FCC SAR Test Report

FCC ID: QISM2-802L

Project No.	:	1504C091E
Equipment	:	HUAWEI MediaPad M2 8.0
Model Name	:	M2-802L
Applicant	:	Huawei Technologies Co., Ltd.
Address	:	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District Shenzhen China

Date of Receipt	:	Feb.05, 2016
Date of Test	:	Feb.14, 2016~ Mar.03, 2016
Issued Date	:	Mar.03, 2016
Tested by	:	BTL Inc.

PREPARED BY : (Super Jiang/ Technical Engineer)

APPROVED BY : (Steven Lu / Technical Manager)

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Testing Laboratory 2640

Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**), or National Institute of Standards and Technology (**NIST**) .

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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Table of Contents   Page

Table of Contents Page

REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCC-SAR-1504C091	Original Issue.	May.17, 2015
BTL-FCC SAR-1-1504C091E	Compared with previous report (BTL-FCC-SAR-1504C091) the differences as follow: 1. WIFI 5G has been closed via software. 2. The size of the main antenna is changed, and the antenna gain is different. 3. The output power of the main antenna and WiFi antenna are Reduced. All data are retested and recorded in this test report.	Mar.03, 2016

1. GENERAL SUMMARY

Equipment	HUAWEI MediaPad M2 8.0
Model Name	M2-802L
Brand Name	HUAWEI
Manufacturer	Huawei Technologies Co., Ltd.
Address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District Shenzhen China
Standard(s)	**FCC 47CFR §2.1093** Radio frequency Radiation Exposure Evaluation: Portable Devices **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 1528-2013**Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques **KDB616217 D04** SAR for laptop and tablets v01r02 **KDB941225 D01** 3G SAR Procedures v03r01 **KDB941225 D06** Hotspot Mode V02r01 **KDB447498 D01** General RF Exposure Guidance v06 **KDB248227 D01** 802. 11 Wi-Fi SAR v02r02 **KDB865664 D01** SAR measurement 100 MHz to 6 GHz v01r04 **KDB865664 D02** SAR Reporting v01r02 **KDB690783 D01** SAR Listings on Grants v01r03

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCC SAR-1-1504C091E) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. RF EMISSIONS MEASUREMENT

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **SAR room** at the location of No.3,Jinshagang 1st Road, ShiXia, Dalang Town,Dong Guan, China.523792

2.2 MEASUREMENT UNCERTAINTY

Note: Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04,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 1528-2013 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.

3. GENERAL INFORMATION

3.1 STATEMENT OF COMPLIANCE

Equipment Class	Mode	Highest Body (0mm) SAR-1g(W/kg)
PCE	GSM850	1.17
	GSM1900	1.25
	WCDMA Band 2	1.19
	WCDMA Band 4	1.35
	WCDMA Band 5	0.90
	LTE Band 2	1.20
	LTE Band 4	1.27
	LTE Band 5	0.96
	LTE Band 7	0.84
	LTE Band 26	1.42
	LTE Band 41	0.95
DTS	2.4G WLAN	0.19
The highest simultaneous SAR value is 1.48 W/kg per KDB690783 D01		

Note:

The device is in compliance with Specific Absorption Rate（SAR）for general population/ uncontrolled exposure limits according to the FCC rule §2.1093, the ANSI/IEEE C95.1:1992, the NCRP Report Number 86 for uncontrolled environment, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013.

3.1.1 GENERAL DESCRIPTION OF EUT

Equipment	HUAWEI MediaPad M2 8.0		
Model Name	M2-802L		
S/N	DGV6R15A12000023		
HW Version	SH1M2803LM		
SW Version	M2-802LV100R001C331B002		
Modulation	GSM(GMSK/8PSK),WCDMA(QPSK),LTE(QPSK/16QAM), WiFi(DSSS/OFDM),BT(GFSK/π /4-DQPSK/8-DPSK)		
Operation Frequency Range(s)	Band	TX (MHz)	RX (MHz)
	GSM850	824-849	869-894
	GSM1900	1850-1910	1930-1990
	WCDMA Band 2	1850-1910	1930-1990
	WCDMA Band 4	1710-1755	2110-2155
	WCDMA Band 5	824-849	869-894
	FDD-LTE Band 2	1850-1910	1930-1990
	FDD-LTE Band 4	1710-1755	2110-2155
	FDD-LTE Band 5	824-849	869-894
	FDD-LTE Band 7	2500-2570	2620-2690
	FDD-LTE Band 26	814-849	859-894
	TDD-LTE Band 41	2496-2690	2496-2690
	Bluetooth	2400 ~2483.5	
	WIFI	2412 ~2462	
GPRS/EDGE Multislot Class(12)	Max Number of Timeslots in Uplink:	4	
	Max Number of Timeslots in Downlink:	4	
	Max Total Timeslot:	5	
GSM Device class	Class B		
HSDPA UE Category	14		
HSUPA UE Category	6		
DC-HSDPA UE Category	24		
Power Class:	4,tested with power level 5(GSM850)		
	1,tested with power level 0(GSM1900)		
	3, tested with power control “all 1”(WCDMA Band 2/4/5)		
	3, tested with power control “all Max” (LTE Band 2/4/5/7/26/41)		
Test Channels (low-mid-high):	128-190-251 (GSM850)		
	512-661-810 (GSM1900)		
	9262-9400-9538(WCDMA Band 2)		
	1312-1413-1513 (WCDMA Band 4)		
	4132-4182-4233 (WCDMA Band 5)		
	18607-18900-19193(LTE Band 2 BW=1.4MHz)		
	18615-18900-19185(LTE Band 2 BW=3MHz)		
	18625-18900-19175(LTE Band 2 BW=5MHz)		
	18650-18900-19150(LTE Band 2 BW=10MHz)		
	18675-18900-19125(LTE Band 2 BW=15MHz)		
	18700-18900-19100(LTE Band 2 BW=20MHz)		
	19957-20175-20393(LTE Band 4 BW=1.4MHz)		
	19965-20175-20385(LTE Band 4 BW=3MHz)		
	19975-20175-20375(LTE Band 4 BW=5MHz)		
	20000-20175-20350(LTE Band 4 BW=10MHz)		
	20025-20175-20325(LTE Band 4 BW=15MHz)		
	20050-20175-20300(LTE Band 4 BW=20MHz)		
	20407-20525-20643(LTE Band 5 BW=1.4MHz)		

	20415-20525-20635(LTE Band 5 BW=3MHz)	
	20425-20525-20625(LTE Band 5 BW=5MHz)	
	20450-20525-20600(LTE Band 5 BW=10MHz)	
	20775-21100-21425(LTE Band 7 BW=5MHz)	
	20800-21100-21400(LTE Band 7 BW=10MHz)	
	20825-21100-21375(LTE Band 7 BW=15MHz)	
	20850-21100-21350(LTE Band 7 BW=20MHz)	
	26697-26865-27033 (LTE Band 26 BW=1.4MHz)	
	26705-26865-27025 (LTE Band 26 BW=3MHz)	
	26715-26865-27015 (LTE Band 26 BW=5MHz)	
	26740-26865-26990 (LTE Band 26 BW=10MHz)	
	26765-26865-26965 (LTE Band 26 BW=15MHz)	
	39675-40148-40620-41093-41565 (LTE Band 41 BW=5MHz)	
	39700-40160-40620-41080-41540 (LTE Band 41 BW=10MHz)	
	39725-40173-40620-41068-41515 (LTE Band 41 BW=15MHz)	
	39750-40185-40620-41055-41490 (LTE Band 41 BW=20MHz)	
	1-6 -11 (2.4G WIFI 802.11b/g/n HT20)	
Antenna Gain	BT/2.4G WiFi: 0dBi	
	GSM850/ WCDMA/LTE Band 5:-2.7dBi	
	GSM1900/ WCDMA/LTE Band 2:2.0 dBi	
	LTE Band 7:-2.8 dBi	
	WCDMA/LTE Band 4:1.8 dBi	
	LTE Band 26:-2.7 dBi	
	LTE Band 41:-2.1 dBi	
Other Information		
Battery	Brand	HUAWEI
	Model	HB3080G1EBW
	Capacitance	4800 mAh
	Nominal Voltage	⎓ +3.8V
	Charging Voltage	⎓ +4.35V
	Manufacturer	Huawei Technologies Co.,Ltd.
Earphone	Model	EMC323-011-01
	Manufacturer	MERRY ELECTRONICS CO., LTD

3.2 LABORATORY ENVIRONMENT

Temperature	Min. = 18ºC, Max. = 25ºC
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

3.3 MAIN TEST INSTRUMENTS

Item	Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Interval
1	Data Acquisition Electronics	Speag	DAE4	1390	Sep. 18, 2015	1 Year
2	E-field Probe	Speag	EX3DV4	3661	Apr. 24, 2015	1 Year
3	System Validation Dipole	Speag	D835V2	4d160	Sep. 30, 2015	1 Year
4	System Validation Dipole	Speag	D1750V2	1101	Sep. 22, 2015	1 Year
5	System Validation Dipole	Speag	D1900V2	5d179	Sep. 29, 2015	1 Year
6	System Validation Dipole	Speag	D2450V2	919	Sep. 28, 2015	1 Year
7	System Validation Dipole	Speag	D2600V2	1067	Sep. 28, 2015	1 Year
8	ELI4 Phantom	Speag	ELI4 Phantom V5.0	1222	N/A	N/A
9	8960 Series 10 Wireless Com Test set	Agilent	E5515E	MY52112163	Aug. 03, 2015	1 Year
10	8960 Series 10 Wireless Com Test set	Agilent	E5515E	MY52112163	Sep. 09, 2015	1Year
11	CMW500-Wideband Radio Communication Tester	RS	CMW500	1527	May. 06,2015	1Year
12	Power Amplifier	Mini-Circuits	ZHL-42W+	QA1333003	Mar. 09, 2015	1 Year
13	ENA Network Analyzer	Agilent	E5071C	MY46102965	Mar. 29, 2015	1 Year
14	MXG Analog Signal Generator	Agilent	N5181A	MY49060710	Nov. 02, 2015	1 Year
15	P-series power meter	Agilent	N1911A	MY45100473	Mar. 29, 2015	1 Year
16	wideband power sensor	Agilent	N1921A	MY51100041	Mar. 29, 2015	1 Year
17	Power Meter	Anritsu	ML2487A	6K00004714	Mar. 16, 2015	1 Year
18	Power Meter Sensor	Anritsu	MA2491A	34138	Mar. 16, 2015	1 Year
19	Dielectric Assessment Kit	Speag	DAK-3.5	1226	Aug. 04, 2015	1 Year
20	Low pass filter	Mini-Circuits	SLP-2950+	M108294	Mar. 29, 2015	1 Year
21	Attenuator	Mini-Circuits	VAT-10+	31317-1	Mar. 29, 2015	1 Year
22	Attenuator	Mini-Circuits	VAT-10+	31317-2	Mar. 29, 2015	1 Year
23	Attenuator	MEB	300-affn-03	314	Mar. 29, 2015	1 Year
24	Dual directional coupler	Agilent	777D	50208	Mar. 29, 2015	1 Year

Remark: " N/A" denotes no model name, serial No. or calibration specified.
All calibration period of equipment list is one year.

