04
	1880	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.28	1.377		
	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.18	1.394		
	1910	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.11	1.411		
1900H	1850	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.79	1.354	21.5°C	2015-07-15
	1880	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.69	1.385		
	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.62	1.401		
	1910	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.56	1.410		

1900B	1850	53.30 (50.64~55.97)	1.52 (1.44~1.60)	53.49	1.520	21.4°C	2015-06-22
	1880	53.30 (50.64~55.97)	1.52 (1.44~1.60)	53.43	1.552		
	1900	53.30 (50.64~55.97)	1.52 (1.44~1.60)	53.40	1.569		
	1910	53.30 (50.64~55.97)	1.52 (1.44~1.60)	53.31	1.580		
1900B	1850	53.30 (50.64~55.97)	1.52 (1.44~1.60)	53.46	1.526	21.4°C	2015-07-09
	1880	53.30 (50.64~55.97)	1.52 (1.44~1.60)	53.36	1.562		
	1900	53.30 (50.64~55.97)	1.52 (1.44~1.60)	53.36	1.591		
	1910	53.30 (50.64~55.97)	1.52 (1.44~1.60)	53.23	1.594		
1900B	1850	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.97	1.537	21.4°C	2015-07-19
	1880	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.86	1.572		
	1900	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.80	1.590		
	1910	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.74	1.594		
2450H	2410	39.30 (37.34~41.26)	1.76 (1.67~1.85)	38.17	1.770	21.4°C	2015-07-20
	2435	39.20 (37.24~41.16)	1.79 (1.70~1.88)	38.09	1.791		
	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	38.08	1.810		
	2460	39.20 (37.24~41.16)	1.81 (1.72~1.90)	38.05	1.816		
2450B	2410	52.80 (50.16~55.44)	1.91 (1.81~2.00)	53.32	1.950	21.5°C	2015-07-20
	2435	52.70 (50.07~55.34)	1.94 (1.84~2.04)	53.24	1.976		
	2450	52.70 (50.07~55.34)	1.95 (1.85~2.05)	53.19	1.994		
	2460	52.70 (50.07~55.34)	1.96 (1.86~2.06)	53.16	2.005		
2600H	2510	39.12 (37.16~41.01)	1.86 (1.77~1.96)	39.67	1.820	21.7°C	2015-07-11
	2535	39.1 (37.13~41.04)	1.89 (1.80~1.98)	39.59	1.845		
	2560	39 (37.05~40.95)	1.917 (1.82~2.01)	39.51	1.873		
	2600	39 (37.05~40.95)	1.96 (1.86~2.05)	39.36	1.926		

2600B	2510	52.62 (49.99~55.25)	2.03 (1.93~2.13)	51.29	2.129	21.5°C	2015-07-17
	2535	52.59 (49.96~55.22)	2.07 (1.97~2.17)	51.21	2.157		
	2560	52.57 (49.94~55.20)	2.09 (1.99~2.19)	51.12	2.186		
	2600	52.5 (49.88~55.13)	2.16 (2.05~2.27)	50.97	2.230		
ε _r = Relative permittivity, σ= Conductivity							

Table 5: Measured Tissue Parameter

Note: 1) The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2 °C of the conditions expected during the SAR evaluation to satisfy protocol requirements.

2) KDB 865664 was ensured to be applied for probe calibration frequencies greater than or equal to 50MHz of the EUT frequencies.

3) The above measured tissue parameters were used in the DASY software to perform interpolation via the DASY software to determine actual dielectric parameters at the test frequencies. The SAR test plots may slightly differ from the table above since the DASY rounds to three significant digits.

4.2 System Check

The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE P1528 (described above). The following table shows system check results for all frequency bands and tissue liquids used during the tests(Graphic Plot(s) see Appendix A).

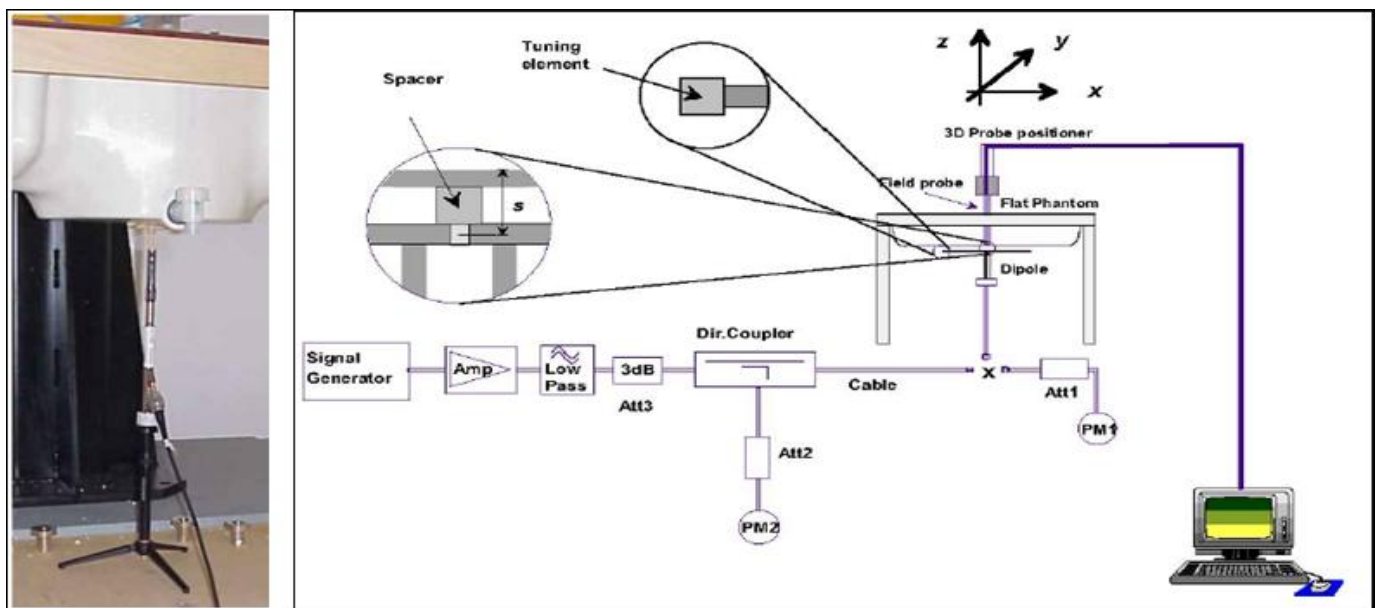
System Check	Target SAR (1W) (+/-10%)		Measured SAR (Normalized to 1W)		Liquid Temp.	Test Date
	1-g (mW/g)	10-g (mW/g)	1-g (mW/g)	10-g (mW/g)		
750MHz Head	8.22 (7.40~9.04)	5.41 (4.87~5.95)	8.24	5.44	21.4°C	2015-06-24
835MHz Head	9.49 (8.54~10.44)	6.18 (5.56~6.80)	9.16	5.96	21.4°C	2015-06-26
835MHz Head	9.49 (8.54~10.44)	6.18 (5.56~6.80)	9.32	6.04	21.4°C	2015-07-02
835MHz Head	9.49 (8.54~10.44)	6.18 (5.56~6.80)	9.40	6.12	21.4°C	2015-07-13
1750MHz Head	35.1 (31.59~38.61)	18.6 (16.74~20.46)	36.08	18.92	21.7°C	2015-07-04
1750MHz Head	35.1 (31.59~38.61)	18.6 (16.74~20.46)	36.28	19.00	21.4°C	2015-07-14
1900MHz Head	40.80 (36.72~44.88)	21.40 (19.26~23.54)	39.60	20.56	21.0°C	2015-06-21
1900MHz Head	40.80 (36.72~44.88)	21.40 (19.26~23.54)	40.40	21.08	21.0°C	2015-07-04
1900MHz Head	40.80 (36.72~44.88)	21.40 (19.26~23.54)	40.40	21.08	21.5°C	2015-07-15
2450MHz Head	52.30 (47.07~57.53)	24.50 (22.05~26.95)	50.40	23.84	21.8°C	2015-07-20
2600MHz Head	58.6 (52.74~64.46)	26.2 (23.58~28.82)	59.20	26.32	21.7°C	2015-07-11
750MHz Body	8.69 (7.82~9.56)	5.76 (4.19~6.33)	8.44	5.68	21.6°C	2015-06-27
835MHz Body	9.42 (8.48~10.36)	6.19 (5.57~6.80)	9.32	6.08	21.4°C	2015-06-30
835MHz Body	9.42 (8.48~10.36)	6.19 (5.57~6.80)	9.32	6.08	21.4°C	2015-07-16
1750MHz Body	36.3 (32.67~39.93)	19.5 (17.55~21.45)	37.84	19.88	21.4°C	2015-07-07
1750MHz Body	36.3 (32.67~39.93)	19.5 (17.55~21.45)	37.72	19.80	22.3°C	2015-07-16
1900MHz Body	40.20 (36.18~44.22)	21.30 (19.17~23.43)	42.00	22.12	21.8°C	2015-06-22
1900MHz Body	40.20 (36.18~44.22)	21.30 (19.17~23.43)	42.80	22.44	21.5°C	2015-07-09
1900MHz Body	40.20 (36.18~44.22)	21.30 (19.17~23.43)	43.60	22.64	21.0°C	2015-07-19
2450MHz Body	51.4 (46.26~56.54)	23.9 (21.51~26.29)	56.00	25.68	21.5°C	2015-07-20
2600MHz Body	57.6 (51.84~63.36)	25.5 (22.95~28.05)	61.20	26.92	21.5°C	2015-07-17

Table 6: System Check Results

4.3 System check Procedure

The system check is performed by using a system check dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a plexiglass spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 250 mW(below 5GHz) or 100mW(above 5GHz). To adjust this power a power meter is used. The power sensor is connected to the cable before the system check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the system check to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).

System check results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system.



5 SAR measurement variability and uncertainty

5.1 SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r03, 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. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

- 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 ≥ 0.80 W/kg, repeat that measurement once.
- 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 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 ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

The detailed repeated measurement results are shown in Section 7.2.

5.2 SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2003 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

6 SAR Test Configuration

6.1 3G SAR Test Reduction Procedure

Per KDB941225 D01v03, in the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

6.2 GSM Test Configuration

SAR tests for GSM850 and GSM1900, a communication link is set up with a base station by air link. Using CMU200 the power lever is set to “5” and “0” in SAR of GSM850 and GSM1900. The tests in the band of GSM850 and GSM1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink, and at most 4 timeslots in downlink, the maximum total timeslot is 5.

When SAR tests for EGPRS mode is necessary, GMSK modulation should be used to minimize SAR measurement error due to higher peak-to-average power (PAR) ratios inherent in 8-PSK.

6.3 UMTS Test Configuration

1) Output Power Verification

Maximum output power is verified on the high, middle and low channels according to procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all “1’s” for WCDMA/HSDPA or by applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HSDPA, HSPA) are required in the SAR report. All configurations that are not supported by the handset or cannot be measured due to technical or equipment limitations must be clearly identified.

2) WCDMA

a. Head SAR Measurements

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode.

b. Body SAR Measurements

SAR for body-worn accessory configurations is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode

3) HSDPA

SAR for body exposure configurations is measured according to the “Body SAR Measurements” procedures of 3G device. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

Per KDB941225 D01v03, the 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures for the highest reported SAR body exposure configuration in 12.2 kbps RMC.

HSDPA should be configured according to UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HAPRQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission condition, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. The β_c and β_d gain factors for DPCCH and DPDCH were set according to the values in the below table, β_{hs} for HS-DPCCH is set automatically to the correct value when ΔACK , $\Delta NACK$, $\Delta CQI = 8$. The variation of the β_c / β_d ratio causes a power reduction at sub-tests 2 - 4.

Sub-test [ⓐ]	β_c [ⓐ]	β_d [ⓐ]	β_d (SF) [ⓐ]	β_c / β_d [ⓐ]	β_{hs} (1) [ⓐ]	CM(dB)(2) [ⓐ]	MPR (dB) [ⓐ]
1 [ⓐ]	2/15 [ⓐ]	15/15 [ⓐ]	64 [ⓐ]	2/15 [ⓐ]	4/15 [ⓐ]	0.0 [ⓐ]	0 [ⓐ]
2 [ⓐ]	12/15(3) [ⓐ]	15/15(3) [ⓐ]	64 [ⓐ]	12/15(3) [ⓐ]	24/15 [ⓐ]	1.0 [ⓐ]	0 [ⓐ]
3 [ⓐ]	15/15 [ⓐ]	8/15 [ⓐ]	64 [ⓐ]	15/8 [ⓐ]	30/15 [ⓐ]	1.5 [ⓐ]	0.5 [ⓐ]
4 [ⓐ]	15/15 [ⓐ]	4/15 [ⓐ]	64 [ⓐ]	15/4 [ⓐ]	30/15 [ⓐ]	1.5 [ⓐ]	0.5 [ⓐ]
Note 1: ΔACK , $\Delta NACK$ and $\Delta CQI = 8$ $A_{hs} = \beta_{hs} / \beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$ Note 2 : CM=1 for $\beta_c / \beta_d = 12/15$, $\beta_{hs} / \beta_c = 24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases. [ⓐ] Note 3 : For subtest 2 the β_c / β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$ [ⓐ]							

Table 7: Sub-tests for UMTS Release 5 HSDPA

The measurements were performed with a Fixed Reference Channel (FRC) and H-Set 1 QPSK.

Parameter	Value
Nominal average inf. bit rate	534 kbit/s
Inter-TTI Distance	3 TTI's
Number of HARQ Processes	2 Processes
Information Bit Payload	3202 Bits
MAC-d PDU size	336 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	4800 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	9600 SMLs
Coding Rate	0.67
Number of Physical Channel Codes	5

Table 8:settings of required H-Set 1 QPSK acc. to 3GPP 34.121

HS-DSCH Category	Maximum HS-DSCH Codes Received	Minimum Inter-TTI Interval	Maximum HS-DSCH Transport Block Bits/HS-DSCH TTI	Total Soft Channel Bits
1	5	3	7298	19200
2	5	3	7298	28800
3	5	2	7298	28800
4	5	2	7298	38400
5	5	1	7298	57600
6	5	1	7298	67200
7	10	1	14411	115200
8	10	1	14411	134400
9	15	1	25251	172800
10	15	1	27952	172800
11	5	2	3630	14400
12	5	1	3630	28800
13	15	1	34800	259200
14	15	1	42196	259200
15	15	1	23370	345600
16	15	1	27952	345600

Table 9:HSDPA UE category

4) HSUPA

SAR for body exposure configurations is measured according to the "Body SAR Measurements" procedures of 3G device. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

Per KDB941225 D01v03, the 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures for the highest reported body exposure SAR configuration in 12.2 kbps RMC.

Due to inner loop power control requirements in HSDPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSDPA should be configured according to the values indicated below as well as other applicable procedures described in the 'WCDMA Handset' and 'Release 5 HSDPA Data Device' sections of 3G device.

Sub-test ¹	β_c ²	β_d ²	β_d (SF) ²	β_c/β_d ²	$\beta_{hs}^{(1)}$ ²	β_{ec} ²	β_{ed} ²	β_{ec} (SF) ²	β_{ed} (code) ²	CM ⁽²⁾ ² (dB) ²	MP R ² (dB) ²	AG ⁽⁴⁾ ² Index ²	E-TFC I ²
1 ²	11/15 ⁽³⁾	15/15 ⁽³⁾	64 ²	11/15 ⁽³⁾	22/15 ²	209/225 ²	1039/225 ²	4 ²	1 ²	1.0 ²	0.0 ²	20 ²	75 ²
2 ²	6/15 ²	15/15 ²	64 ²	6/15 ²	12/15 ²	12/15 ²	94/75 ²	4 ²	1 ²	3.0 ²	2.0 ²	12 ²	67 ²
3 ²	15/15 ²	9/15 ²	64 ²	15/9 ²	30/15 ²	30/15 ²	$\beta_{ed1}:47/15$ $\beta_{ed2}:47/15$ ²	4 ²	2 ²	2.0 ²	1.0 ²	15 ²	92 ²
4 ²	2/15 ²	15/15 ²	64 ²	2/15 ²	4/15 ²	2/15 ²	56/75 ²	4 ²	1 ²	3.0 ²	2.0 ²	17 ²	71 ²
5 ²	15/15 ⁽⁴⁾	15/15 ⁽⁴⁾	64 ²	15/15 ⁽⁴⁾	30/15 ²	24/15 ²	134/15 ²	4 ²	1 ²	1.0 ²	0.0 ²	21 ²	81 ²
Note 1: ΔACK, $\Delta NACK$ and $\Delta CQI = 8$ $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$² Note 2: 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 difference² Note 3 : For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$² Note 4 : For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$² Note 5 : Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g² Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.²													

Table 10:Subtests for UMTS Release 6 HSUPA

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCH TTI(ms)	Minimum Spreading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592
4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	10	2SF2&2SF	11484	5.76
	4	4	2	4	20000	2.00
7 (No DPDCH)	4	8	2	2SF2&2SF	22996	?
	4	4	10	4	20000	?

NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4. UE categories 1 to 6 support QPSK only. UE category 7 supports QPSK and 16QAM.(TS25.306-7.3.0).

Table 11:HSUPA UE category

5) DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a Second serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS 34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

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

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

The measurements were performed with a Fixed Reference Channel (FRC) H-Set 12 with QPSK

Parameter	Value
Nominal average inf. bit rate	60 kbit/s
Inter-TTI Distance	1 TTI's
Number of HARQ Processes	6 Processes
Information Bit Payload	120 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	960 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	3200 SMLs
Coding Rate	0.15
Number of Physical Channel Codes	1

Table 12: settings of required H-Set 12 QPSK acc. to 3GPP 34.121

Note:

- 1.The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table above.
- 2.Maximum number of transmission is limited to 1,i.e.,retransmission is not allowed. The redundancy and constellation version 0 shall be used.

Inf. Bit Payload	120
CRC Addition	120 24 CRC
Code Block Segmentation	144
Turbo-Encoding (R=1/3)	432 12 Tail Bits
1st Rate Matching	432
RV Selection	960
Physical Channel Segmentation	960

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

The following 4 Sub-tests for HSDPA were completed according to Release 5 procedures. A summary of subtest settings are illustrated below:

Sub-test ¹	β_c ²	β_d ³	β_d (SF) ⁴	β_c/β_d ⁵	$\beta_{hs}(1)$ ⁶	CM(dB)(2) ⁷	MPR(dB) ⁸
1 ⁹	2/15 ¹⁰	15/15 ¹¹	64 ¹²	2/15 ¹³	4/15 ¹⁴	0.0 ¹⁵	0 ¹⁶
2 ¹⁷	12/15(3) ¹⁸	15/15(3) ¹⁹	64 ²⁰	12/15(3) ²¹	24/15 ²²	1.0 ²³	0 ²⁴
3 ²⁵	15/15 ²⁶	8/15 ²⁷	64 ²⁸	15/8 ²⁹	30/15 ³⁰	1.5 ³¹	0.5 ³²
4 ³³	15/15 ³⁴	4/15 ³⁵	64 ³⁶	15/4 ³⁷	30/15 ³⁸	1.5 ³⁹	0.5 ⁴⁰
Note 1: Δ ACK, Δ NACK and Δ CQI=8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$⁴¹ Note 2: CM=1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.⁴² Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$⁴³							

Up commands are set continuously to set the UE to Max power.

Note:

- 1.The Dual Carriers transmission only applies to HSDPA physical channels
- 2.The Dual Carriers belong to the same Node and are on adjacent carriers.
- 3.The Dual Carriers do not support MIMO to serve UEs configured for dual cell operation
- 4.The Dual Carriers operate in the same frequency band .
- 5.The device doesn't support the modulation of 16QAM in uplink but 64QAM in downlink for DC-HSDPA mode.
- 6.The device doesn't support carrier aggregation for it just can operate in Release 8.

6.4 LTE Test Configuration

SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices v02r03. The CMW500 WideBand Radio Communication Tester was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR test were performed with the same number of RB and RB offsets transmitting on all TTI frames(Maximum TTI)

1) Spectrum Plots for RB configurations

A properly configured base station simulator was used for LTE output power measurements and SAR testing. Therefore, spectrum plots for RB configurations were not required to be included in this report.

2) MPR

When MPR is implemented permanently within the UE, regardless of network requirements, only those RB configurations allowed by 3GPP for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR.

The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

3) A-MPR

A-MPR(Additional MPR) has been disabled for all SAR tests by using Network Signalling Value of “NS_01” on the base station simulator.

4) LTE procedures for SAR testing

Largest channel bandwidth standalone SAR test requirements

i) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

ii) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in i) are applied to measure the SAR for QPSK with 50% RB allocation.

iii) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in i) and ii) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

iv) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> \frac{1}{2}$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

B) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is $> \frac{1}{2}$ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

6.5 WiFi Test Configuration

For WiFi SAR testing, a communication link is set up with the testing software for WiFi mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. The RF signal utilized in SAR measurement has 100% duty cycle and its crest factor is 1. The test procedures in KDB 248227D01v02r01 are applied. (Refer to KDB 248227D01v02r01 for more details)

6.5.1 Initial Test Position Procedure

For exposure condition with multiple test position, such as handsets operating next to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all position in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is $\leq 0.4 \text{ W/kg}$, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is $\leq 0.8 \text{ W/kg}$ or all test position are measured. For all positions/configurations tested using the initial test position and subsequent test positions, when the *reported* SAR is $> 0.8 \text{ W/kg}$, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the *reported* SAR is $\leq 1.2 \text{ W/kg}$ or all required channels are tested.

6.5.2 Initial Test Configuration Procedure

An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required (see section 5.3.2 of KDB 248227D01v02r01). SAR test reduction of subsequent highest output test channels is based on the *reported* SAR of the initial test configuration.

For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode. For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration.

When the *reported* SAR of the initial test configuration is $> 0.8 \text{ W/kg}$, SAR measurement is required for the subsequent next highest measured output power channel(s) in the initial test configuration until the *reported* SAR is $\leq 1.2 \text{ W/kg}$ or all required channels are tested.

6.5.3 Sub Test Configuration Procedure

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units.

When the highest reported SAR for the initial test configuration, according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is $\leq 1.2 \text{ W/kg}$, SAR is not required for that subsequent test configuration.

6.5.4 WiFi 2.4G SAR Test Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions.

A) 802.11b DSSS SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

- 1) When the *reported* SAR of the highest measured maximum output power channel (section 3.1 of of KDB 248227D01v02) for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 2) When the *reported* SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any *reported* SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

B) 2.4GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3 of of KDB 248227D01v02r01). SAR is not required for the following 2.4 GHz OFDM conditions.

- 1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
- 2) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

7 SAR Measurement Results

7.1 Conducted power measurements

For the measurements a Rohde & Schwarz Radio Communication Tester CMU 200&CMW500 was used. SAR drift measured at the same position in liquid before and after each SAR test as below 7.2 chapter.

Note: CMU200 measures GSM peak and average output power for active timeslots. For SAR the timebased average power is relevant. The difference in between depends on the duty cycle of the TDMA signal :

No. of timeslots	1	2	3	4
Duty Cycle	1:8.3	1:4.1	1:2.77	1:2.08
timebased avg. power compared to slotted avg. power	-9.19dB	-6.13dB	-4.42dB	-3.18dB

The signalling modes differ as follows:

mode	coding scheme	modulation
GPRS	CS1 to CS4	GMSK
EDGE	MCS1 to MCS4	GMSK
EDGE	MCS5 to MCS9	8PSK

Apart from modulation change (GMSK/8PSK) coding schemes differ in code rate without influence on the RF signal. Therefore one coding scheme per mode was selected for conducted power measurements.

7.1.1 Conducted power measurements of GSM850(Second Antenna)

GSM850		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	128CH	190CH	251CH		Tune-up	128CH	190CH	251CH
GSM (CS)		30.50	29.30	29.95	30.10	-9.19	21.31	20.11	20.76	20.91
GPRS/EDGE (GMSK)	1 Tx Slot	30.50	29.25	29.92	30.06	-9.19	21.31	20.06	20.73	20.87
	2 Tx Slots	27.50	26.12	26.33	26.42	-6.13	21.37	19.99	20.20	20.29
	3 Tx Slots	25.50	23.62	23.87	23.93	-4.42	21.08	19.20	19.45	19.51
	4 Tx Slots	24.50	22.85	22.90	23.06	-3.18	21.32	19.67	19.72	19.88
EDGE (8PSK)	1 Tx Slot	28.00	26.16	26.30	26.37	-9.19	18.81	16.97	17.11	17.18
	2 Tx Slots	27.00	25.40	25.58	25.73	-6.13	20.87	19.27	19.45	19.60
	3 Tx Slots	25.00	23.15	23.26	23.27	-4.42	20.58	18.73	18.84	18.85
	4 Tx Slots	24.00	22.02	22.09	22.17	-3.18	20.82	18.84	18.91	18.99

Table 13:Conducted power measurement results of GSM850

Note:

- 1) The conducted power of GSM850 is measured with RMS detector.
- 2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
- 3) Per KDB941225 D01v03, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

7.1.2 Conducted power measurements of GSM1900(Second Antenna)

GSM1900		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	512CH	661CH	810CH		Tune-up	512CH	661CH	810CH
GSM (CS)		26.00	24.55	24.60	25.04	-9.19	16.81	15.36	15.41	15.85
GPRS/ EDGE (GMSK)	1 Tx Slot	26.00	24.54	24.58	25.02	-9.19	16.81	15.35	15.39	15.83
	2 Tx Slots	22.50	20.91	21.35	21.87	-6.13	16.37	14.78	15.22	15.74
	3 Tx Slots	21.00	19.04	19.06	19.07	-4.42	16.58	14.62	14.64	14.65
	4 Tx Slots	19.00	17.49	17.50	18.10	-3.18	15.82	14.31	14.32	14.92
EDGE (8PSK)	1 Tx Slot	25.50	23.54	23.58	23.93	-9.19	16.31	14.35	14.39	14.74
	2 Tx Slots	22.50	20.74	20.78	21.33	-6.13	16.37	14.61	14.65	15.20
	3 Tx Slots	20.00	18.46	18.42	18.84	-4.42	15.58	14.04	14.00	14.42
	4 Tx Slots	19.00	17.07	17.06	17.62	-3.18	15.82	13.89	13.88	14.44

Table 14: Conducted power measurement results of GSM1900

Note:

- 1) The conducted power of GSM1900 is measured with RMS detector.
- 2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
- 3) Per KDB941225 D01v03, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

7.1.3 Conducted power measurements of UMTS Band II(Second Antenna)

UMTS Band II		Tune-up	Conducted Power (dBm)		
			9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	18.00	17.66	17.65	17.66
	64kbps RMC	18.00	17.70	17.71	17.76
	144kbps RMC	18.00	17.67	17.69	17.74
	384kbps RMC	18.00	17.65	17.67	17.72
HSDPA	Subtest 1	17.00	16.77	16.62	16.63
	Subtest 2	17.00	16.50	16.41	16.49
	Subtest 3	16.50	15.94	15.88	15.90
	Subtest 4	16.50	15.94	15.87	15.88
HSUPA	Subtest 1	17.00	16.36	16.33	16.55
	Subtest 2	15.50	15.30	15.38	15.22
	Subtest 3	15.50	14.88	15.33	14.92
	Subtest 4	15.50	16.06	15.90	15.77
	Subtest 5	17.00	16.22	16.33	16.35
DC-HSDPA	Subtest 1	17.00	16.68	16.55	16.49
	Subtest 2	17.00	16.42	16.36	16.40
	Subtest 3	16.50	15.85	15.79	15.83
	Subtest 4	16.50	15.86	15.77	15.79

Table 15: Conducted power measurement results of UMTS Band II

Note: 1) The conducted power of UMTS Band II is measured with RMS detector.

