FCC SAR Compliance Test Report

Product Name:	Smart Phone
Model:	Y538-A1, Y538A1, Y538, HUAWEI Y538-A1 HUAWEI Y538A1, HUAWEI Y538
Report No.:	SYBH(Z-SAR)021012015-2
FCC ID:	QISY538

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DATE	2015-05-27	2015-05-27

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※ ※ Modified History ※ ※

REV.	DESCRIPTION	ISSUED DATE	REMARK
Rev.1.0	Initial Test Report Release	2015-05-27	Gong Zhong

1 General Information

1.1 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Y538-A1, Y538A1, Y538, HUAWEI Y538-A1, HUAWEI Y538A1, HUAWEI Y538 are as below Table 1.

Band	Max Reported SAR(W/kg)		
	1-g Head	1-g Body-worn (15mm) *	1-g Hotspot (10mm)
GSM850	0.635	0.510	0.436
GSM1900	0.422	0.434	0.599
UMTS Band V	0.681	0.617	0.522
UMTS Band II	0.948	0.977	0.777
CDMA BC0	0.732	0.746	0.632
CDMA BC1	**1.222**	**1.196**	1.172
CDMA BC10	0.663	0.880	0.591
LTE Band XXV	0.943	0.767	0.835
LTE Band XXVI	0.636	0.593	0.312
LTE Band XLI	0.362	0.778	**1.177**
WiFi 2.4G	0.553	0.091	0.163
The highest simultaneous SAR value is 1.557W/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.

The device is in compliance with Specific Absorption Rate (SAR) for general population/uncontraolled exposure limits according to the FCC rule §2.1093, the ANSI/IEEE C95.1:1992, 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:	Y538-A1, Y538A1, Y538, HUAWEI Y538-A1, HUAWEI Y538A1, HUAWEI Y538		
FCC ID :	QISY538		
SN No.:	URX0115327000149		
Device Type :	Portable device		
Device Phase:	Identical Prototype		
Exposure Category:	Uncontrolled environment / general population		
Hardware Version :	HL1Y538A1M		
Software Version :	Y538A1V100R001C237B018		
Antenna Type :	Internal antenna		
Others Accessories	Headset		
Device Operating Configurations:			
Supporting Mode(s)	GSM850/1900, UMTS Band II/V, CDMA BC0/BC1/BC10, LTE Band XXV/XXVI/XLI, WiFi 2.4G(Tested);BT(Untested)		
Test Modulation	GSM(GMSK/8PSK),UMTS(QPSK),CDMA(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 V	824-849	869-894
	UMTS Band II	1850-1910	1930-1990
	CDMA BC0	824-849	869-894
	CDMA BC1	1850-1910	1930-1990
	CDMA BC10	816-823.975	861-868.975
	LTE Band XXV	1850-1915	1930-1995
	LTE Band XXVI	814-849	859-894
	LTE Band XLI	2496-2690	2496-2690
	BT	2402-2480	
	WiFi 2.4G	2412-2462	
GPRS Multislot Class(10)	Max Number of Timeslots in Uplink:		2
	Max Number of Timeslots in Downlink:		4
	Max Total Timeslot:		5
EGPRS Multislot Class(10)	Max Number of Timeslots in Uplink:		2
	Max Number of Timeslots in Downlink:		4
	Max Total Timeslot:		5
HSDPA UE Category	14		
HSUPA UE Category	6		
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 V)		
	3, tested with power control “all Up”(CDMA BC 0)		
	3, tested with power control “all Up”(CDMA BC 1)		
	3, tested with power control “all Up”(CDMA BC 10)		
	3, tested with power control all Max.(LTE Band XXV)		
	3, tested with power control all Max.(LTE Band XXVI)		
	3, tested with power control all Max.(LTE Band XLI)		

Test Channels (low-mid-high):	128-190-251(GSM850)
	512-661-810(GSM1900)
	4132-4182-4233(UMTS Band V)
	9262-9400-9538(UMTS Band II)
	1013-384-777(CDMA BC 0)
	25-600-1175(CDMA BC 1)
	450-565-670(CDMA BC 10)
	26047-26365-26683(LTE Band XXV BW=1.4MHz)
	26055-26365-26675(LTE Band XXV BW=3MHz)
	26065-26365-26665(LTE Band XXV BW=5MHz)
	26090-26365-26640(LTE Band XXV BW=10MHz)
	26115-26365-26615 (LTE Band XXV BW=15MHz)
	26140-26365-26590(LTE Band XXV BW=20MHz)
	26697-26865-27033(LTE Band XXVI BW=1.4MHz)
	26705-26865-27025(LTE Band XXVI BW=3MHz)
	26715-26865-27015(LTE Band XXVI BW=5MHz)
	26750-26865-26990(LTE Band XXVI BW=10MHz)
	26775-26865-26965(LTE Band XXVI BW=15MHz)
	39675-40620-41565(LTE Band XLI BW=5MHz)
	39700-40620-41540(LTE Band XLI BW=10MHz)
	39725-40620-41515(LTE Band XLI BW=15MHz)
	39750-40620-41490(LTE Band XLI BW=20MHz)
	802.11b/g/n 20M:1-6-11 (WiFi 2.4G)

Table 3:Device information and operating configuration

1.3.1 General Description

Y538-A1, Y538A1, Y538, HUAWEI Y538-A1, HUAWEI Y538A1, HUAWEI Y538 Smart Phone is subscriber equipment in the GSM/CDMA/EVDO/WCDMA/LTE system. The frequency band is CDMA BC0 (Cell 800) and BC1 (PCS1900) and BC10 (Sec 800). The GSM/GPRS/EDGE frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900. The UMTS frequency band is band II and band V. The LTE frequency band is B25 and B26 and B41. But only GSM850 and GSM1900MHz and CDMA BC0 and CDMA BC1 and CDMA BC10 and WCDMA band II, band V and LTE B25, B26, B41 test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, CDMA2000 1x /1X EV-DO and LTE/UMTS and GSM/GPRS/EDGE protocol processing, voice, MMS service, GPS, AGPS and WIFI etc. Externally it provides micro SD card interface, earphone port (to provide voice service). 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.	1658LCF105G25381	Battery Model: HB474284RBC Rated capacity: 2000mAH Nominal Voltage: ⎓ +3.8V Charging Voltage: ⎓ +4.35V

1.3.2 TDD LTE additional specification

The device supports TDD LTE bands. According to KDB 941225 D05 SAR for LTE Devices v02r03, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.
For this device, TDD LTE SAR should be tested with the highest transmission duty factor (63.33%) , which using Uplink-downlink configuration 0.The detailed TDD LTE test configuration description are provided in Section 6.3 of this report.

1.3.3 Hotspot power reduction specification

This 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. A fixed level power reduction is applied to the Main Antenna 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 V/II, CDMA BC0/BC1/BC10,LTE Band XXV/XXVI/XLI
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

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	SAR test for 3G devices 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 v02
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

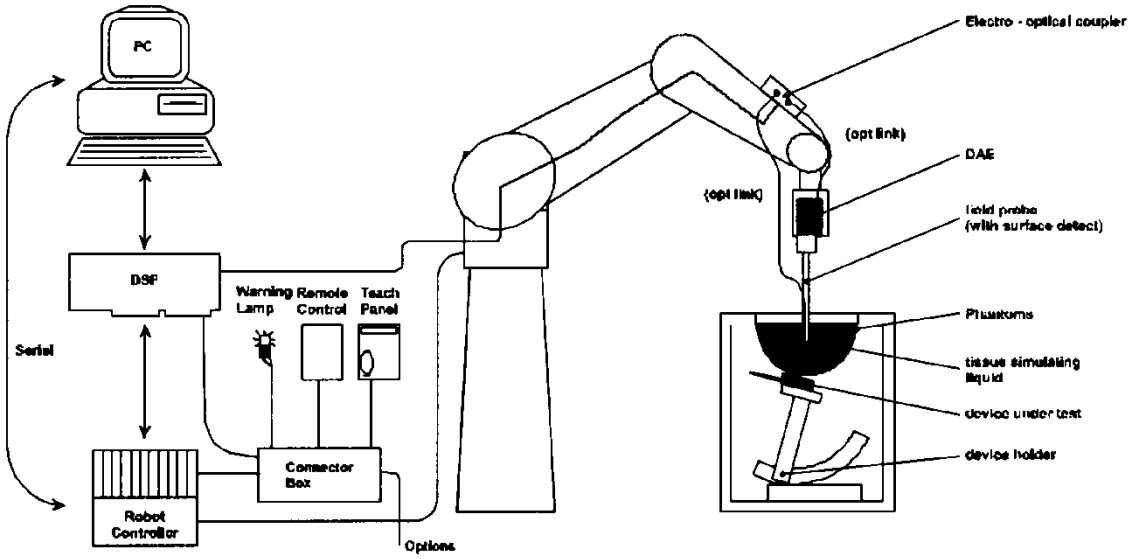
Start Date of test	2015-04-21
End Date of test	2015-05-15

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

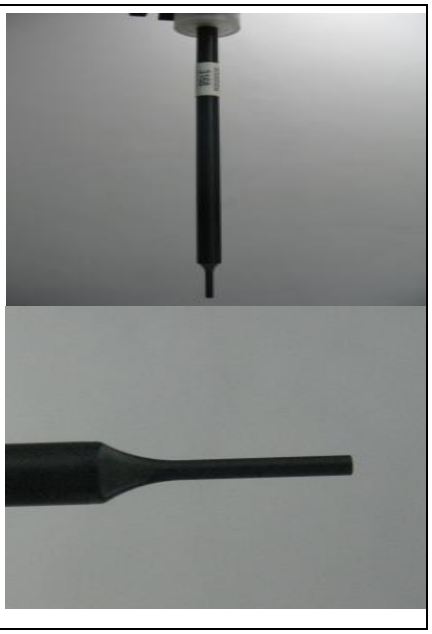
Input Impedance	200MOhm	
The Inputs	symmetrical and floating	
Common mode rejection	above 80 dB	

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 µW/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

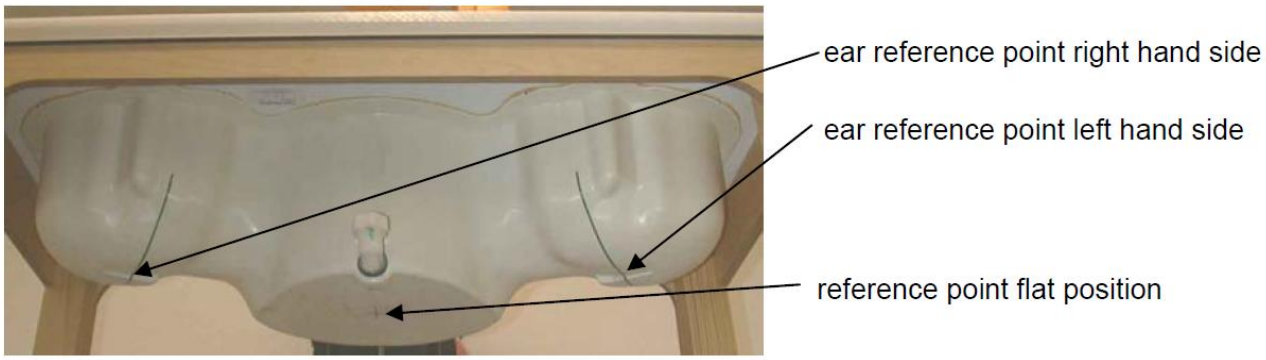
Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to >6 GHz; Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic range	10 µW/g to > 100 mW/g; Linearity: ± 0.2 dB(noise:typically<1µW/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: 1mm
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

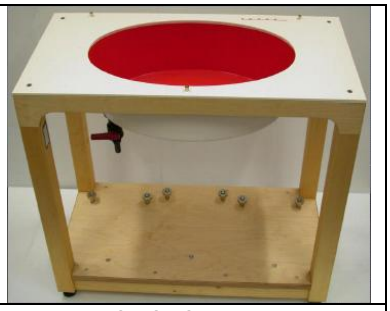
SAM Twin Phantom

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

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 $2 \leq \varepsilon r \leq 5$ at ≤3 GHz, $3 \leq \varepsilon r \leq 4$ at >3 GHz and 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 ε =3 and loss tangent σ =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 ±1° 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	835 MHz Dipole	D835V2	4d059	2013-05-02	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	111379	2014-07-11	One year
☒	R & S	Universal Radio Communication Tester	CMW 500	126855	2014-07-11	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
☒	R & S	Power Meter	NRP	100740	2014-07-11	One year
☒	R & S	Power Meter Sensor	NRP-Z11	106288	2014-07-11	One year
☒	Agilent	Power Meter	E4417A	MY45101339	2015-01-07	One year
☒	Agilent	Power Meter Sensor	E9321A	MY44420359	2015-01-07	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;
b) System check with specific dipole is within 10% of calibrated value;
c) The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement.
d) 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 ± 0.1mm). 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 ± 30°.)

- 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(≤2GHz)，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: Δx_{zoom}, Δy_{zoom}≤ 2GHz - ≤8mm, 2-4GHz - ≤5 mm and 4-6 GHz-≤4mm; Δz_{zoom} ≤3GHz - ≤5 mm, 3-4 GHz- ≤4mm and 4-6GHz-≤2mm 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 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 (Δx_{area}, Δy_{area})	Maximun Zoom Scan spatial resolution (Δx_{Zoom}, Δy_{Zoom})	Maximun Zoom Scan spatial resolution			Minimum zoom scan volume (x,y,z)
			Uniform Grid	Graded Grad		
			$\Delta z_{Zoom}(n)$	$\Delta z_{Zoom}(1)$*	$\Delta z_{Zoom}(n>1)$*	
≤2GHz	≤15mm	≤8mm	≤5mm	≤4mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥30mm
2-3GHz	≤12mm	≤5mm	≤5mm	≤4mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥30mm
3-4GHz	≤12mm	≤5mm	≤4mm	≤3mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥28mm
4-5GHz	≤10mm	≤4mm	≤3mm	≤2.5mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥25mm
5-6GHz	≤10mm	≤4mm	≤2mm	≤2mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥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 compansate 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:

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

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)
dcp_i = diode compression point (DASY parameter)

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

E-field probes: $E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$

H-field probes: $H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1}f + a_{i2}f^2)/f$

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):

$$E_{tot} = (E_x^2 + E_Y^2 + E_z^2)^{1/2}$$

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

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

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/cm^3

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.