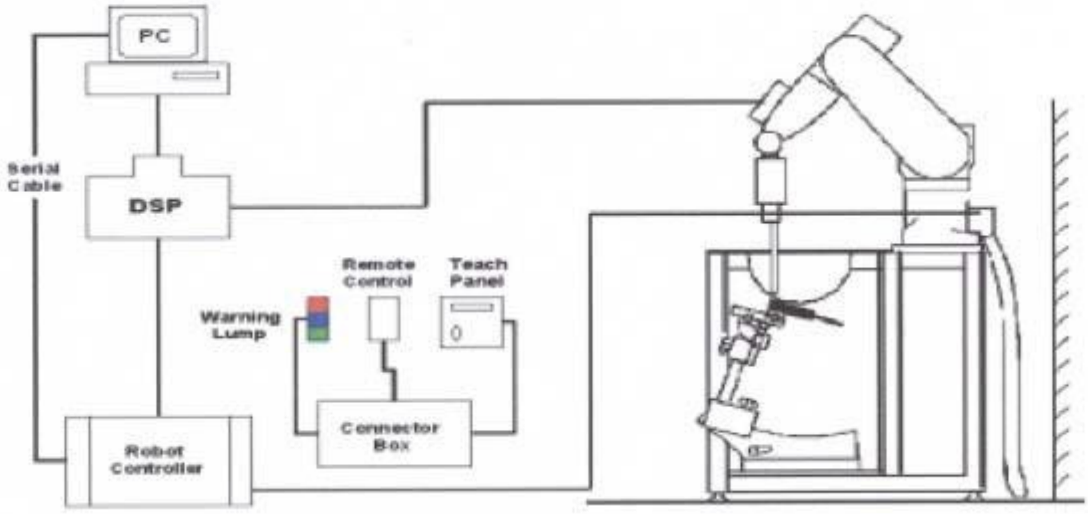
4.SAR MEASUREMENTS SYSTEM CONFIGURATION

4.1SAR MEASUREMENT SET-UP

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

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. 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.
3. 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.
4. A unit to operate the optical surface detector which is connected to the EOC.
5. 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.
6. TheDASY5 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
7. DASY5 software and SEMCAD data evaluation software.
8. Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
9. The generic twin phantom enabling the testing of left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. System validation dipoles allowing to validate the proper functioning of the system.

4.1.1Test Setup Layout



4.2DASY5E-FIELDPROBESYSTEM

The SAR measurements were conducted with the dosimetric probe EX3DV4(manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

4.2.1EX3DV4 PROBE SPECIFICATION

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 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:± 0.2dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Distance from probe tip to dipole centers: 1.0 mm

EX3DV4 E-field Probe

4.2.2E-FIELD PROBE CALIBRATION

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than ±10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$\mathrm{SAR} = C\frac{\Delta T}{\Delta t}$$

Where: Δt = Exposure time (30 seconds),
C = Heat capacity of tissue (brain or muscle),
ΔT = Temperature increase due to RF exposure.

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

Where: σ = Simulated tissue conductivity,
ρ = Tissue density (kg/m3).

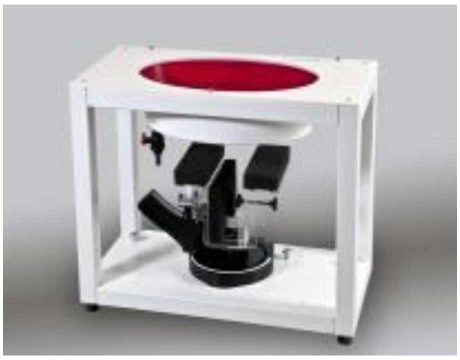
4.2.3OTHER TEST EQUIPMENT

4.2.3.1. Device Holder for Transmitters

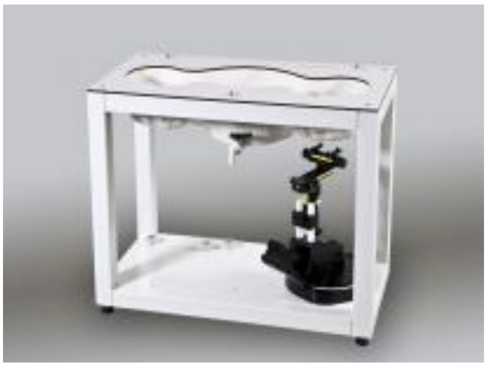
Construction: Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices (e.g., laptops, cameras, etc.) It is light weight and fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin SAM, ELI4and SAM v6.0Phantoms.
Material: POM, Acrylic glass, Foam

4.2.3.2 Phantom

Model	ELI4 Phantom
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.
Shell Thickness	2±0.1 mm
Filling Volume	Approx. 30 liters
Dimensions	Length: 600 mm ; Width: 190mm Height: adjustable feet
Aailable	Special



Model	Twin SAM
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.
Shell Thickness	2 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length:1000mm; Width: 500mm Height: adjustable feet
Aailable	Special



4.2.4SCANNING PROCEDURE

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or Body) 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°.)

- Area Scan

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.

- Zoom Scan

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.

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

4.2.5SPATIAL 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.

4.2.6DATA STORAGE AND EVALUATION

4.2.5.1Data 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/cm^2], [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.

4.4.2 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	Normi, a_{i0}, a_{i1}, a_{i2}
	Conversion factor	$ConvF_i$
	Diode compression point	Dcp_i
Device parameters:	Frequency	f
	Crest factor	cf
Media parameters:	Conductivity	
	Density	

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 multi meter 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

aij = 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

= conductivity in [mho/m] or [Siemens/m]

= 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.

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

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

E_{tot} = total field strength in V/m

H_{tot} = total magnetic field strength in A/m

5. SYSTEM VERIFICATION PROCEDURE

5.1 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.

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
Body 835	0.2	-	0.2	0.9	48.5	-	50.2	-
Body 1750	-	31.0	-	0.2	-	-	68.8	-
Body 1900	-	29.5	-	0.3	-	-	70.2	-
Body 2450	-	31.4	-	0.1	-	-	68.5	-
Body 2600	-	31.8	-	0.1	-	-	68.1	-

Salt: 99+% Pure Sodium Chloride; Sugar: 98+% Pure Sucrose; Water: De-ionized, 16M + 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 Verification									
Tissue Type	**Frequency (MHz)**	**Liquid Temp. (℃)**	**Conductivity (σ)**	**Permittivity (εr)**	**Targeted Conductivity (σ)**	**Targeted Permittivity (εr)**	**Deviation Conductivity (σ) (%)**	**Deviation Permittivity (εr) (%)**	**Date**
Body	835	22.2	0.964	55.810	0.97	55.2	-0.62	1.11	Feb. 17, 2016
Body	835	22.4	0.947	54.290	0.97	55.2	-2.37	-1.65	Mar. 02, 2016
Body	1750	22.3	1.451	53.580	1.49	53.4	-2.62	0.34	Feb. 16, 2016
Body	1750	22.2	1.473	54.660	1.49	53.4	-1.14	2.36	Mar. 02, 2016
Body	1900	22.3	1.541	52.990	1.52	53.3	1.38	-0.58	Feb. 21, 2016
Body	1900	22.1	1.523	52.654	1.52	53.3	0.20	-1.21	Mar. 03, 2016
Body	2450	22.4	1.962	53.260	1.95	52.7	0.62	1.06	Feb. 22, 2016
Body	2600	22.5	2.203	52.610	2.16	52.5	1.99	0.21	Feb. 22, 2016
Body	2600	22.3	2.143	53.450	2.16	52.5	-0.79	1.81	Mar. 03, 2016

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.

5.2 SYSTEM CHECK

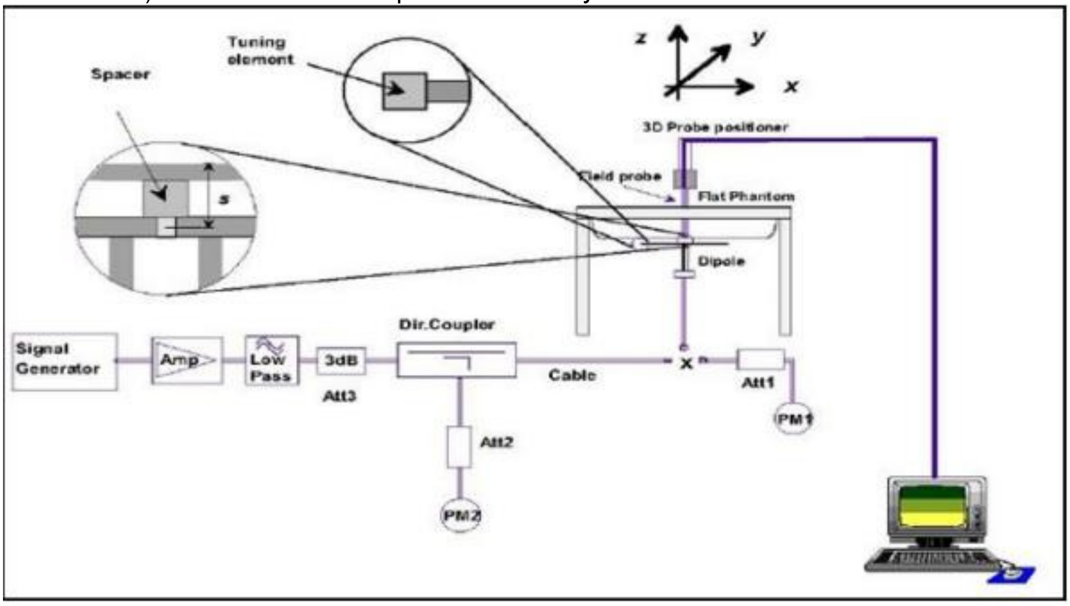
The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE P1528 (described above). The following table shows system check results for all frequency bands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

System Check	Date	Frequency (MHz)	Targeted SAR-1g (W/kg)	Measured SAR-1g (W/kg)	normalized SAR-1g (W/kg)	Deviation (%)	Dipole S/N
Body	Feb. 17, 2016	835	9.52	2.43	9.72	2.10	4d160
Body	Mar. 02, 2016	835	9.52	2.45	9.80	2.94	4d160
Body	Feb. 16, 2016	1750	35.70	9.27	37.08	3.87	1101
Body	Mar. 02, 2016	1750	35.70	9.16	36.64	2.63	1101
Body	Feb. 21, 2016	1900	39.60	10.30	41.20	4.04	5d179
Body	Mar. 03, 2016	1900	39.60	10.08	40.32	1.82	5d179
Body	Feb. 22, 2016	2450	51.10	13.19	52.76	3.25	919
Body	Feb. 22, 2016	2600	54.10	13.30	53.20	-1.66	1067
Body	Mar. 03, 2016	2600	54.10	13.80	55.20	2.03	1067

5.3 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.

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.



6.SAR MEASUREMENT VARIABILITY AND UNCERTAINTY

6.1SAR MEASUREMENT VARIABILITY

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04, 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 8.2.

6.2SAR MEASUREMENT UNCERTAINTY

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04,when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis.

7. OPERATIONAL CONDITIONS DURING TEST

7.1 SAR TEST CONFIGURATION

7.1.1 GSM Test Configuration

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

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

According to specification 3GPP TS 51.010, the maximum power of the GSM can do the power reduction for the multi-slot.

The allowed power reduction in the multi-slot configuration is as following:

Number of timeslots in uplink assignment		Reduction of maximum output power (dB)		
Band	Time Slots	GPRS (GMSK)	EGPRS (GMSK)	EGPRS (8PSK)
GSM850	1 TX slot	0	0	6
	2 TX slots	2	2	9
	3 TX slots	4	4	11
	4 TX slots	6	6	12
GSM1900	1 TX slot	0	0.5	3.5
	2 TX slots	2	1.5	6
	3 TX slots	4	3.5	8
	4 TX slots	6	5.5	9

7.1.2 UMTS Test Configuration

1. Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the procedures description in section 5.2 of 3GPP TS 34.121,using the appropriate RMC or AMR with TPC(transmit power control) set to all "1s" for WCDMA/HSDPA or applying the required inner loop power control procedure to maintain maximum output power while HSUPA is active. Result for all applicable physical channel configurations(DPCCH,DPDCHn and spreading codes, HSDPA, HSPA)
Should be tabulated in the SAR report .All configuration that are not supported by the DUT or cannot be measured due to technical or equipment limitation should be clearly identified.

2. WCDMA

Body SAR Measurements
SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits configured to all "1s". SAR for other spreading codes and multiple DPDCHn, when supported by the EUT, are not required when the maximum average outputs of each RF channel, for each spreading code and DPDCHn configuration, are less than ¼ dB higher than those measured in 12.2 kbps RMC.

3. HSDPA

SAR for body exposure configurations is measured according to the "Body SAR Measurements"" procedures of 3G device. In addition, body SAR is also measured for HSDPA when the maximum average outputs of each RF channel with HSDPA active is at ¼ dB higher than that measured without HSDPA using 12.2kbps RMC or the maximum SAR 12.2kbps RMC is above 75% of the SAR limit. Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA.
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 Δ ACK, Δ NACK, Δ CQI = 8. The variation of the β_c / β_d ratio causes a power reduction at sub-tests 2 - 4.