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

7.1.4 Conducted power measurements of UMTS Band IV(Second Antenna)

UMTS Band IV		Tune-up	Conducted Power (dBm)		
			1312CH	1413CH	1513CH
WCDMA	12.2kbps RMC	16.50	16.13	16.10	16.03
	64kbps RMC	16.50	16.18	16.05	15.92
	144kbps RMC	16.50	16.20	16.03	15.95
	384kbps RMC	16.50	16.10	15.99	15.95
HSDPA	Subtest 1	15.50	15.10	14.91	14.73
	Subtest 2	15.00	14.70	14.68	14.51
	Subtest 3	14.50	14.28	14.17	13.99
	Subtest 4	14.50	14.25	14.14	14.02
HSUPA	Subtest 1	15.50	15.16	15.07	15.01
	Subtest 2	14.00	13.96	13.96	13.73
	Subtest 3	14.00	13.95	13.21	13.06
	Subtest 4	14.00	13.98	13.98	13.83
	Subtest 5	15.50	15.10	15.02	14.95
DC-HSDPA	Subtest 1	15.50	14.98	14.82	14.66
	Subtest 2	15.00	14.62	14.61	14.43
	Subtest 3	14.50	14.21	14.12	13.90
	Subtest 4	14.50	14.18	14.07	13.91

Table 16: Conducted power measurement results of UMTS Band IV

Note: 1) The conducted power of UMTS Band IV is measured with RMS detector.

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

7.1.5 Conducted power measurements of UMTS Band V(Second Antenna)

UMTS Band V		Tune-up	Conducted Power (dBm)		
			4132CH	4182CH	4233CH
WCDMA	12.2kbps RMC	22.00	21.60	21.80	21.66
	64kbps RMC	22.00	21.54	21.70	21.56
	144kbps RMC	22.00	21.51	21.69	21.52
	384kbps RMC	22.00	21.48	21.67	21.52
HSDPA	Subtest 1	21.00	20.41	20.68	20.62
	Subtest 2	21.00	20.30	20.36	20.32
	Subtest 3	20.50	19.81	19.71	19.66
	Subtest 4	20.50	19.57	19.63	19.59
HSUPA	Subtest 1	21.00	20.25	20.42	20.38
	Subtest 2	19.50	19.25	19.22	19.13
	Subtest 3	19.50	18.53	19.15	18.42
	Subtest 4	20.00	19.41	19.48	19.47
	Subtest 5	21.00	20.02	20.14	20.14
DC-HSDPA	Subtest 1	21.00	20.36	20.61	20.54
	Subtest 2	21.00	20.22	20.22	20.22
	Subtest 3	20.50	19.66	19.65	19.58
	Subtest 4	20.50	19.48	19.55	19.52

Table 17: Conducted power measurement results of UMTS Band V

Note: 1) The conducted power of UMTS Band V is measured with RMS detector.

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

7.1.6 Conducted power measurements of LTE Band II(Second Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18607CH	18900CH	19193CH
1.4MHz	QPSK	1	0	17.00	15.99	15.87	16.01
		1	3	17.00	16.06	15.99	15.89
		1	5	17.00	15.98	16.03	15.93
		3	0	17.00	16.02	15.82	16.07
		3	2	17.00	16.06	15.95	15.93
		3	3	17.00	16.07	15.95	15.84
		6	0	16.00	15.01	14.95	15.10
	16QAM	1	0	16.00	15.56	15.50	15.54
		1	3	16.00	15.62	15.53	15.64
		1	5	16.00	15.52	15.56	15.56
		3	0	16.00	15.35	15.30	15.02
		3	2	16.00	15.35	15.24	15.07
		3	3	16.00	15.39	14.70	15.09
		6	0	15.00	13.94	13.73	14.04
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18615CH	18900CH	19185CH
3MHz	QPSK	1	0	17.00	16.24	16.07	16.10
		1	7	17.00	16.27	16.12	16.12
		1	14	17.00	16.26	16.19	16.02
		8	0	16.00	15.07	14.98	15.16
		8	4	16.00	15.02	15.00	14.99
		8	7	16.00	15.11	15.11	14.97
		15	0	16.00	15.12	15.02	15.08
	16QAM	1	0	16.00	15.28	15.31	15.32
		1	7	16.00	15.33	15.30	15.61
		1	14	16.00	15.26	15.21	15.34
		8	0	15.00	14.10	14.20	14.29
		8	4	15.00	14.09	14.22	14.21
		8	7	15.00	14.23	14.22	14.15
		15	0	15.00	14.10	14.11	14.18

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18625CH	18900CH	19175CH
5MHz	QPSK	1	0	17.00	16.14	16.05	16.04
		1	13	17.00	16.16	16.08	15.83
		1	24	17.00	16.18	15.77	15.91
		12	0	16.00	15.05	15.00	15.07
		12	6	16.00	15.12	14.99	15.01
		12	13	16.00	15.07	15.04	14.97
		25	0	16.00	15.07	15.06	15.03
	16QAM	1	0	16.00	14.87	14.56	15.06
		1	13	16.00	15.02	14.63	14.90
		1	24	16.00	14.92	14.95	14.87
		12	0	15.00	13.88	13.98	13.90
		12	6	15.00	14.11	14.03	14.03
		12	13	15.00	14.12	14.04	14.11
		25	0	15.00	14.05	14.12	14.15
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18650CH	18900CH	19150CH
10MHz	QPSK	1	0	17.00	16.42	16.26	16.11
		1	25	17.00	16.10	16.32	16.10
		1	49	17.00	16.22	16.26	16.26
		25	0	16.00	15.11	15.05	15.05
		25	13	16.00	15.02	15.07	15.11
		25	25	16.00	15.02	15.10	15.14
		50	0	16.00	15.02	15.08	15.08
	16QAM	1	0	16.00	15.25	15.25	15.23
		1	25	16.00	15.62	15.44	15.31
		1	49	16.00	15.55	15.76	15.70
		25	0	15.00	14.08	14.12	14.01
		25	13	15.00	14.05	14.04	13.98
		25	25	15.00	14.00	13.99	14.13
		50	0	15.00	13.98	14.02	14.04

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18675CH	18900CH	19125CH
15MHz	QPSK	1	0	17.00	16.35	16.29	16.35
		1	38	17.00	16.12	16.27	16.26
		1	74	17.00	16.10	16.37	16.31
		36	0	16.00	15.11	15.16	15.17
		36	18	16.00	15.07	15.05	15.01
		36	39	16.00	14.95	15.05	15.10
		75	0	16.00	15.04	15.10	15.00
	16QAM	1	0	16.00	14.96	14.90	15.17
		1	38	16.00	14.78	15.34	14.99
		1	74	16.00	14.85	15.48	15.47
		36	0	15.00	14.15	14.09	13.95
		36	18	15.00	14.06	14.15	13.88
		36	39	15.00	13.95	14.04	14.08
		75	0	15.00	14.03	13.98	14.00
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18700CH	18900CH	19100CH
20MHz	QPSK	1	0	17.00	16.07	16.03	16.16
		1	50	17.00	16.24	16.20	16.31
		1	99	17.00	15.89	16.21	15.99
		50	0	16.00	15.10	15.07	15.14
		50	25	16.00	15.02	15.10	15.02
		50	50	16.00	14.92	15.11	15.06
		100	0	16.00	15.07	15.04	15.19
	16QAM	1	0	16.00	15.09	14.85	15.20
		1	50	16.00	14.94	15.01	14.91
		1	99	16.00	14.56	15.06	14.66
		50	0	15.00	14.14	14.09	14.20
		50	25	15.00	14.07	14.17	14.17
		50	50	15.00	13.90	14.22	14.11
		100	0	15.00	14.12	13.98	14.05

Table 18: Conducted power measurement results of LTE Band II

7.1.7 Conducted power measurements of LTE Band IV(Second Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19957CH	20175CH	20393CH
1.4MHz	QPSK	1	0	16.00	15.05	15.00	14.92
		1	3	16.00	15.03	15.02	15.00
		1	5	16.00	14.98	14.99	14.94
		3	0	16.00	14.93	15.01	14.92
		3	2	16.00	15.15	15.07	14.94
		3	3	16.00	15.03	15.05	15.01
		6	0	15.00	13.91	13.94	13.93
	16QAM	1	0	15.00	14.39	14.44	14.34
		1	3	15.00	14.42	14.68	14.51
		1	5	15.00	14.39	14.75	14.44
		3	0	15.00	14.19	14.24	14.10
		3	2	15.00	14.22	14.29	14.11
		3	3	15.00	13.94	14.26	13.68
		6	0	14.00	13.20	13.55	12.77
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19965CH	20175	20385CH
3MHz	QPSK	1	0	16.00	15.22	15.28	15.06
		1	7	16.00	15.22	15.22	15.10
		1	14	16.00	15.14	15.26	15.09
		8	0	15.00	13.94	14.13	13.96
		8	4	15.00	14.12	14.06	13.89
		8	7	15.00	13.99	14.07	13.95
		15	0	15.00	14.03	14.07	13.92
	16QAM	1	0	15.00	14.28	13.97	14.19
		1	7	15.00	14.38	14.03	14.12
		1	14	15.00	14.27	14.21	14.24
		8	0	14.00	13.09	12.95	13.11
		8	4	14.00	13.15	12.96	13.17
		8	7	14.00	13.16	12.90	13.08
		15	0	14.00	13.17	12.97	12.83

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19975CH	20175H	20375CH
5MHz	QPSK	1	0	16.00	15.22	15.16	15.26
		1	13	16.00	15.09	14.98	15.05
		1	24	16.00	15.16	15.12	15.13
		12	0	15.00	14.03	14.02	13.98
		12	6	15.00	14.01	14.07	13.96
		12	13	15.00	14.04	13.99	13.93
		25	0	15.00	14.10	14.07	13.91
	16QAM	1	0	15.00	13.73	13.67	13.85
		1	13	15.00	13.62	13.57	13.40
		1	24	15.00	13.70	13.98	13.47
		12	0	15.00	12.88	13.04	12.85
		12	6	15.00	12.86	13.01	12.79
		12	13	15.00	12.90	12.94	12.87
		25	0	14.00	13.25	13.03	12.90
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20000H	20175CH	20350CH
10MHz	QPSK	1	0	16.00	15.24	15.38	15.33
		1	25	16.00	15.26	15.31	15.21
		1	49	16.00	15.12	15.17	15.16
		25	0	15.00	14.14	14.07	14.05
		25	13	15.00	14.13	14.07	13.93
		25	25	15.00	14.11	14.10	13.95
		50	0	15.00	14.07	14.12	14.11
	16QAM	1	0	15.00	14.13	14.17	14.28
		1	25	15.00	14.33	14.59	14.27
		1	49	15.00	14.05	14.55	14.44
		25	0	14.00	13.22	12.96	13.06
		25	13	14.00	12.98	12.96	12.84
		25	25	14.00	12.96	13.00	12.83
		50	0	14.00	13.00	13.00	12.89

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20025CH	20175CH	20325CH
15MHz	QPSK	1	0	16.00	15.45	15.32	15.33
		1	38	16.00	15.29	15.15	15.12
		1	74	16.00	15.29	15.30	15.07
		36	0	15.00	14.18	14.06	14.15
		36	18	15.00	14.07	14.04	14.02
		36	39	15.00	13.95	14.06	13.92
		75	0	15.00	14.05	14.04	13.97
	16QAM	1	0	15.00	14.38	14.01	13.96
		1	38	15.00	14.19	13.84	13.97
		1	74	15.00	14.01	13.91	13.87
		36	0	14.00	13.14	13.01	12.98
		36	18	14.00	12.94	12.93	12.84
		36	39	14.00	12.90	12.98	12.70
		75	0	14.00	13.02	12.94	13.15
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20050CH	20175CH	20300CH
20MHz	QPSK	1	0	16.00	15.04	14.92	14.92
		1	50	16.00	14.94	15.07	15.05
		1	99	16.00	14.84	14.95	14.87
		50	0	15.00	14.16	14.14	14.18
		50	25	15.00	14.02	14.11	14.09
		50	50	15.00	13.91	13.99	14.01
		100	0	15.00	14.03	14.05	14.12
	16QAM	1	0	15.00	14.61	14.08	14.12
		1	50	15.00	14.59	13.96	14.71
		1	99	15.00	13.78	14.02	13.91
		50	0	14.00	13.22	13.17	13.19
		50	25	14.00	13.06	13.16	13.23
		50	50	14.00	12.93	13.13	12.96
		100	0	14.00	13.06	13.10	13.08

Table 19: Conducted power measurement results of LTE Band IV

7.1.8 Conducted power measurements of LTE Band V(Second Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20407CH	20525CH	20643CH
1.4MHz	QPSK	1	0	20.50	20.38	20.05	20.03
		1	3	20.50	20.31	20.10	20.10
		1	5	20.50	20.35	19.93	20.06
		3	0	20.50	20.18	19.97	20.00
		3	2	20.50	20.30	20.01	20.05
		3	3	20.50	20.31	20.06	20.02
		6	0	19.50	19.25	19.14	19.25
	16QAM	1	0	20.50	19.68	19.60	19.63
		1	3	20.50	19.77	19.70	19.73
		1	5	20.50	19.94	19.58	19.71
		3	0	20.50	18.98	19.38	19.34
		3	2	20.50	19.02	19.42	19.37
		3	3	20.50	19.11	19.35	19.38
		6	0	19.50	18.07	18.54	18.58
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20415CH	20525CH	20635CH
3MHz	QPSK	1	0	20.50	19.95	20.10	20.12
		1	7	20.50	20.21	20.12	20.34
		1	14	20.50	20.23	20.05	20.30
		8	0	19.50	18.95	19.05	18.93
		8	4	19.50	18.96	19.04	18.99
		8	7	19.50	18.98	19.08	19.05
		15	0	19.50	18.96	19.08	18.96
	16QAM	1	0	19.50	19.19	19.36	19.28
		1	7	19.50	19.32	19.32	19.17
		1	14	19.50	19.25	19.26	19.32
		8	0	18.50	18.26	18.10	17.97
		8	4	18.50	18.30	18.09	18.05
		8	7	18.50	18.27	18.06	18.19
		15	0	18.50	18.21	18.13	17.87

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20425CH	20525CH	20625CH
5MHz	QPSK	1	0	20.50	20.11	20.13	20.02
		1	13	20.50	20.33	20.05	19.97
		1	24	20.50	20.04	20.09	20.12
		12	0	19.50	19.02	19.13	19.05
		12	6	19.50	19.06	19.10	19.06
		12	13	19.50	19.18	19.04	19.09
		25	0	19.50	19.10	19.12	18.98
	16QAM	1	0	19.50	18.93	19.10	18.92
		1	13	19.50	19.01	18.39	18.82
		1	24	19.50	19.03	18.33	19.04
		12	0	18.50	17.88	18.02	17.88
		12	6	18.50	17.94	17.99	17.80
		12	13	18.50	18.06	18.05	18.02
		25	0	18.50	18.04	18.15	18.07
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20450CH	20525CH	20600CH
10MHz	QPSK	1	0	20.50	20.30	20.25	20.13
		1	25	20.50	20.27	20.44	20.26
		1	49	20.50	20.37	20.36	20.42
		25	0	19.50	19.16	19.15	19.05
		25	13	19.50	19.13	19.17	19.08
		25	25	19.50	19.08	19.12	19.11
		50	0	19.50	19.14	19.18	19.05
	16QAM	1	0	20.50	19.22	19.49	19.15
		1	25	20.50	19.49	19.90	19.76
		1	49	20.50	19.22	19.74	19.82
		25	0	18.50	18.23	18.04	18.17
		25	13	18.50	18.21	18.00	18.03
		25	25	18.50	18.05	18.08	17.90
		50	0	18.50	18.00	18.11	18.01

Table 20: Conducted power measurement results of LTE Band V

7.1.9 Conducted power measurements of LTE Band VII(Second Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20775CH	21100CH	21425CH
5MHz	QPSK	1	0	15.00	14.37	14.36	14.15
		1	13	15.00	14.22	14.12	13.79
		1	24	15.00	14.20	14.05	13.83
		12	0	14.00	13.15	13.09	12.98
		12	6	14.00	13.06	13.04	12.90
		12	13	14.00	13.05	13.01	12.91
		25	0	14.00	13.13	13.12	12.95
	16QAM	1	0	14.00	13.08	13.17	12.87
		1	13	14.00	12.64	12.83	12.60
		1	24	14.00	12.87	13.02	12.55
		12	0	13.00	12.00	12.01	11.97
		12	6	13.00	12.07	11.96	11.89
		12	13	13.00	12.07	11.84	11.80
		25	0	13.00	12.17	12.18	11.88
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20800CH	21100CH	21400CH
10MHz	QPSK	1	0	15.00	14.46	14.38	14.24
		1	25	15.00	14.49	14.20	14.09
		1	49	15.00	14.32	14.07	14.16
		25	0	14.00	13.22	13.25	13.13
		25	13	14.00	13.11	13.04	12.92
		25	25	14.00	13.07	13.04	12.87
		50	0	14.00	13.08	13.14	13.04
	16QAM	1	0	14.00	13.33	13.37	13.61
		1	25	14.00	13.25	13.63	13.01
		1	49	14.00	13.71	13.65	12.72
		25	0	13.00	12.21	12.10	12.11
		25	13	13.00	12.03	12.01	11.90
		25	25	13.00	12.00	11.91	11.85
		50	0	13.00	12.13	12.02	12.01

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20825CH	21100CH	21375CH
15MHz	QPSK	1	0	15.00	14.55	14.60	14.44
		1	38	15.00	14.32	14.19	13.96
		1	74	15.00	14.26	14.16	14.02
		36	0	14.00	13.14	13.29	13.20
		36	18	14.00	13.19	13.06	13.04
		36	39	14.00	13.17	12.95	12.80
		75	0	14.00	13.08	13.17	13.03
	16QAM	1	0	14.00	13.29	13.70	13.45
		1	38	14.00	13.04	12.94	13.18
		1	74	14.00	13.48	12.82	12.77
		36	0	13.00	12.10	12.11	12.21
		36	18	13.00	12.02	11.98	11.85
		36	39	13.00	12.02	11.85	11.82
		75	0	13.00	12.05	12.19	11.96
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20850CH	21100CH	21350CH
20MHz	QPSK	1	0	15.00	14.33	14.47	14.36
		1	50	15.00	14.38	14.04	14.14
		1	99	15.00	14.23	13.73	13.78
		50	0	14.00	13.10	13.33	13.16
		50	25	14.00	13.14	13.06	13.04
		50	50	14.00	13.13	12.94	12.91
		100	0	14.00	13.09	13.26	13.04
	16QAM	1	0	14.00	13.84	13.90	13.27
		1	50	14.00	13.79	13.05	13.02
		1	99	14.00	13.78	12.75	12.54
		50	0	13.00	12.16	12.27	12.36
		50	25	13.00	12.09	12.00	12.20
		50	50	13.00	12.19	12.03	11.86
		100	0	13.00	12.14	12.20	12.11

Table 21: Conducted power measurement results of LTE Band VII

7.1.10 Conducted power measurements of LTE Band XII(Second Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23017CH	23095CH	23173CH
1.4MHz	QPSK	1	0	22.50	21.35	21.52	21.37
		1	3	22.50	21.59	21.60	21.46
		1	5	22.50	21.49	21.50	21.33
		3	0	22.50	21.23	21.33	21.27
		3	2	22.50	21.31	21.52	21.27
		3	3	22.50	21.40	21.52	21.28
		6	0	21.50	20.32	20.42	20.31
	16QAM	1	0	21.50	20.96	20.83	21.01
		1	3	21.50	21.25	21.03	20.98
		1	5	21.50	21.28	21.02	21.14
		3	0	21.50	20.33	20.39	20.24
		3	2	21.50	20.31	20.67	20.34
		3	3	21.50	20.21	20.67	20.34
		6	0	20.50	19.01	19.67	19.08
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23025CH	23095CH	23165CH
3MHz	QPSK	1	0	22.50	21.38	21.55	21.45
		1	7	22.50	21.40	21.56	21.38
		1	14	22.50	21.38	21.50	21.43
		8	0	21.50	20.42	20.50	20.32
		8	4	21.50	20.26	20.43	20.23
		8	7	21.50	20.38	20.49	20.38
		15	0	21.50	20.37	20.43	20.32
	16QAM	1	0	21.50	20.52	20.81	20.45
		1	7	21.50	20.53	20.81	20.46
		1	14	21.50	20.56	20.71	20.49
		8	0	20.50	19.04	19.48	19.50
		8	4	20.50	18.97	19.47	19.41
		8	7	20.50	18.89	19.50	19.53
		15	0	20.50	19.17	19.56	19.38

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23035CH	23095CH	23155CH
5MHz	QPSK	1	0	22.50	21.37	21.60	21.49
		1	13	22.50	21.24	21.49	21.38
		1	24	22.50	21.41	21.54	21.52
		12	0	21.50	20.29	20.50	20.45
		12	6	21.50	20.36	20.47	20.39
		12	13	21.50	20.35	20.47	20.35
		25	0	21.50	20.33	20.47	20.40
	16QAM	1	0	21.50	20.05	20.32	20.07
		1	13	21.50	20.22	20.29	20.02
		1	24	21.50	20.11	20.21	20.21
		12	0	20.50	19.16	19.40	19.34
		12	6	20.50	19.13	19.49	19.31
		12	13	20.50	19.14	19.58	19.37
		25	0	20.50	19.35	19.62	19.44
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23060CH	23095CH	23130CH
10MHz	QPSK	1	0	22.50	21.45	21.42	21.62
		1	25	22.50	21.40	21.78	21.47
		1	49	22.50	21.71	21.56	21.60
		25	0	21.50	20.43	20.39	20.56
		25	13	21.50	20.35	20.46	20.51
		25	25	21.50	20.53	20.45	20.42
		50	0	21.50	20.47	20.33	20.51
	16QAM	1	0	21.50	20.56	20.38	20.60
		1	25	21.50	21.03	20.54	20.38
		1	49	21.50	21.16	20.85	21.04
		25	0	20.50	19.33	19.42	19.32
		25	13	20.50	19.27	19.50	19.35
		25	25	20.50	19.36	19.19	19.29
		50	0	20.50	19.37	19.35	19.36

Table 22: Conducted power measurement results of LTE Band XII

7.1.11 Conducted power measurements of LTE Band XVII(Second Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23755CH	23790CH	23825CH
5MHz	QPSK	1	0	22.50	21.93	22.01	21.83
		1	13	22.50	21.90	21.89	21.78
		1	24	22.50	21.96	21.93	21.97
		12	0	22.00	20.76	20.77	20.71
		12	6	22.00	20.79	20.71	20.70
		12	13	22.00	20.79	20.63	20.70
		25	0	22.00	20.80	20.73	20.71
	16QAM	1	0	22.00	20.57	20.59	20.53
		1	13	22.00	20.28	20.30	20.21
		1	24	22.00	20.48	20.44	20.43
		12	0	21.00	19.61	19.53	19.45
		12	6	21.00	19.75	19.46	19.44
		12	13	21.00	19.76	19.65	19.73
		25	0	21.00	19.79	19.72	19.69
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23780CH	23790CH	23800CH
10MHz	QPSK	1	0	22.50	22.04	22.08	22.09
		1	25	22.50	21.90	21.80	21.87
		1	49	22.50	21.94	21.94	21.95
		25	0	22.00	20.89	20.85	20.92
		25	13	22.00	20.81	20.78	20.75
		25	25	22.00	20.73	20.74	20.75
		50	0	22.00	20.84	20.75	20.79
	16QAM	1	0	22.00	21.02	21.01	20.99
		1	25	22.00	20.79	20.78	20.71
		1	49	22.00	20.88	20.88	20.95
		25	0	21.00	19.78	19.72	19.76
		25	13	21.00	19.68	19.56	19.82
		25	25	21.00	19.70	19.51	19.59
		50	0	21.00	19.78	19.71	19.75

Table 23: Conducted power measurement results of LTE Band XVII

7.1.12 Conducted power measurements of GSM850(Main Antenna)

GSM850		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	128CH	190CH	251CH		Tune-up	128CH	190CH	251CH
GSM (CS)		33.50	32.49	32.77	32.95	-9.19	24.31	23.30	23.58	23.76
GPRS/EDGE (GMSK)	1 Tx Slot	33.50	32.48	32.75	32.93	-9.19	24.31	23.29	23.56	23.74
	2 Tx Slots	30.50	29.06	29.36	29.57	-6.13	24.37	22.93	23.23	23.44
	3 Tx Slots	28.00	26.32	26.58	27.20	-4.42	23.58	21.90	22.16	22.78
	4 Tx Slots	27.00	25.32	25.62	25.84	-3.18	23.82	22.14	22.44	22.66
EDGE (8PSK)	1 Tx Slot	28.00	26.86	27.13	27.20	-9.19	18.81	17.67	17.94	18.01
	2 Tx Slots	27.50	26.15	26.31	26.51	-6.13	21.37	20.02	20.18	20.38
	3 Tx Slots	26.50	24.95	25.28	25.22	-4.42	22.08	20.53	20.86	20.80
	4 Tx Slots	25.00	23.62	23.80	23.96	-3.18	21.82	20.44	20.62	20.78

Table 24:Conducted power measurement results of GSM850(Hotspot disable)

GSM850		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	128CH	190CH	251CH		Tune-up	128CH	190CH	251CH
GSM (CS)		33.50	32.10	32.33	32.45	-9.19	24.31	23.30	23.58	23.76
GPRS/EDGE (GMSK)	1 Tx Slot	33.50	32.08	32.30	32.42	-9.19	24.31	22.89	23.11	23.23
	2 Tx Slots	30.50	28.81	29.02	29.22	-6.13	24.37	22.68	22.89	23.09
	3 Tx Slots	27.50	26.38	26.62	27.21	-4.42	23.08	21.96	22.20	22.79
	4 Tx Slots	26.50	25.03	25.72	25.85	-3.18	23.32	21.85	22.54	22.67
EDGE (8PSK)	1 Tx Slot	27.50	26.60	26.73	26.85	-9.19	18.31	17.41	17.54	17.66
	2 Tx Slots	27.50	25.95	26.10	26.16	-6.13	21.37	19.82	19.97	20.03
	3 Tx Slots	25.50	24.52	24.72	24.76	-4.42	21.08	20.10	20.30	20.34
	4 Tx Slots	24.50	23.41	23.78	23.66	-3.18	21.32	20.23	20.60	20.48

Table 25:Conducted power measurement results of GSM850(Hotspot activated)