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

with P_{pwe} = equivalent power density of a plane wave in mW/cm^2

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 of the dielectic parameter are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within ± 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, 16MΩ+ 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
		εr (+/-5%)	σ (S/m) (+/-5%)	εr	σ (S/m)		
835H	825	41.60 (39.52~43.68)	0.90 (0.86~0.95)	41.96	0.887	21.4°C	2015-04-21
	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	41.92	0.890		
	850	41.50 (39.43~43.58)	0.92 (0.87~0.96)	41.79	0.900		
835H	825	41.60 (39.52~43.68)	0.90 (0.86~0.95)	40.97	0.881	21.4°C	2015-04-26
	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	40.92	0.890		
	850	41.50 (39.43~43.58)	0.92 (0.87~0.96)	40.85	0.897		
835H	825	41.60 (39.52~43.68)	0.90 (0.86~0.95)	41.49	0.881	21.4°C	2015-05-14
	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	41.41	0.887		
	850	41.50 (39.43~43.58)	0.92 (0.87~0.96)	41.29	0.899		
835B	825	55.20 (52.44~57.96)	0.97 (0.92~1.02)	55.19	0.936	21.4°C	2015-04-26
	835	55.20 (52.44~57.96)	0.97 (0.92~1.02)	55.09	0.946		
	850	55.20 (52.44~57.96)	0.99 (0.94~1.04)	54.92	0.961		
835B	825	55.20 (52.44~57.96)	0.97 (0.92~1.02)	54.51	0.937	21.4°C	2015-04-28
	835	55.20 (52.44~57.96)	0.97 (0.92~1.02)	54.41	0.947		
	850	55.20 (52.44~57.96)	0.99 (0.94~1.04)	54.24	0.963		
835B	825	55.20 (52.44~57.96)	0.97 (0.92~1.02)	54.29	0.935	21.4°C	2015-05-14
	835	55.20 (52.44~57.96)	0.97 (0.92~1.02)	54.19	0.944		
	850	55.20 (52.44~57.96)	0.99 (0.94~1.04)	54.02	0.959		
1900H	1850	40.00 (38.00~42.00)	1.40 (1.33~1.47)	40.05	1.360	21.4°C	2015-04-24
	1880	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.92	1.388		
	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.83	1.410		
	1910	40.00 (38.00~42.00)	1.40 (1.33~1.47)	39.84	1.419		
1900B	1850	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.23	1.519	21.4°C	2015-04-28
	1880	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.79	1.526		
	1900	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.90	1.567		
	1910	53.30 (50.64~55.97)	1.52 (1.44~1.60)	53.05	1.595		

1900B	1850	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.42	1.460	21.4°C	2015-05-14
	1880	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.31	1.490		
	1900	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.23	1.507		
	1910	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.19	1.516		
2450H	2410	39.30 (37.34~41.26)	1.76 (1.67~1.85)	38.52	1.716	21.4°C	2015-05-12
	2435	39.20 (37.24~41.16)	1.79 (1.70~1.88)	38.45	1.738		
	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	38.40	1.754		
	2460	39.20 (37.24~41.16)	1.81 (1.72~1.90)	38.41	1.764		
2450B	2410	52.80 (50.16~55.44)	1.91 (1.81~2.00)	51.72	1.913	21.4°C	2015-05-13
	2435	52.70 (50.07~55.34)	1.94 (1.84~2.04)	51.65	1.938		
	2450	52.70 (50.07~55.34)	1.95 (1.85~2.05)	51.61	1.955		
	2460	52.70 (50.07~55.34)	1.96 (1.86~2.06)	51.58	1.967		
2600H	2510	39.12 (37.16~41.01)	1.86 (1.77~1.96)	38.76	1.864	21.4°C	2015-05-07
	2535	39.1 (37.13~41.04)	1.89 (1.80~1.98)	38.68	1.894		
	2560	39 (37.05~40.95)	1.917 (1.82~2.01)	38.59	1.920		
	2600	39 (37.05~40.95)	1.96 (1.86~2.05)	38.44	1.969		
2600B	2510	52.62 (49.99~55.25)	2.03 (1.93~2.13)	52.54	2.126	21.4°C	2015-05-07
	2535	52.59 (49.96~55.22)	2.07 (1.97~2.17)	52.47	2.154		
	2560	52.57 (49.94~55.20)	2.09 (1.99~2.19)	52.39	2.187		
	2600	52.5 (49.88~55.13)	2.16 (2.05~2.27)	52.31	2.235		
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).

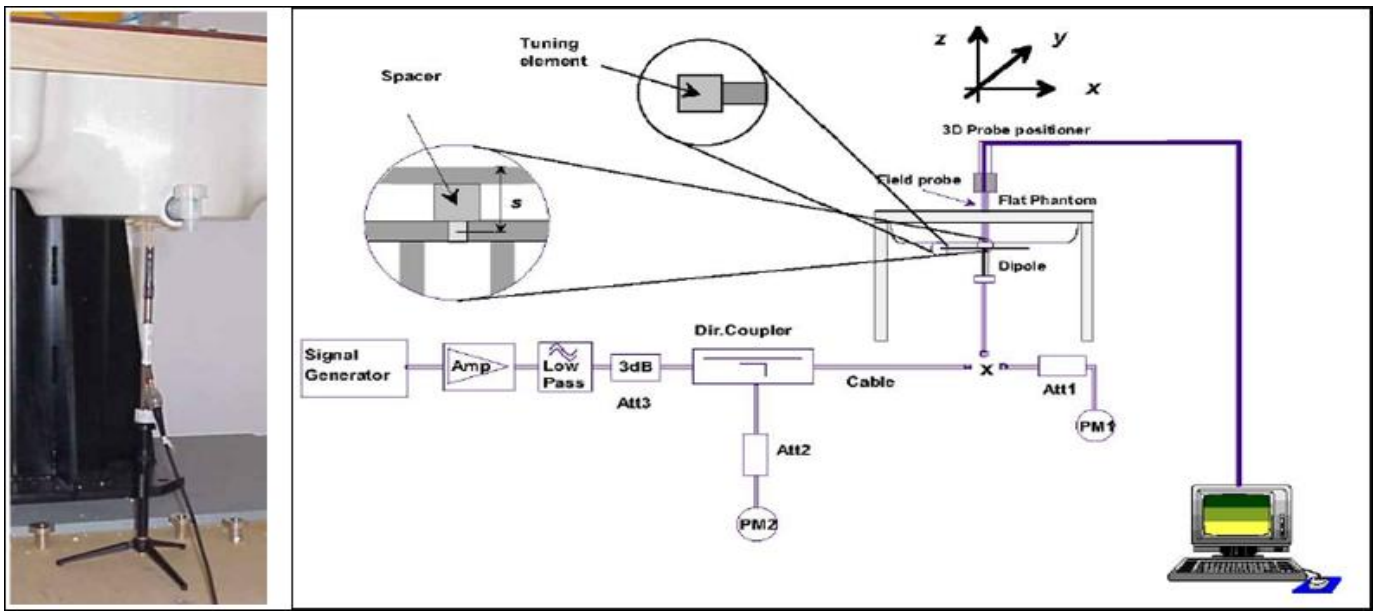
System Check	Target SAR (1W) (+/-10%)		Measured SAR (Normalized to 1W)		Liquid Temp.	Test Date
	1-g (mW/g)	10-g (mW/g)	1-g (mW/g)	10-g (mW/g)		
835MHz Head	9.49 (8.54~10.44)	6.18 (5.56~6.80)	9.00	5.84	21.4°C	2015-04-21
835MHz Head	9.49 (8.54~10.44)	6.18 (5.56~6.80)	9.36	6.12	21.4°C	2015-04-26
835MHz Head	9.49 (8.54~10.44)	6.18 (5.56~6.80)	9.00	5.88	21.4°C	2015-05-14
1900MHz Head	40.80 (36.72~44.88)	21.40 (19.26~23.54)	38.64	20.04	21.4°C	2015-04-24
2450MHz Head	52.30 (47.07~57.53)	24.50 (22.05~26.95)	51.60	23.76	21.4°C	2015-05-12
2600MHz Head	58.6 (52.74~64.46)	26.2 (23.58~28.82)	59.20	26.44	21.4°C	2015-05-07
835MHz Body	9.42 (8.48~10.36)	6.19 (5.57~6.80)	9.40	6.20	21.4°C	2015-04-26
835MHz Body	9.42 (8.48~10.36)	6.19 (5.57~6.80)	9.00	5.92	21.4°C	2015-04-28
835MHz Body	9.42 (8.48~10.36)	6.19 (5.57~6.80)	9.40	6.20	21.4°C	2015-05-14
1900MHz Body	40.20 (36.18~44.22)	21.30 (19.17~23.43)	42.00	21.88	21.4°C	2015-04-28
1900MHz Body	40.20 (36.18~44.22)	21.30 (19.17~23.43)	40.40	21.08	21.4°C	2015-05-14
2450MHz Body	51.4 (46.26~56.54)	23.9 (21.51~26.29)	51.20	23.12	21.4°C	2015-05-13
2600MHz Body	57.6 (51.84~63.36)	25.5 (22.95~28.05)	59.60	26.00	21.4°C	2015-05-07

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 ≤ ¼ 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 10 for this EUT, it has at most 2 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. The EGPRS class is 10 for this EUT, it has at most2 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 requied 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 ≤ ¼ 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, ΔNACK, ΔCQI = 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: △ACK, △NACK and △CQI = 8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$

Note 2 : CM=1 for β_c/β_d= 12/15, β_{hs}/β_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 β_c = 11/15 and β_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 ≤ ¼ 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	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}(1)	β_{ec}	β_{ed}	β_{ec} (SF)	β_{ed} (code)	CM(2) (dB)	MPR (dB)	AG(4) Index	E-TFCI
1	11/15(3)	15/15(3)	64	11/15(3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15(4)	15/15(4)	64	15/15(4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ ACK, Δ NACK and Δ 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, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference

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 $\beta_d = 15/15$

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 $\beta_d = 15/15$

Note 5 : Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g

Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

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 Speading 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&2SF4	11484	5.76
	4	4	2		20000	2.00
7 (No DPDCH)	4	8	2	2SF2&2SF4	22996	?
	4	4	10		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

6.4 CDMA Test Configuration

6.4.1 1x RTT Handsets

1) Output Power Verification

Maximum output power is verified on the high, middle and low channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E. Results for at least steps 3, 4 and 10 of the power measurement procedures are required in the SAR report. Steps 3 and 4 are measured using Loopback Service Option SO55 with power control bits in “All Up” condition. TDSO/SO32 may be used instead of SO55 for step 4. Step 10 is measured using TDSO/SO32 with power control bits in the “Bits Hold” condition (i.e. alternative Up/Down Bits). All power measurements defined in C.S0011/TIA-98-E that are inapplicable to the handset or cannot be measured due to technical or equipment limitations must be clearly identified in the test report.

Test Parameter setup for maximum RF output power according to section 4.4.5 of 3GPP2;

Parameter	Units	Value
I or	dBm/1.23MHz	-104
PilotE c/I or	dB	-7
TrafficE c /I or	dB	-7.4

2) Head SAR

SAR for next to the ear head exposure is measured in RC3 with the handset configured to transmit at full rate in SO55. The 3G SAR test reduction procedure is applied to RC1 with RC3 as the primary mode; otherwise, SAR is required for the channel with maximum measured output in RC1 using the head exposure configuration that results in the highest *reported* SAR in RC3.

3) Body-Worn Accessory SAR

Body-worn accessory SAR is measured in RC3 with the handset configured in TDSO/SO32 to transmit at full rate on FCH only with all other code channels disabled. The body-worn accessory procedures in KDB Publication 447498 are applied. The 3G SAR test reduction procedure is applied to the multiple code channel configuration (FCH+SCHn), with FCH only as the primary mode. Otherwise, SAR is required for multiple code channel configuration (FCH + SCHn), with FCH at full rate and SCH0 enabled at 9600 bps, using the highest *reported* SAR configuration for FCH only. When multiple code channels are enabled, the transmitter output can shift by more than 0.5 dB and may lead to higher SAR drifts and SCH dropouts.

The 3G SAR test reduction procedure is applied to body-worn accessory SAR in RC1 with RC3 as the primary mode.9 Otherwise, SAR is required for RC1, with SO55 and full rate, using the highest *reported* SAR configuration for body-worn accessory exposure in RC3.

Test communication setup meet as followings:

Communication standard between mobile station and base station simulator	3GPP2 C.S0011-B
Radio configuration	RC3(Supporting CDMA 1X)
Spreading Rate	SR1
Data Rate	9600bps
Service Options	SO55(Loopback service)
Service Options	SO32(Test Data service)
Multiplex Options	The mobile station does not support this service

4) Handsets with built-in Ev-Do

For handsets with Ev-Do capabilities, the 3G SAR test reduction procedure is applied to Ev-Do Rev. 0 with 1x RTT RC3 as the primary mode to determine body-worn accessory test requirements. Otherwise, body-worn accessory SAR is required for Rev. 0, at 153.6 kbps, using the highest *reported* SAR configuration for body-worn accessory exposure in RC3.

The 3G SAR test reduction procedure is applied separately to Rev. A and Rev. B, with Rev. 0 as the primary mode to determine body-worn accessory SAR test requirements. When SAR is not required for Rev. 0, the 3G SAR test reduction is applied with 1x RTT RC3 as the primary mode. Otherwise, SAR is required for Rev. A or Rev. B, with a Reverse Data Channel payload size of 4096 bits and a Termination Target of 16 slots defined for Subtype 2 and 3 Physical Layer configurations, using the highest *reported* SAR configuration for body-worn accessory exposure in Rev. 0 or RC3, as appropriate.

A Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with ACK Channel transmitting in all slots is configured in the downlink for Rev. 0, Rev. A and Rev. B.

6.4.2 1x Ev-Do Data Devices

1) Output Power Verification

Maximum output power is verified on the high, middle and low channels according to procedures in section 3.1.2.3.4 of 3GPP2 C.S0033-0/TIA-866 for Rev. 0, section 4.3.4 of 3GPP2 C.S0033-A for Rev. A and section 4.3.4 of 3GPP2 C.S0033-C for Rev. B. Maximum output power is measured for Rev. 0 and Rev. A in Subtype 0/1 and Subtype 2 Physical Layer configurations, respectively. For Rev. B, maximum output power is measured according to power back-off requirements using Subtype 3 Physical Layer with “test 2” and “test 3” configurations. Power is measured using “test 2” with two carries in the maximum frequency separation condition and “test 3” for N-adjacent carriers; where N is the maximum number of carriers supported by the device. Both “test 2” and “test 3” configurations are measured with the channels centered within the transmit frequency band. The device operating configurations under TAP/ETAP/MCTAP must be clearly documented in the test report; including power control, code channel and RF channel output power conditions. The measurement results are required in the SAR report with any measurement difficulties and equipment limitations clearly identified.

2) SAR Measurement

SAR is measured using the F/R TAP configurations required for Rev. 0, Rev. A and Rev. B. The AT is tested with a Reverse Data Channel rate of 153.6 kbps in Subtype 0/1 Physical Layer configurations. A Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots are used for Subtype 2 and 3. FTAP, FETAP and FMCTAP are all configured with a Forward Traffic Channel data rate corresponding to the 2-slot version of 307.2 kbps with ACK Channel transmitting in all slots. AT power control is in “All Bits Up” conditions for the TAP/ETAP/MCTAP.

Body-worn accessory and other body SAR are measured using Subtype 0/1 Physical Layer configurations for Rev. 0. The 3G SAR test reduction procedure is applied to Rev. A, Subtype 2 Physical layer configuration, with Rev. 0 as the primary mode; otherwise, SAR is measured for Rev. A using the highest *reported* SAR configuration for body-worn accessory exposure in Rev. 0. SAR is required for Rev. B, Subtype 3; it is measured by applying both the “test 2” and “test 3” configurations used for power measurement. Head SAR is required for Ev-Do devices that support next to the ear use according to the required handset test configurations; for example, with VOIP in Subtype 2 or Subtype 3 Physical Layer configurations.