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	β_{hs} (1)	CM(dB)(2)	MPR (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0	0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: ΔACK, ΔNACK and ΔCQI = 8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$
Note 2 : CM=1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH,DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.
Note 3 : For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$

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

Settings of required H-Set 1 QPSK acc. to 3GPP 34.121

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

HSDPA UE category

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

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 primary mode and the adjusted SAR is ≤ 1.2W/kg, SAR measurement is not required for the secondary mode.

Per KDB941225 D01v03r01, the 3G SAR test reduction procedures 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 HSUPA, 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.

Subtests for UMTS Release 6 HSUPA

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.

HSUPA UE category

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).

5. DC-HSDPA

In DC-HSDPA implementation of this device, the uplink parameters are the same as HSDPA. No additional channels and modulations (16 QAM, and 64 QAM) are supported in uplink. The difference is only in the downlink parameters, where two carriers are supported. HSDPA settings were used on uplink.

For Rel. 8 DC-HSDPA apply the four subtests from HSDPA Release 5 except use fixed reference channel H-Set 12 for DC-HSDPA. And we can apply the same SAR test exclusion criteria used for Rel. 6 HSPA for Rel. 7 HSPA+ and Rel. 8 DC-HSDPA. That is, if the HSPA, HSPA+, or the DC-HSDPA maximum output is not more than 0.25 dB higher than WCDMA, SAR measurement for those modes is not required.
The following tests were completed according to procedures in section 7.3.13 of 3GPP TS 34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0
Levels for HSDPA connection setup

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

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13
The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.
The measurements were performed with a Fixed Reference Channel (FRC) H-Set 12 with QPSK

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

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

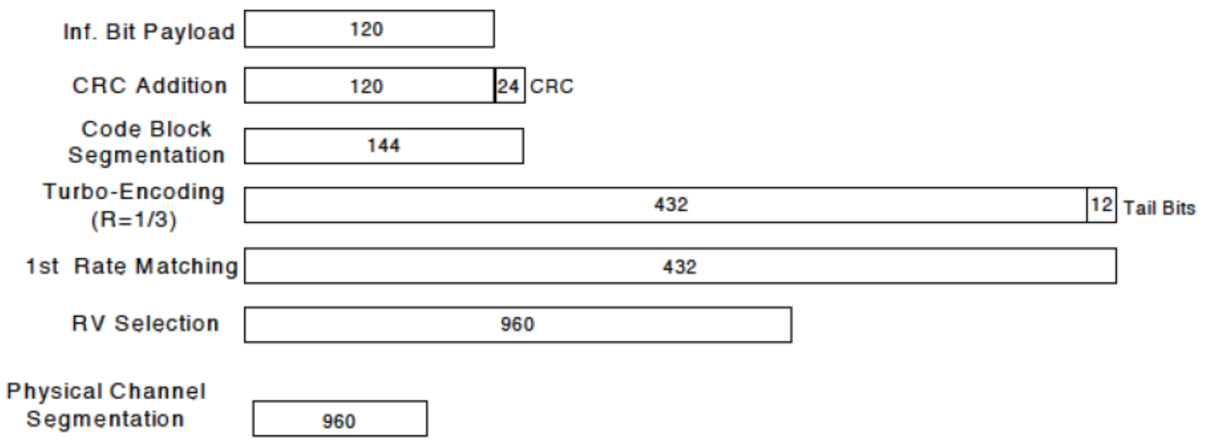


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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

Sub-test	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: 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 and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.
Note 3 : For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$

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

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

7.1.3 LTE Test Configuration

SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices v02r04. The CMW500 Wide Band 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 (N_{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.

LTE (TDD) Test Configuration

TDD LTE Band 41 supports 3GPP TS 36 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. .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

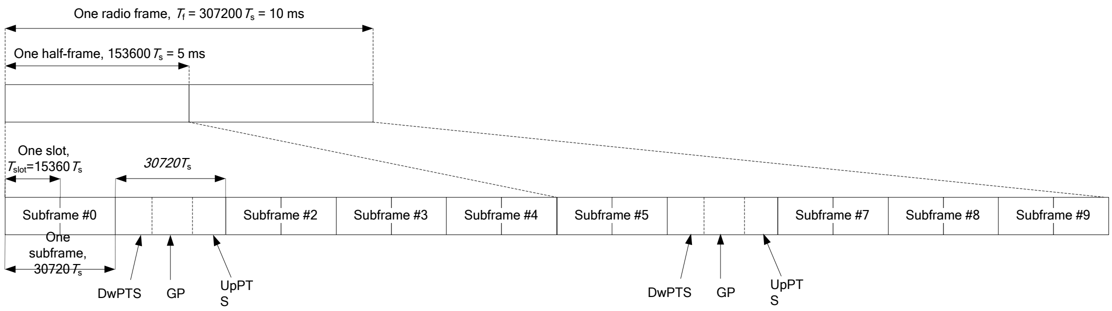


Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

<table>
<tr><th rowspan="3">Special subframe configuration</th><th colspan="3">Normal cyclic prefix in downlink</th><th colspan="3">Extended cyclic prefix in downlink</th></tr>
<tr><th>DwPTS</th><th colspan="2">UpPTS</th><th>DwPTS</th><th colspan="2">UpPTS</th></tr>
<tr><th></th><th>Normal cyclic prefix in uplink</th><th>Extended cyclic prefix in uplink</th><th></th><th>Normal cyclic prefix in uplink</th><th>Extended cyclic prefix in uplink</th></tr>
<tr><td>0</td><td>$6592 \cdot T_s$</td><td rowspan="5">$2192 \cdot T_s$</td><td rowspan="5">$2560 \cdot T_s$</td><td>$7680 \cdot T_s$</td><td rowspan="4">$2192 \cdot T_s$</td><td rowspan="4">$2560 \cdot T_s$</td></tr>
<tr><td>1</td><td>$19760 \cdot T_s$</td><td>$20480 \cdot T_s$</td></tr>
<tr><td>2</td><td>$21952 \cdot T_s$</td><td>$23040 \cdot T_s$</td></tr>
<tr><td>3</td><td>$24144 \cdot T_s$</td><td>$25600 \cdot T_s$</td></tr>
<tr><td>4</td><td>$26336 \cdot T_s$</td><td>$7680 \cdot T_s$</td><td rowspan="4">$4384 \cdot T_s$</td><td rowspan="4">$5120 \cdot T_s$</td></tr>
<tr><td>5</td><td>$6592 \cdot T_s$</td><td rowspan="5">$4384 \cdot T_s$</td><td rowspan="5">$5120 \cdot T_s$</td><td>$20480 \cdot T_s$</td></tr>
<tr><td>6</td><td>$19760 \cdot T_s$</td><td>$23040 \cdot T_s$</td></tr>
<tr><td>7</td><td>$21952 \cdot T_s$</td><td>$12800 \cdot T_s$</td></tr>
<tr><td>8</td><td>$24144 \cdot T_s$</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>9</td><td>$13168 \cdot T_s$</td><td>-</td><td>-</td><td>-</td></tr>
</table>

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 41, 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 configuratin	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
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.

7.1.4 WiFi Test Configuration

For WLAN SAR testing, WLAN engineering testing software installed on the DUT can provide continuous transmitting RF signal.

Mode	802.11b	802.11g	802.11n (20M)
Duty cycle	100%		
Crest factor	1		

7.1.4.1 2.4G SAR TEST REQUIREMENTS

✧ **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 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.

✧ **2.4 GHz 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. SAR is not required for the following 2.4 GHz OFDM conditions.

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

7.2 TEST POSITION

7.2.1 Head

The device does not have telephone receiver. Next to the ear operation is not supported. Voice mode is limited to speaker mode and headset operations only, so additional Head SAR testing for this type of voice use is not required per KDB616217D04.

7.2.2 Body

The overall diagonal dimension of the display section of a tablet is 24cm>20cm,Per FCC KDB 616217,the back surface and edges of the tablet should be tested for SAR compliance with the Tablet touching the phantom.SAR evaluation for the front surface of tablet display screens are generally not necessary. The SAR Exclusion Threshold in KDB 447498 D01can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned adjacent the phantom and the edge containing the antenna positioned perpendicular to the phantom.

SAR test reduction and exclusion guidance

(1)The SAR exclusion threshold for distances<50mm is defined by the following equation:

$$\frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} \cdot \sqrt{\text{Frequency (GHz)}} \leq 3.0$$

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

(2)The SAR exclusion threshold for distances>50mm is defined by the following equation, as illustrated in KDB 447498 D01 Appendix B:

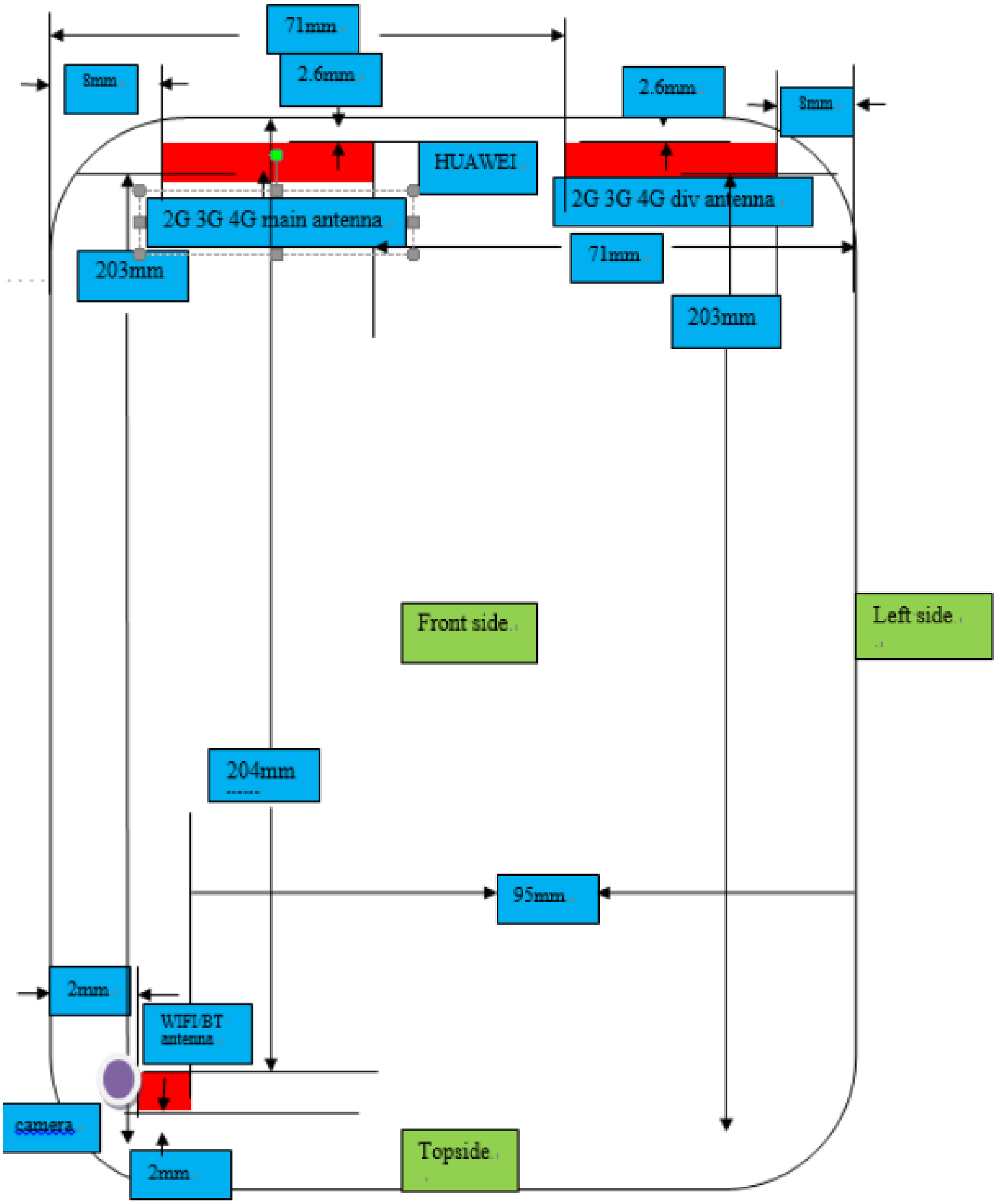
a) at 100 MHz to1500 MHz

[Power allowed at numeric Threshold at 50 mm in step 1) + (test separation distance - 50 mm) · (f $_{(MHz)}$/150)] mW

b) at >1500MHz and ≤6GHz

[Power allowed at numeric Threshold at 50 mm in step 1) + (test separation distance - 50 mm) ·10] mW

The location of the antenna inside EUT is as below.