Note:

- 1) The conducted power of GSM850 is measured with RMS detector.
- 2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
- 3) Per KDB941225 D01v03, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

7.1.13 Conducted power measurements of GSM1900(Main Antenna)

GSM1900		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	512CH	661CH	810CH		Tune-up	512CH	661CH	810CH
GSM (CS)		30.50	29.83	29.62	29.80	-9.19	21.31	20.64	20.43	20.61
GPRS/EDGE (GMSK)	1 Tx Slot	30.50	29.80	29.60	29.78	-9.19	21.31	20.61	20.41	20.59
	2 Tx Slots	27.50	26.27	26.46	26.46	-6.13	21.37	20.14	20.33	20.33
	3 Tx Slots	25.50	25.09	24.99	25.31	-4.42	21.08	20.67	20.89	20.89
	4 Tx Slots	24.50	23.80	23.78	23.80	-3.18	21.32	20.62	20.60	20.62
EDGE (8PSK)	1 Tx Slot	26.50	26.48	26.37	26.59	-9.19	17.31	17.29	17.18	17.40
	2 Tx Slots	26.50	25.67	25.59	25.87	-6.13	20.37	19.54	19.46	19.74
	3 Tx Slots	24.50	24.35	24.20	24.43	-4.42	20.08	19.93	19.78	20.01
	4 Tx Slots	23.50	22.92	22.84	23.09	-3.18	20.32	19.74	19.66	19.91

Table 26: Conducted power measurement results of GSM1900(Hotspot disable)

GSM1900		Burst-Averaged output Power (dBm)				Division Factors	Frame-Averaged output Power (dBm)			
		Tune-up	512CH	661CH	810CH		Tune-up	512CH	661CH	810CH
GSM (CS)		27.00	26.70	26.52	26.94	-9.19	17.81	17.51	17.33	17.75
GPRS/EDGE (GMSK)	1 Tx Slot	27.00	26.68	26.50	26.92	-9.19	17.81	17.49	17.31	17.73
	2 Tx Slots	25.50	25.48	25.30	25.49	-6.13	19.37	19.35	19.17	19.36
	3 Tx Slots	21.50	21.35	21.25	21.34	-4.42	17.08	16.93	16.92	16.92
	4 Tx Slots	20.50	20.18	19.93	20.02	-3.18	17.32	17.00	16.75	16.84
EDGE (8PSK)	1 Tx Slot	27.00	25.86	25.72	25.96	-9.19	17.81	16.67	16.53	16.77
	2 Tx Slots	25.00	24.85	24.82	24.98	-6.13	18.87	18.72	18.69	18.85
	3 Tx Slots	21.50	20.68	20.52	20.82	-4.42	17.08	16.26	16.10	16.40
	4 Tx Slots	20.00	19.48	19.32	19.62	-3.18	16.82	16.30	16.14	16.44

Table 27: Conducted power measurement results of GSM1900(Hotspot activated)

Note:

- 1) The conducted power of GSM1900 is measured with RMS detector.
- 2) Frame-averaged output power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
- 3) Per KDB941225 D01v03, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

7.1.14 Conducted power measurements of UMTS Band II(Main Antenna)

UMTS Band II		Tune-up	Conducted Power (dBm)		
			9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	23.50	23.02	23.11	23.15
	64kbps RMC	23.50	23.07	23.15	23.18
	144kbps RMC	23.50	23.09	23.13	23.16
	384kbps RMC	23.50	23.12	23.16	23.19
HSDPA	Subtest 1	22.50	22.03	22.08	21.93
	Subtest 2	22.00	21.77	21.78	21.63
	Subtest 3	21.50	21.29	21.21	20.94
	Subtest 4	21.50	21.24	21.15	20.99
HSUPA	Subtest 1	22.50	21.65	21.71	21.77
	Subtest 2	21.00	20.78	20.75	20.57
	Subtest 3	21.00	20.32	20.74	20.57
	Subtest 4	21.00	20.78	20.78	20.76
	Subtest 5	22.50	21.83	21.48	21.17
DC-HSDPA	Subtest 1	22.50	21.88	21.95	21.86
	Subtest 2	22.00	21.68	21.71	21.55
	Subtest 3	21.50	21.20	21.13	20.85
	Subtest 4	21.50	21.16	21.04	20.88

Table 28: Conducted power measurement results of UMTS Band II(Hotspot disable)

Note: 1) The conducted power of UMTS Band II is measured with RMS detector.

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

UMTS Band II		Tune-up	Conducted Power (dBm)		
			9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	20.00	19.49	19.55	19.40
	64kbps RMC	20.00	19.48	19.69	19.55
	144kbps RMC	20.00	19.51	19.67	19.65
	384kbps RMC	20.00	19.48	19.65	19.63
HSDPA	Subtest 1	19.00	18.47	18.58	18.42
	Subtest 2	18.50	18.27	18.28	18.17
	Subtest 3	18.00	17.67	17.79	17.70
	Subtest 4	18.00	17.74	17.77	17.68
HSUPA	Subtest 1	19.00	18.33	18.37	18.24
	Subtest 2	17.50	17.29	17.23	17.14
	Subtest 3	17.50	16.82	16.95	17.28
	Subtest 4	18.00	17.21	17.28	17.29
	Subtest 5	19.00	18.04	18.13	17.89
DC-HSDPA	Subtest 1	19.00	18.39	18.50	18.33
	Subtest 2	18.50	18.21	18.22	18.11
	Subtest 3	18.00	17.60	17.71	17.63
	Subtest 4	18.00	17.66	17.71	17.62

Table 29: Conducted power measurement results of UMTS Band II(Hotspot activated)

Note: 1) The conducted power of UMTS Band II is measured with RMS detector.

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

7.1.15 Conducted power measurements of UMTS Band IV(Main Antenna)

UMTS Band IV		Tune-up	Conducted Power (dBm)		
			1312CH	1413CH	1513CH
WCDMA	12.2kbps RMC	23.50	23.27	23.26	23.23
	64kbps RMC	23.50	23.26	23.25	23.21
	144kbps RMC	23.50	23.28	23.23	23.20
	384kbps RMC	23.50	23.26	23.21	23.19
HSDPA	Subtest 1	22.50	22.10	22.17	22.11
	Subtest 2	22.00	21.75	21.72	21.63
	Subtest 3	21.50	21.19	21.03	20.87
	Subtest 4	21.50	21.13	20.96	20.83
HSUPA	Subtest 1	22.50	21.75	21.93	21.92
	Subtest 2	21.50	21.11	20.94	20.90
	Subtest 3	21.50	20.30	20.99	20.55
	Subtest 4	21.50	21.32	21.06	21.03
	Subtest 5	22.30	21.82	21.67	21.56
DC-HSDPA	Subtest 1	22.50	22.01	22.12	22.01
	Subtest 2	22.00	21.66	21.61	21.55
	Subtest 3	21.50	21.11	20.92	20.78
	Subtest 4	21.50	21.05	20.88	20.76

Table 30: Conducted power measurement results of UMTS Band IV(Hotspot disable)

Note: 1) The conducted power of UMTS Band IV is measured with RMS detector.

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

UMTS Band IV		Tune-up	Conducted Power (dBm)		
			1312CH	1413CH	1513CH
WCDMA	12.2kbps RMC	20.50	20.05	19.96	19.87
	64kbps RMC	20.50	19.96	19.92	19.85
	144kbps RMC	20.50	20.04	19.97	19.87
	384kbps RMC	20.50	19.98	19.91	19.95
HSDPA	Subtest 1	19.50	18.91	18.90	18.79
	Subtest 2	19.00	18.62	18.56	18.38
	Subtest 3	18.50	18.13	18.08	17.84
	Subtest 4	18.50	18.05	18.01	17.95
HSUPA	Subtest 1	19.50	18.89	18.20	18.10
	Subtest 2	18.00	17.80	17.78	17.63
	Subtest 3	18.00	17.17	17.14	16.99
	Subtest 4	18.00	17.78	17.76	17.72
	Subtest 5	19.50	18.89	18.74	18.59
DC-HSDPA	Subtest 1	19.50	18.82	18.81	18.72
	Subtest 2	19.00	18.55	18.48	18.32
	Subtest 3	18.50	18.01	18.02	17.77
	Subtest 4	18.50	17.98	17.88	17.88

Table 31: Conducted power measurement results of UMTS Band IV(Hotspot activated)

Note: 1) The conducted power of UMTS Band IV is measured with RMS detector.

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

7.1.16 Conducted power measurements of UMTS Band V(Main Antenna)

UMTS Band V		Tune-up	Conducted Power (dBm)		
			4132CH	4182CH	4233CH
WCDMA	12.2kbps RMC	24.80	24.17	24.32	24.31
	64kbps RMC	24.80	24.22	24.29	24.28
	144kbps RMC	24.80	24.13	24.28	24.24
	384kbps RMC	24.80	24.20	24.32	24.20
HSDPA	Subtest 1	23.80	23.14	23.21	23.18
	Subtest 2	23.80	23.23	23.01	22.97
	Subtest 3	23.30	22.42	22.50	22.36
	Subtest 4	23.30	22.36	22.39	22.22
HSUPA	Subtest 1	23.80	23.09	23.17	22.87
	Subtest 2	22.30	21.70	21.97	21.90
	Subtest 3	22.30	21.96	22.10	21.72
	Subtest 4	22.30	22.22	22.20	22.18
	Subtest 5	23.80	22.55	22.45	22.56
DC-HSDPA	Subtest 1	23.80	23.02	23.09	23.04
	Subtest 2	23.80	23.13	22.94	22.88
	Subtest 3	23.30	22.35	22.38	22.25
	Subtest 4	23.30	22.25	22.28	22.15

Table 32: Conducted power measurement results of UMTS Band V

Note: 1) The conducted power of UMTS Band V is measured with RMS detector.

2) The bolded 12.2kbps RMC mode was selected for SAR testing(the primary mode).

3) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest *reported* SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

7.1.17 Conducted power measurements of LTE Band II(Main Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18607CH	18900CH	19193CH
1.4MHz	QPSK	1	0	23.00	22.15	22.18	22.33
		1	3	23.00	22.14	22.26	22.48
		1	5	23.00	22.09	22.16	22.38
		3	0	23.00	22.08	22.08	22.40
		3	2	23.00	22.23	22.22	22.31
		3	3	23.00	22.20	22.25	22.33
		6	0	22.00	21.14	21.10	21.34
	16QAM	1	0	22.00	21.82	21.91	21.89
		1	3	22.00	21.85	21.89	21.85
		1	5	22.00	21.93	21.88	21.95
		3	0	22.00	21.43	21.43	21.21
		3	2	22.00	21.33	21.23	21.26
		3	3	22.00	20.95	21.22	21.31
		6	0	21.00	20.08	20.08	20.50
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18615CH	18900CH	19185CH
3MHz	QPSK	1	0	23.00	22.24	22.37	22.42
		1	7	23.00	22.36	22.45	22.43
		1	14	23.00	22.44	22.55	22.44
		8	0	22.00	21.07	21.15	21.15
		8	4	22.00	21.08	21.15	21.15
		8	7	22.00	21.09	21.10	21.13
		15	0	22.00	21.15	21.15	21.17
	16QAM	1	0	22.00	21.35	21.43	21.43
		1	7	22.00	21.34	21.25	21.27
		1	14	22.00	21.28	21.49	21.39
		8	0	21.00	20.09	20.33	20.34
		8	4	21.00	20.11	20.43	20.02
		8	7	21.00	20.31	20.49	20.03
		15	0	21.00	20.32	20.30	20.28

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18625CH	18900CH	19175CH
5MHz	QPSK	1	0	23.00	21.96	22.19	22.14
		1	13	23.00	22.05	22.24	22.02
		1	24	23.00	21.98	22.36	22.18
		12	0	22.00	21.05	21.12	21.19
		12	6	22.00	21.08	21.17	21.24
		12	13	22.00	21.05	21.18	21.22
		25	0	22.00	21.11	21.14	21.19
	16QAM	1	0	22.00	20.52	21.07	20.72
		1	13	22.00	20.64	20.60	20.83
		1	24	22.00	20.52	20.87	20.96
		12	0	21.00	20.03	20.20	20.18
		12	6	21.00	20.24	20.16	20.20
		12	13	21.00	20.26	20.27	20.14
		25	0	21.00	20.18	20.27	20.38
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18650CH	18900CH	19150CH
10MHz	QPSK	1	0	23.00	22.60	22.54	22.78
		1	25	23.00	22.34	22.41	22.34
		1	49	23.00	22.42	22.58	22.51
		25	0	22.00	21.24	21.32	21.39
		25	13	22.00	21.25	21.22	21.29
		25	25	22.00	21.23	21.31	21.29
		50	0	22.00	21.25	21.30	21.25
	16QAM	1	0	22.00	21.92	21.92	21.95
		1	25	22.00	21.94	21.95	21.86
		1	49	22.00	21.95	21.95	21.42
		25	0	21.00	20.48	20.31	20.40
		25	13	21.00	20.41	20.36	20.44
		25	25	21.00	20.48	20.37	20.46
		50	0	21.00	20.25	20.23	20.26

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18675CH	18900CH	19125CH
15MHz	QPSK	1	0	23.00	22.49	22.67	22.81
		1	38	23.00	22.44	22.36	22.52
		1	74	23.00	22.50	22.57	22.59
		36	0	22.00	21.29	21.33	21.46
		36	18	22.00	21.21	21.26	21.29
		36	39	22.00	21.18	21.30	21.17
		75	0	22.00	21.25	21.28	21.31
	16QAM	1	0	22.00	21.73	21.70	21.94
		1	38	22.00	21.65	21.57	21.67
		1	74	22.00	21.71	21.86	21.72
		36	0	21.00	20.18	20.33	20.50
		36	18	21.00	20.11	20.26	20.31
		36	39	21.00	20.20	20.24	20.36
		75	0	21.00	20.21	20.19	20.20
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18700CH	18900CH	19100CH
20MHz	QPSK	1	0	23.00	22.32	22.29	22.51
		1	50	23.00	22.63	22.42	22.96
		1	99	23.00	22.34	22.47	22.29
		50	0	22.00	21.31	21.29	21.46
		50	25	22.00	21.18	21.25	21.36
		50	50	22.00	21.18	21.38	21.41
		100	0	22.00	21.24	21.24	21.32
	16QAM	1	0	22.00	21.31	21.42	21.95
		1	50	22.00	21.40	21.41	21.92
		1	99	22.00	21.05	21.39	21.24
		50	0	21.00	20.24	20.39	20.53
		50	25	21.00	20.37	20.34	20.44
		50	50	21.00	20.38	20.40	20.43
		100	0	21.00	20.16	20.32	20.43

Table 33: Conducted power measurement results of LTE Band II(Hotspot disable)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18607CH	18900CH	19193CH
1.4MHz	QPSK	1	0	19.50	18.44	18.51	18.62
		1	3	19.50	18.53	18.49	18.61
		1	5	19.50	18.53	18.48	18.52
		3	0	19.50	18.54	18.54	18.57
		3	2	19.50	18.65	18.63	18.61
		3	3	19.50	18.65	18.52	18.53
		6	0	19.50	18.58	18.47	18.58
	16QAM	1	0	19.50	19.10	19.04	19.08
		1	3	19.50	19.23	19.13	19.18
		1	5	19.50	19.14	19.03	19.10
		3	0	19.50	18.60	18.79	18.81
		3	2	19.50	18.71	18.86	18.83
		3	3	19.50	18.71	18.83	18.85
		6	0	19.50	18.65	18.96	18.63
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18615CH	18900CH	19185CH
3MHz	QPSK	1	0	19.50	18.66	18.77	18.77
		1	7	19.50	18.82	18.63	18.77
		1	14	19.50	18.84	18.66	18.63
		8	0	19.50	18.50	18.56	18.62
		8	4	19.50	18.62	18.56	18.53
		8	7	19.50	18.60	18.52	18.49
		15	0	19.50	18.60	18.55	18.60
	16QAM	1	0	19.50	18.52	18.81	18.82
		1	7	19.50	18.70	18.75	18.79
		1	14	19.50	18.59	18.71	18.68
		8	0	19.50	18.17	18.54	18.81
		8	4	19.50	18.28	18.74	18.72
		8	7	19.50	18.25	18.49	18.47
		15	0	19.50	18.44	18.71	18.68

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18625CH	18900CH	19175CH
5MHz	QPSK	1	0	19.50	18.60	18.69	18.68
		1	13	19.50	18.68	18.60	18.59
		1	24	19.50	18.75	18.65	18.44
		12	0	19.50	18.50	18.56	18.61
		12	6	19.50	18.61	18.58	18.57
		12	13	19.50	18.62	18.57	18.54
		25	0	19.50	18.57	18.63	18.57
	16QAM	1	0	19.50	18.52	18.41	18.59
		1	13	19.50	18.44	18.44	18.43
		1	24	19.50	18.14	18.50	18.34
		12	0	19.50	18.62	18.36	18.42
		12	6	19.50	18.68	18.29	18.39
		12	13	19.50	18.62	18.51	18.57
		25	0	19.50	18.59	18.47	18.73
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18650CH	18900CH	19150CH
10MHz	QPSK	1	0	19.50	18.92	18.82	18.88
		1	25	19.50	19.00	18.71	19.08
		1	49	19.50	18.79	18.73	18.86
		25	0	19.50	18.78	18.60	18.64
		25	13	19.50	18.62	18.62	18.66
		25	25	19.50	18.53	18.56	18.64
		50	0	19.50	18.55	18.54	18.68
	16QAM	1	0	19.50	18.82	18.67	18.73
		1	25	19.50	19.24	19.25	19.37
		1	49	19.50	19.26	19.14	19.33
		25	0	19.50	18.61	18.63	18.66
		25	13	19.50	18.57	18.53	18.56
		25	25	19.50	18.49	18.47	18.66
		50	0	19.50	18.57	18.50	18.56

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18675CH	18900CH	19125CH
15MHz	QPSK	1	0	19.50	18.93	18.84	18.77
		1	38	19.50	18.71	18.70	18.88
		1	74	19.50	18.63	18.79	18.89
		36	0	19.50	18.66	18.63	18.62
		36	18	19.50	18.50	18.54	18.59
		36	39	19.50	18.56	18.50	18.58
		75	0	19.50	18.49	18.61	18.59
	16QAM	1	0	19.50	18.77	18.95	18.96
		1	38	19.50	18.88	18.82	18.89
		1	74	19.50	18.89	18.94	18.95
		36	0	19.50	18.62	18.68	18.76
		36	18	19.50	18.50	18.41	18.49
		36	39	19.50	18.55	18.37	18.38
		75	0	19.50	18.49	18.46	18.59
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					18700CH	18900CH	19100CH
20MHz	QPSK	1	0	19.50	18.79	18.60	18.67
		1	50	19.50	18.85	18.77	18.61
		1	99	19.50	18.42	18.57	18.47
		50	0	19.50	18.71	18.60	18.68
		50	25	19.50	18.59	18.59	18.59
		50	50	19.50	18.50	18.55	18.60
		100	0	19.50	18.60	18.64	18.67
	16QAM	1	0	19.50	18.89	18.54	18.68
		1	50	19.50	18.84	18.72	18.80
		1	99	19.50	18.40	18.63	18.57
		50	0	19.50	18.60	18.68	18.62
		50	25	19.50	18.65	18.70	18.62
		50	50	19.50	18.56	18.70	18.62
		100	0	19.50	18.57	18.62	18.70

Table 34: Conducted power measurement results of LTE Band II(Hotspot activated)

7.1.18 Conducted power measurements of LTE Band IV(Main Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19957CH	20175CH	20393CH
1.4MHz	QPSK	1	0	23.00	22.57	22.46	22.59
		1	3	23.00	22.44	22.46	22.59
		1	5	23.00	22.48	22.52	22.55
		3	0	23.00	22.47	22.49	22.52
		3	2	23.00	22.74	22.53	22.49
		3	3	23.00	22.61	22.53	22.57
		6	0	22.00	21.54	21.42	21.53
	16QAM	1	0	22.00	21.72	21.66	21.49
		1	3	22.00	21.74	21.69	21.72
		1	5	22.00	21.67	21.75	21.77
		3	0	22.00	21.62	21.38	21.69
		3	2	22.00	21.48	21.43	21.46
		3	3	22.00	21.46	21.50	21.54
		6	0	21.00	20.53	20.47	20.71
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19965CH	20175	20385CH
3MHz	QPSK	1	0	23.00	22.72	22.76	22.66
		1	7	23.00	22.78	22.71	22.83
		1	14	23.00	22.73	22.61	22.80
		8	0	22.00	21.42	21.44	21.44
		8	4	22.00	21.42	21.44	21.43
		8	7	22.00	21.38	21.47	21.44
		15	0	22.00	21.52	21.48	21.59
	16QAM	1	0	22.00	21.60	21.45	21.60
		1	7	22.00	21.46	21.98	21.87
		1	14	22.00	21.28	21.35	21.56
		8	0	21.00	20.57	20.45	20.36
		8	4	21.00	20.53	20.08	20.56
		8	7	21.00	20.46	20.10	20.48
		15	0	21.00	20.52	20.40	20.56

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19975CH	20175H	20375CH
5MHz	QPSK	1	0	23.00	22.75	22.54	22.67
		1	13	23.00	22.61	22.65	22.58
		1	24	23.00	22.55	22.56	22.73
		12	0	22.00	21.45	21.39	21.42
		12	6	22.00	21.35	21.44	21.43
		12	13	22.00	21.27	21.43	21.50
		25	0	22.00	21.42	21.43	21.51
	16QAM	1	0	22.00	21.41	21.33	21.35
		1	13	22.00	21.32	21.03	21.05
		1	24	22.00	21.12	21.01	20.87
		12	0	21.00	20.29	20.18	20.18
		12	6	21.00	20.19	20.27	20.29
		12	13	21.00	20.25	20.24	20.37
		25	0	21.00	20.38	20.43	20.61
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20000H	20175CH	20350CH
10MHz	QPSK	1	0	23.00	22.78	22.73	22.79
		1	25	23.00	22.97	22.77	22.75
		1	49	23.00	22.73	22.88	22.84
		25	0	22.00	21.45	21.55	21.44
		25	13	22.00	21.39	21.44	21.43
		25	25	22.00	21.48	21.52	21.45
		50	0	22.00	21.46	21.49	21.45
	16QAM	1	0	22.00	21.67	21.66	21.60
		1	25	22.00	21.62	21.67	21.63
		1	49	22.00	21.99	21.66	21.68
		25	0	21.00	20.57	20.52	20.52
		25	13	21.00	20.36	20.41	20.41
		25	25	21.00	20.52	20.41	20.34
		50	0	21.00	20.37	20.45	20.39

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20025CH	20175CH	20325CH
15MHz	QPSK	1	0	23.00	22.85	22.79	22.87
		1	38	23.00	22.65	22.64	22.67
		1	74	23.00	22.67	22.60	22.92
		36	0	22.00	21.46	21.53	21.51
		36	18	22.00	21.47	21.52	21.46
		36	39	22.00	21.41	21.49	21.54
		75	0	22.00	21.47	21.48	21.50
	16QAM	1	0	22.00	21.95	21.92	21.94
		1	38	22.00	21.74	21.81	21.79
		1	74	22.00	21.78	21.80	21.92
		36	0	21.00	20.56	20.35	20.57
		36	18	21.00	20.44	20.40	20.42
		36	39	21.00	20.35	20.48	20.45
		75	0	21.00	20.30	20.42	20.39
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20050CH	20175CH	20300CH
20MHz	QPSK	1	0	23.00	22.53	22.40	22.54
		1	50	23.00	22.51	22.60	22.55
		1	99	23.00	22.20	22.17	22.46
		50	0	22.00	21.45	21.49	21.60
		50	25	22.00	21.39	21.50	21.38
		50	50	22.00	21.34	21.43	21.36
		100	0	22.00	21.41	21.46	21.49
	16QAM	1	0	22.00	21.35	21.37	21.31
		1	50	22.00	21.34	21.31	21.31
		1	99	22.00	21.06	21.05	21.34
		50	0	21.00	20.38	20.36	20.58
		50	25	21.00	20.42	20.52	20.38
		50	50	21.00	20.37	20.59	20.41
		100	0	21.00	20.47	20.51	20.50

Table 35: Conducted power measurement results of LTE Band IV(Hotspot disable)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19957CH	20175CH	20393CH
1.4MHz	QPSK	1	0	20.50	19.83	19.82	19.98
		1	3	20.50	19.78	19.91	20.10
		1	5	20.50	19.79	19.85	19.88
		3	0	20.50	19.81	19.88	19.83
		3	2	20.50	19.83	19.83	19.86
		3	3	20.50	19.77	19.79	19.82
		6	0	20.50	19.83	19.77	19.89
	16QAM	1	0	20.50	20.36	20.43	20.44
		1	3	20.50	20.48	20.45	20.44
		1	5	20.50	20.43	20.42	20.49
		3	0	20.50	20.21	20.23	20.19
		3	2	20.50	19.71	19.95	20.23
		3	3	20.50	19.63	19.92	20.19
		6	0	20.50	19.59	19.91	20.28
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19965CH	20175	20385CH
3MHz	QPSK	1	0	20.50	19.92	19.95	20.01
		1	7	20.50	20.00	19.97	20.06
		1	14	20.50	20.05	19.93	20.10
		8	0	20.50	19.95	19.89	19.90
		8	4	20.50	19.79	19.88	19.92
		8	7	20.50	19.77	19.86	19.90
		15	0	20.50	19.78	19.88	19.93
	16QAM	1	0	20.50	20.25	20.16	20.23
		1	7	20.50	20.16	20.02	20.19
		1	14	20.50	19.80	19.82	20.21
		8	0	20.50	19.53	19.60	19.92
		8	4	20.50	20.01	19.59	20.06
		8	7	20.50	19.89	20.11	20.14
		15	0	20.50	19.89	19.98	19.75

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					19975CH	20175H	20375CH
5MHz	QPSK	1	0	20.50	19.80	19.95	20.14
		1	13	20.50	19.77	19.90	19.94
		1	24	20.50	19.72	19.94	20.11
		12	0	20.50	19.73	19.90	19.96
		12	6	20.50	19.88	19.91	20.00
		12	13	20.50	19.82	19.95	19.90
		25	0	20.50	19.81	19.96	19.93
	16QAM	1	0	20.50	19.38	19.39	19.75
		1	13	20.50	19.33	19.36	19.55
		1	24	20.50	19.44	19.48	19.83
		12	0	20.50	19.92	19.88	19.87
		12	6	20.50	19.84	19.90	19.90
		12	13	20.50	19.84	19.95	20.00
		25	0	20.50	19.86	19.97	20.06
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20000H	20175CH	20350CH
10MHz	QPSK	1	0	20.50	20.20	20.22	20.28
		1	25	20.50	20.03	20.12	20.09
		1	49	20.50	20.09	20.09	20.22
		25	0	20.50	19.95	20.02	20.07
		25	13	20.50	19.92	19.95	19.94
		25	25	20.50	19.84	19.95	19.93
		50	0	20.50	19.94	19.98	19.98
	16QAM	1	0	20.50	20.15	20.15	20.15
		1	25	20.50	20.17	19.91	20.08
		1	49	20.50	20.39	20.40	20.45
		25	0	20.50	19.91	19.99	20.01
		25	13	20.50	19.95	20.00	19.96
		25	25	20.50	20.00	20.01	19.85
		50	0	20.50	19.83	19.88	19.88