3) 1x RTT Support

For Ev-Do data devices that also support 1x RTT voice and/or data operations, the 3G SAR test reduction procedure is applied to 1x RTT RC3 and RC1 with Ev-Do Rev. 0, Rev. A and Rev. B as the respective primary modes.16 Otherwise, the 'Body-Worn Accessory SAR' procedures in the '3GPP2 CDMA 2000 1x Handsets' section are applied.

4) 1x-Advanced

Maximum output power is verified for 1x-Advanced by applying the 1x RTT power measurement procedures using SO75, with RC 8 in the uplink and RC11 in the downlink. Smart blanking must be disabled. The test device is configured with Forward Power Control Mode = 000 and Reverse Power Control = 400 bps; that is, 400 kHz for both uplink and downlink power control. The power measurement results must be included in the SAR report to satisfy power requirements in KDB Publication 447498 and to qualify for SAR test exclusion or to support the SAR test setup and results.

The 3G SAR test reduction procedure is applied to 1x-Advanced with 1x RTT RC3 as the primary mode. When SAR measurement is required, the 1x-Advanced power measurement configurations are used. The 1x Advanced SAR procedures are applied separately to head, body-worn accessory and other exposure conditions.

6.5 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

A) 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 > ½ 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 > ½ 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.

5) TDD LTE test configuration

According to KDB 941225 D05 SAR for LTE Devices v02r03, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

TDD LTE Band 41 supports 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Figure 4.2-1: Frame structure type 2

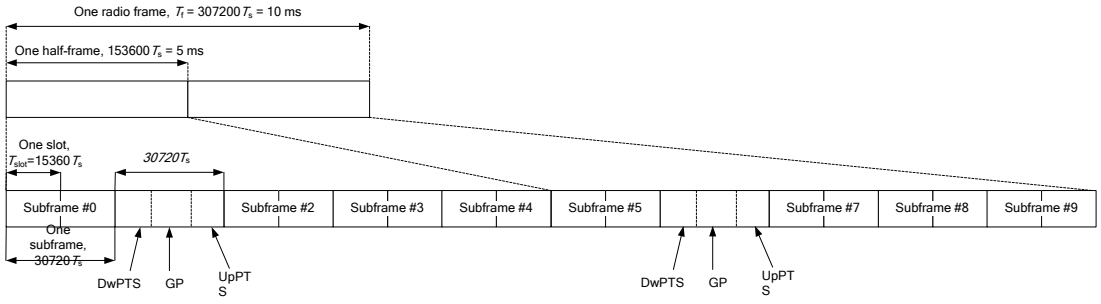


Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Table 4.2-2: Uplink-downlink configurations

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

According to Figure 4.2-1, one radio frame is configured by 10 subframes, which consist of Uplink-subframe, Downlink-subframe and Special subframe. For TDD-LTE, the Duty Cycle should be calculated on Uplink-subframes and Special subframes, due to Special subframe containing both Uplink transmissions. So for one radio frame, Duty Cycle can be calculated with formula as below. The count of Uplink subframes are according to Table 4.2-2:

Duty cycle =(30720Ts*Ups+Uplink Component*Specials)/(307200Ts)

About the uplink component of Special subframes, we can figure out by Table 4.2-1:

Uplink Component=UpPTS

In conclusion, for the TDD LTE Band, Duty Cycle can be calculated with formula as below .all these sets are ok when we test, or we can set as below.

Duty cycle =[(30720Ts*Ups)+ UpPTS *Specials]/(307200Ts)

And we can get different Duty cycles under different configurations:

Uplink-downlink configuration	Subframe number			Configuration of special subframe							
				Normal cyclic prefix in downlink				Extended cyclic prefix in downlink			
				Normal cyclic prefix in uplink		Extended cyclic prefix in uplink		Normal cyclic prefix in uplink		Extended cyclic prefix in uplink	
	D	S	U	configuration 0~4	configuration 5~9	configuration 0~4	configuration 5~9	configuration 0~3	configuration 4~7	configuration 0~3	configuration 4~7
0	2	2	6	61.43%	62.85%	61.67%	63.33%	61.43%	62.85%	61.67%	63.33%
1	4	2	4	41.43%	42.85%	41.67%	43.33%	41.43%	42.85%	41.67%	43.33%
2	6	2	2	21.43%	22.85%	21.67%	23.33%	21.43%	22.85%	21.67%	23.33%
3	6	1	3	30.71%	31.43%	30.83%	31.67%	30.71%	31.43%	30.83%	31.67%
4	7	1	2	20.71%	21.43%	20.83%	21.67%	20.71%	21.43%	20.83%	21.67%
5	8	1	1	10.71%	11.43%	10.83%	11.67%	10.71%	11.43%	10.83%	11.67%
6	3	2	5	51.43%	52.85%	51.67%	53.33%	51.43%	52.85%	51.67%	53.33%

For TDD LTE, SAR should be tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7 for Frame structure type 2.

6.6 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 248227D01v02 are applied. (Refer to KDB 248227D01v02 for more details)

6.6.1 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 ≤ 0.4W/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 ≤ 0.8W/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.

6.6.2 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 248227D01v02). 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 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 ≤ 1.2 W/kg or all required channels are tested.

6.6.3 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 ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.

6.6.4 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 248227D01v02). 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.

C) SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 g/n OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

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

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	33.29	33.30	33.30	-9.19	24.31	24.10	24.11	24.11
GPRS/ EDGE (GMSK)	1 Tx Slot	33.50	33.26	33.28	33.22	-9.19	24.31	24.07	24.09	24.03
	2 Tx Slots	32.50	31.30	31.32	31.12	-6.13	26.37	25.17	25.19	24.99
EDGE (8PSK)	1 Tx Slot	26.00	25.41	25.30	25.15	-9.19	16.81	16.22	16.11	15.96
	2 Tx Slots	25.00	23.23	23.25	23.24	-6.13	18.87	17.10	17.12	17.11

Table 12: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)		32.50	32.26	32.20	32.12	-9.19	23.31	23.07	23.01	22.93
GPRS/ EDGE (GMSK)	1 Tx Slot	32.50	32.18	32.24	32.15	-9.19	23.31	22.99	23.05	22.96
	2 Tx Slots	31.50	31.28	31.32	31.20	-6.13	**25.37**	**25.15**	**25.19**	**25.07**
EDGE (8PSK)	1 Tx Slot	26.00	25.30	25.25	24.96	-9.19	16.81	16.11	16.06	15.77
	2 Tx Slots	24.00	23.25	23.28	23.26	-6.13	17.87	17.12	17.15	17.13

Table 13: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 timesolts.

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

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)		30.00	29.38	29.35	29.52	-9.19	20.81	20.19	20.16	20.33
GPRS/ EDGE (GMSK)	1 Tx Slot	30.00	29.35	29.34	29.50	-9.19	20.81	20.16	20.15	20.31
	2 Tx Slots	29.00	28.30	28.30	28.42	-6.13	22.87	22.17	22.17	22.29
EDGE (8PSK)	1 Tx Slot	25.00	23.40	23.45	23.48	-9.19	15.81	14.21	14.26	14.29
	2 Tx Slots	24.00	22.16	22.30	22.08	-6.13	17.87	16.03	16.17	15.95

Table 14: 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)		29.50	28.88	28.86	29.15	-9.19	20.31	19.69	19.67	19.96
GPRS/ EDGE (GMSK)	1 Tx Slot	29.50	28.90	28.89	29.20	-9.19	20.31	19.71	19.70	20.01
	2 Tx Slots	28.00	27.68	27.68	27.75	-6.13	**21.87**	**21.55**	**21.55**	**21.62**
EDGE (8PSK)	1 Tx Slot	24.00	22.89	22.85	22.87	-9.19	14.81	13.70	13.66	13.68
	2 Tx Slots	23.00	21.68	21.55	21.63	-6.13	16.87	15.55	15.42	15.50

Table 15: 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 timesolts.

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 V

UMTS Band V		Tune-up	Conducted Power (dBm)		
			4132CH	4182CH	4233CH
WCDMA	12.2kbps RMC	**24.00**	**23.51**	**23.65**	**23.58**
	64kbps RMC	24.00	23.52	23.60	23.56
	144kbps RMC	24.00	23.57	23.59	23.55
	384kbps RMC	24.00	23.53	23.58	23.56
HSDPA	Subtest 1	23.00	22.76	22.46	22.70
	Subtest 2	23.50	22.60	22.85	22.74
	Subtest 3	23.00	22.51	22.06	22.26
	Subtest 4	22.50	21.79	21.66	22.27
HSUPA	Subtest 1	23.00	22.62	22.61	22.69
	Subtest 2	22.00	21.36	21.35	21.42
	Subtest 3	22.00	21.20	21.25	21.21
	Subtest 4	22.00	21.50	21.48	21.56
	Subtest 5	23.00	22.30	22.35	22.36

Table 16: Conducted power measurement results of UMTS Band V(Hotspot disable)

UMTS Band V		Tune-up	Conducted Power (dBm)		
			4132CH	4182CH	4233CH
WCDMA	12.2kbps RMC	**23.00**	**21.29**	**21.29**	**21.36**
	64kbps RMC	23.00	21.35	21.25	21.30
	144kbps RMC	23.00	21.32	21.25	21.32
	384kbps RMC	23.00	21.33	21.35	21.37
HSDPA	Subtest 1	22.00	20.37	20.32	20.39
	Subtest 2	22.00	20.26	20.18	20.19
	Subtest 3	21.00	19.63	19.47	19.55
	Subtest 4	21.00	19.60	19.48	19.55
HSUPA	Subtest 1	21.00	20.42	20.47	20.48
	Subtest 2	21.00	19.36	19.35	19.38
	Subtest 3	21.00	19.12	19.20	19.20
	Subtest 4	21.00	19.50	19.51	19.52
	Subtest 5	21.00	20.21	20.24	20.18

Table 17: Conducted power measurement results of UMTS Band V(Hotspot activated)

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 ≤ ¼ 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 II

UMTS Band II		Tune-up	Conducted Power (dBm)		
			9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	**24.00**	**23.55**	**23.63**	**23.49**
	64kbps RMC	24.00	23.57	23.58	23.42
	144kbps RMC	24.00	23.62	23.58	23.40
	384kbps RMC	24.00	23.63	23.56	23.48
HSDPA	Subtest 1	23.00	22.69	22.60	22.20
	Subtest 2	23.50	22.30	22.42	22.28
	Subtest 3	23.00	21.91	21.56	21.52
	Subtest 4	22.50	21.94	21.62	21.90
HSUPA	Subtest 1	23.00	22.06	22.19	22.03
	Subtest 2	22.00	21.07	21.05	21.04
	Subtest 3	22.00	21.14	21.22	21.25
	Subtest 4	22.00	21.61	21.70	21.72
	Subtest 5	23.00	21.84	21.92	21.97

Table 18: Conducted power measurement results of UMTS Band II(Hotspot disable)

UMTS Band II		Tune-up	Conducted Power (dBm)		
			9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	**21.00**	**19.40**	**19.33**	**19.28**
	64kbps RMC	21.00	19.30	19.31	19.23
	144kbps RMC	21.00	19.32	19.32	19.23
	384kbps RMC	21.00	19.35	19.25	19.23
HSDPA	Subtest 1	20.00	18.44	18.24	18.24
	Subtest 2	20.00	18.14	18.00	18.01
	Subtest 3	19.00	17.50	17.51	17.49
	Subtest 4	19.00	17.53	17.48	17.46
HSUPA	Subtest 1	20.00	18.12	18.20	18.15
	Subtest 2	19.00	17.12	17.10	17.15
	Subtest 3	19.00	17.25	17.28	17.27
	Subtest 4	19.00	17.68	17.70	17.75
	Subtest 5	19.00	17.98	18.14	18.10

Table 19: 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 ≤ ¼ 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.

7.1.1 Conducted power measurements of CDMA BC0

CDMA&EVDO BC0		Average Power (dBm)			
		Tune-up	1013CH	384CH	777CH
RC1	SO55 (Loopback)	25.00	24.35	24.28	24.45
RC3	SO55 (Loopback)	25.00	24.35	24.30	24.43
	TDSO32 (FCH+SCH)	25.00	24.37	24.31	24.40
	TDSO32 (FCH)	25.00	24.36	24.30	24.38
1x Advanced	SO75	25.00	24.42	24.40	24.52
Rev 0	FTAP/RTAP	25.00	24.23	24.30	24.28
Rev A	FETAP/RETAP	25.00	24.32	24.21	24.32

Table 20: Conducted power measurement results of CDMA BC0(Hotspot disable)

CDMA&EVDO BC0		Average Power (dBm)			
		Tune-up	1013CH	384CH	777CH
RC1	SO55 (Loopback)	24.00	22.30	22.50	22.42
RC3	SO55 (Loopback)	24.00	22.38	22.50	22.38
	TDSO32 (FCH+SCH)	24.00	22.32	22.47	22.39
	TDSO32 (FCH)	24.00	22.32	22.50	22.40
1x Advanced	SO75	24.00	22.45	22.60	22.54
Rev 0	FTAP/RTAP	24.00	22.38	22.40	22.32
Rev A	FETAP/RETAP	24.00	22.40	22.45	22.42

Table 21: Conducted power measurement results of CDMA BC0(Hotspot activated)

Note: 1) The conducted power of CDMA BC0 is measured with RMS detector.

2) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is ≤ ¼ 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.

7.1.1 Conducted power measurements of CDMA BC1

CDMA&EVDO BC 1		Average Power (dBm)			
		Tune-up	1013CH	384CH	777CH
RC1	SO55 (Loopback)	25.00	23.92	24.08	23.79
RC3	SO55 (Loopback)	25.00	23.90	24.05	23.81
	TDSO32 (FCH+SCH)	25.00	23.91	24.06	23.80
	TDSO32 (FCH)	25.00	23.90	24.05	23.81
1x Advanced	SO75	25.00	24.29	24.43	24.56
Rev 0	FTAP/RTAP	25.00	24.11	24.18	23.85
Rev A	FETAP/RETAP	25.00	24.14	24.22	23.83

Table 22: Conducted power measurement results of CDMA BC 1(Hotspot disable)

CDMA&EVDO BC1		Average Power (dBm)			
		Tune-up	1013CH	384CH	777CH
RC1	SO55 (Loopback)	22.00	20.33	20.35	20.12
RC3	SO55 (Loopback)	22.00	20.48	20.41	20.10
	TDSO32 (FCH+SCH)	22.00	20.42	20.30	20.05
	TDSO32 (FCH)	22.00	20.41	20.27	20.02
1x Advanced	SO75	22.00	20.91	20.56	20.88
Rev 0	FTAP/RTAP	22.00	20.42	20.55	20.10
Rev A	FETAP/RETAP	22.00	20.38	20.58	20.15

Table 23: Conducted power measurement results of CDMA BC1(Hotspot activated)

Note: 1) The conducted power of CDMA BC1 is measured with RMS detector.

2) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is ≤ ¼ 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.

7.1.1 Conducted power measurements of CDMA BC10

CDMA&EVDO BC 10		Average Power (dBm)			
		Tune-up	1013CH	384CH	777CH
RC1	SO55 (Loopback)	25.00	24.62	24.50	24.32
RC3	SO55 (Loopback)	25.00	24.48	24.48	24.39
	TDSO32 (FCH+SCH)	25.00	24.52	24.38	24.38
	TDSO32 (FCH)	25.00	24.48	24.48	24.39
1x Advanced	SO75	25.00	24.53	24.64	24.43
Rev 0	FTAP/RTAP	25.00	24.35	24.32	24.21
Rev A	FETAP/RETAP	25.00	24.35	24.32	24.25

Table 24: Conducted power measurement results of CDMA BC10(Hotspot disable)

Note: 1) The conducted power of CDMA BC 10 is measured with RMS detector.

2) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is ≤ ¼ 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.

CDMA&EVDO BC10		Average Power (dBm)			
		Tune-up	1013CH	384CH	777CH
RC1	SO55 (Loopback)	24.00	23.55	23.57	23.70
RC3	SO55 (Loopback)	24.00	23.73	23.61	23.71
	TDSO32 (FCH+SCH)	24.00	23.62	23.62	23.73
	TDSO32 (FCH)	24.00	23.65	23.59	23.62
1x Advanced	SO75	24.00	23.63	23.65	23.89
Rev 0	FTAP/RTAP	24.00	23.60	23.50	23.62
Rev A	FETAP/RETAP	24.00	23.54	23.45	23.63

Table 25: Conducted power measurement results of CDMA BC10(Hotspot activated)

Note: 1) The conducted power of CDMA BC 10 is measured with RMS detector.

2) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is ≤ ¼ 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.

7.1.2 Conducted power measurements of LTE Band XXV

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26047CH	26365CH	26683CH
1.4MHz	QPSK	1	0	24.00	22.82	22.58	22.48
		1	3	24.00	22.93	22.67	22.57
		1	5	24.00	22.77	22.64	22.52
		3	0	24.00	22.76	22.56	22.74
		3	2	24.00	22.80	22.61	22.66
		3	3	24.00	22.77	22.58	22.77
		6	0	23.00	21.65	21.52	21.60
	16QAM	1	0	23.00	22.79	21.17	21.36
		1	3	23.00	22.97	21.32	21.59
		1	5	23.00	22.53	21.29	21.55
		3	0	23.00	21.62	21.09	21.53
		3	2	23.00	21.48	21.11	21.45
		3	3	23.00	21.46	21.22	21.39
		6	0	22.00	20.39	20.22	20.46
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26055CH	26365CH	26675CH
3MHz	QPSK	1	0	24.00	22.79	22.60	22.77
		1	7	24.00	22.80	22.77	22.43
		1	14	24.00	22.80	22.82	22.75
		8	0	23.00	21.83	21.58	21.81
		8	4	23.00	21.73	21.56	21.63
		8	7	23.00	21.72	21.63	21.83
		15	0	23.00	21.75	21.58	21.72
	16QAM	1	0	23.00	21.64	21.80	22.58
		1	7	23.00	22.23	21.68	22.07
		1	14	23.00	21.54	21.72	21.51
		8	0	22.00	20.95	20.75	20.44
		8	4	22.00	21.03	20.72	20.39
		8	7	22.00	20.98	20.81	20.43
		15	0	22.00	20.60	20.72	20.82

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26065CH	26365CH	26665CH
5MHz	QPSK	1	0	24.00	22.81	22.65	22.82
		1	13	24.00	23.07	22.65	22.81
		1	24	24.00	22.97	22.76	22.77
		12	0	23.00	21.77	21.58	21.98
		12	6	23.00	21.68	21.50	21.95
		12	13	23.00	21.63	21.53	21.84
		25	0	23.00	21.64	21.48	22.03
	16QAM	1	0	23.00	21.70	21.52	21.45
		1	13	23.00	21.79	21.44	21.40
		1	24	23.00	21.82	21.45	21.28
		12	0	22.00	20.69	20.36	20.73
		12	6	22.00	20.64	20.35	20.71
		12	13	22.00	20.69	20.37	20.67
		25	0	22.00	20.83	20.48	21.13
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26090CH	26365CH	26640CH
10MHz	QPSK	1	0	24.00	22.98	22.86	23.14
		1	25	24.00	23.24	22.80	23.19
		1	49	24.00	23.01	22.80	23.06
		25	0	23.00	21.79	21.62	22.02
		25	13	23.00	21.80	21.64	21.92
		25	25	23.00	21.77	21.52	21.92
		50	0	23.00	21.81	21.53	22.02
	16QAM	1	0	23.00	22.70	21.60	22.45
		1	25	23.00	21.84	21.64	22.48
		1	49	23.00	21.71	21.50	22.47
		25	0	22.00	20.79	20.60	20.79
		25	13	22.00	20.79	20.52	20.76
		25	25	22.00	20.75	20.51	20.67
		50	0	22.00	20.78	20.50	20.93

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26115CH	26365CH	26615CH
15MHz	QPSK	1	0	24.00	22.94	22.94	23.14
		1	38	24.00	22.69	22.77	23.11
		1	74	24.00	22.80	22.93	23.00
		36	0	23.00	21.87	21.61	22.01
		36	18	23.00	21.84	21.59	21.99
		36	39	23.00	21.50	21.57	21.91
		75	0	23.00	21.67	21.63	21.97
	16QAM	1	0	23.00	22.49	22.54	22.28
		1	38	23.00	22.34	22.42	22.16
		1	74	23.00	22.30	22.38	22.28
		36	0	22.00	20.90	20.64	20.75
		36	18	22.00	20.87	20.63	20.73
		36	39	22.00	20.66	20.61	20.63
		75	0	22.00	20.69	20.58	20.90
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26140CH	26365CH	26590CH
20MHz	QPSK	1	0	24.00	**23.04**	22.82	22.65
		1	50	24.00	22.86	**22.92**	**22.72**
		1	99	24.00	22.68	22.63	22.24
		50	0	23.00	**21.90**	21.65	21.62
		50	25	23.00	21.84	21.62	21.59
		50	50	23.00	21.55	22.86	21.51
		100	0	23.00	**21.74**	21.56	21.55
	16QAM	1	0	23.00	22.59	21.75	21.74
		1	50	23.00	22.42	21.51	21.66
		1	99	23.00	22.23	21.52	21.29
		50	0	22.00	20.78	20.71	20.69
		50	25	22.00	20.74	20.67	20.69
		50	50	22.00	20.61	20.60	20.63
		100	0	22.00	20.83	20.62	20.71

Table 26: Conducted power measurement results of LTE Band XXV(Hotspot disable)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26047CH	26365CH	26683CH
1.4MHz	QPSK	1	0	20.00	19.11	19.04	19.09
		1	3	20.00	19.17	19.11	19.10
		1	5	20.00	19.03	18.93	19.10
		3	0	20.00	19.22	19.11	18.99
		3	2	20.00	19.15	19.15	19.11
		3	3	20.00	19.14	19.23	19.10
		6	0	20.00	19.09	18.91	19.00
	16QAM	1	0	20.00	19.20	18.54	20.21
		1	3	20.00	19.44	18.78	19.97
		1	5	20.00	19.35	18.74	19.80
		3	0	20.00	19.43	18.52	18.84
		3	2	20.00	19.72	18.54	18.92
		3	3	20.00	19.26	18.52	18.74
		6	0	20.00	19.55	18.62	18.82
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26055CH	26365CH	26675CH
3MHz	QPSK	1	0	20.00	19.36	19.21	19.44
		1	7	20.00	19.40	19.29	19.46
		1	14	20.00	19.45	19.39	19.41
		8	0	20.00	19.08	19.04	19.18
		8	4	20.00	19.00	19.02	19.02
		8	7	20.00	19.09	19.13	19.11
		15	0	20.00	19.09	19.03	19.14
	16QAM	1	0	20.00	18.28	18.03	20.43
		1	7	20.00	18.41	18.16	20.61
		1	14	20.00	19.43	18.05	20.30
		8	0	20.00	19.35	19.17	19.52
		8	4	20.00	19.35	19.28	19.47
		8	7	20.00	19.35	19.28	19.30
		15	0	20.00	19.30	19.14	19.09

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26065CH	26365CH	26665CH
5MHz	QPSK	1	0	20.00	19.11	19.15	18.68
		1	13	20.00	19.09	19.22	18.73
		1	24	20.00	19.11	19.19	18.59
		12	0	20.00	19.05	18.96	19.18
		12	6	20.00	19.07	19.00	19.17
		12	13	20.00	19.13	18.92	19.09
		25	0	20.00	19.13	18.95	19.20
	16QAM	1	0	20.00	18.97	18.70	18.69
		1	13	20.00	18.96	18.79	18.72
		1	24	20.00	18.90	18.99	18.57
		12	0	20.00	19.21	18.80	19.01
		12	6	20.00	19.27	18.81	19.01
		12	13	20.00	19.20	18.87	18.95
		25	0	20.00	19.36	18.93	19.16
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26090CH	26365CH	26640CH
10MHz	QPSK	1	0	20.00	19.45	19.29	19.38
		1	25	20.00	19.44	19.15	19.57
		1	49	20.00	19.42	19.27	19.38
		25	0	20.00	19.21	19.01	19.24
		25	13	20.00	19.20	19.06	19.21
		25	25	20.00	19.15	18.95	19.08
		50	0	20.00	19.21	18.93	19.13
	16QAM	1	0	20.00	19.98	19.94	19.03
		1	25	20.00	19.45	19.01	18.88
		1	49	20.00	19.04	18.88	18.93
		25	0	20.00	19.15	19.04	19.03
		25	13	20.00	19.25	19.03	19.20
		25	25	20.00	19.20	18.88	18.90
		50	0	20.00	19.13	19.04	19.15

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26115CH	26365CH	26615CH
15MHz	QPSK	1	0	20.00	19.37	19.32	19.32
		1	38	20.00	19.23	19.12	19.32
		1	74	20.00	19.19	19.14	19.24
		36	0	20.00	19.15	19.03	19.17
		36	18	20.00	19.18	18.94	19.16
		36	39	20.00	19.00	19.01	19.15
		75	0	20.00	19.03	18.97	19.22
	16QAM	1	0	20.00	19.56	18.84	19.10
		1	38	20.00	19.17	18.72	18.90
		1	74	20.00	18.84	18.83	18.92
		36	0	20.00	18.98	18.84	19.04
		36	18	20.00	18.98	18.75	19.00
		36	39	20.00	18.85	18.78	19.00
		75	0	20.00	19.29	19.14	19.29
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26140CH	26365CH	26590CH
20MHz	QPSK	1	0	20.00	**19.23**	19.12	19.16
		1	50	20.00	19.09	**19.24**	**19.37**
		1	99	20.00	19.03	19.06	19.01
		50	0	20.00	**19.23**	19.09	19.11
		50	25	20.00	19.21	19.10	19.06
		50	50	20.00	19.12	19.07	19.01
		100	0	20.00	**19.17**	19.03	19.05
	16QAM	1	0	20.00	19.82	19.09	19.02
		1	50	20.00	18.98	18.90	19.04
		1	99	20.00	18.91	18.96	18.91
		50	0	20.00	19.28	19.07	19.20
		50	25	20.00	19.23	19.07	19.15
		50	50	20.00	19.12	19.15	19.09
		100	0	20.00	19.06	19.12	19.07

Table 27: Conducted power measurement results of LTE Band XXV(Hotspot actinated)

7.1.1 Conducted power measurements of LTE Band XXVI

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26697CH	26865CH	27033CH
1.4MHz	QPSK	1	0	24.00	23.06	22.96	23.01
		1	3	24.00	23.05	22.90	23.05
		1	5	24.00	23.09	22.97	22.89
		3	0	24.00	22.89	22.90	23.18
		3	2	24.00	23.00	22.94	23.10
		3	3	24.00	23.09	22.97	23.25
		6	0	23.00	21.99	21.97	21.98
	16QAM	1	0	23.00	22.75	22.72	22.67
		1	3	23.00	21.91	21.20	22.47
		1	5	23.00	21.87	21.07	22.25
		3	0	23.00	21.11	21.08	21.10
		3	2	23.00	21.08	21.04	21.08
		3	3	23.00	21.07	21.09	21.12
		6	0	22.00	21.06	21.06	21.03
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26705CH	26865CH	27025CH
3MHz	QPSK	1	0	24.00	23.59	23.08	23.23
		1	7	24.00	23.28	23.48	23.43
		1	14	24.00	23.25	23.15	23.26
		8	0	23.00	22.09	21.91	21.98
		8	4	23.00	22.16	21.88	21.97
		8	7	23.00	22.15	22.01	21.89
		15	0	23.00	22.14	21.98	21.99
	16QAM	1	0	23.00	21.86	21.81	21.49
		1	7	23.00	21.93	21.87	21.53
		1	14	23.00	21.83	21.99	21.63
		8	0	22.00	20.89	20.77	20.70
		8	4	22.00	20.86	20.76	20.93
		8	7	22.00	20.80	20.78	20.88
		15	0	22.00	21.04	20.83	20.98

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26715CH	26865CH	27015CH
5MHz	QPSK	1	0	24.00	23.02	22.92	22.75
		1	13	24.00	23.18	23.00	22.94
		1	24	24.00	23.14	23.09	22.95
		12	0	23.00	22.05	21.92	22.05
		12	6	23.00	22.03	21.91	22.06
		12	13	23.00	21.95	22.01	21.98
		25	0	23.00	22.07	21.96	21.97
	16QAM	1	0	23.00	22.57	21.98	22.14
		1	13	23.00	22.60	22.10	22.01
		1	24	23.00	22.49	21.98	22.09
		12	0	22.00	20.92	20.91	20.92
		12	6	22.00	20.84	20.97	21.03
		12	13	22.00	20.82	20.98	21.06
		25	0	22.00	21.05	20.87	20.91
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26750CH	26865CH	26990CH
10MHz	QPSK	1	0	24.00	23.09	22.96	23.17
		1	25	24.00	23.04	23.08	23.04
		1	49	24.00	23.11	23.07	23.09
		25	0	23.00	22.17	21.96	22.01
		25	13	23.00	22.00	22.00	22.01
		25	25	23.00	21.95	22.03	21.99
		50	0	23.00	22.11	22.01	22.03
	16QAM	1	0	23.00	22.61	22.47	22.49
		1	25	23.00	22.61	22.30	22.14
		1	49	23.00	22.52	22.58	22.49
		25	0	22.00	21.23	20.97	20.69
		25	13	22.00	21.04	20.82	20.90
		25	25	22.00	21.08	21.02	20.90
		50	0	22.00	21.05	20.88	21.06

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel 26775CH	Channel 26865CH	Channel 26965CH
15MHz	QPSK	1	0	24.00	**23.06**	23.23	23.16
		1	38	24.00	22.99	23.18	23.05
		1	74	24.00	22.92	**23.32**	**23.29**
		36	0	23.00	**22.08**	21.97	22.05
		36	18	23.00	21.92	21.93	22.00
		36	39	23.00	21.98	22.00	22.01
		75	0	23.00	22.04	21.95	22.03
	16QAM	1	0	23.00	22.61	22.47	22.49
		1	38	23.00	22.61	22.30	22.14
		1	74	23.00	22.52	22.58	22.49
		36	0	22.00	21.23	20.97	20.69
		36	18	22.00	21.04	20.82	20.90
		36	39	22.00	21.08	21.02	20.90
		75	0	22.00	21.05	20.88	21.06