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

The distance <50mm

Mode	Position	P_{max} (dBm) *	P_{max} (mW)	Distance (mm)	f (GHz)	Calculation Result	SAR Exclusion threshold	Test Requirement (Yes/No)
BT	Rear/Right/ Top	6	3.98	5	2.480	1.25	3	No
2.4GWiFi	Rear/Right/ Top	14	25.12	5	2.462	7.88	3	**Yes**
GSM850	Rear/ Bottom	24.87	306.90	5	0.8488	56.55	3	**Yes**
	Right	24.87	306.90	8	0.8488	35.34	3	**Yes**
GSM1900	Rear/ Bottom	21.87	153.82	5	1.9098	42.51	3	**Yes**
	Right	21.87	153.82	8	1.9098	26.57	3	**Yes**
WCMDA Band 2	Rear/ Bottom	23.5	223.87	5	1.9076	61.84	3	**Yes**
	Right	23.5	223.87	8	1.9076	38.65	3	**Yes**
WCMDA Band 4	Rear/ Bottom	23.5	223.87	5	1.7526	59.28	3	**Yes**
	Right	23.5	223.87	8	1.7526	37.05	3	**Yes**
WCMDA Band 5	Rear/ Bottom	23.5	223.87	5	0.8466	41.18	3	**Yes**
	Right	23.5	223.87	8	0.8466	25.75	3	**Yes**
LTE Band 2	Rear/ Bottom	23	199.53	5	1.900	55.01	3	**Yes**
	Right	23	199.53	8	1.900	34.38	3	**Yes**
LTE Band 4	Rear/ Bottom	22.5	177.83	5	1.745	46.98	3	**Yes**
	Right	22.5	177.83	8	1.745	29.36	3	**Yes**
LTE Band 5	Rear/ Bottom	23	199.53	5	0.844	36.66	3	**Yes**
	Right	23	199.53	8	0.844	22.91	3	**Yes**
LTE Band 7	Rear/ Bottom	23	199.53	5	2.560	63.85	3	**Yes**
	Right	23	199.53	8	2.560	39.91	3	**Yes**
LTE Band 26	Rear/ Bottom	22.5	177.83	5	0.8415	32.63	3	**Yes**
	Right	22.5	177.83	8	0.8415	20.39	3	**Yes**
LTE Band 41	Rear/ Bottom	22	158.49	5	2.68	51.89	3	**Yes**
	Right	22	158.49	8	2.68	32.43	3	**Yes**

The distance >50mm

Mode	Position	f (GHz)	Power allowed at numeric Threshold at 50mm	Distance (mm)	P_{max} (dBm)*	P_{max} (mW)	SAR Exclusion Result (mW)	Test Requirement (Yes/No)
BT	Left	2.480	95.25	95	6	3.98	545.25	No
	Bottom	2.480	95.25	204	6	3.98	1635.25	No
2.4GWiFi	Left	2.462	95.60	95	14	25.12	545.60	No
	Bottom	2.462	95.60	204	14	25.12	1635.60	No
GSM850	Left	0.8488	162.81	71	24.87	306.90	281.64	**Yes**
	Top	0.8488	162.81	203	24.87	306.90	1028.59	No
GSM1900	Left	1.9098	108.54	71	21.87	153.82	318.54	No
	Top	1.9098	108.54	203	21.87	153.82	1638.54	No
WCMDA Band 2	Left	1.9076	108.60	71	23.5	223.87	318.60	No
	Top	1.9076	108.60	203	23.5	223.87	1638.60	No
WCMDA Band 4	Left	1.7526	113.31	71	23.5	223.87	323.31	No
	Top	1.7526	113.31	203	23.5	223.87	1643.31	No
WCMDA Band 5	Left	0.8466	163.02	71	23.5	223.87	281.55	No
	Top	0.8466	163.02	203	23.5	223.87	1026.56	No
LTE Band 2	Left	1.900	108.82	71	23	199.53	318.82	No
	Top	1.900	108.82	203	23	199.53	1638.82	No
LTE Band 4	Left	1.745	113.55	71	22.5	177.83	323.55	No
	Top	1.745	113.55	203	22.5	177.83	1643.55	No
LTE Band 5	Left	0.844	163.28	71	23	199.53	281.44	No
	Top	0.844	163.28	203	23	199.53	1024.16	No
LTE Band 7	Left	2.560	93.75	71	23	199.53	303.75	No
	Top	2.560	93.75	203	23	199.53	1623.75	No
LTE Band 26	Left	0.8415	163.52	71	22.5	177.83	281.33	No
	Top	0.8415	163.52	203	22.5	177.83	1021.85	No
LTE Band 41	Left	2.68	91.63	71	22	158.49	301.63	No
	Top	2.68	91.63	203	22	158.49	1621.63	No

8. POWER TEST RESULT

8.1CONDUCTED POWER MEASUREMENTS OF GSM850

GSM850		Tune-up	Max Burst Average Power (dBm)			Tune-up	Max Frame Average Power (dBm)		
			128CH	190CH	251CH		128CH	190CH	251CH
			824.2MHz	836.6MHz	848.8MHz		824.2MHz	836.6MHz	848.8MHz
GPRS (GMSK)	1 Tx Slot	33.00	32.10	32.19	32.32	23.81	22.91	23.00	23.13
	2 Tx Slots	31.00	30.09	30.37	30.32	24.87	23.96	**24.24**	24.19
	3 Tx Slots	29.00	28.18	28.24	28.41	24.58	23.76	23.82	23.99
	4 Tx Slots	27.00	26.24	26.32	26.48	23.82	23.06	23.14	23.30
EDGE (GMSK)	1 Tx Slot	33.00	32.11	32.13	32.31	23.81	22.92	22.94	23.12
	2 Tx Slots	31.00	30.08	30.24	30.26	24.87	23.95	24.11	24.13
	3 Tx Slots	29.00	28.09	28.24	28.37	24.58	23.67	23.82	23.95
	4 Tx Slots	27.00	26.13	26.25	26.39	23.82	22.95	23.07	23.21
EDGE (8PSK)	1 Tx Slot	27.00	25.87	25.76	25.71	17.81	16.68	16.57	16.52
	2 Tx Slots	24.00	23.88	23.85	23.67	17.87	17.75	17.72	17.54
	3 Tx Slots	22.00	21.86	21.84	21.82	17.58	17.44	17.42	17.40
	4 Tx Slots	21.00	20.12	19.96	20.08	17.82	16.94	16.78	16.90

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 time slots.
3) Per KDB941225 D01v03r01, the bolded GPRS 2Tx mode was selected for SAR testing according to the highest frame –averaged output power table.

8.2CONDUCTED POWER MEASUREMENTS OF GSM1900

GSM1900		Tune-up	Max Burst Average Power (dBm)			Tune-up	Max Frame Average Power (dBm)		
			512CH	661CH	810CH		512CH	661CH	810CH
			1850.2MHz	1880MHz	1909.8MHz		1850.2MHz	1880MHz	1909.8MHz
GPRS (GMSK)	1 Tx Slot	30.00	29.24	29.38	29.55	20.81	20.05	20.19	20.36
	2 Tx Slots	28.00	27.46	27.55	27.53	21.87	21.33	**21.42**	21.40
	3 Tx Slots	26.00	25.24	25.33	25.39	21.58	20.82	20.91	20.97
	4 Tx Slots	24.00	22.80	23.41	23.63	20.82	19.62	20.23	20.45
EDGE (GMSK)	1 Tx Slot	30.50	29.13	29.33	29.39	21.31	19.94	20.14	20.20
	2 Tx Slots	28.50	26.94	27.49	27.48	22.37	20.81	21.36	21.35
	3 Tx Slots	26.50	25.04	25.26	25.23	22.08	20.62	20.84	20.81
	4 Tx Slots	24.50	22.77	23.36	23.59	21.32	19.59	20.18	20.41
EDGE (8PSK)	1 Tx Slot	26.50	25.02	24.98	25.01	17.31	15.83	15.79	15.82
	2 Tx Slots	24.00	23.02	23.04	22.98	17.87	16.89	16.91	16.85
	3 Tx Slots	22.00	21.05	20.92	20.94	17.58	16.63	16.50	16.52
	4 Tx Slots	21.00	19.75	19.82	19.87	17.82	16.57	16.64	16.69

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 time slots.
3) Per KDB941225 D01v03r01, the bolded GPRS 2Tx mode was selected for SAR testing according to the highest frame –averaged output power table.

8.3CONDUCTED POWER MEASUREMENTS OF WCDMA1900 Band 2

WCDMA1900 (Band 2)		Tune-up	SAR Conducted Power (dBm)		
			9262CH	9400CH	9538CH
			1852.4	1880	1907.6
WCDMA	12.2kbps RMC	**23.50**	22.88	22.42	22.24
	64kbps RMC	**23.50**	22.92	22.35	22.40
	144kbps RMC	**23.50**	22.95	22.38	22.39
	384kbps RMC	**23.50**	22.90	22.42	22.46
HSDPA	Subtest 1	**23.50**	22.92	22.42	22.43
	Subtest 2	**23.50**	22.39	21.93	21.92
	Subtest 3	**23.00**	21.86	21.38	21.42
	Subtest 4	**23.00**	21.88	21.39	21.42
HSUPA	Subtest 1	**23.50**	22.37	21.95	21.89
	Subtest 2	**23.50**	22.95	22.42	22.45
	Subtest 3	**22.50**	21.95	21.40	21.39
	Subtest 4	**23.50**	22.94	22.41	22.42
	Subtest 5	**23.50**	22.43	21.93	21.92
DC-HSDPA	Subtest 1	**23.50**	22.92	22.42	22.43
	Subtest 2	**23.00**	22.39	21.93	21.92
	Subtest 3	**22.50**	21.86	21.38	21.42
	Subtest 4	**22.50**	21.88	21.39	21.42

Note:
1) The conducted power of UMTS Band 2 is measured with RMS detector.
2)Note: Per KDB941225 D01v03r01, 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.

8.4 CONDUCTED POWER MEASUREMENTS OF WCDMA 1700 Band 4

WCDMA 1700 (Band 4)		Tune-up	SAR Conducted Power (dBm)		
			1312CH	1413CH	1513CH
			1712.4	1732.6	1752.6
WCDMA	12.2kbps RMC	**23.50**	22.36	22.69	22.27
	64kbps RMC	**23.50**	22.36	22.64	22.29
	144kbps RMC	**23.50**	22.35	22.59	22.25
	384kbps RMC	**23.50**	22.40	22.68	22.31
HSDPA	Subtest 1	**23.50**	22.38	22.68	22.30
	Subtest 2	**23.50**	21.88	22.17	21.79
	Subtest 3	**23.00**	21.29	21.66	21.31
	Subtest 4	**23.00**	21.25	21.63	21.28
HSUPA	Subtest 1	**23.50**	21.93	22.19	21.77
	Subtest 2	**23.50**	22.41	22.67	22.32
	Subtest 3	**22.50**	21.82	21.68	21.27
	Subtest 4	**23.50**	22.45	22.68	22.28
	Subtest 5	**23.50**	21.89	22.17	21.75
DC-HSDPA	Subtest 1	**23.50**	22.38	22.68	22.30
	Subtest 2	**23.00**	21.88	22.17	21.79
	Subtest 3	**22.50**	21.29	21.66	21.31
	Subtest 4	**22.50**	21.25	21.63	21.28

Note:
1) The conducted power of UMTS Band 4 is measured with RMS detector.
2)Note: Per KDB941225 D01v03r01, 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.