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20025CH	20175CH	20325CH
15MHz	QPSK	1	0	20.50	20.27	20.31	20.38
		1	38	20.50	20.01	20.14	20.15
		1	74	20.50	20.01	20.11	20.30
		36	0	20.50	19.94	19.99	20.09
		36	18	20.50	19.92	19.97	20.04
		36	39	20.50	19.88	19.91	19.92
		75	0	20.50	19.89	19.93	20.03
	16QAM	1	0	20.50	20.35	20.06	20.12
		1	38	20.50	20.28	19.90	19.72
		1	74	20.50	20.27	19.88	20.40
		36	0	20.50	20.04	20.03	20.19
		36	18	20.50	19.97	20.01	20.05
		36	39	20.50	19.92	19.94	20.03
		75	0	20.50	19.91	19.92	20.05
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20050CH	20175CH	20300CH
20MHz	QPSK	1	0	20.50	19.98	20.10	20.15
		1	50	20.50	20.04	20.23	20.07
		1	99	20.50	19.79	19.92	19.72
		50	0	20.50	19.90	19.98	20.12
		50	25	20.50	19.79	19.96	20.03
		50	50	20.50	19.84	19.90	19.98
		100	0	20.50	19.95	19.99	20.12
	16QAM	1	0	20.50	20.04	20.03	20.09
		1	50	20.50	19.73	20.07	19.92
		1	99	20.50	19.53	19.64	19.93
		50	0	20.50	20.02	20.06	20.04
		50	25	20.50	19.95	20.04	19.99
		50	50	20.50	19.81	19.89	20.02
		100	0	20.50	19.91	19.98	20.07

Table 36: Conducted power measurement results of LTE Band IV(Hotspot activated)

7.1.19 Conducted power measurements of LTE Band V(Main Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20407CH	20525CH	20643CH
1.4MHz	QPSK	1	0	23.50	23.20	23.27	23.10
		1	3	23.50	23.25	23.50	23.29
		1	5	23.50	23.23	23.13	23.25
		3	0	23.50	22.99	23.11	23.19
		3	2	23.50	23.04	23.18	23.17
		3	3	23.50	23.12	23.12	23.12
		6	0	22.50	22.05	22.14	22.14
	16QAM	1	0	22.50	22.41	22.45	22.47
		1	3	22.50	22.50	22.43	22.45
		1	5	22.50	22.48	22.48	22.46
		3	0	22.50	22.44	22.28	21.85
		3	2	22.50	22.41	22.05	21.92
		3	3	22.50	22.50	21.89	21.92
		6	0	21.50	21.35	20.90	20.92
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20415CH	20525CH	20635CH
3MHz	QPSK	1	0	23.50	23.16	23.31	23.24
		1	7	23.50	23.37	23.47	23.49
		1	14	23.50	23.46	23.43	23.45
		8	0	22.50	22.11	22.22	22.09
		8	4	22.50	22.21	22.04	22.28
		8	7	22.50	22.26	22.25	22.13
		15	0	22.50	22.24	22.21	22.08
	16QAM	1	0	22.50	22.42	22.37	22.45
		1	7	22.50	22.35	22.18	22.24
		1	14	22.50	22.06	22.02	22.26
		8	0	21.50	21.07	20.81	20.95
		8	4	21.50	21.09	20.81	20.79
		8	7	21.50	21.06	20.77	20.68
		15	0	21.50	21.02	20.95	20.88

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20425CH	20525CH	20625CH
5MHz	QPSK	1	0	23.50	22.91	23.36	23.12
		1	13	23.50	22.76	23.02	23.09
		1	24	23.50	22.94	23.18	22.91
		12	0	22.50	22.13	22.25	22.06
		12	6	22.50	22.19	22.24	22.02
		12	13	22.50	22.30	22.23	22.08
		25	0	22.50	22.22	22.25	22.12
	16QAM	1	0	22.50	21.92	22.00	21.87
		1	13	22.50	22.08	21.54	21.74
		1	24	22.50	22.01	21.45	21.89
		12	0	21.50	21.10	21.13	21.02
		12	6	21.50	21.15	21.21	20.89
		12	13	21.50	21.28	21.23	20.91
		25	0	21.50	21.41	21.35	21.21
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20450CH	20525CH	20600CH
10MHz	QPSK	1	0	23.50	23.34	23.45	23.28
		1	25	23.50	23.37	23.43	23.22
		1	49	23.50	23.31	23.25	23.25
		25	0	22.50	22.31	22.29	22.13
		25	13	22.50	22.21	22.21	22.13
		25	25	22.50	22.17	22.21	22.14
		50	0	22.50	22.25	22.22	22.14
	16QAM	1	0	22.50	22.34	22.35	22.31
		1	25	22.50	22.48	22.47	22.48
		1	49	22.50	22.47	22.19	22.38
		25	0	21.50	21.00	21.17	21.21
		25	13	21.50	21.08	21.23	21.01
		25	25	21.50	21.24	21.13	21.11
		50	0	21.50	21.15	21.20	21.12

Table 37: Conducted power measurement results of LTE Band V

7.1.20 Conducted power measurements of LTE Band VII(Main Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20775CH	21100CH	21425CH
5MHz	QPSK	1	0	23.50	22.63	22.72	22.73
		1	13	23.50	22.60	22.52	22.78
		1	24	23.50	22.61	22.54	22.51
		12	0	22.50	21.62	21.72	21.68
		12	6	22.50	21.60	21.68	21.59
		12	13	22.50	21.56	21.66	21.52
		25	0	22.50	21.61	21.74	21.61
	16QAM	1	0	22.50	21.46	21.40	21.48
		1	13	22.50	21.28	21.17	21.24
		1	24	22.50	21.35	21.16	21.07
		12	0	21.50	20.52	20.66	20.66
		12	6	21.50	20.52	20.63	20.59
		12	13	21.50	20.52	20.62	20.44
		25	0	21.50	20.70	20.74	20.65
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20800CH	21100CH	21400CH
10MHz	QPSK	1	0	23.50	22.83	22.98	22.79
		1	25	23.50	22.87	23.10	22.78
		1	49	23.50	22.83	22.89	22.87
		25	0	22.50	21.73	21.80	21.67
		25	13	22.50	21.56	21.75	21.59
		25	25	22.50	21.53	21.60	21.57
		50	0	22.50	21.61	21.79	21.63
	16QAM	1	0	22.50	22.21	21.90	21.85
		1	25	22.50	22.30	21.71	22.21
		1	49	22.50	22.12	22.14	22.17
		25	0	21.50	20.75	20.91	20.63
		25	13	21.50	20.64	20.64	20.68
		25	25	21.50	20.61	20.59	20.60
		50	0	21.50	20.61	20.57	20.63

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20825CH	21100CH	21375CH
15MHz	QPSK	1	0	23.50	23.10	22.98	23.11
		1	38	23.50	22.85	22.83	22.86
		1	74	23.50	22.78	22.88	22.84
		36	0	22.50	21.70	21.85	21.72
		36	18	22.50	21.62	21.75	21.75
		36	39	22.50	21.47	21.59	21.60
		75	0	22.50	21.63	21.69	21.64
	16QAM	1	0	22.50	22.19	21.67	22.21
		1	38	22.50	21.96	21.43	22.05
		1	74	22.50	21.90	21.52	21.51
		36	0	21.50	20.84	20.87	20.71
		36	18	21.50	20.76	20.77	20.65
		36	39	21.50	20.63	20.62	20.61
		75	0	21.50	20.64	20.67	20.58
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20850CH	21100CH	21350CH
20MHz	QPSK	1	0	23.50	22.81	23.03	22.96
		1	50	23.50	22.79	23.19	23.15
		1	99	23.50	22.53	22.61	22.42
		50	0	22.50	21.76	21.91	21.80
		50	25	22.50	21.67	21.76	21.74
		50	50	22.50	21.52	21.54	21.61
		100	0	22.50	21.72	21.78	21.60
	16QAM	1	0	22.50	22.24	21.84	21.89
		1	50	22.50	21.74	21.61	21.53
		1	99	22.50	21.47	21.40	21.53
		50	0	21.50	20.76	20.91	20.74
		50	25	21.50	20.66	20.79	20.73
		50	50	21.50	20.52	20.57	20.55
		100	0	21.50	20.72	20.75	20.63

Table 38: Conducted power measurement results of LTE Band VII(Hotspot disable)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20775CH	21100CH	21425CH
5MHz	QPSK	1	0	20.50	19.40	19.76	19.70
		1	13	20.50	19.43	19.49	19.56
		1	24	20.50	19.48	19.73	19.57
		12	0	20.50	19.58	19.55	19.59
		12	6	20.50	19.54	19.55	19.47
		12	13	20.50	19.54	19.54	19.41
		25	0	20.50	19.59	19.63	19.54
	16QAM	1	0	20.50	19.44	19.45	19.40
		1	13	20.50	19.34	19.19	19.10
		1	24	20.50	19.17	19.16	19.06
		12	0	20.50	19.38	19.53	19.51
		12	6	20.50	19.46	19.55	19.44
		12	13	20.50	19.39	19.56	19.33
		25	0	20.50	19.54	19.59	19.58
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20800CH	21100CH	21400CH
10MHz	QPSK	1	0	20.50	19.85	19.76	19.92
		1	25	20.50	19.72	19.76	19.78
		1	49	20.50	19.74	19.80	19.68
		25	0	20.50	19.71	19.71	19.64
		25	13	20.50	19.56	19.62	19.52
		25	25	20.50	19.53	19.58	19.56
		50	0	20.50	19.61	19.65	19.56
	16QAM	1	0	20.50	20.12	19.75	19.71
		1	25	20.50	20.15	19.63	19.65
		1	49	20.50	20.15	20.12	19.58
		25	0	20.50	19.59	19.62	19.60
		25	13	20.50	19.58	19.52	19.49
		25	25	20.50	19.50	19.55	19.45
		50	0	20.50	19.58	19.56	19.51

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20825CH	21100CH	21375CH
15MHz	QPSK	1	0	20.50	19.92	19.96	19.95
		1	38	20.50	19.60	19.78	19.80
		1	74	20.50	19.64	19.76	19.66
		36	0	20.50	19.68	19.69	19.65
		36	18	20.50	19.53	19.64	19.56
		36	39	20.50	19.53	19.52	19.49
		75	0	20.50	19.62	19.58	19.49
	16QAM	1	0	20.50	20.11	20.07	19.68
		1	38	20.50	19.96	19.95	19.48
		1	74	20.50	20.07	19.90	19.46
		36	0	20.50	19.71	19.72	19.74
		36	18	20.50	19.59	19.61	19.61
		36	39	20.50	19.51	19.56	19.44
		75	0	20.50	19.62	19.65	19.46
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					20850CH	21100CH	21350CH
20MHz	QPSK	1	0	20.50	19.70	19.64	19.60
		1	50	20.50	19.70	19.71	19.72
		1	99	20.50	19.48	19.44	19.47
		50	0	20.50	19.74	19.77	19.68
		50	25	20.50	19.61	19.63	19.69
		50	50	20.50	19.45	19.50	19.51
		100	0	20.50	19.58	19.63	19.59
	16QAM	1	0	20.50	19.72	19.70	19.68
		1	50	20.50	19.69	19.75	19.52
		1	99	20.50	19.13	19.11	19.23
		50	0	20.50	19.61	19.63	19.58
		50	25	20.50	19.48	19.72	19.54
		50	50	20.50	19.57	19.59	19.43
		100	0	20.50	19.62	19.66	19.65

Table 39: Conducted power measurement results of LTE Band VII(Hotspot activated)

7.1.21 Conducted power measurements of LTE Band XII(Main Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23017CH	23095CH	23173CH
1.4MHz	QPSK	1	0	23.00	22.11	22.22	22.01
		1	3	23.00	22.14	22.29	22.11
		1	5	23.00	22.11	22.21	22.08
		3	0	23.00	22.01	22.06	22.03
		3	2	23.00	22.14	22.02	22.11
		3	3	23.00	22.08	22.02	22.09
		6	0	22.00	20.96	20.96	20.98
	16QAM	1	0	22.00	21.57	21.88	21.68
		1	3	22.00	21.73	21.60	21.81
		1	5	22.00	21.35	21.89	21.79
		3	0	22.00	20.91	21.19	21.12
		3	2	22.00	20.82	21.15	21.18
		3	3	22.00	20.75	21.15	21.15
		6	0	21.00	19.91	20.28	20.45
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23025CH	23095CH	23165CH
3MHz	QPSK	1	0	23.00	22.19	22.17	22.26
		1	7	23.00	22.20	22.14	22.25
		1	14	23.00	22.27	22.08	22.25
		8	0	23.00	21.01	21.06	21.02
		8	4	23.00	21.05	21.02	21.02
		8	7	23.00	21.01	21.02	21.03
		15	0	22.00	21.03	20.94	20.96
	16QAM	1	0	22.00	21.20	21.31	21.22
		1	7	22.00	21.10	21.04	21.08
		1	14	22.00	21.13	21.02	21.15
		8	0	21.00	20.05	20.02	20.04
		8	4	21.00	20.14	20.01	20.01
		8	7	21.00	20.10	20.06	20.18
		15	0	21.00	20.12	20.00	20.15

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23035CH	23095CH	23155CH
5MHz	QPSK	1	0	23.00	22.16	22.13	22.20
		1	13	23.00	22.18	22.08	22.28
		1	24	23.00	22.32	22.17	22.23
		12	0	22.00	21.00	20.97	20.90
		12	6	22.00	20.92	20.92	20.98
		12	13	22.00	20.93	20.89	20.93
		25	0	22.00	20.99	20.94	21.04
	16QAM	1	0	22.00	20.79	20.74	20.83
		1	13	22.00	20.79	20.78	20.67
		1	24	22.00	20.83	20.72	20.68
		12	0	21.00	20.00	20.04	19.92
		12	6	21.00	20.01	19.93	20.15
		12	13	21.00	20.04	19.89	20.03
		25	0	21.00	20.11	20.07	20.05
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23060CH	23095CH	23130CH
10MHz	QPSK	1	0	23.00	22.23	22.26	22.38
		1	25	23.00	22.14	22.12	22.18
		1	49	23.00	22.36	22.35	22.31
		25	0	22.00	20.91	20.99	21.07
		25	13	22.00	20.94	20.95	21.00
		25	25	22.00	21.04	20.90	21.06
		50	0	22.00	21.02	20.92	21.08
	16QAM	1	0	22.00	21.16	21.09	21.30
		1	25	22.00	21.76	21.67	21.73
		1	49	22.00	21.81	21.44	21.70
		25	0	21.00	20.11	20.07	20.11
		25	13	21.00	20.03	20.05	20.11
		25	25	21.00	20.02	20.04	20.10
		50	0	21.00	20.01	20.03	20.01

Table 40: Conducted power measurement results of LTE Band XII

7.1.22 Conducted power measurements of LTE Band XVII(Main Antenna)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23755CH	23790CH	23825CH
5MHz	QPSK	1	0	23.00	22.12	22.18	22.09
		1	13	23.00	22.07	22.06	22.10
		1	24	23.00	22.19	22.19	22.15
		12	0	22.00	20.89	20.86	20.90
		12	6	22.00	20.91	20.90	20.96
		12	13	22.00	20.84	20.97	20.91
		25	0	22.00	20.93	20.88	21.01
	16QAM	1	0	22.00	20.84	20.60	20.63
		1	13	22.00	20.49	20.42	20.58
		1	24	22.00	20.56	20.58	20.56
		12	0	21.00	20.02	19.67	19.72
		12	6	21.00	19.93	19.73	19.78
		12	13	21.00	20.03	19.90	19.85
		25	0	21.00	20.00	19.94	20.16
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					23780CH	23790CH	23800CH
10MHz	QPSK	1	0	23.00	22.34	22.28	22.26
		1	25	23.00	22.13	22.09	22.34
		1	49	23.00	22.44	22.33	22.33
		25	0	22.00	20.99	20.90	20.94
		25	13	22.00	20.94	20.98	20.98
		25	25	22.00	21.04	20.95	20.99
		50	0	22.00	20.94	20.92	20.90
	16QAM	1	0	22.00	21.18	21.16	21.13
		1	25	22.00	20.99	21.14	21.30
		1	49	22.00	21.67	21.56	21.58
		25	0	21.00	20.05	19.94	19.87
		25	13	21.00	20.04	20.03	19.98
		25	25	21.00	20.01	19.99	20.05
		50	0	21.00	19.96	19.94	19.94

Table 41: Conducted power measurement results of LTE Band XVII

7.1.23 Conducted power measurements of WiFi 2.4G

Wi-Fi 2450MHz	Channel	Tune- up	Average Power (dBm) for Data Rates (Mbps)							
			1	2	5.5	11	/	/	/	/
802.11b	1	18.00	17.44	17.41	17.33	16.93	/	/	/	/
	6	18.00	17.96	17.82	17.75	17.67	/	/	/	/
	11	18.00	17.02	17.03	16.95	16.66	/	/	/	/
802.11g	Channel	Tune- up	6	9	12	18	24	36	48	54
	1	15.00	13.64	13.55	13.48	13.20	12.87	12.17	11.36	11.20
	6	15.00	13.92	13.83	13.70	13.16	12.85	12.20	11.40	11.17
	11	15.00	13.58	13.39	13.00	12.81	12.64	12.03	11.24	11.08
802.11n (HT20)	Channel	Tune- up	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	1	13.00	10.51	10.22	9.76	9.27	8.72	8.66	8.43	8.11
	6	13.00	10.65	10.41	9.90	9.46	8.97	8.71	8.39	8.05
	11	13.00	10.62	10.42	9.94	9.55	8.99	8.60	8.45	8.08

Table 42: Conducted power measurement results of WiFi 2.4G.

Note: 1) The Average conducted power of WiFi is measured with RMS detector.

After Simultaneous Transmission Power Reduction

Wi-Fi 2450MHz	Channel	Tune- up	Average Power (dBm) for Data Rates (Mbps)							
			1	2	5.5	11	/	/	/	/
802.11b	1	15.50	14.53	14.44	14.38	14.05	/	/	/	/
	6	15.50	14.79	14.71	14.67	14.25	/	/	/	/
	11	15.50	14.35	14.36	14.25	13.92	/	/	/	/
802.11g	Channel	Tune- up	6	9	12	18	24	36	48	54
	1	15.00	13.64	13.55	13.48	13.20	12.87	12.17	11.36	11.20
	6	15.00	13.92	13.83	13.70	13.16	12.85	12.20	11.40	11.17
	11	15.00	13.58	13.39	13.00	12.81	12.64	12.03	11.24	11.08
802.11n (HT20)	Channel	Tune- up	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	1	13.00	10.51	10.22	9.76	9.27	8.72	8.66	8.43	8.11
	6	13.00	10.65	10.41	9.90	9.46	8.97	8.71	8.39	8.05
	11	13.00	10.62	10.42	9.94	9.55	8.99	8.60	8.45	8.08

Table 43: Conducted power measurement results of WiFi 2.4G.

Note: 1) The Average conducted power of WiFi is measured with RMS detector.

7.1.24 Conducted power measurements of BT

The output power of BT antenna is as following:

BT 2450	Tune-up	Average Conducted Power (dBm)		
		0CH	39CH	78CH
DH5	9.00	6.75	8.37	7.29
2DH5	9.00	4.44	6.03	5.02
3DH5	9.00	4.53	6.03	4.97

BT 2450	Tune-up	Average Conducted Power (dBm)		
		0CH	19CH	39CH
BT 4.0	9.00	2.71	5.19	3.22

Table 44: Conducted power measurement results of BT.

Note: The conducted power of BT is measured with RMS detector.

7.2 SAR measurement Results

General Notes:

- 1) Per KDB447498 D01v05r02, all SAR measurement results are scaled to the maximum tune-up tolerance limit to demonstrate SAR compliance.
- 2) Per KDB447498 D01v05r02, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - $\leq 0.8\text{W/kg}$ for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is $\leq 100\text{MHz}$.
 - $\leq 0.6\text{ W/kg}$ or 1.5 W/kg , for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
 - $\leq 0.4\text{ W/kg}$ or 1.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\geq 200\text{ MHz}$.When the maximum output power variation across the required test channels is $> \frac{1}{2}\text{ dB}$, instead of the middle channel, the highest output power channel must be used.
- 3) Per KDB865664 D01v01r03, for each frequency band, repeated SAR measurement is required only when the measured SAR is $\geq 0.8\text{W/Kg}$; if the deviation among the repeated measurement is $\leq 20\%$, and the measured SAR $< 1.45\text{W/Kg}$, only one repeated measurement is required.
- 4) Per KDB941225 D06v02, the DUT Dimension is bigger than $9\text{ cm} \times 5\text{ cm}$, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.
- 5) Per KDB648474 D04v01r02, SAR is evaluated without a headset connected to the device. When the standalone reported body-worn SAR is $\leq 1.2\text{ W/kg}$, no additional SAR evaluations using a headset are required.
- 6) For SAR test, the Main Antenna and Second Antenna are set to the MAX transmit power level respectively and test the SAR respectively in all applicable RF exposure conditions. Some AT commands are supplied to fix the operation state and choose the antenna, and only one TX antenna is chosen and tested at a time. All independent antennas are completely covered by the appropriate SAR measurements and all simultaneous transmission possibilities are fully considered.
- 7) Additional SAR tests in simultaneous transmission fixed power reduction scenario are also tested in some frequency bands and test positions, which are used to ensure simultaneous transmission SAR test exclusion. (Refer to Section 7.3.4 for details). The standalone SAR compliance still uses the SAR results tested at the maximum output power level without any power reduction.
- 8) Per KDB865664 D02v01r01, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is $> 1.5\text{ W/kg}$, or $> 7.0\text{ W/kg}$ for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing(Refer to the blue SAR test results in the tables of Section 7.3 and appendix B for detailed SAR plots).

GSM Notes:

- 1) Per KDB941225 D01v03, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
- 2) Per KDB648474 D04v01r02, the device does not support DTM function. Body-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.

UMTS Note:

1) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is $\leq \frac{1}{4}$ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

LTE Notes:

- 1) The LTE test configurations are determined according to KDB941225 D05 SAR for LTE Devices v02r03. The general test procedures used for SAR testing can be found in Section 6.4.
- 2) A-MPR was disabled for all SAR test by setting NS_01 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI)

WiFi Notes:

Per KDB248227D01v02:

- 1) When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8 W/kg or all test position are measured. For all positions/configurations tested using the initial test position and subsequent test positions, when the *reported* SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the *reported* SAR is ≤ 1.2 W/kg or all required channels are tested..
- 2) When the DSSS *reported* SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 3) When the highest *reported* SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for 2.4 GHz 802.11g/n OFDM configurations
- 4) The highest SAR measured for the initial test position or initial test configuration should be used to determine SAR test exclusion according to the sum of 1-g SAR and SAR peak to location ratio provisions in KDB 447498. In addition, a test lab may also choose to perform standalone SAR measurements for test positions and 802.11 configurations that are not required by the initial test position or initial test configuration procedures and apply the results to determine simultaneous transmission SAR test exclusion, according to sum of 1-g and SAR peak to location ratio requirements to reduce the number of simultaneous transmission SAR measurements.