Table 28: Conducted power measurement results of LTE Band XXVI(Hotspot disable)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26697CH	26865CH	27033CH
1.4MHz	QPSK	1	0	21.00	20.18	20.05	20.25
		1	3	21.00	20.29	20.06	20.32
		1	5	21.00	20.26	20.12	20.21
		3	0	21.00	20.07	20.11	20.27
		3	2	21.00	20.23	20.11	20.38
		3	3	21.00	20.32	20.14	20.29
		6	0	21.00	20.16	20.09	20.24
	16QAM	1	0	21.00	20.65	20.83	20.03
		1	3	21.00	20.84	20.76	20.17
		1	5	21.00	20.85	20.83	20.09
		3	0	21.00	20.30	20.30	20.07
		3	2	21.00	20.30	20.29	20.09
		3	3	21.00	20.39	20.30	19.99
		6	0	21.00	20.59	20.57	20.14
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26705CH	26865CH	27025CH
3MHz	QPSK	1	0	21.00	20.31	20.24	20.31
		1	7	21.00	20.37	20.29	20.49
		1	14	21.00	20.48	20.54	20.48
		8	0	21.00	20.24	20.21	20.21
		8	4	21.00	20.24	20.16	20.25
		8	7	21.00	20.11	20.11	20.32
		15	0	21.00	20.29	20.18	20.26
	16QAM	1	0	21.00	20.42	20.37	20.18
		1	7	21.00	20.75	20.23	20.24
		1	14	21.00	20.54	20.30	19.27
		8	0	21.00	19.90	19.72	20.52
		8	4	21.00	19.69	19.69	20.62
		8	7	21.00	19.66	19.98	20.53
		15	0	21.00	19.97	20.07	20.41

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26715CH	26865CH	27015CH
5MHz	QPSK	1	0	21.00	20.22	20.04	20.18
		1	13	21.00	20.15	19.98	20.23
		1	24	21.00	20.05	20.11	20.33
		12	0	21.00	20.11	20.05	20.20
		12	6	21.00	20.15	20.07	20.25
		12	13	21.00	20.18	20.12	20.31
		25	0	21.00	20.15	20.14	20.14
	16QAM	1	0	21.00	20.18	19.62	20.89
		1	13	21.00	20.05	19.55	19.75
		1	24	21.00	20.12	19.67	19.86
		12	0	21.00	20.21	19.96	20.26
		12	6	21.00	20.24	19.94	20.08
		12	13	21.00	20.22	19.93	20.14
		25	0	21.00	20.35	20.35	20.32
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					26750CH	26865CH	26990CH
10MHz	QPSK	1	0	21.00	20.69	20.43	20.57
		1	25	21.00	20.61	20.41	20.66
		1	49	21.00	20.74	20.96	20.57
		25	0	21.00	20.23	20.14	20.25
		25	13	21.00	20.08	20.18	20.25
		25	25	21.00	20.12	20.24	20.38
		50	0	21.00	20.21	20.22	20.29
	16QAM	1	0	21.00	20.70	20.67	20.79
		1	25	21.00	20.82	20.65	20.76
		1	49	21.00	20.55	20.79	20.86
		25	0	21.00	20.26	19.98	20.22
		25	13	21.00	20.23	19.98	20.27
		25	25	21.00	20.08	20.03	20.29
		50	0	21.00	20.16	20.12	20.27

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel 26775CH	Channel 26865CH	Channel 26965CH
15MHz	QPSK	1	0	21.00	20.35	20.45	20.47
		1	38	21.00	20.36	20.32	20.29
		1	74	21.00	20.36	**20.54**	20.49
		36	0	21.00	20.15	20.19	20.18
		36	18	21.00	20.13	20.16	20.33
		36	39	21.00	20.12	**20.34**	20.19
		75	0	21.00	20.20	20.20	20.35
	16QAM	1	0	21.00	20.18	20.57	20.18
		1	38	21.00	20.05	20.45	20.14
		1	74	21.00	20.07	20.74	20.22
		36	0	21.00	20.14	20.16	20.12
		36	18	21.00	20.10	20.27	20.25
		36	39	21.00	20.03	20.41	20.09
		75	0	21.00	20.41	20.24	20.43

Table 29: Conducted power measurement results of LTE Band XXVI(Hotspot actinated)

7.1.1 Conducted power measurements of LTE Band XLI

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					39675CH	40620CH	41565CH
5MHz	QPSK	1	0	23.50	22.31	22.42	22.60
		1	13	23.50	22.18	22.42	22.40
		1	24	23.50	22.28	22.45	22.21
		12	0	22.50	21.39	21.59	21.68
		12	6	22.50	21.33	21.80	21.56
		12	13	22.50	21.39	21.69	21.54
		25	0	22.50	21.39	21.80	21.64
	16QAM	1	0	22.50	20.86	21.26	21.19
		1	13	22.50	20.80	21.35	21.09
		1	24	22.50	20.73	21.39	21.10
		12	0	21.50	20.13	20.40	20.44
		12	6	21.50	20.08	20.50	20.35
		12	13	21.50	20.13	20.57	20.33
		25	0	21.50	20.35	20.64	20.54
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					39700CH	40620CH	41540CH
10MHz	QPSK	1	0	23.50	22.36	22.74	22.72
		1	25	23.50	22.25	22.82	22.59
		1	49	23.50	22.35	22.58	22.42
		25	0	22.50	21.37	21.80	21.80
		25	13	22.50	21.28	21.88	21.71
		25	25	22.50	21.28	21.75	21.58
		50	0	22.50	21.25	21.77	21.78
	16QAM	1	0	22.50	21.69	22.40	22.45
		1	25	22.50	21.69	22.41	22.42
		1	49	22.50	21.52	22.26	22.26
		25	0	21.50	20.44	20.65	20.72
		25	13	21.50	20.37	20.74	20.64
		25	25	21.50	20.29	20.63	20.59
		50	0	21.50	20.45	20.65	20.64

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel 39725CH	Channel 40620CH	Channel 41515CH
15MHz	QPSK	1	0	23.50	22.50	22.68	22.77
		1	38	23.50	22.20	22.56	22.55
		1	74	23.50	22.32	22.38	22.46
		36	0	22.50	21.32	21.82	21.81
		36	18	22.50	21.32	21.77	21.75
		36	39	22.50	21.30	21.72	21.63
		75	0	22.50	21.27	21.75	21.75
	16QAM	1	0	22.50	22.18	22.42	22.41
		1	38	22.50	21.71	22.24	22.31
		1	74	22.50	21.97	22.23	22.26
		36	0	21.50	20.34	20.65	20.73
		36	18	21.50	20.27	20.61	20.64
		36	39	21.50	20.25	20.56	20.50
		75	0	21.50	20.33	20.74	20.68
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel 39750CH	Channel 40620CH	Channel 41490CH
20MHz	QPSK	1	0	23.50	**22.73**	22.59	**23.25**
		1	50	23.50	22.72	**22.85**	23.19
		1	99	23.50	22.40	22.52	22.84
		50	0	22.50	21.36	21.84	**21.85**
		50	25	22.50	21.30	21.77	21.84
		50	50	22.50	21.29	21.71	21.65
		100	0	22.50	21.21	21.78	21.80
	16QAM	1	0	22.50	21.86	22.04	22.16
		1	50	22.50	21.81	22.12	22.15
		1	99	22.50	21.55	22.00	21.93
		50	0	21.50	20.38	20.85	20.74
		50	25	21.50	20.31	20.78	20.73
		50	50	21.50	20.26	20.64	20.53
		100	0	21.50	20.37	20.80	20.69

Table 30: Conducted power measurement results of LTE Band XLI(Hotspot disable)

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					39675CH	40620CH	41565CH
5MHz	QPSK	1	0	20.00	18.25	18.56	18.47
		1	13	20.00	18.08	18.50	18.37
		1	24	20.00	18.13	18.64	18.30
		12	0	20.00	18.29	18.71	18.67
		12	6	20.00	18.33	18.72	18.59
		12	13	20.00	18.32	18.74	18.59
		25	0	20.00	18.31	18.70	18.66
	16QAM	1	0	20.00	18.20	18.40	18.34
		1	13	20.00	18.37	18.41	18.20
		1	24	20.00	18.30	18.44	18.21
		12	0	20.00	18.17	18.50	18.54
		12	6	20.00	18.21	18.62	18.42
		12	13	20.00	18.30	18.58	18.39
		25	0	20.00	18.42	18.75	18.64
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					39700CH	40620CH	41540CH
10MHz	QPSK	1	0	20.00	18.56	18.87	18.81
		1	25	20.00	18.55	18.89	18.65
		1	49	20.00	18.86	18.67	18.70
		25	0	20.00	18.40	18.73	18.85
		25	13	20.00	18.41	18.80	18.75
		25	25	20.00	18.35	18.80	18.61
		50	0	20.00	18.39	18.82	18.75
	16QAM	1	0	20.00	19.07	19.47	19.50
		1	25	20.00	18.94	19.51	19.43
		1	49	20.00	19.00	19.48	19.39
		25	0	20.00	18.31	18.64	18.76
		25	13	20.00	18.35	18.73	18.66
		25	25	20.00	18.27	18.60	18.52
		50	0	20.00	18.32	18.62	18.65

Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					39725CH	40620CH	41515CH
15MHz	QPSK	1	0	20.00	18.55	18.94	18.84
		1	38	20.00	18.32	18.73	18.62
		1	74	20.00	18.45	18.78	18.56
		36	0	20.00	18.47	18.88	18.93
		36	18	20.00	18.39	18.83	18.78
		36	39	20.00	18.36	18.79	18.64
		75	0	20.00	18.34	18.82	18.72
	16QAM	1	0	20.00	19.04	19.45	19.42
		1	38	20.00	18.88	19.27	19.21
		1	74	20.00	19.03	19.28	19.13
		36	0	20.00	18.38	18.72	18.77
		36	18	20.00	18.40	18.67	18.69
		36	39	20.00	18.37	18.64	18.56
		75	0	20.00	18.37	18.78	18.74
Bandwidth	Modulation	RB size	RB offset	Tune-up	Channel	Channel	Channel
					39750CH	40620CH	41490CH
20MHz	QPSK	1	0	20.00	**18.47**	19.06	**19.16**
		1	50	20.00	18.44	**19.15**	19.13
		1	99	20.00	18.36	18.79	18.78
		50	0	20.00	**18.45**	**18.94**	**18.95**
		50	25	20.00	18.42	18.88	18.91
		50	50	20.00	18.32	18.82	18.70
		100	0	20.00	18.41	**18.88**	18.86
	16QAM	1	0	20.00	18.61	19.24	19.28
		1	50	20.00	18.44	19.29	19.24
		1	99	20.00	18.40	19.05	18.97
		50	0	20.00	18.46	18.76	18.81
		50	25	20.00	18.39	18.80	18.81
		50	50	20.00	18.25	18.74	18.63
		100	0	20.00	18.35	18.90	18.76

Table 31: Conducted power measurement results of LTE Band XLI(Hotspot activated)

7.1.2 Conducted power measurements of WiFi 2.4G

The output power of WiFi antenna is as following:

Wi-Fi 2450MHz	Channel	Tune-up	Average Power (dBm) for Data Rates (Mbps)							
			1	2	5.5	11	/	/	/	/
802.11b	1	18.00	16.54	16.32	16.21	16.05	/	/	/	/
	6	18.00	17.18	17.05	16.90	16.75	/	/	/	/
	11	18.00	**17.66**	17.51	17.42	17.11	/	/	/	/
802.11g	Channel	Tune-up	6	9	12	18	24	36	48	54
	1	15.00	13.20	13.04	12.99	12.59	12.38	11.88	11.12	10.79
	6	15.00	13.76	13.69	13.59	13.22	13.04	12.54	11.81	11.54
	11	15.00	14.44	14.32	14.20	13.81	13.61	13.15	12.45	12.14
802.11n (HT20)	Channel	Tune-up	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
	1	13.50	11.85	11.77	11.28	11.00	10.50	9.82	9.60	8.59
	6	13.50	12.97	12.90	12.51	12.17	11.67	10.98	10.82	9.75
	11	13.50	13.34	13.24	12.82	12.49	12.06	11.41	11.20	10.13

Table 32: Conducted power measurement results of WiFi 2.4G.

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

7.1.3 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	11.50	9.83	10.91	9.85
2DH5	11.50	8.35	9.42	7.91
3DH5	11.50	8.58	9.43	7.90

BT 2450	Tune-up	Average Conducted Power (dBm)		
		0CH	19CH	39CH
BT 4.0	3.50	2.62	3.15	1.92

Table 33: 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:

● ≤ 0.8W/kg for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is ≤ 100MHz.

● ≤ 0.6 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.

● ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz.

When the maximum output power variation across the required test channels is > ½ 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 ≥0.8W/Kg; if the deviation among the repeated measurement is ≤20%, and the measured SAR <1.45W/Kg, only one repeated measurement is required.

4) 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 W/kg, or > 7.0 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).

5) Per KDB941225 D06v02, the DUT Dimension is bigger than 9 cm x 5 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.

6) Per KDB648474 D04v01r02, SAR is evaluated without a headset connected to the device. When the standalone reported body-worn SAR is ≤1.2 W/kg, no additional SAR evaluations using a headset are required.

7) 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 W/kg, or > 7.0 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 appendix B for details).

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 Notes:

1) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is ≤ ¼ 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.

CDMA Notes:

1) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is ≤ ¼ 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 6.5.

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)

3) According to KDB 941225 D05 SAR for LTE Devices v02r03, for Time-Division Duplex (TDD) systems, SAR is tested using a fixed periodic duty factor according to the highest transmission duty factor (63.33%) implemented for the device and supported by the defined 3GPP LTE TDD configurations.