8.5CONDUCTED POWER MEASUREMENTS OF WCDMA850 Band 5

WCDMA 850 (Band 5)		Tune-up	SAR Conducted Power (dBm)		
			4132CH	4182CH	4233CH
			826.4	836.4	846.6
WCDMA	12.2kbps RMC	**23.50**	22.73	22.83	22.67
	64kbps RMC	**23.50**	22.62	22.57	22.68
	144kbps RMC	**23.50**	22.64	22.54	22.69
	384kbps RMC	**23.50**	22.75	22.69	22.80
HSDPA	Subtest 1	**23.50**	22.73	22.66	22.80
	Subtest 2	**23.50**	22.20	22.12	22.25
	Subtest 3	**23.00**	21.62	21.53	21.66
	Subtest 4	**23.00**	21.59	21.61	21.66
HSUPA	Subtest 1	**23.50**	22.16	22.13	22.28
	Subtest 2	**23.50**	22.74	22.68	22.72
	Subtest 3	**22.50**	21.65	21.52	21.70
	Subtest 4	**23.50**	22.66	22.54	22.79
	Subtest 5	**23.50**	22.23	22.17	22.25
DC-HSDPA	Subtest 1	**23.50**	22.73	22.66	22.80
	Subtest 2	**23.00**	22.20	22.12	22.25
	Subtest 3	**22.50**	21.62	21.53	21.66
	Subtest 4	**22.50**	21.59	21.61	21.66

Note:
1) The conducted power of UMTS Band 5 is measured with RMS detector.
2)Note: Per KDB941225 D01v03r01, 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.

8.6CONDUCTED POWER MEASUREMENTS OF LTE Band 2

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					18607	18900	19193
					1850.7	1880	1909.3
1.4MHz	QPSK	1	0	**23.00**	22.49	21.81	21.85
		1	2	**23.00**	22.51	22.01	22.09
		1	5	**23.00**	22.48	21.94	22.09
		3	0	**23.00**	22.53	21.85	21.93
		3	1	**23.00**	22.58	21.93	22.03
		3	3	**23.00**	22.58	21.95	22.07
		6	0	**22.50**	21.62	21.09	21.06
	16QAM	1	0	**22.50**	21.88	21.10	20.96
		1	2	**22.50**	22.04	21.30	21.22
		1	5	**22.50**	21.91	21.22	21.23
		3	0	**22.50**	21.82	21.16	20.91
		3	1	**22.50**	21.88	21.24	21.01
		3	3	**22.50**	21.87	21.28	21.08
		6	0	**21.50**	20.97	20.12	20.13
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					18615	18900	19185
					1851.5	1880	1908.5
3MHz	QPSK	1	0	**23.00**	22.46	22.29	22.30
		1	7	**23.00**	21.85	22.06	22.00
		1	14	**23.00**	22.41	21.89	21.88
		8	0	**22.50**	21.44	20.86	21.33
		8	3	**22.50**	21.53	21.08	20.90
		8	7	**22.50**	21.44	21.05	20.97
		15	0	**22.50**	21.44	20.94	20.80
	16QAM	1	0	**22.50**	21.49	21.22	21.14
		1	7	**22.50**	22.15	21.34	21.20
		1	14	**22.50**	21.75	21.05	21.12
		8	0	**21.50**	20.80	19.98	19.72
		8	3	**21.50**	20.90	20.21	19.99
		8	7	**21.50**	20.82	20.20	20.06
		15	0	**21.50**	20.64	20.02	19.84

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					18625	18900	19175
					1852.5	1880	1907.5
5MHz	QPSK	1	0	**23.00**	22.32	21.95	21.88
		1	12	**23.00**	21.77	22.02	21.83
		1	24	**23.00**	21.80	21.44	21.44
		12	0	**22.50**	21.26	21.36	21.34
		12	6	**22.50**	21.28	21.11	20.79
		12	13	**22.50**	21.08	21.07	20.81
		25	0	**22.50**	21.53	20.86	21.31
	16QAM	1	0	**22.50**	21.16	20.63	20.60
		1	12	**22.50**	21.94	21.70	21.17
		1	24	**22.50**	21.00	20.97	20.80
		12	0	**21.50**	20.74	19.77	19.56
		12	6	**21.50**	20.86	20.26	19.93
		12	13	**21.50**	20.66	20.22	19.94
		25	0	**21.50**	20.58	20.04	19.71
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					18650	18900	19150
					1855	1880	1905
10MHz	QPSK	1	0	**23.00**	22.07	22.15	21.83
		1	24	**23.00**	22.10	22.53	22.44
		1	49	**23.00**	22.60	21.98	22.34
		25	0	**22.50**	20.94	21.07	20.95
		25	12	**22.50**	20.82	21.52	21.23
		25	25	**22.50**	21.18	21.45	21.17
		50	0	**22.50**	21.58	21.46	21.18
	16QAM	1	0	**22.50**	21.72	20.55	20.91
		1	24	**22.50**	22.38	21.90	21.58
		1	49	**22.50**	20.95	21.93	21.32
		25	0	**21.50**	21.05	20.03	19.90
		25	12	**21.50**	20.97	20.61	20.17
		25	25	**21.50**	20.35	20.66	20.11
		50	0	**21.50**	20.67	20.49	20.08

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					18675	18900	19125
					1857.5	1880	1902.5
15MHz	QPSK	1	0	**23.00**	22.62	22.00	22.27
		1	37	**23.00**	21.92	22.31	21.83
		1	74	**23.00**	21.99	22.36	22.52
		36	0	**22.00**	21.33	21.36	20.92
		36	19	**22.00**	20.86	21.01	20.70
		36	39	**22.00**	20.02	21.52	20.69
		75	0	**22.00**	20.69	20.99	20.74
	16QAM	1	0	**22.00**	21.76	20.28	21.54
		1	37	**22.00**	21.31	21.53	20.97
		1	74	**22.00**	20.48	20.50	20.66
		36	0	**21.00**	20.54	20.84	19.87
		36	19	**21.00**	20.09	20.12	19.65
		36	39	**21.00**	19.27	20.61	19.64
		75	0	**21.00**	19.90	20.05	19.70
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					18700	18900	19100
					1860	1880	1900
20MHz	QPSK	1	0	**23.00**	22.62	22.61	22.64
		1	50	**23.00**	22.58	21.97	21.98
		1	99	**23.00**	22.41	22.29	21.82
		50	0	**22.00**	21.43	21.52	21.55
		50	25	**22.00**	21.11	21.14	20.81
		50	50	**22.00**	20.97	20.97	20.90
		100	0	**22.00**	20.79	21.07	21.17
	16QAM	1	0	**22.50**	22.18	22.43	22.44
		1	50	**22.50**	20.95	21.52	21.30
		1	99	**22.50**	20.91	21.14	21.12
		50	0	**21.00**	20.47	19.54	20.56
		50	25	**21.00**	19.67	20.28	19.83
		50	50	**21.00**	19.04	20.76	19.94
		100	0	**21.00**	19.74	20.10	20.22

8.7CONDUCTED POWER MEASUREMENTS OF LTE Band 4

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					19957	20175	20393
					1710.7	1732.5	1754.3
1.4MHz	QPSK	1	0	**22.50**	21.74	21.67	21.68
		1	2	**22.50**	21.85	21.77	21.87
		1	5	**22.50**	21.68	21.71	21.73
		3	0	**22.50**	20.76	20.70	20.73
		3	1	**22.50**	20.80	20.73	20.76
		3	3	**22.50**	20.79	20.75	20.74
		6	0	**21.50**	20.90	20.68	19.88
	16QAM	1	0	**21.50**	20.77	20.31	19.68
		1	2	**21.50**	20.91	20.52	19.97
		1	5	**21.50**	20.76	20.48	20.03
		3	0	**21.50**	20.73	20.31	20.14
		3	1	**21.50**	20.78	20.39	20.15
		3	3	**21.50**	20.78	20.44	20.12
		6	0	**21.00**	19.86	19.35	19.12
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					19965	20175	20385
					1711.5	1732.5	1753.5
3MHz	QPSK	1	0	**22.50**	22.37	22.24	22.16
		1	7	**22.50**	21.76	21.79	21.95
		1	14	**22.50**	21.67	21.69	21.71
		8	0	**21.50**	20.74	20.84	20.75
		8	3	**21.50**	20.78	20.67	20.91
		8	7	**21.50**	20.74	20.72	20.89
		15	0	**21.50**	20.67	20.59	19.81
	16QAM	1	0	**21.50**	20.62	20.12	19.59
		1	7	**21.50**	20.96	20.67	20.00
		1	14	**21.50**	20.49	20.54	19.52
		8	0	**20.50**	19.69	19.28	18.65
		8	3	**20.50**	19.75	19.38	18.84
		8	7	**20.50**	19.75	19.41	18.82
		15	0	**20.50**	19.49	19.26	18.81

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					19975	20175	20375
					1712.5	1732.5	1752.5
5MHz	QPSK	1	0	**22.50**	22.30	21.86	21.93
		1	12	**22.50**	22.03	21.78	21.89
		1	24	**22.50**	21.97	22.46	22.40
		12	0	**21.50**	21.25	21.46	20.96
		12	6	**21.50**	20.77	20.71	21.03
		12	13	**21.50**	20.94	20.76	20.91
		25	0	**21.50**	20.55	20.52	19.91
	16QAM	1	0	**21.50**	20.50	19.85	20.00
		1	12	**21.50**	20.94	20.81	20.19
		1	24	**21.50**	20.23	20.47	19.64
		12	0	**20.50**	19.52	19.15	18.90
		12	6	**20.50**	19.70	19.39	18.95
		12	13	**20.50**	19.56	19.41	18.85
		25	0	**20.50**	19.45	19.19	18.80
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20000	20175	20350
					1715	1732.5	1750
10MHz	QPSK	1	0	**22.50**	22.19	21.46	22.31
		1	24	**22.50**	22.42	22.45	22.41
		1	49	**22.50**	22.43	22.47	21.29
		25	0	**22.00**	21.11	20.96	21.27
		25	12	**22.00**	21.18	21.54	21.03
		25	25	**22.00**	20.81	21.61	21.53
		50	0	**22.00**	20.89	21.30	20.86
	16QAM	1	0	**22.00**	21.29	20.27	21.57
		1	24	**22.00**	21.74	21.58	21.70
		1	49	**22.00**	20.68	21.71	20.45
		25	0	**20.50**	20.18	19.58	20.36
		25	12	**20.50**	20.24	20.16	20.19
		25	25	**20.50**	19.83	20.26	19.64
		50	0	**20.50**	19.89	19.97	19.96

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20025	20175	20325
					1717.5	1732.5	1747.5
15MHz	QPSK	1	0	**22.50**	21.73	22.01	22.30
		1	37	**22.50**	22.33	21.82	21.86
		1	74	**22.50**	22.37	21.91	22.18
		36	0	**22.00**	21.37	20.91	21.07
		36	19	**22.00**	21.31	21.62	20.71
		36	39	**22.00**	20.81	21.01	21.16
		75	0	**22.00**	21.15	21.59	20.68
	16QAM	1	0	**22.00**	20.85	20.06	21.45
		1	37	**22.00**	20.50	20.66	21.11
		1	74	**22.00**	20.08	20.92	20.10
		36	0	**20.50**	19.30	20.42	20.02
		36	19	**20.50**	19.22	19.28	19.71
		36	39	**20.50**	18.65	19.74	19.16
		75	0	**20.50**	19.04	19.30	19.64
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20050	20175	20300
					1720	1732.5	1745
20MHz	QPSK	1	0	**22.50**	22.30	22.49	22.44
		1	50	**22.50**	22.16	22.10	22.16
		1	99	**22.50**	22.07	22.19	22.20
		50	0	**22.00**	21.41	21.10	21.46
		50	25	**22.00**	21.45	21.64	21.51
		50	50	**22.00**	20.95	21.23	21.25
		100	0	**22.00**	21.18	20.73	21.08
	16QAM	1	0	**22.00**	21.41	20.54	21.63
		1	50	**22.00**	20.50	21.83	21.55
		1	99	**22.00**	20.19	21.67	20.10
		50	0	**20.50**	19.36	18.87	20.33
		50	25	**20.50**	18.99	19.37	19.97
		50	50	**20.50**	18.72	20.07	19.58
		100	0	**20.50**	19.05	19.50	20.01