7.2.1 SAR measurement Result of GSM850(Second Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Left Hand Touched	190/836.6	GSM	0.467	0.249	0.060	29.95	30.50	0.530	21.4°C
Left Hand Tilted 15°	190/836.6	GSM	0.416	0.256	-0.050	29.95	30.50	0.472	21.4°C
Right Hand Touched	190/836.6	GSM	0.405	0.236	-0.010	29.95	30.50	0.460	21.4°C
Right Hand Tilted 15°	190/836.6	GSM	0.312	0.191	0.000	29.95	30.50	0.354	21.4°C
Left Hand Touched	128/824.2	GSM	0.429	0.233	0.130	29.30	30.50	0.566	21.4°C
Left Hand Touched	251/848.8	GSM	0.423	0.229	-0.070	30.10	30.50	0.464	21.4°C
Tested at the worst position with SIM2									
Left Hand Touched	128/824.2	GSM	0.443	0.239	-0.010	29.30	30.50	0.584	21.4°C
Tested at the worst position with SIM2 and battery 2#									
Left Hand Touched	128/824.2	GSM	0.434	0.233	0.160	29.30	30.50	0.572	21.4°C

Table 45: Head SAR test results of GSM850

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	190/836.6	GSM	0.101	0.072	0.120	29.95	30.50	0.115	21.4°C
Back Side	190/836.6	GSM	0.104	0.074	0.010	29.95	30.50	0.118	21.4°C
Tested at the worst position with SIM2									
Back Side	190/836.6	GSM	0.109	0.077	0.070	29.95	30.50	0.124	21.4°C
Tested at the worst position with SIM2 and battery 2#									
Back Side	190/836.6	GSM	0.097	0.070	0.170	29.95	30.50	0.111	21.4°C

Table 46: Body-Worn SAR test results of GSM850

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	190/836.6	GPRS 2TS	0.154	0.101	0.110	26.33	27.50	0.202	21.4°C
Back Side	190/836.6	GPRS 2TS	0.166	0.098	0.110	26.33	27.50	0.217	21.4°C
Left Side	190/836.6	GPRS 2TS	0.089	0.059	-0.110	26.33	27.50	0.116	21.4°C
Right Side	190/836.6	GPRS 2TS	0.026	0.017	0.110	26.33	27.50	0.033	21.4°C
Top Side	190/836.6	GPRS 2TS	0.105	0.052	-0.010	26.33	27.50	0.137	21.4°C
Tested at the worst position with SIM2									
Back Side	190/836.6	GPRS 2TS	0.169	0.097	0.000	26.33	27.50	0.221	21.4°C
Tested at the worst position with battery 2#									
Back Side	190/836.6	GPRS 2TS	0.146	0.085	0.050	26.33	27.50	0.191	21.4°C

Table 47: Hotspot SAR test results of GSM850

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.2 SAR measurement Result of GSM1900(Second Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Left Hand Touched	661/1880	GSM	0.335	0.165	0.180	24.60	26.00	0.462	21.5°C
Left Hand Tilted 15°	661/1880	GSM	0.322	0.162	0.120	24.60	26.00	0.444	21.5°C
Right Hand Touched	661/1880	GSM	0.458	0.226	0.030	24.60	26.00	0.632	21.5°C
Right Hand Tilted 15°	661/1880	GSM	0.534	0.251	0.040	24.60	26.00	0.737	21.5°C
Right Hand Tilted 15°	512/1850.2	GSM	0.491	0.232	0.080	24.55	26.00	0.686	21.5°C
Right Hand Tilted 15°	810/1909.8	GSM	0.678	0.318	0.020	25.04	26.00	0.846	21.5°C
Tested at the worst position with SIM2									
Right Hand Tilted 15°	810/1909.8	GSM	0.687	0.323	0.120	25.04	26.00	0.857	21.5°C
Tested at the worst position with battery 2#									
Right Hand Tilted 15°	810/1909.8	GSM	0.779	0.360	0.040	25.04	26.00	0.972	21.5°C

Table 48: Head SAR test results of GSM1900

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	661/1880	GSM	0.041	0.023	0.150	24.60	26.00	0.056	21.4°C
Back Side	661/1880	GSM	0.044	0.024	0.050	24.60	26.00	0.060	21.4°C
Tested at the worst position with SIM2									
Back Side	661/1880	GSM	0.049	0.026	0.050	24.60	26.00	0.067	21.4°C
Tested at the worst position with battery 2#									
Back Side	661/1880	GSM	0.061	0.034	-0.110	24.60	26.00	0.084	21.4°C

Table 49: Body-Worn SAR test results of GSM1900

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	661/1880	GPRS 1TS	0.096	0.052	-0.010	24.58	26.00	0.133	21.4°C
Back Side	661/1880	GPRS 1TS	0.125	0.066	0.100	24.58	26.00	0.173	21.4°C
Left Side	661/1880	GPRS 1TS	0.034	0.016	0.130	24.58	26.00	0.048	21.4°C
Right Side	661/1880	GPRS 1TS	0.006	0.004	0.050	24.58	26.00	0.009	21.4°C
Top Side	661/1880	GPRS 1TS	0.221	0.108	0.160	24.58	26.00	0.306	21.4°C
Tested at the worst position with SIM2									
Top Side	661/1880	GPRS 1TS	0.235	0.114	-0.110	24.58	26.00	0.326	21.1°C
Tested at the worst position with battery 2#									
Top Side	661/1880	GPRS 1TS	0.253	0.124	0.120	24.58	26.00	0.351	21.1°C

Table 50: Hotspot SAR test results of GSM1900

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.3 SAR measurement Result of UMTS Band II(Second Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Left Hand Touched	9400/1880	RMC	0.540	0.262	0.020	17.65	18.00	0.585	21.5°C
Left Hand Tilted 15°	9400/1880	RMC	0.436	0.230	0.010	17.65	18.00	0.473	21.5°C
Right Hand Touched	9400/1880	RMC	0.662	0.329	0.020	17.65	18.00	0.718	21.5°C
Right Hand Tilted 15°	9400/1880	RMC	0.694	0.333	0.010	17.65	18.00	0.752	21.5°C
Right Hand Tilted 15°	9262/1852.4	RMC	0.721	0.347	0.010	17.66	18.00	0.780	21.5°C
Right Hand Tilted 15°	9538/1907.6	RMC	0.691	0.332	-0.020	17.66	18.00	0.747	21.5°C
Tested at the worst position with battery 2#									
Right Hand Tilted 15°	9262/1852.4	RMC	0.661	0.314	0.030	17.66	18.00	0.715	21.5°C

Table 51: Head SAR test results of UMTS Band II

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	9400/1880	RMC	0.066	0.038	-0.030	17.65	18.00	0.072	21.4°C
Back Side	9400/1880	RMC	0.079	0.044	-0.140	17.65	18.00	0.086	21.4°C
Tested at the worst position with battery 2#									
Back Side	9400/1880	RMC	0.064	0.036	-0.080	17.65	18.00	0.069	21.4°C

Table 52: Body-Worn SAR test results of UMTS Band II

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	9400/1880	RMC	0.138	0.076	0.050	17.65	18.00	0.150	21.4°C
Back Side	9400/1880	RMC	0.182	0.096	0.000	17.65	18.00	0.197	21.4°C
Left Side	9400/1880	RMC	0.029	0.015	0.180	17.65	18.00	0.032	21.4°C
Right Side	9400/1880	RMC	0.008	0.005	0.160	17.65	18.00	0.009	21.4°C
Top Side	9400/1880	RMC	0.260	0.129	0.060	17.65	18.00	0.282	21.4°C
Tested at the worst position with battery 2#									
Top Side	9400/1880	RMC	0.259	0.127	0.140	17.65	18.00	0.281	21.4°C

Table 53: Hotspot SAR test results of UMTS Band II

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.4 SAR measurement Result of UMTS Band IV(Second Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Left Hand Touched	1413/1732.6	RMC	0.384	0.191	0.140	16.10	16.50	0.421	21.4°C
Left Hand Tilted 15°	1413/1732.6	RMC	0.427	0.208	0.050	16.10	16.50	0.468	21.4°C
Right Hand Touched	1413/1732.6	RMC	0.503	0.245	-0.040	16.10	16.50	0.552	21.4°C
Right Hand Tilted 15°	1413/1732.6	RMC	0.575	0.271	-0.010	16.10	16.50	0.630	21.4°C
Right Hand Tilted 15°	1312/1712.4	RMC	0.588	0.277	-0.080	16.13	16.50	0.640	21.4°C
Right Hand Tilted 15°	1513/1752.6	RMC	0.610	0.287	0.060	16.03	16.50	0.680	21.4°C
Tested at the worst position with battery 2#									
Right Hand Tilted 15°	1513/1752.6	RMC	0.569	0.266	0.000	16.03	16.50	0.634	21.4°C

Table 54: Head SAR test results of UMTS Band IV

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	1413/1732.6	RMC	0.148	0.084	0.040	16.10	16.50	0.162	21.4°C
Back Side	1413/1732.6	RMC	0.165	0.092	-0.070	16.10	16.50	0.181	21.4°C
Tested at the worst position with battery 2#									
Back Side	1413/1732.6	RMC	0.135	0.077	-0.110	16.10	16.50	0.148	21.4°C

Table 55: Body-Worn SAR test results of UMTS Band IV

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	1413/1732.6	RMC	0.310	0.166	0.180	16.10	16.50	0.340	21.4°C
Back Side	1413/1732.6	RMC	0.321	0.170	-0.030	16.10	16.50	0.352	21.4°C
Left Side	1413/1732.6	RMC	0.037	0.021	-0.160	16.10	16.50	0.041	21.4°C
Right Side	1413/1732.6	RMC	0.017	0.010	-0.150	16.10	16.50	0.018	21.4°C
Top Side	1413/1732.6	RMC	0.673	0.321	0.060	16.10	16.50	0.738	21.4°C
Tested at the worst position with battery 2#									
Top Side	1413/1732.6	RMC	0.619	0.295	-0.030	16.10	16.50	0.679	21.4°C

Table 56: Hotspot SAR test results of UMTS Band IV

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.5 SAR measurement Result of UMTS Band V(Second Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Left Hand Touched	4182/836.4	RMC	0.651	0.354	0.120	21.80	22.00	0.682	21.4°C
Left Hand Tilted 15°	4182/836.4	RMC	0.580	0.299	-0.030	21.80	22.00	0.607	21.4°C
Right Hand Touched	4182/836.4	RMC	0.680	0.403	0.020	21.80	22.00	0.712	21.4°C
Right Hand Tilted 15°	4182/836.4	RMC	0.633	0.333	0.170	21.80	22.00	0.663	21.4°C
Right Hand Touched	4132/826.4	RMC	0.653	0.381	0.080	21.60	22.00	0.716	21.4°C
Right Hand Touched	4233/846.6	RMC	0.759	0.448	-0.010	21.66	22.00	0.821	21.4°C
Tested at the worst position with battery 2#									
Right Hand Touched	4233/846.6	RMC	0.586	0.341	0.090	21.66	22.00	0.634	21.4°C

Table 57: Head SAR test results of UMTS Band V

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	4182/836.4	RMC	0.089	0.060	0.040	21.80	22.00	0.093	21.4°C
Back Side	4182/836.4	RMC	0.111	0.078	-0.030	21.80	22.00	0.116	21.4°C
Tested at the worst position with battery 2#									
Back Side	4182/836.4	RMC	0.074	0.050	0.060	21.80	22.00	0.077	21.4°C

Table 58: Body-Worn SAR test results of UMTS Band V

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	4182/836.4	RMC	0.111	0.065	0.060	21.80	22.00	0.116	21.4°C
Back Side	4182/836.4	RMC	0.123	0.072	0.040	21.80	22.00	0.129	21.4°C
Left Side	4182/836.4	RMC	0.098	0.065	0.030	21.80	22.00	0.102	21.4°C
Right Side	4182/836.4	RMC	0.021	0.013	0.120	21.80	22.00	0.022	21.4°C
Top Side	4182/836.4	RMC	0.106	0.053	-0.100	21.80	22.00	0.111	21.4°C
Tested at the worst position with battery 2#									
Back Side	4182/836.4	RMC	0.107	0.062	0.100	21.80	22.00	0.112	21.4°C

Table 59: Hotspot SAR test results of UMTS Band V

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.6 SAR measurement Result of LTE Band II(Second Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Left Hand Touched	19100/1900	20M QPSK 1RB#50	0.448	0.221	0.020	16.31	17.00	0.525	21.5°C
Left Hand Tilted 15°	19100/1900	20M QPSK 1RB#50	0.398	0.200	-0.110	16.31	17.00	0.467	21.5°C
Right Hand Touched	19100/1900	20M QPSK 1RB#50	0.527	0.257	0.080	16.31	17.00	0.618	21.5°C
Right Hand Tilted 15°	19100/1900	20M QPSK 1RB#50	0.571	0.273	0.010	16.31	17.00	0.669	21.5°C
Right Hand Tilted 15°	18700/1860	20M QPSK 1RB#50	0.611	0.291	-0.160	16.24	17.00	0.728	21.5°C
Right Hand Tilted 15°	18900/1880	20M QPSK 1RB#99	0.572	0.273	0.190	16.21	17.00	0.686	21.5°C
50%RB									
Left Hand Touched	19100/1900	20M QPSK 50%RB#0	0.298	0.152	0.060	15.14	16.00	0.363	21.5°C
Left Hand Tilted 15°	19100/1900	20M QPSK 50%RB#0	0.358	0.179	-0.070	15.14	16.00	0.436	21.5°C
Right Hand Touched	19100/1900	20M QPSK 50%RB#0	0.381	0.205	-0.010	15.14	16.00	0.464	21.5°C
Right Hand Tilted 15°	19100/1900	20M QPSK 50%RB#0	0.489	0.234	0.110	15.14	16.00	0.596	21.5°C
Tested at the worst position with battery 2#									
Right Hand Tilted 15°	18700/1860	20M QPSK 1RB#50	0.480	0.224	-0.030	16.24	17.00	0.572	21.5°C

Table 60: Head SAR test results of LTE Band II

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	19100/1900	20M QPSK 1RB#50	0.096	0.055	0.180	16.31	17.00	0.112	21.4°C
Back Side	19100/1900	20M QPSK 1RB#50	0.108	0.061	0.140	16.31	17.00	0.127	21.4°C
50%RB									
Front Side	19100/1900	20M QPSK 50%RB#0	0.073	0.040	0.120	15.14	16.00	0.089	21.4°C
Back Side	19100/1900	20M QPSK 50%RB#0	0.084	0.047	0.160	15.14	16.00	0.103	21.4°C
Tested at the worst position with battery 2#									
Back Side	19100/1900	20M QPSK 1RB#50	0.087	0.047	0.160	16.31	17.00	0.102	21.4°C

Table 61: Body-Worn SAR test results of LTE Band II

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	19100/1900	20M QPSK 1RB#50	0.122	0.066	0.040	16.31	17.00	0.143	21.4°C
Back Side	19100/1900	20M QPSK 1RB#50	0.117	0.063	0.120	16.31	17.00	0.137	21.4°C
Left Side	19100/1900	20M QPSK 1RB#50	0.033	0.016	0.160	16.31	17.00	0.038	21.4°C
Right Side	19100/1900	20M QPSK 1RB#50	0.009	0.005	0.110	16.31	17.00	0.011	21.4°C
Top Side	19100/1900	20M QPSK 1RB#50	0.227	0.113	0.190	16.31	17.00	0.266	21.4°C
50%RB									
Front Side	19100/1900	20M QPSK 50%RB#0	0.097	0.052	0.140	15.14	16.00	0.118	21.4°C
Back Side	19100/1900	20M QPSK 50%RB#0	0.094	0.050	0.110	15.14	16.00	0.114	21.4°C
Left Side	19100/1900	20M QPSK 50%RB#0	0.029	0.014	0.120	15.14	16.00	0.035	21.4°C
Right Side	19100/1900	20M QPSK 50%RB#0	0.009	0.005	0.140	15.14	16.00	0.011	21.4°C
Top Side	19100/1900	20M QPSK 50%RB#0	0.184	0.092	0.100	15.14	16.00	0.224	21.4°C
Tested at the worst position with battery 2#									
Top Side	19100/1900	20M QPSK 1RB#50	0.180	0.090	0.140	16.31	17.00	0.211	21.4°C

Table 62: Hotspot SAR test results of LTE Band II

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.7 SAR measurement Result of LTE Band IV(Second Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Left Hand Touched	20175/1732.5	20M QPSK 1RB#50	0.266	0.144	-0.080	15.07	16.00	0.330	21.4°C
Left Hand Tilted 15°	20175/1732.5	20M QPSK 1RB#50	0.306	0.164	0.110	15.07	16.00	0.379	21.4°C
Right Hand Touched	20175/1732.5	20M QPSK 1RB#50	0.385	0.189	-0.010	15.07	16.00	0.477	21.4°C
Right Hand Tilted 15°	20175/1732.5	20M QPSK 1RB#50	0.429	0.208	0.170	15.07	16.00	0.531	21.4°C
Right Hand Tilted 15°	20050/1720	20M QPSK 1RB#0	0.499	0.241	0.060	15.04	16.00	0.622	21.4°C
Right Hand Tilted 15°	20300/1745	20M QPSK 1RB#50	0.502	0.237	-0.180	15.05	16.00	0.625	21.4°C
50%RB									
Left Hand Touched	20300/1745	20M QPSK 50%RB#0	0.225	0.122	0.110	14.18	15.00	0.272	21.4°C
Left Hand Tilted 15°	20300/1745	20M QPSK 50%RB#0	0.246	0.131	0.090	14.18	15.00	0.297	21.4°C
Right Hand Touched	20300/1745	20M QPSK 50%RB#0	0.341	0.181	0.170	14.18	15.00	0.412	21.4°C
Right Hand Tilted 15°	20300/1745	20M QPSK 50%RB#0	0.361	0.185	0.130	14.18	15.00	0.436	21.4°C
Tested at the worst position with battery 2#									
Right Hand Tilted 15°	20300/1745	20M QPSK 1RB#50	0.460	0.210	0.020	15.05	16.00	0.572	21.4°C

Table 63: Head SAR test results of LTE Band IV

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	20175/1732.5	20M QPSK 1RB#50	0.110	0.063	0.170	15.07	16.00	0.136	21.4°C
Back Side	20175/1732.5	20M QPSK 1RB#50	0.110	0.062	-0.140	15.07	16.00	0.136	21.4°C
50%RB									
Front Side	20300/1745	20M QPSK 50%RB#0	0.072	0.040	0.180	14.18	15.00	0.086	21.4°C
Back Side	20300/1745	20M QPSK 50%RB#0	0.101	0.056	-0.070	14.18	15.00	0.122	21.4°C
Tested at the worst position with battery 2#									
Front Side	20175/1732.5	20M QPSK 1RB#50	0.103	0.058	-0.090	15.07	16.00	0.128	21.4°C

Table 64: Body-Worn SAR test results of LTE Band IV

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	20175/1732.5	20M QPSK 1RB#50	0.212	0.116	0.170	15.07	16.00	0.263	21.4°C
Back Side	20175/1732.5	20M QPSK 1RB#50	0.238	0.126	0.040	15.07	16.00	0.295	21.4°C
Left Side	20175/1732.5	20M QPSK 1RB#50	0.066	0.033	0.080	15.07	16.00	0.081	21.4°C
Right Side	20175/1732.5	20M QPSK 1RB#50	0.016	0.009	0.160	15.07	16.00	0.019	21.4°C
Top Side	20175/1732.5	20M QPSK 1RB#50	0.344	0.171	0.150	15.07	16.00	0.426	21.4°C
50%RB									
Front Side	20300/1745	20M QPSK 50%RB#0	0.165	0.089	0.130	14.18	15.00	0.199	21.4°C
Back Side	20300/1745	20M QPSK 50%RB#0	0.185	0.098	0.190	14.18	15.00	0.223	21.4°C
Left Side	20300/1745	20M QPSK 50%RB#0	0.048	0.025	0.110	14.18	15.00	0.058	21.4°C
Right Side	20300/1745	20M QPSK 50%RB#0	0.011	0.006	0.160	14.18	15.00	0.013	21.4°C
Top Side	20300/1745	20M QPSK 50%RB#0	0.278	0.137	0.100	14.18	15.00	0.336	21.4°C
Tested at the worst position with battery 2#									
Top Side	20175/1732.5	20M QPSK 1RB#50	0.382	0.187	-0.120	15.07	16.00	0.473	21.4°C

Table 65: Hotspot SAR test results of LTE Band IV

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.8 SAR measurement Result of LTE Band V(Second Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Left Hand Touched	20525/836.5	10M QPSK 1RB#25	0.365	0.196	0.040	20.44	20.50	0.370	21.4°C
Left Hand Tilted 15°	20525/836.5	10M QPSK 1RB#25	0.273	0.140	-0.020	20.44	20.50	0.277	21.4°C
Right Hand Touched	20525/836.5	10M QPSK 1RB#25	0.358	0.205	0.060	20.44	20.50	0.363	21.4°C
Right Hand Tilted 15°	20525/836.5	10M QPSK 1RB#25	0.245	0.131	-0.030	20.44	20.50	0.248	21.4°C
Left Hand Touched	20450/829	10M QPSK 1RB#49	0.359	0.193	0.020	20.37	20.50	0.370	21.4°C
Left Hand Touched	20600/844	10M QPSK 1RB#49	0.319	0.172	0.080	20.42	20.50	0.325	21.4°C
50%RB									
Left Hand Touched	20525/836.5	10M QPSK 50%RB#13	0.281	0.150	0.060	19.17	19.50	0.303	21.4°C
Left Hand Tilted 15°	20525/836.5	10M QPSK 50%RB#13	0.216	0.111	0.070	19.17	19.50	0.233	21.4°C
Right Hand Touched	20525/836.5	10M QPSK 50%RB#13	0.263	0.152	-0.020	19.17	19.50	0.284	21.4°C
Right Hand Tilted 15°	20525/836.5	10M QPSK 50%RB#13	0.215	0.109	0.100	19.17	19.50	0.232	21.4°C
Tested at the worst position with battery 2#									
Left Hand Touched	20525/836.5	10M QPSK 1RB#25	0.293	0.158	0.190	20.44	20.50	0.297	21.4°C

Table 66: Head SAR test results of LTE Band V

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	20525/836.5	10M QPSK 1RB#25	0.077	0.053	0.130	20.44	20.50	0.078	21.4°C
Back Side	20525/836.5	10M QPSK 1RB#25	0.089	0.064	-0.020	20.44	20.50	0.090	21.4°C
50%RB									
Front Side	20525/836.5	10M QPSK 50%RB#13	0.055	0.037	0.020	19.17	19.50	0.059	21.4°C
Back Side	20525/836.5	10M QPSK 50%RB#13	0.068	0.046	-0.010	19.17	19.50	0.073	21.4°C
Tested at the worst position with battery 2#									
Back Side	20525/836.5	10M QPSK 1RB#25	0.061	0.044	0.120	20.44	20.50	0.061	21.4°C

Table 67: Body-Worn SAR test results of LTE Band V

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	20525/836.5	10M QPSK 1RB#25	0.118	0.082	-0.110	20.44	20.50	0.120	21.4°C
Back Side	20525/836.5	10M QPSK 1RB#25	0.173	0.098	0.090	20.44	20.50	0.175	21.4°C
Left Side	20525/836.5	10M QPSK 1RB#25	0.091	0.061	0.110	20.44	20.50	0.092	21.4°C
Right Side	20525/836.5	10M QPSK 1RB#25	0.022	0.015	0.030	20.44	20.50	0.022	21.4°C
Top Side	20525/836.5	10M QPSK 1RB#25	0.072	0.042	-0.080	20.44	20.50	0.073	21.4°C
50%RB									
Front Side	20525/836.5	10M QPSK 50%RB#13	0.085	0.055	0.070	19.17	19.50	0.091	21.4°C
Back Side	20525/836.5	10M QPSK 50%RB#13	0.114	0.072	-0.050	19.17	19.50	0.123	21.4°C
Left Side	20525/836.5	10M QPSK 50%RB#13	0.075	0.050	0.030	19.17	19.50	0.081	21.4°C
Right Side	20525/836.5	10M QPSK 50%RB#13	0.016	0.011	0.010	19.17	19.50	0.017	21.4°C
Top Side	20525/836.5	10M QPSK 50%RB#13	0.057	0.033	-0.060	19.17	19.50	0.061	21.4°C
Tested at the worst position with battery 2#									
Back Side	20525/836.5	10M QPSK 1RB#25	0.115	0.065	0.040	20.44	20.50	0.117	21.4°C

Table 68: Hotspot SAR test results of LTE Band V

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.9 SAR measurement Result of LTE Band VII(Second Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Left Hand Touched	21100/2535	20M QPSK 1RB#0	0.557	0.257	0.170	14.47	15.00	0.629	21.7°C
Left Hand Tilted 15°	21100/2535	20M QPSK 1RB#0	0.646	0.287	-0.040	14.47	15.00	0.730	21.7°C
Right Hand Touched	21100/2535	20M QPSK 1RB#0	0.792	0.380	0.120	14.47	15.00	0.895	21.7°C
Right Hand Touched	20850/2510	20M QPSK 1RB#50	0.719	0.345	0.060	14.38	15.00	0.829	21.7°C
Right Hand Touched	21350/2560	20M QPSK 1RB#0	0.786	0.366	0.060	14.36	15.00	0.911	21.7°C
Right Hand Tilted 15°	21100/2535	20M QPSK 1RB#0	0.590	0.286	0.000	14.47	15.00	0.667	21.7°C
50%RB									
Left Hand Touched	21100/2535	20M QPSK 50%RB#0	0.417	0.199	0.050	13.33	14.00	0.487	21.7°C
Left Hand Tilted 15°	21100/2535	20M QPSK 50%RB#0	0.512	0.226	0.060	13.33	14.00	0.597	21.7°C
Right Hand Touched	21100/2535	20M QPSK 50%RB#0	0.574	0.270	0.080	13.33	14.00	0.670	21.7°C
Right Hand Tilted 15°	21100/2535	20M QPSK 50%RB#0	0.455	0.218	0.060	13.33	14.00	0.531	21.7°C
100%RB									
Right Hand Touched	21100/2535	20M QPSK 100%RB#0	0.558	0.261	0.030	13.26	14.00	0.662	21.7°C
Tested at the worst position with battery 2#									
Right Hand Touched	21350/2560	20M QPSK 1RB#0	0.793	0.358	-0.110	14.36	15.00	0.919	21.7°C

Table 69: Head SAR test results of LTE Band VII

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	21100/2535	20M QPSK 1RB#0	0.086	0.049	0.110	14.47	15.00	0.098	21.5°C
Back Side	21100/2535	20M QPSK 1RB#0	0.067	0.039	-0.110	14.47	15.00	0.075	21.5°C
50%RB									
Front Side	21100/2535	20M QPSK 50%RB#0	0.066	0.037	-0.170	13.33	14.00	0.077	21.5°C
Back Side	21100/2535	20M QPSK 50%RB#0	0.055	0.032	-0.120	13.33	14.00	0.065	21.5°C
Tested at the worst position with battery 2#									
Front Side	21100/2535	20M QPSK 1RB#0	0.068	0.272	-0.040	14.47	15.00	0.077	21.5°C

Table 70: Body-Worn SAR test results of LTE Band VII

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	21100/2535	20M QPSK 1RB#0	0.152	0.083	0.190	14.47	15.00	0.172	21.5°C
Back Side	21100/2535	20M QPSK 1RB#0	0.127	0.071	0.150	14.47	15.00	0.143	21.5°C
Left Side	21100/2535	20M QPSK 1RB#0	0.094	0.039	0.030	14.47	15.00	0.106	21.5°C
Right Side	21100/2535	20M QPSK 1RB#0	0.012	0.004	0.080	14.47	15.00	0.013	21.5°C
Top Side	21100/2535	20M QPSK 1RB#0	0.269	0.139	-0.110	14.47	15.00	0.304	21.5°C
50%RB									
Front Side	21100/2535	20M QPSK 50%RB#0	0.114	0.062	0.150	13.33	14.00	0.133	21.5°C
Back Side	21100/2535	20M QPSK 50%RB#0	0.110	0.060	0.110	13.33	14.00	0.128	21.5°C
Left Side	21100/2535	20M QPSK 50%RB#0	0.073	0.030	0.040	13.33	14.00	0.085	21.5°C
Right Side	21100/2535	20M QPSK 50%RB#0	0.012	0.005	0.040	13.33	14.00	0.014	21.5°C
Top Side	21100/2535	20M QPSK 50%RB#0	0.193	0.100	0.010	13.33	14.00	0.225	21.5°C
Tested at the worst position with battery 2#									
Top Side	21100/2535	20M QPSK 1RB#0	0.152	0.077	0.090	14.47	15.00	0.172	21.5°C

Table 71: Hotspot SAR test results of LTE Band VII

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.10 SAR measurement Result of LTE Band XII(Second Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Left Hand Touched	23095/707.5	10M QPSK 1RB#25	0.591	0.320	-0.150	21.78	22.50	0.698	21.4°C
Left Hand Tilted 15°	23095/707.5	10M QPSK 1RB#25	0.532	0.278	0.060	21.78	22.50	0.628	21.4°C
Right Hand Touched	23095/707.5	10M QPSK 1RB#25	0.563	0.328	0.100	21.78	22.50	0.665	21.4°C
Right Hand Tilted 15°	23095/707.5	10M QPSK 1RB#25	0.534	0.275	0.080	21.78	22.50	0.630	21.4°C
Left Hand Touched	23060/704	10M QPSK 1RB#49	0.570	0.312	-0.120	21.71	22.50	0.684	21.4°C
Left Hand Touched	23130/711	10M QPSK 1RB#0	0.618	0.339	0.050	21.62	22.50	0.757	21.4°C
50%RB									
Left Hand Touched	23130/711	10M QPSK 50%RB#0	0.484	0.264	-0.060	20.56	21.50	0.601	21.4°C
Left Hand Tilted 15°	23130/711	10M QPSK 50%RB#0	0.427	0.222	0.010	20.56	21.50	0.530	21.4°C
Right Hand Touched	23130/711	10M QPSK 50%RB#0	0.448	0.259	-0.010	20.56	21.50	0.556	21.4°C
Right Hand Tilted 15°	23130/711	10M QPSK 50%RB#0	0.436	0.226	0.020	20.56	21.50	0.541	21.4°C
Tested at the worst position with battery 2#									
Left Hand Touched	23130/711	10M QPSK 1RB#0	0.580	0.319	0.040	21.62	22.50	0.710	21.4°C