WiFi Notes:

Per KDB248227D01v02:

1) When reported SAR for the initial test position is ≤ 0.4W/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 ≤ 0.8W/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 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

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					
Left Hand Touched	190/836.6	GSM	0.342	0.261	0.100	33.30	33.50	0.358	21.4°C
Left Hand Tilted 15°	190/836.6	GSM	0.215	0.165	0.030	33.30	33.50	0.225	21.4°C
Right Hand Touched	190/836.6	GSM	0.376	0.283	0.080	33.30	33.50	0.394	21.4°C
Right Hand Tilted 15°	190/836.6	GSM	0.271	0.170	0.040	33.30	33.50	0.284	21.4°C
Right Hand Touched	128/824.2	GSM	0.379	0.288	0.000	33.29	33.50	0.398	21.4°C
Right Hand Touched	251/848.8	GSM	0.606	0.458	-0.130	33.30	33.50	0.635	21.4°C

Table 34: 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)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Front Side	190/836.6	GSM	0.448	0.342	0.040	33.30	33.50	0.469	21.4°C
Back Side	190/836.6	GSM	0.487	0.371	-0.030	33.30	33.50	0.510	21.4°C

Table 35: 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)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Front Side	190/836.6	GPRS 2TS	0.199	0.154	-0.040	31.32	31.50	0.207	21.4°C
Back Side	190/836.6	GPRS 2TS	0.389	0.298	0.150	31.32	31.50	0.405	21.4°C
Left Side	190/836.6	GPRS 2TS	0.251	0.174	-0.020	31.32	31.50	0.262	21.4°C
Right Side	190/836.6	GPRS 2TS	0.418	0.291	-0.050	31.32	31.50	0.436	21.4°C
Bottom Side	190/836.6	GPRS 2TS	0.108	0.067	0.020	31.32	31.50	0.113	21.4°C

Table 36: Hotspot SAR test results of GSM850

7.2.2 SAR measurement Result of GSM1900

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					
Left Hand Touched	661/1880	GSM	0.235	0.155	0.060	29.35	30.00	0.273	21.4°C
Left Hand Tilted 15°	661/1880	GSM	0.173	0.102	0.180	29.35	30.00	0.201	21.4°C
Right Hand Touched	661/1880	GSM	0.363	0.228	0.000	29.35	30.00	0.422	21.4°C
Right Hand Tilted 15°	661/1880	GSM	0.156	0.087	0.010	29.35	30.00	0.181	21.4°C
Right Hand Touched	512/1850.2	GSM	0.261	0.156	-0.040	29.38	30.00	0.301	21.4°C
Right Hand Touched	810/1909.8	GSM	0.335	0.199	0.070	29.52	30.00	0.374	21.4°C

Table 37: 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)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Front Side	661/1880	GSM	0.273	0.160	-0.020	29.35	30.00	0.317	21.4°C
Back Side	661/1880	GSM	0.374	0.216	0.020	29.35	30.00	0.434	21.4°C

Table 38: 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)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Front Side	661/1880	GPRS 2TS	0.405	0.223	-0.040	27.68	28.00	0.436	21.4°C
Back Side	661/1880	GPRS 2TS	0.556	0.303	-0.070	27.68	28.00	0.599	21.4°C
Left Side	661/1880	GPRS 2TS	0.110	0.065	0.180	27.68	28.00	0.118	21.4°C
Right Side	661/1880	GPRS 2TS	0.165	0.098	0.080	27.68	28.00	0.178	21.4°C
Bottom Side	661/1880	GPRS 2TS	0.543	0.281	0.200	27.68	28.00	0.585	21.4°C

Table 39: Hotspot SAR test results of GSM1900

7.2.3 SAR measurement Result of UMTS Band V

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					
Left Hand Touched	4182/836.4	RMC	0.466	0.359	0.190	23.65	24.00	0.505	21.4°C
Left Hand Tilted 15°	4182/836.4	RMC	0.320	0.245	0.010	23.65	24.00	0.347	21.4°C
Right Hand Touched	4182/836.4	RMC	0.562	0.423	0.160	23.65	24.00	0.609	21.4°C
Right Hand Tilted 15°	4182/836.4	RMC	0.360	0.271	0.140	23.65	24.00	0.390	21.4°C
Right Hand Touched	4132/826.4	RMC	0.607	0.461	0.080	23.51	24.00	0.679	21.4°C
Right Hand Touched	4233/846.6	RMC	0.618	0.464	0.060	23.58	24.00	0.681	21.4°C

Table 40: 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)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Front Side	4182/836.4	RMC	0.533	0.410	0.010	23.65	24.00	0.578	21.4°C
Back Side	4182/836.4	RMC	0.569	0.435	0.110	23.65	24.00	0.617	21.4°C

Table 41: 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)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Front Side	4182/836.4	RMC	0.352	0.274	-0.010	21.29	23.00	0.522	21.4°C
Back Side	4182/836.4	RMC	0.333	0.256	0.040	21.29	23.00	0.494	21.4°C
Left Side	4182/836.4	RMC	0.238	0.166	-0.030	21.29	23.00	0.353	21.4°C
Right Side	4182/836.4	RMC	0.331	0.231	0.170	21.29	23.00	0.491	21.4°C
Bottom Side	4182/836.4	RMC	0.099	0.061	0.080	21.29	23.00	0.146	21.4°C

Table 42: Hotspot SAR test results of UMTS Band V

7.2.4 SAR measurement Result of UMTS Band II

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					
Left Hand Touched	9400/1880	RMC	0.591	0.382	-0.100	23.63	24.00	0.644	21.4°C
Left Hand Tilted 15°	9400/1880	RMC	0.387	0.229	-0.100	23.63	24.00	0.421	21.4°C
Right Hand Touched	9400/1880	RMC	0.814	0.511	0.060	23.63	24.00	0.886	21.4°C
Right Hand Touched-repeated	9400/1880	RMC	0.871	0.536	0.030	23.63	24.00	0.948	21.4°C
Right Hand Tilted 15°	9400/1880	RMC	0.344	0.195	0.110	23.63	24.00	0.375	21.4°C
Right Hand Touched	9262/1852.4	RMC	0.807	0.510	0.080	23.55	24.00	0.895	21.4°C
Right Hand Touched	9538/1907.6	RMC	0.740	0.463	-0.160	23.49	24.00	0.832	21.4°C

Table 43: 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)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Front Side	9400/1880	RMC	0.652	0.380	0.030	23.63	24.00	0.710	21.4°C
Back Side	9400/1880	RMC	0.800	0.474	0.090	23.63	24.00	0.871	21.4°C
Back Side	9262/1852.4	RMC	0.719	0.433	0.020	23.55	24.00	0.797	21.4°C
Back Side	9538/1907.6	RMC	0.869	0.505	-0.090	23.49	24.00	0.977	21.4°C
Back Side - repeated	9538/1907.6	RMC	0.835	0.494	-0.050	23.49	24.00	0.939	21.4°C

Table 44: 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)	Conducted Power (dBm)	Tune-up Power (dBm)	Scaled SAR1-g (W/kg)	Liquid Temp.
			1-g	10-g					
Front Side	9400/1880	RMC	0.369	0.203	0.050	19.33	21.00	0.542	21.4°C
Back Side	9400/1880	RMC	0.474	0.263	0.030	19.33	21.00	0.696	21.4°C
Left Side	9400/1880	RMC	0.086	0.051	0.180	19.33	21.00	0.126	21.4°C
Right Side	9400/1880	RMC	0.153	0.091	0.140	19.33	21.00	0.225	21.4°C
Bottom Side	9400/1880	RMC	0.529	0.274	0.180	19.33	21.00	0.777	21.4°C

Table 45: Hotspot SAR test results of UMTS Band II

7.2.5 SAR measurement Result of CDMA BC 0

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					
Left Hand Touched	384/836.52	RC3 SO55	0.543	0.411	-0.120	24.30	25.00	0.638	21.4°C
Left Hand Tilted 15°	384/836.52	RC3 SO55	0.357	0.272	0.060	24.30	25.00	0.419	21.4°C
Right Hand Touched	384/836.52	RC3 SO55	0.555	0.420	0.120	24.30	25.00	0.652	21.4°C
Right Hand Tilted 15°	384/836.52	RC3 SO55	0.456	0.206	-0.010	24.30	25.00	0.536	21.4°C
Right Hand Touched	1013/824.7	RC3 SO55	0.582	0.444	0.100	24.35	25.00	0.676	21.4°C
Right Hand Touched	777/848.31	RC3 SO55	0.642	0.489	0.100	24.43	25.00	0.732	21.4°C

Table 46: Head SAR test results of CDMA BC 0

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					
Front Side	384/836.52	RC3 TDSO32	0.611	0.470	0.170	24.30	25.00	0.718	21.4°C
Back Side	384/836.52	RC3 TDSO32	0.635	0.484	0.030	24.30	25.00	0.746	21.4°C

Table 47: Body-Worn SAR test results of CDMA BC 0

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	10-g					
Front Side	384/836.52	Rev.0	0.387	0.299	0.010	22.40	24.00	0.559	21.4°C
Back Side	384/836.52	Rev.0	0.412	0.316	0.040	22.40	24.00	0.596	21.4°C
Left Side	384/836.52	Rev.0	0.301	0.204	0.100	22.40	24.00	0.435	21.4°C
Right Side	384/836.52	Rev.0	0.437	0.303	0.090	22.40	24.00	0.632	21.4°C
Bottom Side	384/836.52	Rev.0	0.132	0.083	0.140	22.40	24.00	0.191	21.4°C

Table 48: Hotspot SAR test results of CDMA BC 0

7.2.6 SAR measurement Result of CDMA BC 1

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					
Left Hand Touched	600/1880	RC3 SO55	0.585	0.377	0.070	24.05	25.00	0.728	21.4°C
Left Hand Tilted 15°	600/1880	RC3 SO55	0.397	0.249	0.070	24.05	25.00	0.494	21.4°C
Right Hand Touched	600/1880	RC3 SO55	0.982	0.572	-0.060	24.05	25.00	1.222	21.4°C
Right Hand Touched-repeated	600/1880	RC3 SO55	0.952	0.557	-0.070	24.05	25.00	1.185	21.4°C
Right Hand Tilted 15°	600/1880	RC3 SO55	0.382	0.225	-0.050	24.05	25.00	0.475	21.4°C
Right Hand Touched	25/1851.25	RC3 SO55	0.880	0.543	0.010	23.90	25.00	1.134	21.4°C
Right Hand Touched	1175/1908.75	RC3 SO55	0.791	0.485	0.040	23.81	25.00	1.040	21.4°C

Table 49: Head SAR test results of CDMA BC 1

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					
Front Side	600/1880	RC3 TDSO32	0.695	0.412	0.030	24.05	25.00	0.865	21.4°C
Back Side	600/1880	RC3 TDSO32	0.846	0.505	-0.040	24.05	25.00	1.053	21.4°C
Back Side	25/1851.25	RC3 TDSO32	0.770	0.465	-0.010	23.90	25.00	0.992	21.4°C
Back Side	1175/1908.75	RC3 TDSO32	0.893	0.519	0.030	23.81	25.00	1.174	21.4°C
Back Side-repeated	1175/1908.75	RC3 TDSO32	0.909	0.529	-0.040	23.81	25.00	1.196	21.4°C

Table 50: Body-Worn SAR test results of CDMA BC 1

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	10-g					
Front Side	600/1880	Rev.0	0.495	0.270	0.040	20.55	22.00	0.691	21.4°C
Back Side	600/1880	Rev.0	0.697	0.376	-0.050	20.55	22.00	0.973	21.4°C
Back Side	25/1851.25	Rev.0	0.621	0.349	-0.050	20.42	22.00	0.893	21.4°C
Back Side	1175/1908.75	Rev.0	0.757	0.400	0.050	20.10	22.00	1.172	21.4°C
Left Side	600/1880	Rev.0	0.098	0.058	0.140	20.55	22.00	0.137	21.4°C
Right Side	600/1880	Rev.0	0.184	0.107	0.180	20.55	22.00	0.257	21.4°C
Bottom Side	600/1880	Rev.0	0.126	0.077	-0.130	20.55	22.00	0.176	21.4°C

Table 51: Hotspot SAR test results of CDMA BC 1

7.2.7 SAR measurement Result of CDMA BC 10

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					
Left Hand Touched	565/820.125	RC3 SO55	0.506	0.388	0.060	24.48	25.00	0.570	21.4°C
Left Hand Tilted 15°	565/820.125	RC3 SO55	0.370	0.257	0.010	24.48	25.00	0.417	21.4°C
Right Hand Touched	565/820.125	RC3 SO55	0.549	0.418	0.030	24.48	25.00	0.619	21.4°C
Right Hand Tilted 15°	565/820.125	RC3 SO55	0.519	0.344	0.020	24.48	25.00	0.585	21.4°C
Right Hand Touched	450/817.25	RC3 SO55	0.569	0.435	-0.010	24.48	25.00	0.641	21.4°C
Right Hand Touched	670/822.75	RC3 SO55	0.576	0.440	0.070	24.39	25.00	0.663	21.4°C

Table 52: Head SAR test results of CDMA BC 10

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					
Front Side	565/820.125	RC3 TDSO32	0.646	0.502	-0.190	24.48	25.00	0.728	21.4°C
Back Side	565/820.125	RC3 TDSO32	0.728	0.556	-0.030	24.48	25.00	0.821	21.4°C
Back Side	450/817.25	RC3 TDSO32	0.781	0.595	0.070	24.48	25.00	0.880	21.4°C
Back Side	670/822.75	RC3 TDSO32	0.723	0.550	0.100	24.39	25.00	0.832	21.4°C

Table 53: Body-Worn SAR test results of CDMA BC 10

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	10-g					
Front Side	565/820.125	Rev.0	0.440	0.343	0.010	23.50	24.00	0.494	21.4°C
Back Side	565/820.125	Rev.0	0.521	0.402	0.010	23.50	24.00	0.585	21.4°C
Left Side	565/820.125	Rev.0	0.389	0.264	0.050	23.50	24.00	0.436	21.4°C
Right Side	565/820.125	Rev.0	0.527	0.366	0.070	23.50	24.00	0.591	21.4°C
Bottom Side	565/820.125	Rev.0	0.102	0.064	0.170	23.50	24.00	0.114	21.4°C

Table 54: Hotspot SAR test results of CDMA BC 10

7.2.8 SAR measurement Result of LTE Band XXV

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					
1RB									
Left Hand Touched	26140/1860	20M QPSK 1RB#0	0.428	0.279	0.120	23.04	24.00	0.534	21.4°C
Left Hand Tilted 15°	26140/1860	20M QPSK 1RB#0	0.281	0.179	-0.010	23.04	24.00	0.351	21.4°C
Right Hand Touched	26140/1860	20M QPSK 1RB#0	0.677	0.409	0.100	23.04	24.00	0.844	21.4°C
Right Hand Tilted 15°	26140/1860	20M QPSK 1RB#0	0.330	0.196	0.040	23.04	24.00	0.412	21.4°C
Right Hand Touched	26365/1882.5	20M QPSK 1RB#50	0.675	0.398	0.050	22.92	24.00	0.866	21.4°C
Right Hand Touched	26590/1905	20M QPSK 1RB#50	0.702	0.406	0.070	22.72	24.00	0.943	21.4°C
50%RB									
Left Hand Touched	26140/1860	20M QPSK 50%RB#0	0.389	0.253	0.140	21.90	23.00	0.501	21.4°C
Left Hand Tilted 15°	26140/1860	20M QPSK 50%RB#0	0.265	0.169	-0.050	21.90	23.00	0.341	21.4°C
Right Hand Touched	26140/1860	20M QPSK 50%RB#0	0.535	0.323	-0.010	21.90	23.00	0.689	21.4°C
Right Hand Tilted 15°	26140/1860	20M QPSK 50%RB#0	0.258	0.152	0.040	21.90	23.00	0.332	21.4°C
100%RB									
Right Hand Touched	26140/1860	20M QPSK 100%RB50	0.588	0.366	0.060	21.74	23.00	0.786	21.4°C

Table 55: Head SAR test results of LTE Band XXV

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					
1RB									
Front Side	26140/1860	20M QPSK 1RB#0	0.452	0.270	-0.150	23.04	24.00	0.564	21.4°C
Back Side	26140/1860	20M QPSK 1RB#0	0.609	0.361	-0.140	23.04	24.00	0.760	21.4°C
50%RB									
Front Side	26140/1860	20M QPSK 50%RB#0	0.404	0.243	0.050	21.90	23.00	0.520	21.4°C
Back Side	26140/1860	20M QPSK 50%RB#0	0.595	0.339	0.080	21.90	23.00	0.767	21.4°C