8.8CONDUCTED POWER MEASUREMENTS OF LTE Band 5

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20407	20525	20643
					824.7	836.5	848.3
1.4MHz	QPSK	1	0	**23.00**	22.04	22.02	21.98
		1	2	**23.00**	22.24	22.23	22.00
		1	5	**23.00**	22.23	22.01	21.61
		3	0	**23.00**	21.12	21.07	21.04
		3	1	**23.00**	21.21	21.21	21.09
		3	3	**23.00**	21.25	21.17	21.03
		6	0	**22.00**	21.21	21.15	21.02
	16QAM	1	0	**22.00**	20.91	20.97	20.99
		1	2	**22.00**	21.14	21.21	21.03
		1	5	**22.00**	21.14	20.99	20.60
		3	0	**22.00**	20.83	20.96	21.06
		3	1	**22.00**	20.93	21.08	20.99
		3	3	**22.00**	20.97	21.09	20.89
		6	0	**21.50**	20.04	19.99	20.06
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20415	20525	20635
					825.5	836.5	847.5
3MHz	QPSK	1	0	**23.00**	21.77	21.82	21.94
		1	7	**23.00**	22.39	22.25	22.15
		1	14	**23.00**	22.24	21.89	21.99
		8	0	**22.50**	21.16	21.03	21.06
		8	3	**22.50**	21.40	21.14	21.14
		8	7	**22.50**	21.36	21.14	21.14
		15	0	**22.50**	21.33	21.09	21.13
	16QAM	1	0	**22.00**	20.74	20.81	20.88
		1	7	**22.00**	21.37	21.19	21.16
		1	14	**22.00**	21.24	20.79	20.51
		8	0	**21.50**	19.97	19.90	20.05
		8	3	**21.50**	20.23	20.02	20.16
		8	7	**21.50**	20.52	20.00	20.17
		15	0	**21.50**	19.93	19.91	20.05

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low 20425 826.5	Mid 20525 836.5	High 20625 846.5
5MHz	QPSK	1	0	**23.00**	21.60	21.71	21.95
		1	12	**23.00**	22.11	22.24	22.23
		1	24	**23.00**	21.97	22.00	22.16
		12	0	**22.50**	21.20	20.96	21.28
		12	6	**22.50**	21.19	21.21	20.91
		12	13	**22.50**	21.42	21.08	21.25
		25	0	**22.50**	21.29	21.00	21.12
	16QAM	1	0	**22.00**	20.57	20.75	21.06
		1	12	**22.00**	21.54	21.24	21.50
		1	24	**22.00**	21.04	20.43	20.46
		12	0	**21.50**	19.91	19.77	20.13
		12	6	**21.50**	20.58	20.03	20.36
		12	13	**21.50**	20.54	19.89	20.25
		25	0	**21.50**	20.37	19.82	19.98

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low 20450 829	Mid 20525 836.5	High 20600 844
10MHz	QPSK	1	0	**23.00**	22.13	22.22	22.29
		1	24	**23.00**	22.42	22.46	22.31
		1	49	**23.00**	22.05	22.20	22.14
		25	0	**22.50**	20.79	20.57	20.62
		25	12	**22.50**	21.37	21.48	21.27
		25	25	**22.50**	20.70	21.21	20.69
		50	0	**22.50**	21.81	21.69	21.70
	16QAM	1	0	**22.50**	21.30	21.50	21.35
		1	24	**22.50**	22.14	21.93	22.23
		1	49	**22.50**	21.60	21.45	21.44
		25	0	**22.00**	20.53	20.37	20.32
		25	12	**22.00**	20.78	20.46	20.63
		25	25	**22.00**	20.51	20.15	20.47
		50	0	**22.00**	20.55	20.50	20.43

8.9CONDUCTED POWER MEASUREMENTS OF LTE Band 7

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20775	21100	21425
					2502.5	2535	2567.5
5MHz	QPSK	1	0	**23.00**	22.53	22.37	22.24
		1	12	**23.00**	22.45	22.48	22.41
		1	24	**23.00**	21.94	22.02	22.04
		12	0	**22.50**	20.94	21.12	21.13
		12	6	**22.50**	21.26	21.33	21.14
		12	13	**22.50**	21.23	21.37	21.49
		25	0	**22.50**	21.04	21.25	21.54
	16QAM	1	0	**22.50**	21.04	21.79	21.33
		1	12	**22.50**	22.18	22.48	21.81
		1	24	**22.50**	21.71	21.93	20.98
		12	0	**22.50**	20.52	20.75	20.55
		12	6	**22.00**	20.84	20.96	20.58
		12	13	**22.00**	20.83	20.98	20.44
		25	0	**22.00**	20.58	20.86	20.47
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20800	21100	21400
					2505	2535	2565
10MHz	QPSK	1	0	**23.00**	22.49	22.53	22.48
		1	24	**23.00**	22.53	22.29	21.91
		1	49	**23.00**	22.17	22.16	21.95
		25	0	**22.50**	20.95	20.92	20.90
		25	12	**22.50**	21.29	21.27	21.10
		25	25	**22.50**	21.10	21.07	21.07
		50	0	**22.50**	21.03	21.05	21.08
	16QAM	1	0	**22.50**	21.03	21.49	21.44
		1	24	**22.50**	22.46	22.33	21.82
		1	49	**22.50**	22.12	22.16	20.88
		25	0	**22.00**	20.60	20.62	20.23
		25	12	**22.00**	20.96	20.95	20.40
		25	25	**22.00**	20.77	20.71	20.33
		50	0	**22.00**	20.64	20.76	20.48

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20825	21100	21375
					2507.5	2535	2562.5
15MHz	QPSK	1	0	**23.00**	22.08	22.08	22.12
		1	37	**23.00**	22.40	22.41	21.96
		1	74	**23.00**	22.02	22.02	22.05
		36	0	**22.50**	21.24	21.12	21.10
		36	19	**22.50**	21.42	21.30	21.03
		36	39	**22.50**	21.08	21.24	20.73
		75	0	**22.50**	21.22	21.25	21.06
	16QAM	1	0	**22.50**	21.92	21.96	22.04
		1	37	**22.50**	22.39	22.49	21.94
		1	74	**22.50**	21.36	21.89	20.86
		36	0	**22.00**	20.88	20.80	20.58
		36	19	**22.00**	21.10	20.97	20.56
		36	39	**22.00**	20.79	20.91	20.53
		75	0	**22.00**	20.86	20.88	20.55

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					20850	21100	21350
					2510	2535	2560
20MHz	QPSK	1	0	**23.00**	22.27	22.11	22.30
		1	50	**23.00**	22.50	22.60	22.47
		1	99	**23.00**	21.65	22.13	21.47
		50	0	**22.50**	21.63	21.58	21.40
		50	25	**22.50**	21.51	21.61	21.24
		50	50	**22.50**	21.38	21.52	21.01
		100	0	**22.50**	21.47	21.50	21.30
	16QAM	1	0	**22.00**	21.03	21.07	21.24
		1	50	**22.00**	21.41	21.52	21.24
		1	99	**22.00**	20.60	21.07	20.03
		50	0	**21.00**	20.22	20.16	20.03
		50	25	**21.00**	20.12	20.23	19.89
		50	50	**21.00**	20.01	20.24	19.71
		100	0	**21.00**	20.07	20.20	19.96

8.10 CONDUCTED POWER MEASUREMENTS OF LTE Band 26

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26697	26865	27033
					814.7	831	848.3
1.4MHz	QPSK	1	0	**22.50**	22.01	22.26	21.96
		1	2	**22.50**	22.20	22.24	22.00
		1	5	**22.50**	22.20	22.15	21.60
		3	0	**22.50**	21.29	21.17	21.19
		3	1	**22.50**	21.37	21.23	21.14
		3	3	**22.50**	21.29	21.24	21.05
		6	0	**22.00**	21.43	21.28	21.22
	16QAM	1	0	**22.00**	21.00	21.30	21.12
		1	2	**22.00**	21.21	21.44	21.16
		1	5	**22.00**	21.17	21.33	20.72
		3	0	**22.00**	20.98	21.03	20.98
		3	1	**22.00**	21.06	21.06	20.93
		3	3	**22.00**	21.09	21.06	20.84
		6	0	**21.00**	20.08	20.11	20.07

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26705	26865	27025
					815.5	831	847.5
3MHz	QPSK	1	0	**22.50**	21.81	21.97	21.96
		1	7	**22.50**	22.31	22.28	22.27
		1	14	**22.50**	21.90	21.96	21.52
		8	0	**22.00**	21.12	21.22	21.13
		8	3	**22.00**	21.25	21.29	21.24
		8	7	**22.00**	21.18	21.23	21.14
		15	0	**22.00**	21.15	21.25	21.20
	16QAM	1	0	**22.00**	20.85	21.17	21.05
		1	7	**22.00**	21.38	21.47	21.42
		1	14	**22.00**	21.01	21.17	20.64
		8	0	**21.00**	20.00	20.12	20.01
		8	3	**21.00**	20.15	20.18	20.17
		8	7	**21.00**	20.08	20.12	20.09
		15	0	**21.00**	19.94	20.11	20.18

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low 26715 816.5	Mid 26865 831	High 27015 846.5
5MHz	QPSK	1	0	**22.50**	21.65	21.77	21.85
		1	12	**22.50**	22.24	22.26	22.32
		1	24	**22.50**	21.69	21.53	21.72
		12	0	**22.00**	21.08	21.23	21.14
		12	6	**22.00**	21.24	21.38	21.34
		12	13	**22.00**	21.04	21.20	21.33
		25	0	**22.00**	21.00	21.15	21.27
	16QAM	1	0	**22.00**	20.58	21.05	20.85
		1	12	**22.00**	21.23	21.53	21.48
		1	24	**22.00**	20.38	20.79	20.38
		12	0	**21.00**	19.91	20.06	19.94
		12	6	**21.00**	20.09	20.20	20.21
		12	13	**21.00**	19.90	20.03	20.28
		25	0	**21.00**	19.82	19.94	20.10

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low 26740 819	Mid 26865 831	High 26990 844
10MHz	QPSK	1	0	**22.50**	22.24	22.23	22.22
		1	24	**22.50**	21.82	21.90	22.04
		1	49	**22.50**	22.33	22.32	22.06
		25	0	**22.00**	20.72	20.64	20.52
		25	12	**22.00**	21.42	20.75	20.76
		25	25	**22.00**	21.21	20.53	20.70
		50	0	**22.00**	21.26	20.61	20.59
	16QAM	1	0	**22.00**	21.27	21.42	21.22
		1	24	**22.00**	21.85	21.90	21.92
		1	49	**22.00**	21.41	21.35	21.22
		25	0	**21.00**	20.30	20.44	20.33
		25	12	**21.00**	20.32	20.50	20.58
		25	25	**21.00**	20.04	20.28	20.58
		50	0	**21.00**	20.03	20.37	20.34

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	High
					26765	26865	26965
					821.5	831	841.5
15MHz	QPSK	1	0	**22.50**	22.23	22.30	22.16
		1	37	**22.50**	22.26	22.36	22.31
		1	74	**22.50**	21.91	21.63	21.56
		36	0	**22.00**	21.12	21.43	21.33
		36	19	**22.00**	21.02	21.28	21.32
		36	39	**22.00**	21.03	20.99	21.26
		75	0	**22.00**	21.09	21.17	21.15
	16QAM	1	0	**22.00**	21.35	21.23	21.12
		1	37	**22.00**	21.33	21.36	21.32
		1	74	**22.00**	21.03	20.61	20.67
		36	0	**21.00**	19.82	20.61	19.82
		36	19	**21.00**	19.80	20.06	20.08
		36	39	**21.00**	19.77	19.79	20.05
		75	0	**21.00**	19.86	19.92	19.92