Table 72: Head SAR test results of LTE Band XII

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	23095/707.5	10M QPSK 1RB#25	0.109	0.078	-0.030	21.78	22.50	0.129	21.6°C
Back Side	23095/707.5	10M QPSK 1RB#25	0.120	0.084	0.040	21.78	22.50	0.142	21.6°C
50%RB									
Front Side	23130/711	10M QPSK 50%RB#0	0.094	0.067	-0.010	20.56	21.50	0.116	21.6°C
Back Side	23130/711	10M QPSK 50%RB#0	0.105	0.072	0.020	20.56	21.50	0.130	21.6°C
Tested at the worst position with battery 2#									
Back Side	23095/707.5	10M QPSK 1RB#25	0.104	0.073	0.150	21.78	22.50	0.123	21.6°C

Table 73: Body-Worn SAR test results of LTE Band XII

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	23095/707.5	10M QPSK 1RB#25	0.178	0.104	0.000	21.78	22.50	0.210	21.6°C
Back Side	23095/707.5	10M QPSK 1RB#25	0.195	0.115	-0.050	21.78	22.50	0.230	21.6°C
Left Side	23095/707.5	10M QPSK 1RB#25	0.076	0.052	-0.040	21.78	22.50	0.089	21.6°C
Right Side	23095/707.5	10M QPSK 1RB#25	0.044	0.030	-0.040	21.78	22.50	0.052	21.6°C
Top Side	23095/707.5	10M QPSK 1RB#25	0.145	0.074	-0.140	21.78	22.50	0.171	21.6°C
50%RB									
Front Side	23130/711	10M QPSK 50%RB#0	0.146	0.086	-0.080	20.56	21.50	0.181	21.6°C
Back Side	23130/711	10M QPSK 50%RB#0	0.167	0.109	0.040	20.56	21.50	0.207	21.6°C
Left Side	23130/711	10M QPSK 50%RB#0	0.066	0.045	-0.190	20.56	21.50	0.082	21.6°C
Right Side	23130/711	10M QPSK 50%RB#0	0.038	0.025	-0.020	20.56	21.50	0.047	21.6°C
Top Side	23130/711	10M QPSK 50%RB#0	0.110	0.058	-0.190	20.56	21.50	0.137	21.6°C
Tested at the worst position with battery 2#									
Back Side	23095/707.5	10M QPSK 1RB#25	0.159	0.102	0.130	21.78	22.50	0.188	21.6°C

Table 74: Hotspot SAR test results of LTE Band XII

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.11 SAR measurement Result of LTE Band XVII(Second Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Left Hand Touched	23800/711	10M QPSK 1RB#0	0.678	0.369	-0.040	22.09	22.50	0.745	21.4°C
Left Hand Tilted 15°	23800/711	10M QPSK 1RB#0	0.413	0.263	0.010	22.09	22.50	0.454	21.4°C
Right Hand Touched	23800/711	10M QPSK 1RB#0	0.636	0.365	0.050	22.09	22.50	0.699	21.4°C
Right Hand Tilted 15°	23800/711	10M QPSK 1RB#0	0.537	0.273	0.120	22.09	22.50	0.590	21.4°C
Left Hand Touched	23780/709	10M QPSK 1RB#0	0.600	0.322	0.070	22.04	22.50	0.667	21.4°C
Left Hand Touched	23790/710	10M QPSK 1RB#0	0.586	0.318	0.090	22.08	22.50	0.646	21.4°C
50%RB									
Left Hand Touched	23780/709	10M QPSK 50%RB#0	0.533	0.291	0.010	20.92	22.00	0.683	21.4°C
Left Hand Tilted 15°	23780/709	10M QPSK 50%RB#0	0.416	0.265	0.000	20.92	22.00	0.533	21.4°C
Right Hand Touched	23780/709	10M QPSK 50%RB#0	0.477	0.271	-0.050	20.92	22.00	0.612	21.4°C
Right Hand Tilted 15°	23780/709	10M QPSK 50%RB#0	0.426	0.217	0.010	20.92	22.00	0.546	21.4°C
Tested at the worst position with battery 2#									
Left Hand Touched	23800/711	10M QPSK 1RB#0	0.564	0.307	-0.020	22.09	22.50	0.620	21.4°C

Table 75: Head SAR test results of LTE Band XVII

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	23800/711	10M QPSK 1RB#0	0.118	0.085	0.110	22.09	22.50	0.130	21.4°C
Back Side	23800/711	10M QPSK 1RB#0	0.146	0.101	0.140	22.09	22.50	0.160	21.4°C
50%RB									
Front Side	23800/711	10M QPSK 50%RB#0	0.094	0.067	0.060	20.92	22.00	0.121	21.4°C
Back Side	23800/711	10M QPSK 50%RB#0	0.118	0.082	0.060	20.92	22.00	0.151	21.4°C
Tested at the worst position with battery 2#									
Back Side	23800/711	10M QPSK 1RB#0	0.130	0.901	-0.010	22.09	22.50	0.143	21.4°C

Table 76: Body-Worn SAR test results of LTE Band XVII

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	23800/711	10M QPSK 1RB#0	0.199	0.130	0.110	22.09	22.50	0.219	21.4°C
Back Side	23800/711	10M QPSK 1RB#0	0.258	0.148	-0.010	22.09	22.50	0.284	21.4°C
Left Side	23800/711	10M QPSK 1RB#0	0.080	0.055	-0.040	22.09	22.50	0.088	21.4°C
Right Side	23800/711	10M QPSK 1RB#0	0.039	0.026	0.090	22.09	22.50	0.043	21.4°C
Top Side	23800/711	10M QPSK 1RB#0	0.130	0.075	-0.160	22.09	22.50	0.143	21.4°C
50%RB									
Front Side	23800/711	10M QPSK 50%RB#0	0.152	0.100	0.190	20.92	22.00	0.195	21.4°C
Back Side	23800/711	10M QPSK 50%RB#0	0.196	0.128	0.080	20.92	22.00	0.251	21.4°C
Left Side	23800/711	10M QPSK 50%RB#0	0.073	0.050	-0.040	20.92	22.00	0.093	21.4°C
Right Side	23800/711	10M QPSK 50%RB#0	0.032	0.021	0.080	20.92	22.00	0.041	21.4°C
Top Side	23800/711	10M QPSK 50%RB#0	0.103	0.060	-0.060	20.92	22.00	0.132	21.4°C
Tested at the worst position with battery 2#									
Back Side	23800/711	10M QPSK 1RB#0	0.241	0.139	0.000	22.09	22.50	0.265	21.4°C

Table 77: Hotspot SAR test results of LTE Band XVII

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.12 SAR measurement Result of GSM850(Main Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Left Hand Touched	190/836.6	GSM	0.131	0.101	0.020	32.77	33.50	0.155	21.4°C
Left Hand Tilted 15°	190/836.6	GSM	0.064	0.045	0.170	32.77	33.50	0.075	21.4°C
Right Hand Touched	190/836.6	GSM	0.137	0.107	0.160	32.77	33.50	0.162	21.4°C
Right Hand Tilted 15°	190/836.6	GSM	0.072	0.050	0.130	32.77	33.50	0.085	21.4°C
Right Hand Touched	128/824.2	GSM	0.093	0.073	0.130	32.49	33.50	0.117	21.4°C
Right Hand Touched	251/848.8	GSM	0.166	0.129	0.070	32.95	33.50	0.188	21.4°C
Tested at the worst position with SIM2									
Right Hand Touched	251/848.8	GSM	0.189	0.144	-0.130	32.95	33.50	0.215	21.4°C
Tested at the worst position with battery 2#									
Right Hand Touched	251/848.8	GSM	0.174	0.131	0.140	32.95	33.50	0.197	21.4°C

Table 78: Head SAR test results of GSM850

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	190/836.6	GSM	0.151	0.117	0.000	32.77	33.50	0.179	21.4°C
Back Side	190/836.6	GSM	0.187	0.144	-0.020	32.77	33.50	0.221	21.4°C
Tested at the worst position with SIM2									
Back Side	190/836.6	GSM	0.190	0.147	-0.030	32.77	33.50	0.225	21.4°C
Tested at the worst position with battery 2#									
Back Side	190/836.6	GSM	0.221	0.170	-0.030	32.77	33.50	0.261	21.4°C

Table 79: Body-Worn SAR test results of GSM850

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	190/836.6	GPRS 2TS	0.154	0.119	-0.050	29.02	30.50	0.217	21.4°C
Back Side	190/836.6	GPRS 2TS	0.189	0.148	0.000	29.02	30.50	0.266	21.4°C
Left Side	190/836.6	GPRS 2TS	0.172	0.117	0.030	29.02	30.50	0.242	21.4°C
Right Side	190/836.6	GPRS 2TS	0.198	0.135	-0.090	29.02	30.50	0.278	21.4°C
Bottom Side	190/836.6	GPRS 2TS	0.073	0.040	0.010	29.02	30.50	0.102	21.4°C
Tested at the worst position with SIM2									
Right Side	190/836.6	GPRS 2TS	0.207	0.141	0.010	29.02	30.50	0.291	21.4°C
Tested at the worst position with battery 2#									
Right Side	190/836.6	GPRS 2TS	0.228	0.156	-0.190	29.02	30.50	0.321	21.4°C

Table 80: Hotspot SAR test results of GSM850

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.13 SAR measurement Result of GSM1900(Main Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Left Hand Touched	661/1880	GSM	0.062	0.039	0.170	29.62	30.50	0.076	21.5°C
Left Hand Tilted 15°	661/1880	GSM	0.033	0.017	0.030	29.62	30.50	0.040	21.5°C
Right Hand Touched	661/1880	GSM	0.036	0.022	0.190	29.62	30.50	0.044	21.5°C
Right Hand Tilted 15°	661/1880	GSM	0.031	0.018	0.170	29.62	30.50	0.038	21.5°C
Left Hand Touched	512/1850.2	GSM	0.064	0.041	-0.010	29.83	30.50	0.075	21.5°C
Left Hand Touched	810/1909.8	GSM	0.085	0.053	0.080	29.80	30.50	0.100	21.5°C
Tested at the worst position with SIM2									
Left Hand Touched	810/1909.8	GSM	0.100	0.062	0.090	29.80	30.50	0.117	21.5°C
Tested at the worst position with battery 2#									
Left Hand Touched	810/1909.8	GSM	0.090	0.057	0.180	29.80	30.50	0.105	21.5°C

Table 81: Head SAR test results of GSM1900

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	661/1880	GSM	0.216	0.125	0.130	29.62	30.50	0.265	21.4°C
Back Side	661/1880	GSM	0.264	0.152	0.140	29.62	30.50	0.323	21.4°C
Tested at the worst position with SIM2									
Back Side	661/1880	GSM	0.294	0.168	0.040	29.62	30.50	0.360	21.4°C
Tested at the worst position with battery 2#									
Back Side	661/1880	GSM	0.348	0.200	0.100	29.62	30.50	0.426	21.4°C

Table 82: Body-Worn SAR test results of GSM1900

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	661/1880	GPRS 2TS	0.137	0.076	0.000	25.30	25.50	0.143	21.4°C
Back Side	661/1880	GPRS 2TS	0.165	0.092	0.070	25.30	25.50	0.173	21.4°C
Left Side	661/1880	GPRS 2TS	0.065	0.036	-0.100	25.30	25.50	0.068	21.4°C
Right Side	661/1880	GPRS 2TS	0.034	0.019	0.160	25.30	25.50	0.036	21.4°C
Bottom Side	661/1880	GPRS 2TS	0.648	0.340	-0.190	25.30	25.50	0.679	21.4°C
Tested at the worst position with SIM2									
Bottom Side	661/1880	GPRS 2TS	0.668	0.351	-0.040	25.30	25.50	0.699	21.1°C
Tested at the worst position with battery 2#									
Bottom Side	661/1880	GPRS 2TS	0.784	0.410	-0.130	25.30	25.50	0.821	21.4°C
Bottom Side	512/1850.2	GPRS 2TS	0.637	0.336	0.150	25.48	25.50	0.640	21.4°C
Bottom Side	810/1909.8	GPRS 2TS	1.100	0.571	-0.090	25.49	25.50	1.103	21.4°C
Bottom Side-repeated	810/1909.8	GPRS 2TS	1.130	0.593	0.120	25.49	25.50	1.133	21.4°C

Table 83: Hotspot SAR test results of GSM1900

Per KDB648474D04, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold:

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	10-g Extremity SAR Exclusion
			1-g	10-g					
Test data with battery 1#									
Front Side	661/1880	GPRS 2TS	0.137	0.076	0.000	25.30	27.50	0.227	NO
Back Side	661/1880	GPRS 2TS	0.165	0.092	0.070	25.30	27.50	0.274	NO
Left Side	661/1880	GPRS 2TS	0.065	0.036	-0.100	25.30	27.50	0.107	NO
Right Side	661/1880	GPRS 2TS	0.034	0.019	0.160	25.30	27.50	0.057	NO
Bottom Side	661/1880	GPRS 2TS	0.648	0.340	-0.190	25.30	27.50	1.075	NO
Front Side	661/1880	GPRS 2TS	0.137	0.076	0.000	25.30	27.50	0.227	NO
Tested at the worst position with SIM2									
Bottom Side	661/1880	GPRS 2TS	0.668	0.351	-0.040	25.30	27.50	1.109	NO
Tested at the Worst position with battery 2#									
Bottom Side	661/1880	GPRS 2TS	0.784	0.410	-0.130	25.30	27.50	1.301	Yes
Bottom Side	512/1850.2	GPRS 2TS	0.637	0.336	0.150	25.48	27.50	1.014	NO
Bottom Side	810/1909.8	GPRS 2TS	1.100	0.571	-0.090	25.49	27.50	1.747	Yes
Bottom Side-repeated	810/1909.8	GPRS 2TS	1.130	0.593	0.120	25.49	27.50	1.795	Yes

Table 84: 10-g Extremity SAR test reduction evaluation of GSM1900

Note : According to the table above , 10-g Extremity SAR test is required for this frequency band.

According to the table above , only **bottom side** 10-g Extremity SAR test are required for this frequency band:

Test Position of 10-g Extremity with 0mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled 10-g SAR (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Bottom Side	661/1880	GPRS 2TS	3.570	1.490	0.150	26.46	27.50	1.893	21.4°C
Bottom Side	512/1850.2	GPRS 2TS	3.270	1.400	0.110	26.27	27.50	1.858	21.4°C
Bottom Side	810/1909.8	GPRS 2TS	0.341	1.400	0.160	26.46	27.50	1.779	21.4°C
Tested at the worst position with SIM2									
Bottom Side	661/1880	GPRS 2TS	3.570	1.500	0.160	26.46	27.50	1.906	21.4°C
Tested at the Worst position with battery 2#									
Bottom Side	661/1880	GPRS 2TS	3.340	1.400	0.110	26.46	27.50	1.779	21.4°C

Table 85: 10-g Extremity SAR test results of GSM1900

7.2.14 SAR measurement Result of UMTS Band II(Main Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Left Hand Touched	9400/1880	RMC	0.206	0.129	0.130	23.11	23.50	0.225	21.5°C
Left Hand Tilted 15°	9400/1880	RMC	0.094	0.051	0.110	23.11	23.50	0.103	21.5°C
Right Hand Touched	9400/1880	RMC	0.120	0.078	0.180	23.11	23.50	0.131	21.5°C
Right Hand Tilted 15°	9400/1880	RMC	0.110	0.067	0.180	23.11	23.50	0.120	21.5°C
Left Hand Touched	9262/1852.4	RMC	0.201	0.129	-0.130	23.02	23.50	0.224	21.5°C
Left Hand Touched	9538/1907.6	RMC	0.223	0.141	0.170	23.15	23.50	0.242	21.5°C
Tested at the worst position with battery 2#									
Left Hand Touched	9538/1907.6	RMC	0.161	0.094	0.040	23.15	23.50	0.175	21.5°C

Table 86: Head SAR test results of UMTS Band II

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	9400/1880	RMC	0.623	0.366	0.160	23.11	23.50	0.682	21.4°C
Back Side	9400/1880	RMC	0.754	0.441	-0.050	23.11	23.50	0.825	21.4°C
Back Side	9262/1852.4	RMC	0.730	0.429	-0.060	23.02	23.50	0.815	21.4°C
Back Side	9538/1907.6	RMC	0.774	0.451	0.080	23.15	23.50	0.839	21.4°C
Tested at the worst position with battery 2#									
Back Side	9538/1907.6	RMC	0.676	0.388	0.110	23.15	23.50	0.733	21.4°C

Table 87: Body-Worn SAR test results of UMTS Band II

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	9400/1880	RMC	0.219	0.119	0.120	19.55	20.00	0.243	21.4°C
Back Side	9400/1880	RMC	0.257	0.141	0.180	19.55	20.00	0.285	21.4°C
Left Side	9400/1880	RMC	0.046	0.025	0.190	19.55	20.00	0.051	21.4°C
Right Side	9400/1880	RMC	0.025	0.014	0.060	19.55	20.00	0.028	21.4°C
Bottom Side	9400/1880	RMC	0.464	0.243	-0.120	19.55	20.00	0.515	21.4°C
Tested at the worst position with battery 2#									
Bottom Side	9400/1880	RMC	0.561	0.291	-0.070	19.55	20.00	0.622	21.4°C

Table 88: Hotspot SAR test results of UMTS Band II

Per KDB648474D04, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold:

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	10-g Extremity SAR Exclusion
			1-g	10-g					
Test data with battery 1#									
Front Side	9400/1880	RMC	0.219	0.119	0.120	19.55	23.50	0.544	NO
Back Side	9400/1880	RMC	0.257	0.141	0.180	19.55	23.50	0.638	NO
Left Side	9400/1880	RMC	0.046	0.025	0.190	19.55	23.50	0.113	NO
Right Side	9400/1880	RMC	0.025	0.014	0.060	19.55	23.50	0.062	NO
Bottom Side	9400/1880	RMC	0.464	0.243	-0.120	19.55	23.50	1.152	NO
Tested at the Worst position with battery 2#									
Bottom Side	9400/1880	RMC	0.561	0.291	-0.070	19.55	23.50	1.393	Yes

Table 89: 10-g Extremity SAR test reduction evaluation of UMTS Band II

Note : According to the table above , 10-g Extremity SAR test is required for this frequency band.

According to the table above , only **bottom side** 10-g Extremity SAR test are required for this frequency band:

Test Position of 10-g Extremity with 0mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled 10-g SAR (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Bottom Side	9400/1880	RMC	6.670	2.710	-0.070	23.11	23.50	2.965	21.4°C
Bottom Side	9262/1852.4	RMC	6.710	2.780	-0.130	23.02	23.50	3.105	21.4°C
Bottom Side	9538/1907.6	RMC	6.790	2.720	-0.070	23.15	23.50	2.948	21.4°C
Tested at the Worst position with battery 2#									
Bottom Side	9262/1852.4	RMC	7.050	2.940	-0.080	23.02	23.50	3.284	21.4°C
Bottom Side-repeated	9262/1852.4	RMC	6.480	2.770	-0.010	23.02	23.50	3.094	21.4°C

Table 90: 10-g Extremity SAR test results of UMTS Band II

7.2.15 SAR measurement Result of UMTS Band IV(Main Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Left Hand Touched	1413/1732.6	RMC	0.270	0.173	0.040	23.26	23.50	0.285	21.7°C
Left Hand Tilted 15°	1413/1732.6	RMC	0.117	0.648	0.160	23.26	23.50	0.124	21.7°C
Right Hand Touched	1413/1732.6	RMC	0.156	0.100	0.100	23.26	23.50	0.165	21.7°C
Right Hand Tilted 15°	1413/1732.6	RMC	0.105	0.058	0.090	23.26	23.50	0.111	21.7°C
Left Hand Touched	1312/1712.4	RMC	0.310	0.197	0.010	23.27	23.50	0.327	21.7°C
Left Hand Touched	1513/1752.6	RMC	0.256	0.161	0.060	23.23	23.50	0.272	21.7°C
Tested at the worst position with battery 2#									
Left Hand Touched	1312/1712.4	RMC	0.217	0.139	0.160	23.27	23.50	0.229	21.7°C

Table 91: Head SAR test results of UMTS Band IV

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	1413/1732.6	RMC	0.564	0.328	0.120	23.26	23.50	0.596	21.4°C
Back Side	1413/1732.6	RMC	0.679	0.393	0.100	23.26	23.50	0.718	21.4°C
Tested at the worst position with battery 2#									
Back Side	1413/1732.6	RMC	0.814	0.469	0.150	23.26	23.50	0.860	21.4°C
Back Side- repeated	1413/1732.6	RMC	0.727	0.422	0.130	23.26	23.50	0.768	21.4°C
Back Side	1312/1712.4	RMC	0.763	0.448	0.170	23.27	23.50	0.804	21.4°C
Back Side	1513/1752.6	RMC	0.679	0.393	0.040	23.23	23.50	0.723	21.4°C

Table 92: Body-Worn SAR test results of UMTS Band IV

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	1413/1732.6	RMC	0.510	0.278	0.070	19.96	20.50	0.578	21.4°C
Back Side	1413/1732.6	RMC	0.568	0.312	0.050	19.96	20.50	0.643	21.4°C
Left Side	1413/1732.6	RMC	0.060	0.033	0.050	19.96	20.50	0.067	21.4°C
Right Side	1413/1732.6	RMC	0.048	0.026	-0.020	19.96	20.50	0.054	21.4°C
Bottom Side	1413/1732.6	RMC	1.140	0.596	-0.030	19.96	20.50	1.291	21.4°C
Bottom Side	1312/1712.4	RMC	1.090	0.569	0.040	20.05	20.50	1.209	21.4°C
Bottom Side	1513/1752.6	RMC	1.080	0.560	-0.200	19.87	20.50	1.249	21.4°C
Tested at the worst position with battery 2#									
Bottom Side	1413/1732.6	RMC	1.190	0.625	0.040	19.96	20.50	1.348	21.4°C
Bottom Side-repeated	1413/1732.6	RMC	1.240	0.643	-0.100	19.96	20.50	1.404	21.4°C

Table 93: Hotspot SAR test results of UMTS Band IV

Per KDB648474D04, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold:

Test Position of Hotspot with 10mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	10-g Extremity SAR Exclusion
			1-g	10-g					
Test data with battery 1#									
Front Side	1413/1732.6	RMC	0.510	0.278	0.070	19.96	23.50	1.152	NO
Back Side	1413/1732.6	RMC	0.568	0.312	0.050	19.96	23.50	1.283	Yes
Left Side	1413/1732.6	RMC	0.060	0.033	0.050	19.96	23.50	0.134	NO
Right Side	1413/1732.6	RMC	0.048	0.026	-0.020	19.96	23.50	0.108	NO
Bottom Side	1413/1732.6	RMC	1.140	0.596	-0.030	19.96	23.50	2.576	Yes
Bottom Side	1312/1712.4	RMC	1.090	0.569	0.040	20.05	23.50	2.412	Yes
Bottom Side	1513/1752.6	RMC	1.080	0.560	-0.200	19.87	23.50	2.491	Yes
Tested at the Worst position with battery 2#									
Bottom Side	1413/1732.6	RMC	1.190	0.625	0.040	19.96	23.50	2.689	Yes
Bottom Side-repeated	1413/1732.6	RMC	1.240	0.643	-0.100	19.96	23.50	2.802	Yes

Table 94: 10-g Extremity SAR test reduction evaluation of UMTS Band IV

Note : According to the table above , 10-g Extremity SAR test is required for this frequency band.