Table 56: Body-Worn SAR test results of LTE Band XXV

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	10-g					
1RB									
Front Side	26590/1905	20M QPSK 1RB#50	0.511	0.269	-0.150	19.37	20.00	0.591	21.4°C
Back Side	26590/1905	20M QPSK 1RB#50	0.722	0.367	0.030	19.37	20.00	0.835	21.4°C
Back Side	26140/1860	20M QPSK 1RB#0	0.559	0.314	0.000	19.23	20.00	0.667	21.4°C
Back Side	26365/1882.5	20M QPSK 1RB#50	0.577	0.321	-0.170	19.24	20.00	0.687	21.4°C
Left Side	26590/1905	20M QPSK 1RB#50	0.104	0.062	-0.100	19.37	20.00	0.120	21.4°C
Right Side	26590/1905	20M QPSK 1RB#50	0.172	0.101	0.170	19.37	20.00	0.199	21.4°C
Bottom Side	26590/1905	20M QPSK 1RB#50	0.655	0.332	-0.090	19.37	20.00	0.757	21.4°C
50%RB									
Front Side	26140/1860	20M QPSK 50%RB#0	0.406	0.222	0.120	19.23	20.00	0.485	21.4°C
Back Side	26140/1860	20M QPSK 50%RB#0	0.561	0.309	-0.020	19.23	20.00	0.670	21.4°C
Left Side	26140/1860	20M QPSK 50%RB#0	0.086	0.051	0.010	19.23	20.00	0.103	21.4°C
Right Side	26140/1860	20M QPSK 50%RB#0	0.137	0.082	0.140	19.23	20.00	0.164	21.4°C
Bottom Side	26140/1860	20M QPSK 50%RB#0	0.524	0.271	0.160	19.23	20.00	0.626	21.4°C
100%RB									
Back Side	26140/1860	20M QPSK 100%RB#0	0.548	0.294	0.070	19.17	20.00	0.663	21.4°C

Table 57: Hotspot SAR test results of LTE Band XXV

7.2.9 SAR measurement Result of LTE Band XXVI

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					
1RB									
Left Hand Touched	26865/831.5	15M QPSK 1RB#74	0.434	0.329	0.160	23.32	24.00	0.508	21.4°C
Left Hand Tilted 15°	26865/831.5	15M QPSK 1RB#74	0.265	0.201	0.020	23.32	24.00	0.310	21.4°C
Right Hand Touched	26865/831.5	15M QPSK 1RB#74	0.435	0.330	0.040	23.32	24.00	0.509	21.4°C
Right Hand Tilted 15°	26865/831.5	15M QPSK 1RB#74	0.344	0.200	0.020	23.32	24.00	0.402	21.4°C
Right Hand Touched	26775/822.5	15M QPSK 1RB#0	0.397	0.276	-0.050	23.06	24.00	0.493	21.4°C
Right Hand Touched	26965/841.5	15M QPSK 1RB#74	0.540	0.412	0.090	23.29	24.00	0.636	21.4°C
50%RB									
Left Hand Touched	26775/822.5	15M QPSK 50%RB#0	0.336	0.228	-0.090	22.08	23.00	0.415	21.4°C
Left Hand Tilted 15°	26775/822.5	15M QPSK 50%RB#0	0.233	0.161	0.070	22.08	23.00	0.288	21.4°C
Right Hand Touched	26775/822.5	15M QPSK 50%RB#0	0.319	0.221	-0.110	22.08	23.00	0.394	21.4°C
Right Hand Tilted 15°	26775/822.5	15M QPSK 50%RB#0	0.255	0.177	0.110	22.08	23.00	0.315	21.4°C

Table 58: Head SAR test results of LTE Band XXVI

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					
1RB									
Front Side	26865/831.5	15M QPSK 1RB#74	0.468	0.358	0.000	23.32	24.00	0.547	21.4°C
Back Side	26865/831.5	15M QPSK 1RB#74	0.465	0.354	-0.100	23.32	24.00	0.544	21.4°C
50%RB									
Front Side	26775/822.5	15M QPSK 50%RB#0	0.429	0.331	-0.040	22.08	23.00	0.530	21.4°C
Back Side	26775/822.5	15M QPSK 50%RB#0	0.480	0.367	0.010	22.08	23.00	0.593	21.4°C

Table 59: Body-Worn SAR test results of LTE Band XXVI

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	10-g					
1RB									
Front Side	26865/831.5	15M QPSK 1RB#74	0.248	0.192	0.010	20.54	21.00	0.276	21.4°C
Back Side	26865/831.5	15M QPSK 1RB#74	0.238	0.182	0.010	20.54	21.00	0.265	21.4°C
Left Side	26865/831.5	15M QPSK 1RB#74	0.179	0.125	0.110	20.54	21.00	0.199	21.4°C
Right Side	26865/831.5	15M QPSK 1RB#74	0.255	0.176	0.010	20.54	21.00	0.283	21.4°C
Bottom Side	26865/831.5	15M QPSK 1RB#74	0.083	0.051	0.160	20.54	21.00	0.093	21.4°C
50%RB									
Front Side	26865/831.5	15M QPSK 50%RB#39	0.256	0.199	0.100	20.34	21.00	0.298	21.4°C
Back Side	26865/831.5	15M QPSK 50%RB#39	0.268	0.205	0.010	20.34	21.00	0.312	21.4°C
Left Side	26865/831.5	15M QPSK 50%RB#39	0.192	0.133	-0.070	20.34	21.00	0.224	21.4°C
Right Side	26865/831.5	15M QPSK 50%RB#39	0.258	0.180	0.200	20.34	21.00	0.300	21.4°C
Bottom Side	26865/831.5	15M QPSK 50%RB#39	0.081	0.049	0.150	20.34	21.00	0.094	21.4°C

Table 60: Hotspot SAR test results of LTE Band XXVI

7.2.10 SAR measurement Result of LTE Band XLI

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					
1RB									
Left Hand Touched	41490/2680	20M QPSK 1RB#0	0.292	0.146	0.190	23.25	23.50	0.309	21.4°C
Left Hand Tilted 15°	41490/2680	20M QPSK 1RB#0	0.063	0.031	-0.160	23.25	23.50	0.067	21.4°C
Right Hand Touched	41490/2680	20M QPSK 1RB#0	0.182	0.100	0.120	23.25	23.50	0.193	21.4°C
Right Hand Tilted 15°	41490/2680	20M QPSK 1RB#0	0.106	0.053	0.180	23.25	23.50	0.112	21.4°C
Left Hand Touched	39750/2506	20M QPSK 1RB#0	0.188	0.102	0.180	22.73	23.50	0.224	21.4°C
Left Hand Touched	40620/2593	20M QPSK 1RB#50	0.312	0.162	0.190	22.85	23.50	0.362	21.4°C
50%RB									
Left Hand Touched	41490/2680	20M QPSK 50%RB#0	0.256	0.126	0.120	21.85	22.50	0.297	21.4°C
Left Hand Tilted 15°	41490/2680	20M QPSK 50%RB#0	0.047	0.023	0.120	21.85	22.50	0.054	21.4°C
Right Hand Touched	41490/2680	20M QPSK 50%RB#0	0.135	0.074	0.170	21.85	22.50	0.157	21.4°C
Right Hand Tilted 15°	41490/2680	20M QPSK 50%RB#0	0.081	0.040	0.180	21.85	22.50	0.094	21.4°C

Table 61: Head SAR test results of LTE Band XLI

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	41490/2680	20M QPSK 1RB#0	0.586	0.293	-0.010	23.25	23.50	0.621	21.4°C
Front Side	39750/2506	20M QPSK 1RB#0	0.341	0.179	0.190	22.73	23.50	0.407	21.4°C
Front Side	40620/2593	20M QPSK 1RB#50	0.604	0.312	0.160	22.85	23.50	0.702	21.4°C
Back Side	41490/2680	20M QPSK 1RB#0	0.577	0.300	-0.170	23.25	23.50	0.611	21.4°C
Back Side	39750/2506	20M QPSK 1RB#0	0.421	0.218	0.100	22.73	23.50	0.503	21.4°C
Back Side	40620/2593	20M QPSK 1RB#50	0.670	0.349	0.100	22.85	23.50	0.778	21.4°C
50%RB									
Front Side	41490/2680	20M QPSK 50%RB#0	0.404	0.207	0.190	21.85	22.50	0.469	21.4°C
Back Side	41490/2680	20M QPSK 50%RB#0	0.431	0.223	0.180	21.85	22.50	0.501	21.4°C

Table 62: Body-Worn SAR test results of LTE Band XLI

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	10-g					
Test data with battery 1#									
1RB									
Front Side	41490/2680	20M QPSK 1RB#0	0.430	0.204	0.200	19.16	20.00	0.522	21.4°C
Back Side	41490/2680	20M QPSK 1RB#0	0.432	0.215	0.140	19.16	20.00	0.524	21.4°C
Left Side	41490/2680	20M QPSK 1RB#0	0.061	0.030	0.110	19.16	20.00	0.074	21.4°C
Right Side	41490/2680	20M QPSK 1RB#0	0.052	0.029	0.030	19.16	20.00	0.063	21.4°C
Bottom Side	41490/2680	20M QPSK 1RB#0	0.930	0.424	0.130	19.16	20.00	1.128	21.4°C
Bottom Side-repeated	41490/2680	20M QPSK 1RB#0	0.965	0.440	0.130	19.16	20.00	1.171	21.4°C
Bottom Side	39750/2506	20M QPSK 1RB#0	0.666	0.307	0.180	18.47	20.00	0.947	21.4°C
Bottom Side	40620/2593	20M QPSK 1RB#50	0.925	0.420	0.060	19.15	20.00	1.125	21.4°C
50%RB									
Front Side	41490/2680	20M QPSK 50%RB#0	0.415	0.196	0.120	18.95	20.00	0.529	21.4°C
Back Side	41490/2680	20M QPSK 50%RB#0	0.400	0.199	0.140	18.95	20.00	0.509	21.4°C
Left Side	41490/2680	20M QPSK 50%RB#0	0.059	0.029	0.130	18.95	20.00	0.074	21.4°C
Right Side	41490/2680	20M QPSK 50%RB#0	0.051	0.028	0.140	18.95	20.00	0.065	21.4°C
Bottom Side	41490/2680	20M QPSK 50%RB#0	0.904	0.412	0.090	18.95	20.00	1.151	21.4°C
Bottom Side	39750/2506	20M QPSK 50%RB#0	0.688	0.306	0.130	18.45	20.00	0.983	21.4°C
Bottom Side	40620/2593	20M QPSK 50%RB#0	0.922	0.417	0.170	18.94	20.00	**1.177**	21.4°C
100%RB									
Bottom Side	40620/2593	20M QPSK 100%RB#0	0.797	0.369	0.150	18.88	20.00	1.031	21.4°C

Table 63: Hotspot SAR test results of LTE Band XLI

7.2.11 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					
Left Hand Touched	11/2462	802.11 b	0.496	0.511	0.070	17.66	18.00	0.553	21.4°C
Left Hand Tilted 15°	11/2462	802.11 b	0.363	0.386	0.100	17.66	18.00	0.417	21.4°C
Right Hand Touched	11/2462	802.11 b	0.284	0.310	0.140	17.66	18.00	0.335	21.4°C
Right Hand Tilted 15°	11/2462	802.11 b	0.323	/	0.130	17.66	18.00	/	21.4°C

Table 64: 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					
Front Side	11/2462	802.11 b	0.069	/	0.170	17.66	18.00	/	21.4°C
Back Side	11/2462	802.11 b	0.083	0.084	0.150	17.66	18.00	0.091	21.4°C

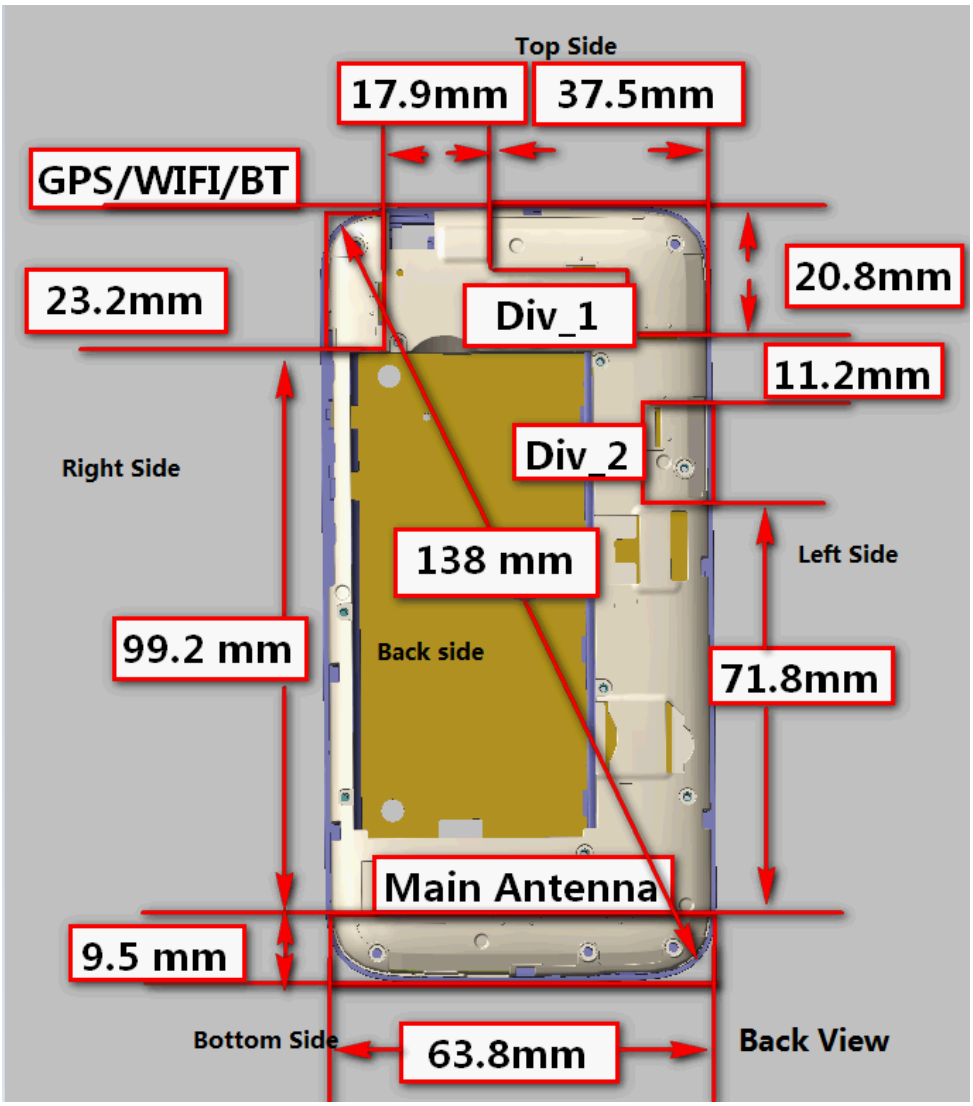
Table 65: Body-Worn SAR test results of WiFi 2450MHz

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					
Front Side	11/2462	802.11 b	0.114	/	-0.170	17.66	18.00	/	21.4°C
Back Side	11/2462	802.11 b	0.151	0.151	0.030	17.66	18.00	0.163	21.4°C
Left Side	11/2462	802.11 b	0.030	/	0.130	17.66	18.00	/	21.4°C
Right Side	11/2462	802.11 b	0.103	/	0.020	17.66	18.00	/	21.4°C
Top Side	11/2462	802.11 b	<0.010	/	0.180	17.66	18.00	/	21.4°C

Table 66: Hotspot SAR test results of WiFi 2450MHz

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) Diversity antenna is used to improve the acceptance of performance of the main antenna. it does not have a transmitter function.