8.11CONDUCTED POWER MEASUREMENTS OF LTE Band 41

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	Mid	Mid	High
					39675	40148	40620	41093	41565
					2498.5	2545.8	2593	2640.3	2687.5
5MHz	QPSK	1	0	**22.00**	21.35	21.32	21.30	21.27	21.23
		1	12	**22.00**	21.36	21.31	20.99	21.65	21.31
		1	24	**22.00**	21.13	21.21	21.33	21.35	21.06
		12	0	**21.00**	20.17	20.26	20.22	20.31	20.24
		12	6	**21.00**	20.08	20.27	19.95	20.01	20.07
		12	13	**21.00**	20.15	20.11	19.99	19.86	20.05
		25	0	**21.00**	20.43	20.41	19.62	19.72	20.32
	16QAM	1	0	**21.00**	20.06	20.12	19.47	19.52	20.05
		1	12	**21.00**	20.72	20.65	20.17	20.23	20.27
		1	24	**21.00**	20.03	20.05	19.52	19.63	20.37
		12	0	**20.50**	19.50	19.52	18.90	19.51	19.52
		12	6	**20.50**	19.71	19.68	19.12	19.21	19.58
		12	13	**20.50**	19.59	19.57	19.07	19.06	19.79
		25	0	**20.50**	19.47	19.35	18.90	19.23	19.59
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	Mid	Mid	High
					39700	40160	40620	41080	41540
					2501	2547	2593	2639	2685
10MHz	QPSK	1	0	**22.00**	20.97	20.96	21.18	21.05	21.09
		1	24	**22.00**	21.21	21.15	20.94	21.01	21.19
		1	49	**22.00**	21.23	21.26	21.13	21.16	21.28
		25	0	**21.00**	20.16	20.21	20.14	20.06	20.05
		25	12	**21.00**	20.17	20.11	19.96	20.12	20.17
		25	25	**21.00**	20.14	20.16	20.12	20.14	20.24
		50	0	**21.00**	20.20	20.42	20.44	20.35	20.37
	16QAM	1	0	**21.00**	20.24	20.14	19.38	19.92	19.93
		1	24	**21.00**	20.90	20.63	20.13	20.16	20.91
		1	49	**21.00**	20.51	20.53	19.67	20.25	20.64
		25	0	**20.50**	19.31	19.26	18.76	19.21	19.03
		25	12	**20.50**	19.54	19.52	18.98	19.05	19.45
		25	25	**20.50**	19.30	19.12	18.81	18.92	19.43
		50	0	**20.50**	19.34	19.21	18.76	18.85	18.57

Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	Mid	Mid	High
					39725	40173	40620	41068	41515
					2503.5	2548.3	2593	2637.8	2682.5
15MHz	QPSK	1	0	**22.00**	21.05	21.16	21.11	21.08	21.14
		1	37	**22.00**	20.89	20.86	21.23	21.13	21.19
		1	74	**22.00**	21.25	21.21	21.32	21.25	21.36
		36	0	**21.00**	20.24	20.21	19.92	20.05	20.08
		36	19	**21.00**	20.17	20.15	20.03	20.12	20.20
		36	39	**21.00**	20.07	20.11	19.92	19.94	20.19
		75	0	**21.00**	20.11	19.96	19.93	19.92	20.32
	16QAM	1	0	**21.00**	20.00	20.12	19.92	19.97	20.18
		1	37	**21.00**	20.12	20.23	20.20	20.42	20.46
		1	74	**21.00**	19.69	19.64	19.66	19.56	20.34
		36	0	**20.50**	18.96	19.46	18.97	19.03	19.05
		36	19	**20.50**	19.01	18.96	19.12	19.23	19.26
		36	39	**20.50**	18.92	19.21	18.89	18.92	19.44
		75	0	**20.50**	18.94	18.86	18.97	18.95	19.33
Bandwidth	Modulation	RB size	RB offset	Tune-up	Low	Mid	Mid	Mid	High
					39750	40185	40620	41055	41490
					2506	2549.5	2593	2636.5	2680
20MHz	QPSK	1	0	**22.00**	21.29	21.32	21.39	21.28	21.30
		1	50	**22.00**	21.13	21.21	21.12	21.16	21.27
		1	99	**22.00**	21.14	21.16	21.09	21.03	21.13
		50	0	**21.00**	20.12	20.08	20.06	20.05	20.13
		50	25	**21.00**	20.26	20.25	20.29	20.22	20.27
		50	50	**21.00**	19.99	20.11	20.13	20.15	20.13
		100	0	**21.00**	20.03	20.02	20.10	20.43	20.46
	16QAM	1	0	**21.00**	20.17	20.16	20.49	20.68	20.67
		1	50	**21.00**	20.04	20.06	20.50	20.64	20.59
		1	99	**21.00**	20.07	20.21	20.47	20.35	20.78
		50	0	**20.50**	18.77	19.12	19.13	19.32	19.16
		50	25	**20.50**	18.67	19.02	19.07	19.13	19.33
		50	50	**20.50**	18.89	18.96	19.20	19.21	19.75
		100	0	**20.50**	18.91	18.89	19.22	19.32	19.48

8.12 CONDUCTED POWER MEASUREMENTS OF WiFi 2.4G

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Power Setting	Tune-up	Average Power (dBm)	SAR Test (Yes/No)
802.11b	1	2412	1	12.00	14.00	12.44	Yes
	6	2437		12.00	14.00	12.93	Yes
	11	2462		12.00	14.00	12.86	Yes
802.11g	1	2412	6	13.00	14.00	13.12	No
	6	2437		13.00	14.00	13.82	No
	11	2462		13.00	14.00	13.92	No
802.11n HT20	1	2412	6.5	13.00	14.00	12.89	No
	6	2437		12.00	14.00	12.41	No
	11	2462		12.00	14.00	12.80	No

Note:

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

2) Per KDB248227, for WiFi 2.4GHz, the highest measured maximum output power Channel for DSSS modes(802.11b)was selected for SAR measurement.SAR for OFDM modes(2.4GHz 802.11g/n) was not required When the highest reported SAR for DSSS is adjusted by the ratio of OFDM modes(802.11g/n)to DSSS modes(802.11b)specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

8.13 Conducted power measurements of BT

BT MHz	Tune Up	Average Conducted Power (dBm)		
		DH5	2DH5	3DH5
CH0	**6.00**	4.06	4.23	2.37
CH39	**6.00**	2.53	2.76	1.06
CH78	**6.00**	3.16	3.27	1.16

BT MHz	Tune Up	Average Conducted Power (dBm)		
		CH0	CH19	CH39
BT (4.0)	**6.00**	5.16	5.57	3.26

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

9 . SAR TEST RESULTS

General Notes:

1) Per KDB447498 D01v06, all measurement SAR results are scaled to the maximum tune-up tolerance limit to demonstrate compliant.
2) Per KDB447498 D01v06, 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:≤0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is≤100 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 D01v01r04,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 KDB648474 D04v01r03, SAR is evaluated without a headset connected to the device. When the standalone reported Body SAR is ≤1.2 W/kg, no additional SAR evaluations using a headset are required.
5) Per KDB865664 D02v01r02, 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.

GSM Notes:

1) Per KDB648474 D04v01r03, Body accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for Body SAR.
2) Per KDB941225 D01v03r01, 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.

WCDMA Notes:

Per KDB941225 D01v03r01, 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.

LTE notes:

1) The LTE test configurations are determined according to KDB941225 D05 SAR for LTE Devices v02r04.The general test procedures used for SAR testing can be found in Section 7.1.3.
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)

WLAN Notes:

1. For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode, 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 positions in an exposure condition. The test position with the highest extrapolated(peak)SAR is used as the initial test position. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 for 2.4GHZ WIFI single transmission chain operations, the highest measured maximum output power Channel for DSSS was selected for SAR measurement.SAR for OFDM modes(2.4GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 7.1.4 for more information.

9.1 SAR MEASUREMENT RESULT

SAR test results of GSM&WCDMA

Test No.	Band	Mode	CH	Test Position With 0cm	Earphone	Tune up	Measured	Drift(dB)	SAR Value (W/kg)1-g	Reported SAR
T001	GSM850	GPRS 2TX	190	Rear Face	-	31.00	30.37	0.07	0.882	1.020
T002	GSM850	GPRS 2TX	190	Left Side	-	31.00	30.37	0.02	0.042	0.049
T003	GSM850	GPRS 2TX	190	Right Side	-	31.00	30.37	0.04	0.193	0.223
T004	GSM850	GPRS 2TX	190	Bottom Side	-	31.00	30.37	0.05	0.341	0.394
T005	GSM850	GPRS 2TX	128	Rear Face	-	31.00	30.09	0.09	0.766	0.945
T006	GSM850	GPRS 2TX	251	Rear Face	-	31.00	30.32	0.08	**1.000**	1.169
T007	GSM850	GPRS 2TX	251	Rear Face(1st Repeated)	-	31.00	30.32	0.09	0.980	1.146
T011	GSM1900	GPRS 2TX	661	Rear Face	-	28.00	27.55	0.02	0.984	1.091
T013	GSM1900	GPRS 2TX	661	Right Side	-	28.00	27.55	0.05	0.156	0.173
T014	GSM1900	GPRS 2TX	661	Bottom Side	-	28.00	27.55	0.07	0.443	0.491
T015	GSM1900	GPRS 2TX	512	Rear Face	-	28.00	27.46	0.04	0.764	0.865
T016	GSM1900	GPRS 2TX	810	Rear Face	-	28.00	27.53	0.03	**1.120**	1.248
T175	GSM1900	GPRS 2TX	810	Rear Face	1	28.00	27.53	0.02	1.090	1.215
T017	GSM1900	GPRS 2TX	810	Rear Face(1st Repeated)	-	28.00	27.53	0.02	1.075	1.198
T021	WCDMA B2	RMC12.2K	9400	Rear Face	-	23.50	22.42	0	0.728	0.934
T023	WCDMA B2	RMC12.2K	9400	Right Side	-	23.50	22.42	0.05	0.107	0.137
T024	WCDMA B2	RMC12.2K	9400	Bottom Side	-	23.50	22.42	-0.08	0.323	0.414
T025	WCDMA B2	RMC12.2K	9262	Rear Face	-	23.50	22.88	-0.02	**1.030**	1.188
T026	WCDMA B2	RMC12.2K	9538	Rear Face	-	23.50	22.24	0.01	0.494	0.660
T027	WCDMA B2	RMC12.2K	9262	Rear Face(1st Repeated)	-	23.50	22.88	-0.06	0.961	1.108
T031	WCDMA B4	RMC12.2K	1413	Rear Face	-	23.50	22.69	0.09	0.819	0.987
T033	WCDMA B4	RMC12.2K	1413	Right Side	-	23.50	22.69	0.08	0.151	0.182
T034	WCDMA B4	RMC12.2K	1413	Bottom Side	-	23.50	22.69	-0.03	0.214	0.258
T035	WCDMA B4	RMC12.2K	1312	Rear Face	-	23.50	22.36	0.09	0.645	0.839
T036	WCDMA B4	RMC12.2K	1513	Rear Face	-	23.50	22.27	0.09	**1.020**	1.354
T176	WCDMA B4	RMC12.2K	1513	Rear Face	1	23.50	22.27	0.05	0.960	1.274
T037	WCDMA B4	RMC12.2K	1513	Rear Face(1st Repeated)	-	23.50	22.27	0.06	1.010	1.341
T041	WCDMA B5	RMC12.2K	4182	Rear Face	-	23.50	22.83	0.05	**0.769**	0.897
T043	WCDMA B5	RMC12.2K	4182	Right Side	-	23.50	22.83	0.05	0.134	0.156
T044	WCDMA B5	RMC12.2K	4182	Bottom Side	-	23.50	22.83	-0.06	0.266	0.310
T045	WCDMA B5	RMC12.2K	4132	Rear Face	-	23.50	22.73	0.01	0.749	0.894
T046	WCDMA B5	RMC12.2K	4233	Rear Face	-	23.50	22.67	0.04	0.667	0.807