According to the table above , only **Back Side** and **bottom side** 10-g Extremity SAR test are required for this frequency band:

Test Position of 10-g Extremity with 0mm	Test channel /Freq.	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled 10-g SAR (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Back Side	1413/1732.6	RMC	6.680	3.090	0.020	23.26	23.50	3.266	22.3°C
Back Side	1312/1712.4	RMC	6.990	3.210	0.160	23.27	23.50	3.385	22.3°C
Back Side	1513/1752.6	RMC	6.230	2.890	0.070	23.23	23.50	3.075	22.3°C
Bottom Side	1413/1732.6	RMC	5.650	2.430	-0.060	23.26	23.50	2.568	22.3°C
Bottom Side	1312/1712.4	RMC	5.440	2.350	-0.060	23.27	23.50	2.478	22.3°C
Bottom Side	1513/1752.6	RMC	5.650	2.430	-0.010	23.23	23.50	2.586	22.3°C
Tested at the Worst position with battery 2#									
Back Side	1312/1712.4	RMC	7.130	3.290	0.180	23.27	23.50	3.469	22.3°C
Back Side-repeated	1312/1712.4	RMC	7.000	3.220	0.090	23.27	23.50	3.395	22.3°C

Table 95: 10-g Extremity SAR test results of UMTS Band IV

7.2.16 SAR measurement Result of UMTS Band V(Main Antenna)

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Left Hand Touched	4182/836.4	RMC	0.092	0.072	0.017	24.32	24.80	0.103	21.4°C
Left Hand Tilted 15°	4182/836.4	RMC	0.046	0.032	0.190	24.32	24.80	0.052	21.4°C
Right Hand Touched	4182/836.4	RMC	0.107	0.082	0.150	24.32	24.80	0.120	21.4°C
Right Hand Tilted 15°	4182/836.4	RMC	0.055	0.038	0.150	24.32	24.80	0.061	21.4°C
Right Hand Touched	4132/826.4	RMC	0.091	0.070	0.017	24.17	24.80	0.105	21.4°C
Right Hand Touched	4233/846.6	RMC	0.137	0.105	0.090	24.31	24.80	0.153	21.4°C
Tested at the worst position with battery 2#									
Right Hand Touched	4233/846.6	RMC	0.121	0.093	0.040	24.31	24.80	0.135	21.4°C

Table 96: Head SAR test results of UMTS Band V

Test Position of Body-Worn with 15mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	4182/836.4	RMC	0.105	0.081	0.100	24.32	24.80	0.117	21.4°C
Back Side	4182/836.4	RMC	0.221	0.171	0.050	24.32	24.80	0.247	21.4°C
Tested at the worst position with battery 2#									
Back Side	4182/836.4	RMC	0.100	0.077	0.080	24.32	24.80	0.111	21.4°C

Table 97: Body-Worn SAR test results of UMTS Band V

Test Position of Hotspot with 10mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
Front Side	4182/836.4	RMC	0.114	0.070	0.110	24.32	24.80	0.127	21.4°C
Back Side	4182/836.4	RMC	0.152	0.118	0.170	24.32	24.80	0.170	21.4°C
Left Side	4182/836.4	RMC	0.123	0.083	0.140	24.32	24.80	0.137	21.4°C
Right Side	4182/836.4	RMC	0.169	0.114	-0.030	24.32	24.80	0.189	21.4°C
Bottom Side	4182/836.4	RMC	0.042	0.026	-0.060	24.32	24.80	0.047	21.4°C
Tested at the worst position with battery 2#									
Right Side	4182/836.4	RMC	0.121	0.083	0.080	24.32	24.80	0.135	21.4°C

Table 98: Hotspot SAR test results of UMTS Band V

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.17 SAR measurement Result of LTE Band II(Main Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Left Hand Touched	19100/1900	20M QPSK 1RB#50	0.195	0.122	0.160	22.96	23.00	0.197	21.5°C
Left Hand Tilted 15°	19100/1900	20M QPSK 1RB#50	0.072	0.032	0.000	22.96	23.00	0.073	21.5°C
Right Hand Touched	19100/1900	20M QPSK 1RB#50	0.117	0.076	0.190	22.96	23.00	0.118	21.5°C
Right Hand Tilted 15°	19100/1900	20M QPSK 1RB#50	0.140	0.077	0.160	22.96	23.00	0.141	21.5°C
Left Hand Touched	18700/1860	20M QPSK 1RB#50	0.176	0.111	0.160	22.63	23.00	0.192	21.5°C
Left Hand Touched	18900/1880	20M QPSK 1RB#99	0.178	0.111	0.110	22.47	23.00	0.201	21.5°C
50%RB									
Left Hand Touched	19100/1900	20M QPSK 50%RB#0	0.152	0.095	0.150	21.46	22.00	0.172	21.5°C
Left Hand Tilted 15°	19100/1900	20M QPSK 50%RB#0	0.050	0.027	0.190	21.46	22.00	0.056	21.5°C
Right Hand Touched	19100/1900	20M QPSK 50%RB#0	0.096	0.061	0.080	21.46	22.00	0.108	21.5°C
Right Hand Tilted 15°	19100/1900	20M QPSK 50%RB#0	0.119	0.064	0.150	21.46	22.00	0.135	21.5°C
Tested at the worst position with battery 2#									
Left Hand Touched	18900/1880	20M QPSK 1RB#99	0.114	0.071	0.080	22.47	23.00	0.129	21.5°C

Table 99: Head SAR test results of LTE Band II

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	19100/1900	20M QPSK 1RB#50	0.610	0.355	-0.170	22.96	23.00	0.616	21.4°C
Back Side	19100/1900	20M QPSK 1RB#50	0.623	0.363	-0.010	22.96	23.00	0.629	21.4°C
50%RB									
Front Side	19100/1900	20M QPSK 50%RB#0	0.461	0.268	0.130	21.46	22.00	0.522	21.4°C
Back Side	19100/1900	20M QPSK 50%RB#0	0.490	0.285	-0.010	21.46	22.00	0.555	21.4°C
Tested at the worst position with battery 2#									
Back Side	19100/1900	20M QPSK 1RB#50	0.460	0.268	0.070	22.96	23.00	0.464	21.4°C

Table 100: Body-Worn SAR test results of LTE Band II

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	18700/1860	20M QPSK 1RB#50	0.267	0.146	0.030	18.85	19.50	0.310	21.4°C
Back Side	18700/1860	20M QPSK 1RB#50	0.231	0.129	0.180	18.85	19.50	0.268	21.4°C
Left Side	18700/1860	20M QPSK 1RB#50	0.064	0.035	0.180	18.85	19.50	0.074	21.4°C
Right Side	18700/1860	20M QPSK 1RB#50	0.026	0.015	0.160	18.85	19.50	0.031	21.4°C
Bottom Side	18700/1860	20M QPSK 1RB#50	0.578	0.303	0.030	18.85	19.50	0.671	21.4°C
50%RB									
Front Side	18700/1860	20M QPSK 50%RB#0	0.328	0.178	0.110	18.71	19.50	0.393	21.4°C
Back Side	18700/1860	20M QPSK 50%RB#0	0.295	0.162	-0.030	18.71	19.50	0.354	21.4°C
Left Side	18700/1860	20M QPSK 50%RB#0	0.062	0.035	0.110	18.71	19.50	0.074	21.4°C
Right Side	18700/1860	20M QPSK 50%RB#0	0.031	0.017	0.110	18.71	19.50	0.037	21.4°C
Bottom Side	18700/1860	20M QPSK 50%RB#0	0.576	0.302	-0.060	18.71	19.50	0.691	21.4°C
Tested at the worst position with battery 2#									
Bottom Side	18700/1860	20M QPSK 50%RB#0	0.734	0.386	-0.150	18.71	19.50	0.880	21.4°C
Bottom Side	18900/1880	20M QPSK 50%RB#0	0.741	0.389	0.000	18.60	19.50	0.912	21.4°C
Bottom Side	19100/1900	20M QPSK 50%RB#0	0.748	0.392	-0.140	18.68	19.50	0.903	21.4°C
100%RB									
Bottom Side	19100/1900	20M QPSK 100%RB#0	0.742	0.382	0.030	18.67	19.50	0.898	21.4°C

Table 101: Hotspot SAR test results of LTE Band II

Per KDB648474D04, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold:

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conduct Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	10-g Extremity SAR
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	18700/1860	20M QPSK 1RB#50	0.267	0.146	0.030	18.85	23.00	0.694	NO
Back Side	18700/1860	20M QPSK 1RB#50	0.231	0.129	0.180	18.85	23.00	0.601	NO
Left Side	18700/1860	20M QPSK 1RB#50	0.064	0.035	0.180	18.85	23.00	0.166	NO
Right Side	18700/1860	20M QPSK 1RB#50	0.026	0.015	0.160	18.85	23.00	0.069	NO
Bottom Side	18700/1860	20M QPSK 1RB#50	0.578	0.303	0.030	18.85	23.00	1.503	Yes
50%RB									
Front Side	18700/1860	20M QPSK 50%RB#0	0.328	0.178	0.110	18.71	22.00	0.700	NO
Back Side	18700/1860	20M QPSK 50%RB#0	0.295	0.162	-0.030	18.71	22.00	0.629	NO
Left Side	18700/1860	20M QPSK 50%RB#0	0.062	0.035	0.110	18.71	22.00	0.132	NO
Right Side	18700/1860	20M QPSK 50%RB#0	0.031	0.017	0.110	18.71	22.00	0.065	NO
Bottom Side	18700/1860	20M QPSK 50%RB#0	0.576	0.302	-0.060	18.71	22.00	1.229	Yes
Tested at the worst position with battery 2#									
Bottom Side	18700/1860	20M QPSK 50%RB#0	0.734	0.386	-0.150	18.71	22.00	1.566	Yes
Bottom Side	18900/1880	20M QPSK 50%RB#0	0.741	0.389	0.000	18.60	22.00	1.621	Yes
Bottom Side	19100/1900	20M QPSK 50%RB#0	0.748	0.392	-0.140	18.68	22.00	1.607	Yes
100%RB									
Bottom Side	19100/1900	20M QPSK 100%RB#0	0.742	0.382	0.030	18.67	22.00	1.597	Yes

Table 102: 10-g Extremity SAR test reduction evaluation of LTE Band II

Note : According to the table above , 10-g Extremity SAR test is required for this frequency band.

According to the table above , only **Bottom side** 10-g Extremity SAR test are required for this frequency band:

Test Position of 10-g Extremity with 0mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled 10-g SAR (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Bottom Side	19100/1900	20M QPSK 1RB#50	5.930	2.450	-0.040	22.96	23.00	2.473	21.4°C
Bottom Side-repeated	19100/1900	20M QPSK 1RB#99	5.900	2.470	-0.040	22.96	23.00	2.493	21.4°C
Bottom Side	18700/1860	20M QPSK 1RB#50	5.590	2.390	-0.020	22.63	23.00	2.603	21.4°C
Bottom Side	18900/1880	20M QPSK 1RB#99	5.640	2.340	-0.100	22.47	23.00	2.644	21.4°C
50%RB									
Bottom Side	19100/1900	20M QPSK 50%RB#0	4.710	1.920	-0.030	21.46	22.00	2.174	21.4°C
Bottom Side	18700/1860	20M QPSK 50%RB#0	4.580	1.900	-0.070	21.31	22.00	2.227	21.4°C
Bottom Side	18900/1880	20M QPSK 50%RB#50	4.640	1.890	-0.040	21.38	22.00	2.180	21.4°C
100%RB									
Bottom Side	19100/1900	20M QPSK 100%RB#0	4.830	1.940	-0.030	21.32	22.00	2.269	21.4°C
Tested at the worst position with battery 2#									
Bottom Side	18900/1880	20M QPSK 1RB#99	5.090	2.030	-0.040	22.47	23.00	2.293	21.4°C

Table 103: 10-g Extremity SAR test results of LTE Band II

7.2.18 SAR measurement Result of LTE Band IV(Main Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Left Hand Touched	20300/1745	20M QPSK 1RB#50	0.200	0.127	-0.060	22.60	23.00	0.219	21.7°C
Left Hand Tilted 15°	20300/1745	20M QPSK 1RB#50	0.057	0.031	-0.090	22.60	23.00	0.062	21.7°C
Right Hand Touched	20300/1745	20M QPSK 1RB#50	0.109	0.070	0.050	22.60	23.00	0.120	21.7°C
Right Hand Tilted 15°	20300/1745	20M QPSK 1RB#50	0.068	0.040	0.140	22.60	23.00	0.075	21.7°C
Left Hand Touched	20050/1720	20M QPSK 1RB#0	0.245	0.159	0.160	22.53	23.00	0.273	21.7°C
Left Hand Touched	20175/1732.5	20M QPSK 1RB#50	0.212	0.137	0.120	22.55	23.00	0.235	21.7°C
50%RB									
Left Hand Touched	20300/1745	20M QPSK 50%RB#0	0.158	0.101	0.090	21.60	22.00	0.173	21.7°C
Left Hand Tilted 15°	20300/1745	20M QPSK 50%RB#0	0.045	0.025	0.170	21.60	22.00	0.050	21.7°C
Right Hand Touched	20300/1745	20M QPSK 50%RB#0	0.094	0.054	0.110	21.60	22.00	0.103	21.7°C
Right Hand Tilted 15°	20300/1745	20M QPSK 50%RB#0	0.051	0.028	-0.160	21.60	22.00	0.056	21.7°C
Tested at the worst position with battery 2#									
Left Hand Touched	20050/1720	20M QPSK 1RB#0	0.226	0.143	0.110	22.53	23.00	0.252	21.7°C

Table 104: Head SAR test results of LTE Band IV

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	20175/1732.5	20M QPSK 1RB#50	0.370	0.216	0.180	22.60	23.00	0.406	21.4°C
Back Side	20175/1732.5	20M QPSK 1RB#50	0.474	0.275	0.130	22.60	23.00	0.520	21.4°C
50%RB									
Front Side	20300/1745	20M QPSK 50%RB#0	0.268	0.156	0.120	21.60	22.00	0.294	21.4°C
Back Side	20300/1745	20M QPSK 50%RB#0	0.327	0.187	-0.040	21.60	22.00	0.359	21.4°C
Tested at the worst position with battery 2#									
Back Side	20175/1732.5	20M QPSK 1RB#50	0.484	0.283	-0.010	22.60	23.00	0.531	21.4°C

Table 105: Body-Worn SAR test results of LTE Band IV

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	20175/1732.5	20M QPSK 1RB#50	0.474	0.256	0.160	20.23	20.50	0.504	21.4°C
Back Side	20175/1732.5	20M QPSK 1RB#50	0.568	0.306	0.110	20.23	20.50	0.604	21.4°C
Left Side	20175/1732.5	20M QPSK 1RB#50	0.090	0.049	-0.060	20.23	20.50	0.096	21.4°C
Right Side	20175/1732.5	20M QPSK 1RB#50	0.050	0.027	0.080	20.23	20.50	0.053	21.4°C
Bottom Side	20175/1732.5	20M QPSK 1RB#50	0.985	0.509	0.010	20.23	20.50	1.048	21.4°C
Bottom Side	20050/1720	20M QPSK 1RB#50	0.881	0.462	-0.190	20.04	20.50	0.979	21.4°C
Bottom Side	20300/1745	20M QPSK 1RB#0	0.904	0.472	-0.170	20.15	20.50	0.980	21.4°C
50%RB									
Front Side	20300/1745	20M QPSK 50%RB#0	0.464	0.250	0.190	20.12	20.50	0.506	21.4°C
Back Side	20300/1745	20M QPSK 50%RB#0	0.562	0.303	0.160	20.12	20.50	0.613	21.4°C
Left Side	20300/1745	20M QPSK 50%RB#0	0.091	0.050	0.040	20.12	20.50	0.099	21.4°C
Right Side	20300/1745	20M QPSK 50%RB#0	0.048	0.026	0.030	20.12	20.50	0.052	21.4°C
Bottom Side	20300/1745	20M QPSK 50%RB#0	0.975	0.503	-0.040	20.12	20.50	1.064	21.4°C
Bottom Side	20050/1720	20M QPSK 50%RB#0	0.872	0.431	-0.090	19.90	20.50	1.001	21.4°C
Bottom Side	20175/1732.5	20M QPSK 50%RB#0	0.990	0.513	-0.160	19.98	20.50	1.116	21.4°C
100%RB									
Bottom Side	20300/1745	20M QPSK 100%RB#0	0.895	0.466	-0.170	20.12	20.50	0.977	21.4°C
Tested at the worst position with battery 2#									
Bottom Side	20175/1732.5	20M QPSK 50%RB#0	1.110	0.575	-0.040	19.98	20.50	1.251	21.4°C

Table 106: Hotspot SAR test results of LTE Band IV

Per KDB648474D04, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold:

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conduct Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	10-g Extremity SAR
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	20175/1732 .5	20M QPSK 1RB#50	0.474	0.256	0.160	20.23	23.00	0.897	NO
Back Side	20175/1732 .5	20M QPSK 1RB#50	0.568	0.306	0.110	20.23	23.00	1.075	NO
Left Side	20175/1732 .5	20M QPSK 1RB#50	0.090	0.049	-0.060	20.23	23.00	0.171	NO
Right Side	20175/1732 .5	20M QPSK 1RB#50	0.050	0.027	0.080	20.23	23.00	0.094	NO
Bottom Side	20175/1732 .5	20M QPSK 1RB#50	0.985	0.509	0.010	20.23	23.00	1.864	Yes
Bottom Side	20050/1720	20M QPSK 1RB#50	0.881	0.462	-0.190	20.04	23.00	1.742	Yes
Bottom Side	20300/1745	20M QPSK 1RB#0	0.904	0.472	-0.170	20.15	23.00	1.742	Yes
50%RB									
Front Side	20300/1745	20M QPSK 50%RB#0	0.464	0.250	0.190	20.12	22.00	0.715	NO
Back Side	20300/1745	20M QPSK 50%RB#0	0.562	0.303	0.160	20.12	22.00	0.866	NO
Left Side	20300/1745	20M QPSK 50%RB#0	0.091	0.050	0.040	20.12	22.00	0.140	NO
Right Side	20300/1745	20M QPSK 50%RB#0	0.048	0.026	0.030	20.12	22.00	0.074	NO
Bottom Side	20300/1745	20M QPSK 50%RB#0	0.975	0.503	-0.040	20.12	22.00	1.503	Yes
Bottom Side	20050/1720	20M QPSK 50%RB#0	0.872	0.431	-0.090	19.90	22.00	1.414	Yes
Bottom Side	20175/1732 .5	20M QPSK 50%RB#0	0.990	0.513	-0.160	19.98	22.00	1.576	Yes
100%RB									
Bottom Side	20300/1745	20M QPSK 100%RB#0	0.895	0.466	-0.170	20.12	22.00	1.380	Yes
Tested at the worst position with battery 2#									
Bottom Side	20175/1732 .5	20M QPSK 50%RB#0	1.110	0.575	-0.040	19.98	22.00	1.767	Yes

Table 107: 10-g Extremity SAR test reduction evaluation of LTE Band IV

Note : According to the table above , 10-g Extremity SAR test is required for this frequency band.

According to the table above , only **Bottom side** 10-g Extremity SAR test are required for this frequency band:

Test Position of 10-g Extremity with 0mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled 10-g SAR (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Bottom Side	20175/1732.5	20M QPSK 1RB#50	4.850	2.020	-0.160	22.60	23.00	2.215	21.4°C
Bottom Side	20050/1720	20M QPSK 1RB#0	4.550	1.980	-0.110	22.53	23.00	2.206	21.4°C
Bottom Side	20300/1745	20M QPSK 1RB#50	4.860	2.100	-0.190	22.55	23.00	2.329	21.4°C
Bottom Side-repeated	20300/1745	20M QPSK 1RB#50	5.350	2.270	0.020	22.55	23.00	2.518	21.4°C
50%RB									
Bottom Side	20300/1745	20M QPSK 50%RB#0	4.190	1.820	0.020	21.60	22.00	1.996	21.4°C
Tested at the worst position with battery 2#									
Bottom Side	20300/1745	20M QPSK 1RB#50	4.490	1.840	-0.130	22.55	23.00	2.041	21.4°C

Table 108: 10-g Extremity SAR test results of LTE Band IV

7.2.19 SAR measurement Result of LTE Band V(Main Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Left Hand Touched	20525/836.5	10M QPSK 1RB#0	0.125	0.861	-0.060	23.45	23.50	0.126	21.4°C
Left Hand Tilted 15°	20525/836.5	10M QPSK 1RB#0	0.075	0.051	0.040	23.45	23.50	0.075	21.4°C
Right Hand Touched	20525/836.5	10M QPSK 1RB#0	0.139	0.108	0.100	23.45	23.50	0.141	21.4°C
Right Hand Tilted 15°	20525/836.5	10M QPSK 1RB#0	0.074	0.052	-0.050	23.45	23.50	0.075	21.4°C
Right Hand Touched	20450/829	10M QPSK 1RB#0	0.134	0.102	-0.060	23.34	23.50	0.139	21.4°C
Right Hand Touched	20600/844	10M QPSK 1RB#0	0.168	0.128	-0.010	23.28	23.50	0.177	21.4°C
50%RB									
Left Hand Touched	20450/829	10M QPSK 50%RB#0	0.092	0.064	0.150	22.31	22.50	0.097	21.4°C
Left Hand Tilted 15°	20450/829	10M QPSK 50%RB#0	0.062	0.043	0.180	22.31	22.50	0.064	21.4°C
Right Hand Touched	20450/829	10M QPSK 50%RB#0	0.119	0.080	-0.180	22.31	22.50	0.124	21.4°C
Right Hand Tilted 15°	20450/829	10M QPSK 50%RB#0	0.057	0.040	0.140	22.31	22.50	0.059	21.4°C
Tested at the worst position with battery 2#									
Right Hand Touched	20600/844	10M QPSK 1RB#0	0.144	0.108	-0.180	23.28	23.50	0.151	21.4°C

Table 109: Head SAR test results of LTE Band V

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	20525/836.5	10M QPSK 1RB#0	0.140	0.107	-0.060	23.45	23.50	0.142	21.4°C
Back Side	20525/836.5	10M QPSK 1RB#0	0.192	0.144	0.100	23.45	23.50	0.194	21.4°C
50%RB									
Front Side	20450/829	10M QPSK 50%RB#0	0.110	0.077	0.070	22.31	22.50	0.115	21.4°C
Back Side	20450/829	10M QPSK 50%RB#0	0.150	0.115	0.050	22.31	22.50	0.157	21.4°C
Tested at the worst position with battery 2#									
Back Side	20525/836.5	10M QPSK 1RB#0	0.147	0.103	0.020	23.45	23.50	0.149	21.4°C

Table 110: Body-Worn SAR test results of LTE Band V

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	20525/836.5	10M QPSK 1RB#0	0.152	0.090	0.160	23.45	23.50	0.154	21.4°C
Back Side	20525/836.5	10M QPSK 1RB#0	0.199	0.117	0.020	23.45	23.50	0.201	21.4°C
Left Side	20525/836.5	10M QPSK 1RB#0	0.161	0.107	-0.010	23.45	23.50	0.163	21.4°C
Right Side	20525/836.5	10M QPSK 1RB#0	0.260	0.173	-0.060	23.45	23.50	0.263	21.4°C
Bottom Side	20525/836.5	10M QPSK 1RB#0	0.072	0.041	0.070	23.45	23.50	0.072	21.4°C
50%RB									
Front Side	20450/829	10M QPSK 50%RB#0	0.098	0.070	-0.010	22.31	22.50	0.102	21.4°C
Back Side	20450/829	10M QPSK 50%RB#0	0.163	0.115	0.080	22.31	22.50	0.170	21.4°C
Left Side	20450/829	10M QPSK 50%RB#0	0.137	0.092	-0.020	22.31	22.50	0.143	21.4°C
Right Side	20450/829	10M QPSK 50%RB#0	0.212	0.142	-0.010	22.31	22.50	0.221	21.4°C
Bottom Side	20450/829	10M QPSK 50%RB#0	0.047	0.030	0.030	22.31	22.50	0.049	21.4°C
Tested at the worst position with battery 2#									
Right Side	20525/836.5	10M QPSK 1RB#0	0.202	0.137	0.080	23.45	23.50	0.204	21.4°C

Table 111: Hotspot SAR test results of LTE Band V

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.20 SAR measurement Result of LTE Band VII(Main Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Left Hand Touched	21100/2535	20M QPSK 1RB#50	0.138	0.060	0.120	23.19	23.50	0.148	21.7°C
Left Hand Touched	21100/2535	20M QPSK 1RB#50	0.145	0.065	0.100	23.19	23.50	0.156	21.7°C
Right Hand Touched	21100/2535	20M QPSK 1RB#50	0.150	0.072	-0.140	23.19	23.50	0.161	21.7°C
Right Hand Tilted 15°	21100/2535	20M QPSK 1RB#50	0.163	0.077	0.100	23.19	23.50	0.175	21.7°C
Right Hand Tilted 15°	20850/2510	20M QPSK 1RB#0	0.199	0.099	-0.170	22.81	23.50	0.233	21.7°C
Right Hand Tilted 15°	21350/2560	20M QPSK 1RB#50	0.146	0.067	0.120	23.15	23.50	0.158	21.7°C
50%RB									
Left Hand Touched	21100/2535	20M QPSK 50%RB#0	0.106	0.049	-0.030	22.91	22.50	0.096	21.7°C
Left Hand Tilted 15°	21100/2535	20M QPSK 50%RB#0	0.131	0.057	0.090	22.91	22.50	0.119	21.7°C
Right Hand Touched	21100/2535	20M QPSK 50%RB#0	0.121	0.066	0.120	22.91	22.50	0.110	21.7°C
Right Hand Tilted 15°	21100/2535	20M QPSK 50%RB#0	0.121	0.624	0.140	22.91	22.50	0.110	21.7°C
Tested at the worst position with battery 2#									
Right Hand Tilted 15°	20850/2510	20M QPSK 1RB#0	0.160	0.078	0.170	22.81	23.50	0.188	21.7°C

Table 112: Head SAR test results of LTE Band VII

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	21100/2535	20M QPSK 1RB#50	0.187	0.101	0.040	23.19	23.50	0.201	21.5°C
Back Side	21100/2535	20M QPSK 1RB#50	0.244	0.129	-0.030	23.19	23.50	0.262	21.5°C
50%RB									
Front Side	21100/2535	20M QPSK 50%RB#0	0.146	0.082	0.120	22.91	22.50	0.133	21.5°C
Back Side	21100/2535	20M QPSK 50%RB#0	0.173	0.157	0.190	22.91	22.50	0.157	21.5°C
Tested at the worst position with battery 2#									
Back Side	21100/2535	20M QPSK 1RB#50	0.282	0.148	0.000	23.19	23.50	0.303	21.5°C

Table 113: Body-Worn SAR test results of LTE Band VII

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	21350/2560	20M QPSK 1RB#50	0.185	0.099	-0.150	19.72	20.50	0.221	21.5°C
Back Side	21350/2560	20M QPSK 1RB#50	0.289	0.153	0.050	19.72	20.50	0.346	21.5°C
Left Side	21350/2560	20M QPSK 1RB#50	0.143	0.075	-0.100	19.72	20.50	0.171	21.5°C
Right Side	21350/2560	20M QPSK 1RB#50	0.056	0.030	0.100	19.72	20.50	0.066	21.5°C
Bottom Side	21350/2560	20M QPSK 1RB#50	0.358	0.167	-0.040	19.72	20.50	0.428	21.5°C
50%RB									
Front Side	21100/2535	20M QPSK 50%RB#0	0.195	0.103	0.150	19.77	20.50	0.231	21.5°C
Back Side	21100/2535	20M QPSK 50%RB#0	0.308	0.160	0.180	19.77	20.50	0.364	21.5°C
Left Side	21100/2535	20M QPSK 50%RB#0	0.119	0.061	-0.110	19.77	20.50	0.141	21.5°C
Right Side	21100/2535	20M QPSK 50%RB#0	0.043	0.024	0.170	19.77	20.50	0.051	21.5°C
Bottom Side	21100/2535	20M QPSK 50%RB#0	0.365	0.170	0.000	19.77	20.50	0.432	21.5°C
Tested at the worst position with battery 2#									
Bottom Side	21100/2535	20M QPSK 50%RB#0	0.450	0.207	-0.040	19.77	20.50	0.532	21.5°C

Table 114: Hotspot SAR test results of LTE Band VII

Per KDB648474D04, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold:

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conduct Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	10-g Extremity SAR
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	21350/2560	20M QPSK 1RB#50	0.185	0.099	-0.150	19.72	23.50	0.442	NO
Back Side	21350/2560	20M QPSK 1RB#50	0.289	0.153	0.050	19.72	23.50	0.690	NO
Left Side	21350/2560	20M QPSK 1RB#50	0.143	0.075	-0.100	19.72	23.50	0.341	NO
Right Side	21350/2560	20M QPSK 1RB#50	0.056	0.030	0.100	19.72	23.50	0.133	NO
Bottom Side	21350/2560	20M QPSK 1RB#50	0.358	0.167	-0.040	19.72	23.50	0.855	NO
50%RB									
Front Side	21100/2535	20M QPSK 50%RB#0	0.195	0.103	0.150	19.77	22.50	0.366	NO
Back Side	21100/2535	20M QPSK 50%RB#0	0.308	0.160	0.180	19.77	22.50	0.577	NO
Left Side	21100/2535	20M QPSK 50%RB#0	0.119	0.061	-0.110	19.77	22.50	0.223	NO
Right Side	21100/2535	20M QPSK 50%RB#0	0.043	0.024	0.170	19.77	22.50	0.081	NO
Bottom Side	21100/2535	20M QPSK 50%RB#0	0.365	0.170	0.000	19.77	22.50	0.684	NO
Tested at the worst position with battery 2#									
Bottom Side	21100/2535	20M QPSK 50%RB#0	0.450	0.207	-0.040	19.77	22.50	0.844	NO

Table 115: 10-g Extremity SAR test reduction evaluation of LTE Band VII

Note : According to the table above , 10-g Extremity SAR test is not required for this frequency band.