Mode	Exposure Condition	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
Main antenna	Hotspot	Yes	Yes	Yes	Yes	No	Yes
WiFi 2.4G antenna	Hotspot	Yes	Yes	No	Yes	Yes	No

Table 67: Sides for Hotspot SAR testing
Note: Per KDB 941225 D06, particular DUT edges were not required to be evaluated for Hotspot SAR if the antenna-to-edge distance is greater than 2.5cm.

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:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:

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

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	11.50	14.13	15	2.450	1.47	3.00	Yes

Table 68: 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:

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [√f(GHz)/x] 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	11.50	14.13	15	2.450	7.5	0.197

Table 69: 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.	Configuration	Head	Body-worn	Hotspot
1	GSM (Voice) + WiFi 2.4G	Yes	Yes	N/A
2	GPRS/EDGE (DATA) + WiFi 2.4G	N/A	N/A	Yes
3	GSM (Voice) +BT	N/A	Yes	N/A
4	GPRS/EDGE (DATA) + BT	N/A	N/A	N/A
5	UMTS (Voice) + WiFi 2.4G	Yes	Yes	N/A
6	UMTS (DATA) + WiFi 2.4G	N/A	Yes	Yes
7	UMTS (Voice)+BT	N/A	Yes	N/A
8	UMTS (DATA) +BT	N/A	Yes	N/A
9	CDMA (Voice) + WiFi 2.4G	Yes	Yes	N/A
10	CDMA (DATA) + WiFi 2.4G	N/A	Yes	Yes
11	CDMA(Voice) +BT	N/A	Yes	N/A
12	CDMA (DATA) + BT	N/A	Yes	N/A
13	LTE (DATA) + WiFi 2.4G	Yes*	Yes*	Yes
14	LTE (DATA) + BT	N/A	Yes*	N/A

Table 70: Simultaneous Transmission Possibilities

Note:

1) The WiFi and Bluetooth can't transmit simultaneously, because they share the same antenna.

2) Held to ear configurations are not applicable to Bluetooth and therefore were not considered for simultaneous transmission.

3) The device does not support DTM function. Body-worn accessory testing is typically associated with voice operations.

4) * VOIP 3rd party applications may possibly be installed and used by the user.

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 without any power reduction are used.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		GSM850	WiFi 2.4G			
Head	Left Hand Touched	0.358	0.553	0.911	N/A	N/A
	Left Hand Tilted 15°	0.225	0.417	0.642	N/A	N/A
	Right Hand Touched	0.635	0.335	**0.970**	N/A	N/A
	Right Hand Tilted 15°	0.284	0.553	0.837	N/A	N/A
Body-Worn	Front Side	0.469	0.091	0.560	N/A	N/A
	Back Side	0.510	0.091	0.601	N/A	N/A
Hotspot	Front Side	0.207	0.163	0.370	N/A	N/A
	Back Side	0.405	0.163	0.568	N/A	N/A
	Left Side	0.262	0.163	0.425	N/A	N/A
	Right Side	0.436	0.163	0.599	N/A	N/A
	Top Side	/	0.163	0.163	N/A	N/A
	Bottom Side	0.113	0.163	0.276	N/A	N/A

Table 71: 1-g SAR Simultaneous Tx Combination of GSM850 and WiFi 2.4G.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		GSM1900	WiFi 2.4G			
Head	Left Hand Touched	0.273	0.553	**0.826**	N/A	N/A
	Left Hand Tilted 15°	0.201	0.417	0.618	N/A	N/A
	Right Hand Touched	0.422	0.335	0.757	N/A	N/A
	Right Hand Tilted 15°	0.181	0.553	0.734	N/A	N/A
Body-Worn	Front Side	0.317	0.091	0.408	N/A	N/A
	Back Side	0.434	0.091	0.525	N/A	N/A
Hotspot	Front Side	0.436	0.163	0.599	N/A	N/A
	Back Side	0.599	0.163	0.762	N/A	N/A
	Left Side	0.118	0.163	0.281	N/A	N/A
	Right Side	0.178	0.163	0.341	N/A	N/A
	Top Side	/	0.163	0.163	N/A	N/A
	Bottom Side	0.585	0.163	0.748	N/A	N/A

Table 72: 1-g SAR Simultaneous Tx Combination of GSM1900 and WiFi 2.4G.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		UMTS Band V	WiFi 2.4G			
Head	Left Hand Touched	0.505	0.553	**1.058**	N/A	N/A
	Left Hand Tilted 15°	0.347	0.417	0.764	N/A	N/A
	Right Hand Touched	0.681	0.335	1.016	N/A	N/A
	Right Hand Tilted 15°	0.390	0.553	0.943	N/A	N/A
Body-Worn	Front Side	0.578	0.091	0.669	N/A	N/A
	Back Side	0.617	0.091	0.708	N/A	N/A
Hotspot	Front Side	0.522	0.163	0.685	N/A	N/A
	Back Side	0.494	0.163	0.657	N/A	N/A
	Left Side	0.353	0.163	0.516	N/A	N/A
	Right Side	0.491	0.163	0.654	N/A	N/A
	Top Side	/	0.163	0.163	N/A	N/A
	Bottom Side	0.146	0.163	0.309	N/A	N/A

Table 73: 1-g SAR Simultaneous Tx Combination of UMTS Band V and WiFi 2.4G.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		UMTS Band II	WiFi 2.4G			
Head	Left Hand Touched	0.644	0.553	1.197	N/A	N/A
	Left Hand Tilted 15°	0.421	0.417	0.838	N/A	N/A
	Right Hand Touched	0.948	0.335	**1.283**	N/A	N/A
	Right Hand Tilted 15°	0.375	0.553	0.928	N/A	N/A
Body-Worn	Front Side	0.710	0.091	0.801	N/A	N/A
	Back Side	0.977	0.091	1.068	N/A	N/A
Hotspot	Front Side	0.542	0.163	0.705	N/A	N/A
	Back Side	0.696	0.163	0.859	N/A	N/A
	Left Side	0.126	0.163	0.289	N/A	N/A
	Right Side	0.225	0.163	0.388	N/A	N/A
	Top Side	/	0.163	0.163	N/A	N/A
	Bottom Side	0.777	0.163	0.940	N/A	N/A

Table 74: 1-g SAR Simultaneous Tx Combination of UMTS Band II and WiFi 2.4G.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		CDMA BC0	WiFi 2.4G			
Head	Left Hand Touched	0.638	0.553	**1.191**	N/A	N/A
	Left Hand Tilted 15°	0.419	0.417	0.836	N/A	N/A
	Right Hand Touched	0.732	0.335	1.067	N/A	N/A
	Right Hand Tilted 15°	0.536	0.553	1.089	N/A	N/A
Body-Worn	Front Side	0.718	0.091	0.809	N/A	N/A
	Back Side	0.746	0.091	0.837	N/A	N/A
Hotspot	Front Side	0.559	0.163	0.722	N/A	N/A
	Back Side	0.596	0.163	0.759	N/A	N/A
	Left Side	0.435	0.163	0.598	N/A	N/A
	Right Side	0.632	0.163	0.795	N/A	N/A
	Top Side	/	0.163	0.163	N/A	N/A
	Bottom Side	0.191	0.163	0.354	N/A	N/A

Table 75: 1-g SAR Simultaneous Tx Combination of CDMA BC0 and WiFi 2.4G.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		CDMA BC1	WiFi 2.4G			
Head	Left Hand Touched	0.728	0.553	1.281	N/A	N/A
	Left Hand Tilted 15°	0.494	0.417	0.911	N/A	N/A
	Right Hand Touched	1.222	0.335	**1.557**	N/A	N/A
	Right Hand Tilted 15°	0.475	0.553	1.028	N/A	N/A
Body-Worn	Front Side	0.865	0.091	0.956	N/A	N/A
	Back Side	1.196	0.091	1.287	N/A	N/A
Hotspot	Front Side	0.691	0.163	0.854	N/A	N/A
	Back Side	1.172	0.163	1.335	N/A	N/A
	Left Side	0.137	0.163	0.300	N/A	N/A
	Right Side	0.257	0.163	0.420	N/A	N/A
	Top Side	/	0.163	0.163	N/A	N/A
	Bottom Side	0.176	0.163	0.339	N/A	N/A

Table 76: 1-g SAR Simultaneous Tx Combination of CDMA BC1 and WiFi 2.4G.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		CDMA BC10	WiFi 2.4G			
Head	Left Hand Touched	0.570	0.553	1.123	N/A	N/A
	Left Hand Tilted 15°	0.417	0.417	0.834	N/A	N/A
	Right Hand Touched	0.663	0.335	0.998	N/A	N/A
	Right Hand Tilted 15°	0.585	0.553	**1.138**	N/A	N/A
Body-Worn	Front Side	0.728	0.091	0.819	N/A	N/A
	Back Side	0.880	0.091	0.971	N/A	N/A
Hotspot	Front Side	0.494	0.163	0.657	N/A	N/A
	Back Side	0.585	0.163	0.748	N/A	N/A
	Left Side	0.436	0.163	0.599	N/A	N/A
	Right Side	0.591	0.163	0.754	N/A	N/A
	Top Side	/	0.163	0.163	N/A	N/A
	Bottom Side	0.114	0.163	0.277	N/A	N/A

Table 77: 1-g SAR Simultaneous Tx Combination of CDMA BC10 and WiFi 2.4G.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		LTE Band XXV	WiFi 2.4G			
Head	Left Hand Touched	0.534	0.553	1.087	N/A	N/A
	Left Hand Tilted 15°	0.351	0.417	0.768	N/A	N/A
	Right Hand Touched	0.943	0.335	**1.278**	N/A	N/A
	Right Hand Tilted 15°	0.412	0.553	0.965	N/A	N/A
Body-Worn	Front Side	0.564	0.091	0.655	N/A	N/A
	Back Side	0.767	0.091	0.858	N/A	N/A
Hotspot	Front Side	0.591	0.163	0.754	N/A	N/A
	Back Side	0.835	0.163	0.998	N/A	N/A
	Left Side	0.120	0.163	0.283	N/A	N/A
	Right Side	0.199	0.163	0.362	N/A	N/A
	Top Side	/	0.163	0.163	N/A	N/A
	Bottom Side	0.757	0.163	0.920	N/A	N/A

Table 78: 1-g SAR Simultaneous Tx Combination LTE Band XXV and WiFi 2.4G.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		LTE Band XXVI	WiFi 2.4G			
Head	Left Hand Touched	0.508	0.553	**1.061**	N/A	N/A
	Left Hand Tilted 15°	0.310	0.417	0.727	N/A	N/A
	Right Hand Touched	0.636	0.335	0.971	N/A	N/A
	Right Hand Tilted 15°	0.402	0.553	0.955	N/A	N/A
Body-Worn	Front Side	0.547	0.091	0.638	N/A	N/A
	Back Side	0.593	0.091	0.684	N/A	N/A
Hotspot	Front Side	0.298	0.163	0.461	N/A	N/A
	Back Side	0.312	0.163	0.475	N/A	N/A
	Left Side	0.224	0.163	0.387	N/A	N/A
	Right Side	0.300	0.163	0.463	N/A	N/A
	Top Side	/	0.163	0.163	N/A	N/A
	Bottom Side	0.094	0.163	0.257	N/A	N/A

Table 79: 1-g SAR Simultaneous Tx Combination LTE Band XXVI and WiFi 2.4G.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		LTE Band XLI	WiFi 2.4G			
Head	Left Hand Touched	0.362	0.553	0.915	N/A	N/A
	Left Hand Tilted 15°	0.067	0.417	0.484	N/A	N/A
	Right Hand Touched	0.193	0.335	0.528	N/A	N/A
	Right Hand Tilted 15°	0.112	0.553	0.665	N/A	N/A
Body-Worn	Front Side	0.702	0.091	0.793	N/A	N/A
	Back Side	0.778	0.091	0.869	N/A	N/A
Hotspot	Front Side	0.529	0.163	0.692	N/A	N/A
	Back Side	0.524	0.163	0.687	N/A	N/A
	Left Side	0.074	0.163	0.237	N/A	N/A
	Right Side	0.065	0.163	0.228	N/A	N/A
	Top Side	/	0.163	0.163	N/A	N/A
	Bottom Side	1.177	0.163	**1.340**	N/A	N/A

Table 80: 1-g SAR Simultaneous Tx Combination LTE Band XLI and WiFi 2.4G.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		GSM850	BT			
Body-Worn	Front Side	0.469	0.197	0.664	NA	NA
	Back Side	0.510	0.197	0.705	NA	NA

Table 81: 1-g SAR Simultaneous Tx Combination of GSM850 and BT.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		GSM1900	BT			
Body-Worn	Front Side	0.317	0.197	0.514	NA	NA
	Back Side	0.434	0.197	0.631	NA	NA

Table 82: 1-g SAR Simultaneous Tx Combination of GSM1900 and BT.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		UMTS Band V	BT			
Body-Worn	Front Side	0.578	0.197	0.775	NA	NA
	Back Side	0.617	0.197	0.814	NA	NA

Table 83: 1-g SAR Simultaneous Tx Combination of UMTS Band V and BT.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		UMTS Band II	BT			
Body-Worn	Front Side	0.710	0.197	0.907	NA	NA
	Back Side	0.977	0.197	1.174	NA	NA

Table 84: 1-g SAR Simultaneous Tx Combination of UMTS Band II and BT.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		CDMA BC 0	BT			
Body-Worn	Front Side	0.718	0.197	0.915	NA	NA
	Back Side	0.746	0.197	0.943	NA	NA

Table 85: 1-g SAR Simultaneous Tx Combination of CDMA BC0 and BT.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		CDMA BC 1	BT			
Body-Worn	Front Side	0.865	0.197	1.062	NA	NA
	Back Side	1.196	0.197	1.393	NA	NA

Table 86: 1-g SAR Simultaneous Tx Combination of CDMA BC1 and BT.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		CDMA BC 10	BT			
Body-Worn	Front Side	0.728	0.197	0.925	NA	NA
	Back Side	0.880	0.197	1.077	NA	NA

Table 87: 1-g SAR Simultaneous Tx Combination of CDMA BC 10 and BT.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		LTE Band XXV	BT			
Body-Worn	Front Side	0.564	0.197	0.761	NA	NA
	Back Side	0.767	0.197	0.964	NA	NA

Table 88: 1-g SAR Simultaneous Tx Combination of LTE Band XXV and BT.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		LTE Band XXVI	BT			
Body-Worn	Front Side	0.547	0.197	0.744	NA	NA
	Back Side	0.593	0.197	0.790	NA	NA

Table 89: 1-g SAR Simultaneous Tx Combination of LTE Band XXVI and BT.

Test Position		Scaled SAR_{Max}		Σ1-g SAR (W/kg)	SPLSR	Remark
		LTE Band XLI	BT			
Body-Worn	Front Side	0.702	0.197	0.899	NA	NA
	Back Side	0.778	0.197	0.975	NA	NA

Table 90: 1-g SAR Simultaneous Tx Combination of LTE Band XLI and BT.

7.3.4 Simultaneous Transmission Conlcusion

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