7.2.21 SAR measurement Result of LTE Band XII(Main Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Left Hand Touched	23130/711	10M QPSK 1RB#0	0.074	0.057	-0.010	22.38	23.00	0.085	21.4°C
Left Hand Tilted 15°	23130/711	10M QPSK 1RB#0	0.042	0.034	0.140	22.38	23.00	0.049	21.4°C
Right Hand Touched	23130/711	10M QPSK 1RB#0	0.070	0.056	0.170	22.38	23.00	0.081	21.4°C
Right Hand Tilted 15°	23130/711	10M QPSK 1RB#0	0.042	0.034	0.180	22.38	23.00	0.048	21.4°C
Left Hand Touched	23060/704	10M QPSK 1RB#49	0.068	0.054	0.140	22.36	23.00	0.079	21.4°C
Left Hand Touched	23095/707.5	10M QPSK 1RB#49	0.068	0.053	0.140	22.35	23.00	0.079	21.4°C
50%RB									
Left Hand Touched	23130/711	10M QPSK 50%RB#0	0.056	0.044	0.090	21.07	22.00	0.070	21.4°C
Left Hand Tilted 15°	23130/711	10M QPSK 50%RB#0	0.032	0.026	0.200	21.07	22.00	0.040	21.4°C
Right Hand Touched	23130/711	10M QPSK 50%RB#0	0.054	0.043	0.120	21.07	22.00	0.067	21.4°C
Right Hand Tilted 15°	23130/711	10M QPSK 50%RB#0	0.033	0.027	0.090	21.07	22.00	0.041	21.4°C
Tested at the worst position with battery 2#									
Left Hand Touched	23130/711	10M QPSK 1RB#0	0.066	0.052	0.150	22.38	23.00	0.077	21.4°C

Table 116: Head SAR test results of LTE Band XII

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	23130/711	10M QPSK 1RB#0	0.089	0.071	-0.030	22.38	23.00	0.102	21.6°C
Back Side	23130/711	10M QPSK 1RB#0	0.102	0.080	-0.010	22.38	23.00	0.118	21.6°C
50%RB									
Front Side	23130/711	10M QPSK 50%RB#0	0.069	0.055	0.010	21.07	22.00	0.085	21.6°C
Back Side	23130/711	10M QPSK 50%RB#0	0.078	0.062	0.030	21.07	22.00	0.096	21.6°C
Tested at the worst position with battery 2#									
Back Side	23130/711	10M QPSK 1RB#0	0.094	0.075	0.040	22.38	23.00	0.108	21.6°C

Table 117: Body-Worn SAR test results of LTE Band XII

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	23130/711	10M QPSK 1RB#0	0.101	0.081	-0.020	22.38	23.00	0.116	21.6°C
Back Side	23130/711	10M QPSK 1RB#0	0.121	0.097	0.070	22.38	23.00	0.140	21.6°C
Left Side	23130/711	10M QPSK 1RB#0	0.066	0.046	0.120	22.38	23.00	0.076	21.6°C
Right Side	23130/711	10M QPSK 1RB#0	0.092	0.063	-0.010	22.38	23.00	0.106	21.6°C
Bottom Side	23130/711	10M QPSK 1RB#0	0.030	0.017	-0.070	22.38	23.00	0.035	21.6°C
50%RB									
Front Side	23130/711	10M QPSK 50%RB#0	0.078	0.063	0.070	21.07	22.00	0.097	21.6°C
Back Side	23130/711	10M QPSK 50%RB#0	0.093	0.074	-0.040	21.07	22.00	0.115	21.6°C
Left Side	23130/711	10M QPSK 50%RB#0	0.064	0.044	-0.020	21.07	22.00	0.079	21.6°C
Right Side	23130/711	10M QPSK 50%RB#0	0.074	0.051	-0.050	21.07	22.00	0.092	21.6°C
Bottom Side	23130/711	10M QPSK 50%RB#0	0.023	0.013	-0.130	21.07	22.00	0.028	21.6°C
Tested at the worst position with battery 2#									
Back Side	23130/711	10M QPSK 1RB#0	0.112	0.089	0.000	22.38	23.00	0.129	21.6°C

Table 118: Hotspot SAR test results of LTE Band XII

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.22 SAR measurement Result of LTE Band XVII(Main Antenna)

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Left Hand Touched	23780/709	10M QPSK 1RB#49	0.065	0.051	0.060	22.44	23.00	0.074	21.4°C
Left Hand Tilted 15°	23780/709	10M QPSK 1RB#49	0.034	0.024	0.150	22.44	23.00	0.039	21.4°C
Right Hand Touched	23780/709	10M QPSK 1RB#49	0.068	0.054	0.140	22.44	23.00	0.077	21.4°C
Right Hand Tilted 15°	23780/709	10M QPSK 1RB#49	0.041	0.033	0.110	22.44	23.00	0.046	21.4°C
Right Hand Touched	23790/710	10M QPSK 1RB#49	0.068	0.054	0.020	22.33	23.00	0.079	21.4°C
Right Hand Touched	23800/711	10M QPSK 1RB#25	0.065	0.052	0.050	22.34	23.00	0.076	21.4°C
50%RB									
Left Hand Touched	23780/709	10M QPSK 50%RB#25	0.048	0.033	0.150	21.04	22.00	0.059	21.4°C
Left Hand Tilted 15°	23780/709	10M QPSK 50%RB#25	0.027	0.019	0.160	21.04	22.00	0.033	21.4°C
Right Hand Touched	23780/709	10M QPSK 50%RB#25	0.053	0.042	0.160	21.04	22.00	0.066	21.4°C
Right Hand Tilted 15°	23780/709	10M QPSK 50%RB#25	0.031	0.026	0.090	21.04	22.00	0.039	21.4°C
Tested at the worst position with battery 2#									
Right Hand Touched	23790/710	10M QPSK 1RB#49	0.067	0.053	0.160	22.33	22.50	0.070	21.4°C

Table 119: Head SAR test results of LTE Band XVII

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	23780/709	10M QPSK 1RB#49	0.087	0.069	-0.070	22.44	23.00	0.099	21.6°C
Back Side	23780/709	10M QPSK 1RB#49	0.106	0.083	0.120	22.44	23.00	0.121	21.6°C
50%RB									
Front Side	23780/709	10M QPSK 50%RB#25	0.068	0.054	0.020	21.04	22.00	0.085	21.6°C
Back Side	23780/709	10M QPSK 50%RB#25	0.080	0.637	0.080	21.04	22.00	0.100	21.6°C
Tested at the worst position with battery 2#									
Back Side	23780/709	10M QPSK 1RB#49	0.122	0.097	-0.140	22.44	23.00	0.139	21.6°C

Table 120: Body-Worn SAR test results of LTE Band XVII

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducte d Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Test data with battery 1#									
1RB									
Front Side	23780/709	10M QPSK 1RB#49	0.102	0.074	0.080	22.44	23.00	0.116	21.6°C
Back Side	23780/709	10M QPSK 1RB#49	0.119	0.095	0.080	22.44	23.00	0.135	21.6°C
Left Side	23780/709	10M QPSK 1RB#49	0.081	0.055	0.110	22.44	23.00	0.092	21.6°C
Right Side	23780/709	10M QPSK 1RB#49	0.093	0.063	-0.150	22.44	23.00	0.106	21.6°C
Bottom Side	23780/709	10M QPSK 1RB#49	0.030	0.019	-0.040	22.44	23.00	0.034	21.6°C
50%RB									
Front Side	23780/709	10M QPSK 50%RB#25	0.072	0.052	0.030	21.04	22.00	0.090	21.6°C
Back Side	23780/709	10M QPSK 50%RB#25	0.089	0.062	0.020	21.04	22.00	0.111	21.6°C
Left Side	23780/709	10M QPSK 50%RB#25	0.063	0.043	-0.020	21.04	22.00	0.078	21.6°C
Right Side	23780/709	10M QPSK 50%RB#25	0.070	0.048	-0.040	21.04	22.00	0.087	21.6°C
Bottom Side	23780/709	10M QPSK 50%RB#25	0.023	0.013	-0.140	21.04	22.00	0.028	21.6°C
Tested at the worst position with battery 2#									
Back Side	23780/709	10M QPSK 1RB#49	0.110	0.091	-0.080	22.44	23.00	0.125	21.6°C

Table 121: Hotspot SAR test results of LTE Band XVII

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.2.23 SAR measurement Result of WiFi 2.4G

Test Position of Head	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g Area Scan	1-g Zoom Scan					
The data of the RIO-L01 from the report No.: SYBH(Z-SAR)004052015-2									
Test data with battery 1#									
Left Hand Touched	6/2437	802.11 b	0.582	0.543	-0.090	17.96	18.00	0.548	21.4°C
Left Hand Tilted 15°	6/2437	802.11 b	0.428	/	-0.180	17.96	18.00	/	21.4°C
Right Hand Touched	6/2437	802.11 b	0.363	/	0.060	17.96	18.00	/	21.4°C
Right Hand Tilted 15°	6/2437	802.11 b	0.469	0.486	0.170	17.96	18.00	0.490	21.4°C
Left Hand Touched	1/2412	802.11 b	0.425	0.410	-0.040	17.44	18.00	0.466	21.4°C
Left Hand Touched	11/2462	802.11 b	1.010	0.940	-0.010	17.02	18.00	1.178	21.4°C
Left Hand Touched-Repeated	11/2462	802.11 b	1.020	0.942	-0.060	17.02	18.00	1.180	21.4°C
Tested at the worst position with battery 2#									
Left Hand Touched	11/2462	802.11 b	0.984	0.917	0.140	17.02	18.00	1.149	21.4°C
Additional SAR test (When GSM/LTE Second Antenna and WiFi Antenna Simultaneous Transmission)									
Left Hand Touched	11/2462	802.11 b	0.516	0.487	-0.160	14.35	15.50	0.635	21.4°C
Left Hand Tilted 15°	11/2462	802.11 b	0.416	0.453	0.140	14.35	15.50	0.590	21.4°C
Right Hand Touched	11/2462	802.11 b	0.346	0.357	0.030	14.35	15.50	0.465	21.4°C
Right Hand Tilted 15°	11/2462	802.11 b	0.399	0.422	0.040	14.35	15.50	0.547	21.4°C
RIO-L03 Tested at the worst position of RIO-L01 with battery 1#(Full Power)									
Left Hand Touched	11/2462	802.11 b	1.080	1.090	0.120	17.96	18.00	1.100	21.4°C
RIO-L03 Tested at the worst position of RIO-L01 with battery 2#(Full Power)									
Left Hand Touched	11/2462	802.11 b	0.861	0.926	-0.090	17.96	18.00	0.935	21.4°C
Additional SAR test (When GSM/LTE Second Antenna and WiFi Antenna Simultaneous Transmission)									
RIO-L03 Tested at the worst position of RIO-L01 with battery 1#(Reduced Power)									
Left Hand Touched	11/2462	802.11 b	0.362	0.384	0.160	14.35	15.50	0.500	21.4°C
RIO-L03 Tested at the worst position of RIO-L01 with battery 2#(Reduced Power)									
Left Hand Touched	11/2462	802.11 b	0.434	0.459	0.050	14.35	15.50	0.598	21.4°C

Table 122: Head SAR test results of WiFi 2450MHz

Test Position of Body-Worn with 15mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g Area Scan	1-g Zoom Scan					
The data of the RIO-L01 from the report No.: SYBH(Z-SAR)004052015-2									
Test data with battery 1#									
Front Side	6/2437	802.11 b	0.092	/	0.050	17.96	18.00	/	21.6°C
Back Side	6/2437	802.11 b	0.095	0.098	0.000	17.96	18.00	0.099	21.6°C
Back Side	1/2412	802.11 b	0.075	0.076	0.170	17.44	18.00	0.087	21.6°C
Back Side	11/2462	802.11 b	0.131	0.133	0.060	17.02	18.00	0.167	21.6°C
Tested at the worst position with battery 2#									
Back Side	11/2462	802.11 b	0.114	0.116	0.060	17.02	18.00	0.145	21.6°C
RIO-L03 Tested at the worst position of RIO-L01 with battery 1#									
Back Side	11/2462	802.11 b	0.156	0.161	0.040	17.02	18.00	0.202	21.5°C
RIO-L03 Tested at the worst position of RIO-L01 with battery 2#									
Back Side	11/2462	802.11 b	0.129	0.133	-0.050	17.02	18.00	0.167	21.5°C

Table 123: Body-Worn SAR test results of WiFi 2450MHz

Test Position of Hotspot with 10mm	Test channel / Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR _{1-g} (W/kg)	Liquid Temp.
			1-g Area Scan	1-g Zoom Scan					
The data of the RIO-L01 from the report No.: SYBH(Z-SAR)004052015-2									
Test data with battery 1#									
Front Side	6/2437	802.11 b	0.163	/	0.000	17.96	18.00	/	21.6°C
Back Side	6/2437	802.11 b	0.197	0.206	-0.160	17.96	18.00	0.208	21.6°C
Right Side	6/2437	802.11 b	0.120	/	0.180	17.96	18.00	/	21.6°C
Top Side	6/2437	802.11 b	0.300	0.306	0.180	17.96	18.00	0.309	21.6°C
Top Side	1/2412	802.11 b	0.224	0.238	0.030	17.44	18.00	0.271	21.6°C
Top Side	11/2462	802.11 b	0.555	0.595	-0.090	17.02	18.00	0.746	21.6°C
Tested at the worst position with battery 2#									
Top Side	11/2462	802.11 b	0.513	0.519	0.130	17.02	18.00	0.650	21.6°C
RIO-L03 Tested at the worst position of RIO-L01 with battery 1#									
Top Side	11/2462	802.11 b	0.580	0.606	-0.140	17.02	18.00	0.759	21.5°C
RIO-L03 Tested at the worst position of RIO-L01 with battery 2#									
Top Side	11/2462	802.11 b	0.451	0.532	0.100	17.02	18.00	0.667	21.5°C

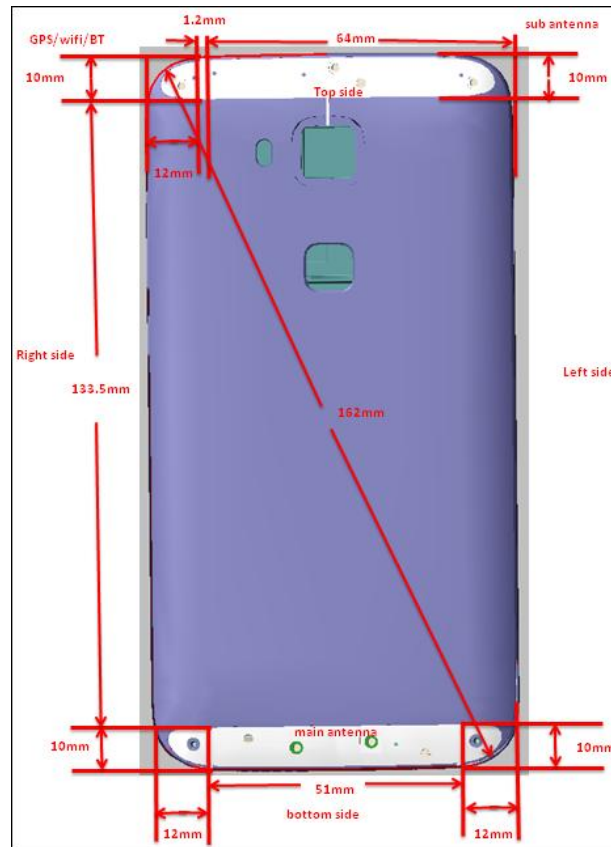
Table 124: Hotspot SAR test results of WiFi 2450MHz

Note: Per KDB648474D04, 10-g Extremity SAR was not evaluated for this frequency band since the hotspot 1-g reported SAR < 1.2W/kg.

7.3 Multiple Transmitter Evaluation

The following tables list information which is relevant for the decision if a simultaneous transmit evaluation is necessary according to FCC KDB 447498D01 General RF Exposure Guidance v05r02.

The location of the antennas inside the device is shown as below picture:



Note:

1) The device supports the dynamic antenna switching function to optimize transmission efficiency for wide range frequency operations. It has two 2G/3G/G Tx antennas (Main Antenna and Second Antenna). It can transmit from either Main Antenna or Second Antenna. The device is capable of switching between the Main Antenna and Second Antenna based on signal strength. The Main Antenna and Second Antenna can not transmit simultaneously.

2) Per KDB 648474 D04, the diagonal distance of this device is > 160mm, it is considered a “Phablet” device.

3) Per KDB 941225 D06 and KDB 648474 D04, particular DUT edges were not required to be evaluated for Hotspot and/or Extremity SAR if the antenna-to-edge distance is greater than 2.5cm. when hotspot mode applies. 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg;

Mode	Exposure Condition	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
Second Antenna	Hotspot/Extremity*	Yes	Yes	Yes	Yes	Yes	No
Main Antenna	Hotspot/Extremity*	Yes	Yes	Yes	Yes	No	Yes
WiFi 2.4G antenna	Hotspot/Extremity*	Yes	Yes	No	Yes	Yes	No

Table 125: Sides for Hotspot / 10g Extremity SAR testing

7.3.1 Stand-alone SAR test exclusion

Per FCC KDB 447498D01v05, the 1-g SAR and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:

- $f(\text{GHz})$ 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

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Mode	Position	P_{max} (dBm)*	P_{max} (mW)	Distance (mm)	f (GHz)	Calculation Result	SAR Exclusion threshold	SAR test exclusion
BT	Body-Worn	9.00	7.94	15	2.48	0.83	3.00	Yes
BT	10-g Extremity	9.00	7.94	5	2.48	2.50	7.50	Yes

Table 126: Standalone SAR test exclusion for BT

Note:

- 1)* - maximum possible output power declared by manufacturer
- 2) Held to ear configurations are not applicable to Bluetooth for this device.

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

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

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

Mode	Position	P_{max} (dBm)*	P_{max} (mW)	Distance (mm)	f (GHz)	X	Estimated SAR (W/Kg)*
BT	Body-worn	9.00	7.94	15	2.48	7.5	0.111
BT	10-g Extremity	9.00	7.94	5	2.48	18.75	0.133

Table 127: Estimated SAR calculation for BT

Note:

- 1) * - maximum possible output power declared by manufacturer
- 2) Held to ear configurations are not applicable to Bluetooth and therefore were not considered for simultaneous transmission.

7.3.2 Simultaneous Transmission Possibilities

The Simultaneous Transmission Possibilities of this device are as below:

No.	Simultaneous Tx Combination	Head	Body-worn	Hotspot	10-g extremity
1	GSM Voice(Main Antenna) + BT	N/A	Yes	N/A	Yes
2	GSM DATA(Main Antenna) + BT	N/A	N/A	N/A	Yes
3	GSM Voice(Second Antenna) + BT	N/A	Yes	N/A	Yes
4	GSM DATA (Second Antenna)+ BT	N/A	N/A	N/A	Yes
5	GSM Voice(Main Antenna) + WiFi	Yes	Yes	N/A	Yes
6	GSM DATA(Main Antenna) + WiFi	N/A	N/A	Yes	Yes
7	GSM Voice(Second Antenna) + WiFi	Yes	Yes	N/A	Yes
8	GSM DATA(Second Antenna) + WiFi	N/A	N/A	Yes	Yes
9	UMTS Voice(Main Antenna) + BT	N/A	Yes	N/A	Yes
10	UMTS DATA (Main Antenna) + BT	N/A	Yes	N/A	Yes
11	UMTS Voice(Second Antenna) + BT	N/A	Yes	N/A	Yes
12	UMTS DATA (Second Antenna) + BT	N/A	Yes	N/A	Yes
13	UMTS Voice(Main Antenna) + WiFi	Yes	Yes	N/A	Yes
14	UMTS DATA (Main Antenna) + WiFi	N/A	Yes	Yes	Yes
15	UMTS Voice (Second Antenna) + WiFi	Yes	Yes	N/A	Yes
16	UMTS DATA (Second Antenna)+ WiFi	N/A	Yes	Yes	Yes
17	LTE DATA (Main Antenna) + WiFi	Yes*	Yes*	Yes	Yes*
18	LTE DATA (Main Antenna) + BT	N/A	Yes*	N/A	Yes
19	LTE DATA (Second Antenna) + WiFi	Yes*	Yes*	Yes	Yes
20	LTE DATA (Second Antenna) + BT	N/A	Yes*	N/A	Yes

Table 128: Simultaneous Transmission Possibilities

Note:

- 1) Wi-Fi 2.4G and Bluetooth share the same Tx antenna and can't transmit simultaneously.
- 2) Main antenna and Secondary antenna can't transmit simultaneously. Only one antenna can be used for 2G/3G/4G transmission at a time.
- 3) The device does not support DTM function.
- 4) Held to ear configurations are not applicable to Bluetooth and therefore were not considered for simultaneous transmission.
- 5) * VOIP 3rd party applications may possibly be installed and used by the end user.
- 6) Per KDB648474 D04, simultaneous transmission SAR consideration for 10-g extremity SAR requires consideration only when standalone 10-g SAR is required.

7.3.3 SAR Summation Scenario

The yellow color SAR test data in the following summed SAR tables represent that the additional SAR test results in simultaneous transmission fixed power reduction scenario are used to ensure simultaneous transmission SAR test exclusion (Also see Section 7.3). For the other SAR test data in the summed SAR tables, the more conservative SAR test results at the maximum output power level are used.

Test Position		Second antenna (Main Modem) SAR _{Max}											WiFi/BT antenna SAR _{Max}		ΣSAR (1.6W/kg Limit for 1g and 4.0W/kg Limit for 10g Extremity)	SPLSR
		GSM850	GSM1900	UMTS Band II	UMTS Band IV	UMTS Band V	LTE Band II	LTE Band IV	LTE Band V	LTE Band VII	LTE Band XII	LTE Band XVII	WiFi 2.4G	BT		
Head	Left Hand Touched	0.584	0.462	0.585	0.421	0.682	0.525	0.330	0.370	0.629	0.757	0.745	0.635	/	1.392	N/A
	Left Hand Tilted 15°	0.472	0.444	0.473	0.468	0.607	0.467	0.379	0.277	0.730	0.628	0.533	0.590	/	1.320	N/A
	Right Hand Touched	0.460	0.632	0.718	0.552	0.821	0.618	0.477	0.363	0.919	0.665	0.699	0.465	/	1.384	N/A
	Right Hand Tilted 15°	0.354	0.972	0.780	0.680	0.663	0.728	0.625	0.248	0.667	0.630	0.590	0.547	/	1.519	N/A
Body-worn 15mm	Front side	0.115	0.056	0.072	0.162	0.093	0.112	0.136	0.078	0.098	0.129	0.130	0.202	0.111	0.364	N/A
	Back side	0.124	0.084	0.086	0.181	0.116	0.127	0.136	0.090	0.075	0.142	0.160	0.202	0.111	0.383	N/A
Hotspot 10mm	Front side	0.202	0.133	0.150	0.340	0.116	0.143	0.263	0.120	0.172	0.210	0.219	0.759	/	1.099	N/A
	Back side	0.221	0.173	0.197	0.352	0.129	0.137	0.295	0.175	0.143	0.230	0.284	0.208	/	0.560	N/A
	Left side	0.116	0.048	0.032	0.041	0.102	0.038	0.081	0.092	0.106	0.089	0.093	0.000	/	0.116	N/A
	Right side	0.033	0.009	0.009	0.018	0.022	0.011	0.019	0.022	0.014	0.052	0.043	0.759	/	0.811	N/A
	Top side	0.137	0.351	0.282	0.738	0.111	0.266	0.473	0.073	0.304	0.171	0.143	0.759	/	1.497	N/A
	Bottom side	/	/	/	/	/	/	/	/	/	/	/	/	/	0.000	N/A
10-g Extremity 0mm	Front side	/	/	/	/	/	/	/	/	/	/	/	/	0.133	0.133	N/A
	Back side	/	/	/	/	/	/	/	/	/	/	/	/	0.133	0.133	N/A
	Left side	/	/	/	/	/	/	/	/	/	/	/	/	0.133	0.133	N/A
	Right side	/	/	/	/	/	/	/	/	/	/	/	/	0.133	0.133	N/A
	Top side	/	/	/	/	/	/	/	/	/	/	/	/	0.133	0.133	N/A
	Bottom side	/	/	/	/	/	/	/	/	/	/	/	/	0.133	0.133	N/A

Table 129: SAR Simultaneous Tx Combination of Second antenna and WiFi/BT.

Test Position		Main antenna (Main Modem) SAR _{Max}											WiFi/BT antenna SAR _{Max}		ΣSAR (1.6W/kg Limit for 1g and 4.0W/kg Limit for 10g Extremity)	SPLSR
		GSM850	GSM1900	UMTS Band II	UMTS Band IV	UMTS Band V	LTE Band II	LTE Band IV	LTE Band V	LTE Band VII	LTE Band XII	LTE Band XVII	WiFi 2.4G	BT		
Head	Left Hand Touched	0.155	0.117	0.242	0.327	0.103	0.197	0.273	0.126	0.148	0.085	0.074	0.635	/	0.962	N/A
	Left Hand Tilted 15°	0.075	0.040	0.103	0.124	0.052	0.073	0.062	0.075	0.156	0.049	0.039	0.590	/	0.746	N/A
	Right Hand Touched	0.215	0.044	0.131	0.165	0.153	0.118	0.120	0.177	0.161	0.081	0.079	0.465	/	0.680	N/A
	Right Hand Tilted 15°	0.085	0.038	0.120	0.111	0.061	0.141	0.075	0.075	0.233	0.048	0.046	0.547	/	0.780	N/A
Body-worn 15mm	Front side	0.179	0.265	0.682	0.596	0.117	0.616	0.406	0.142	0.201	0.102	0.099	0.202	0.111	0.884	N/A
	Back side	0.261	0.426	0.839	0.860	0.247	0.629	0.531	0.194	0.303	0.118	0.139	0.202	0.111	1.062	N/A
Hotspot 10mm	Front side	0.217	0.143	0.243	0.578	0.127	0.393	0.506	0.154	0.231	0.116	0.116	0.759	/	1.337	N/A
	Back side	0.266	0.173	0.285	0.643	0.170	0.354	0.613	0.201	0.364	0.140	0.135	0.208	/	0.851	N/A
	Left side	0.242	0.068	0.051	0.067	0.137	0.074	0.099	0.163	0.171	0.079	0.092	0.000	/	0.242	N/A
	Right side	0.321	0.036	0.028	0.054	0.189	0.037	0.053	0.263	0.066	0.106	0.106	0.759	/	1.080	N/A
	Top side	/	/	/	/	/	/	/	/	/	/	/	0.759	/	0.759	N/A
	Bottom side	0.102	1.133	0.622	1.404	0.047	0.912	1.251	0.072	0.532	0.035	0.034	/	/	1.404	N/A
10-g Extremity 0mm	Front side	/	/	/	/	/	/	/	/	/	/	/	/	0.133	0.133	N/A
	Back side	/	/	/	3.469	/	/	/	/	/	/	/	/	0.133	3.602	N/A
	Left side	/	/	/	/	/	/	/	/	/	/	/	/	0.133	0.133	N/A
	Right side	/	/	/	/	/	/	/	/	/	/	/	/	0.133	0.133	N/A
	Top side	/	/	/	/	/	/	/	/	/	/	/	/	0.133	0.133	N/A
	Bottom side	/	1.906	3.284	2.586	/	2.493	2.518	/	/	/	/	/	0.133	3.417	N/A

Table 130: SAR Simultaneous Tx Combination of Main antenna and WiFi/BT.

7.3.4 Simultaneous Transmission Conclusion

The above numeral summed SAR results and SPLSR analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore simultaneous transmission SAR with Volume Scans is not required per KDB 447498 D01v05r02

Appendix A. System Check Plots
(Pls See Appendix A.)

Appendix B. SAR Measurement Plots
(Pls See Appendix B.)

Appendix C. Calibration Certificate
(Pls See Appendix C.)

Appendix D. Photo documentation
(Pls See Appendix D.)

End