SAR test results of LTE

Test No.	Band	Mode	CH	RB	Offset	Test Position With 0cm	Earphone	Tune up	Measured	Drift (dB)	SAR Value (W/kg)1-g	Reported SAR
T051	LTE 2	QPSK20M	19100	1	0	Rear Face	-	23.00	22.64	0.01	**1.100**	1.195
T053	LTE 2	QPSK20M	19100	1	0	Right Side	-	23.00	22.64	0.07	0.224	0.243
T054	LTE 2	QPSK20M	19100	1	0	Bottom Side	-	23.00	22.64	-0.02	0.396	0.430
T055	LTE 2	QPSK20M	19100	50	0	Rear Face	-	22.00	21.55	0.09	0.675	0.749
T057	LTE 2	QPSK20M	19100	50	0	Right Side	-	22.00	21.55	-0.04	0.103	0.114
T058	LTE 2	QPSK20M	19100	50	0	Bottom Side	-	22.00	21.55	0.08	0.248	0.275
T059	LTE 2	QPSK20M	18700	1	0	Rear Face	-	23.00	22.62	-0.05	0.541	0.590
T060	LTE 2	QPSK20M	18900	1	0	Rear Face	-	23.00	22.61	0	0.505	0.552
T061	LTE 2	QPSK20M	19100	1	0	Rear Face(1st Repeated)	-	23.00	22.64	0.03	1.094	1.189
T062	LTE 2	QPSK20M	19100	100	0	Rear Face	-	22.00	21.17	0.02	0.454	0.550
T071	LTE 4	QPSK20M	20175	1	0	Rear Face	-	22.50	22.49	-0.01	**1.270**	1.273
T073	LTE 4	QPSK20M	20175	1	0	Right Side	-	22.50	22.49	0.04	0.259	0.260
T074	LTE 4	QPSK20M	20175	1	0	Bottom Side	-	22.50	22.49	-0.06	0.442	0.443
T075	LTE 4	QPSK20M	20175	50	25	Rear Face	-	22.00	21.64	0.09	0.823	0.894
T077	LTE 4	QPSK20M	20175	50	25	Right Side	-	22.00	21.64	0.01	0.136	0.148
T078	LTE 4	QPSK20M	20175	50	25	Bottom Side	-	22.00	21.64	-0.02	0.256	0.278
T079	LTE 4	QPSK20M	20050	1	0	Rear Face	-	22.50	22.30	0.09	0.671	0.703
T080	LTE 4	QPSK20M	20300	1	0	Rear Face	-	22.50	22.44	0	1.010	1.024
T081	LTE 4	QPSK20M	20050	50	25	Rear Face	-	22.00	21.45	0.09	0.647	0.734
T082	LTE 4	QPSK20M	20300	50	25	Rear Face	-	22.00	21.51	0	0.767	0.859
T177	LTE 4	QPSK20M	20175	1	0	Rear Face	1	22.50	22.49	0.04	1.020	1.022
T083	LTE 4	QPSK20M	20175	1	0	Rear Face(1st Repeated)	-	22.50	22.49	0.05	1.230	1.233
T084	LTE 4	QPSK20M	20050	100	0	Rear Face	-	22.00	21.18	0.03	0.775	0.936
T091	LTE 5	QPSK10M	20525	1	24	Rear Face	-	23.00	22.46	-0.01	**0.847**	0.959
T093	LTE 5	QPSK10M	20525	1	24	Right Side	-	23.00	22.46	0.04	0.147	0.166
T094	LTE 5	QPSK10M	20525	1	24	Bottom Side	-	23.00	22.46	0.06	0.323	0.366
T095	LTE 5	QPSK10M	20525	25	12	Rear Face	-	22.50	21.48	0.03	0.506	0.640
T097	LTE 5	QPSK10M	20525	25	12	Right Side	-	22.50	21.48	-0.01	0.093	0.118
T098	LTE 5	QPSK10M	20525	25	12	Bottom Side	-	22.50	21.48	-0.03	0.195	0.247
T099	LTE 5	QPSK10M	20450	1	24	Rear Face	-	23.00	22.42	0.07	0.659	0.753
T100	LTE 5	QPSK10M	20600	1	24	Rear Face	-	23.00	22.31	-0.01	0.749	0.878
T101	LTE 5	QPSK10M	20525	1	24	Rear Face(1st Repeated)	-	23.00	22.46	0.02	0.813	0.921
T102	LTE 5	QPSK10M	20450	50	0	Rear Face	-	22.50	21.81	0.05	0.405	0.475
T111	LTE 7	QPSK20M	21100	1	50	Rear Face	-	23.00	22.60	0	0.723	0.793
T113	LTE 7	QPSK20M	21100	1	50	Right Side	-	23.00	22.60	0.06	0.041	0.045
T114	LTE 7	QPSK20M	21100	1	50	Bottom Side	-	23.00	22.60	0.12	**0.762**	0.836

T115	LTE 7	QPSK20M	20850	50	0	Rear Face	-	22.50	21.63	0.09	0.548	0.670
T117	LTE 7	QPSK20M	20850	50	0	Right Side	-	22.50	21.63	0.08	0.041	0.050
T118	LTE 7	QPSK20M	20850	50	0	Bottom Side	-	22.50	21.63	0.02	0.624	0.762
T119	LTE 7	QPSK20M	20850	1	50	Bottom Side	-	23.00	22.50	0.06	0.684	0.767
T120	LTE 7	QPSK20M	21350	1	50	Bottom Side	-	23.00	22.47	-0.03	0.743	0.839
T121	LTE 7	QPSK20M	21100	100	0	Bottom Side	-	22.50	21.50	-0.04	0.615	0.774
T131	LTE 26	QPSK15M	26865	1	37	Rear Face	-	22.50	22.36	0.03	0.881	0.910
T133	LTE 26	QPSK15M	26865	1	37	Right Side	-	22.50	22.36	0.04	0.212	0.219
T134	LTE 26	QPSK15M	26865	1	37	Bottom Side	-	22.50	22.36	0.05	0.324	0.335
T135	LTE 26	QPSK15M	26865	36	0	Rear Face	-	22.00	21.43	-0.04	0.764	0.871
T137	LTE 26	QPSK15M	26865	36	0	Right Side	-	22.00	21.43	-0.08	0.199	0.227
T138	LTE 26	QPSK15M	26865	36	0	Bottom Side	-	22.00	21.43	-0.07	0.233	0.266
T139	LTE 26	QPSK15M	26765	1	37	Rear Face	-	22.50	22.26	0.03	1.090	1.152
T140	LTE 26	QPSK15M	26965	1	37	Rear Face	-	22.50	22.31	0.02	**1.360**	1.421
T141	LTE 26	QPSK15M	26765	36	0	Rear Face	-	22.00	21.12	0.07	0.738	0.904
T142	LTE 26	QPSK15M	26965	36	0	Rear Face	-	22.00	21.33	0.04	0.890	1.038
T178	LTE 26	QPSK15M	26965	1	37	Rear Face	1	22.50	22.31	0.06	1.130	1.181
T143	LTE 26	QPSK15M	26965	1	37	Rear Face(1st Repeated)	-	22.50	22.31	0.02	1.350	1.410
T144	LTE 26	QPSK15M	26865	75	0	Rear Face	-	22.00	21.17	0.01	0.754	0.913
T151	LTE 41	QPSK20M	40620	1	0	Rear Face	-	22.00	21.39	0	**0.824**	0.948
T153	LTE 41	QPSK20M	40620	1	0	Right Side	-	22.00	21.39	0.03	0.038	0.044
T154	LTE 41	QPSK20M	40620	1	0	Bottom Side	-	22.00	21.39	-0.07	0.778	0.895
T155	LTE 41	QPSK20M	40620	50	25	Rear Face	-	21.00	20.29	0	0.569	0.670
T157	LTE 41	QPSK20M	40620	50	25	Right Side	-	21.00	20.29	-0.02	0.047	0.055
T158	LTE 41	QPSK20M	40620	50	25	Bottom Side	-	21.00	20.29	0.01	0.552	0.650
T179	LTE 41	QPSK20M	40185	1	0	Rear Face	-	22.00	21.32	0.04	0.621	0.726
T180	LTE 41	QPSK20M	41055	1	0	Rear Face	-	22.00	21.28	0.01	0.668	0.788
T159	LTE 41	QPSK20M	39750	1	0	Rear Face	-	22.00	21.29	0.01	0.491	0.578
T160	LTE 41	QPSK20M	41490	1	0	Rear Face	-	22.00	21.30	0	0.766	0.900
T181	LTE 41	QPSK20M	40185	1	0	Bottom Side	-	22.00	21.32	-0.02	0.775	0.906
T182	LTE 41	QPSK20M	41055	1	0	Bottom Side	-	22.00	21.28	0.05	0.641	0.757
T183	LTE 41	QPSK20M	39750	1	0	Bottom Side	-	22.00	21.29	0.03	0.484	0.570
T184	LTE 41	QPSK20M	41490	1	0	Bottom Side	-	22.00	21.30	-0.06	0.509	0.598
T161	LTE 41	QPSK20M	40620	1	0	Rear Face(1st Repeated)	-	22.00	21.39	0.02	0.821	0.945
T162	LTE 41	QPSK20M	41490	100	0	Rear Face	-	21.00	20.46	0.07	0.635	0.719
T185	LTE 41	QPSK20M	41490	100	0	Bottom Side	-	21.00	20.46	0.05	0.435	0.493

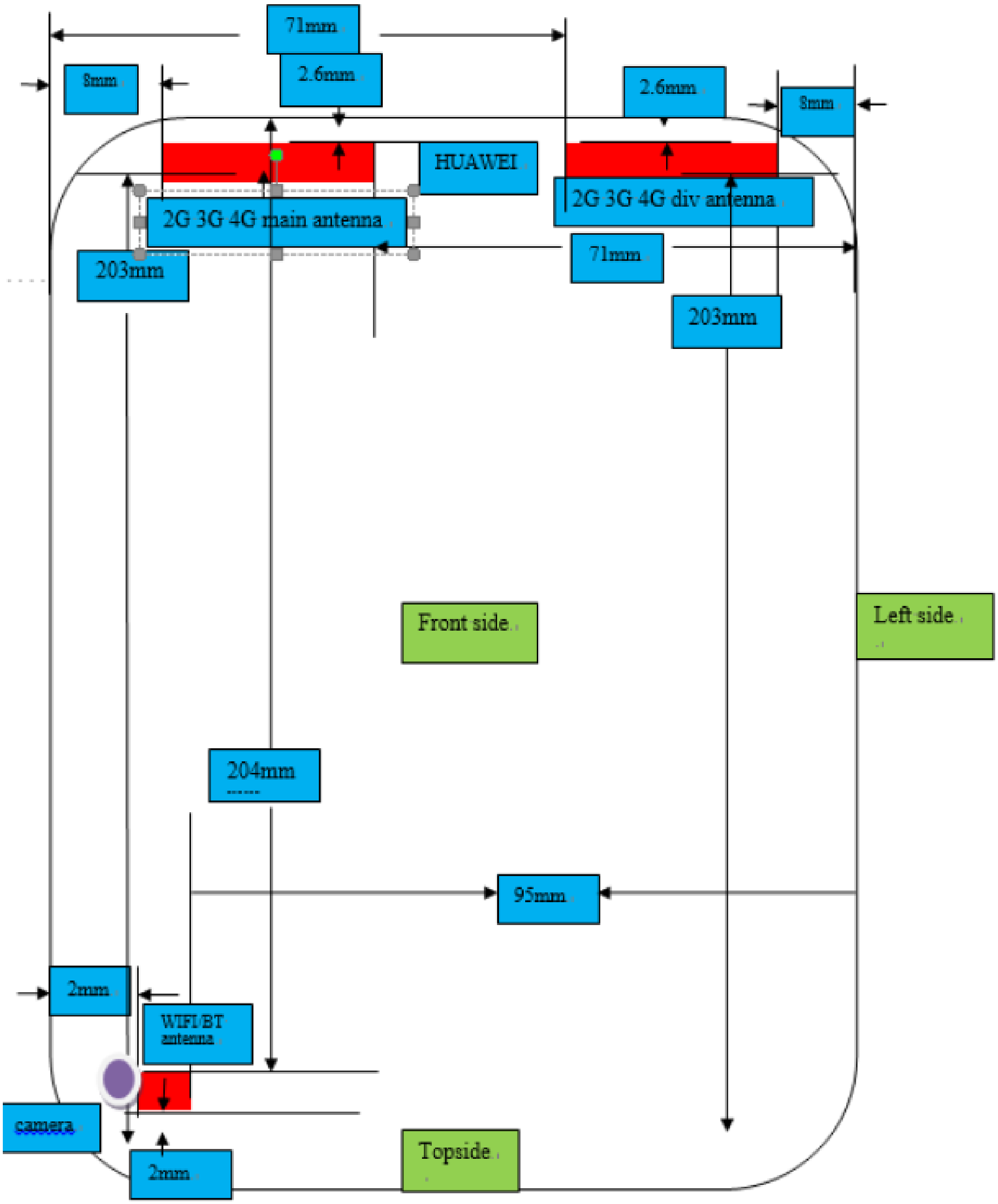
SAR test results of WIFI

Test No.	Band	CH	Test Position	Separation Distance(cm)	Tune up	Measured	Drift(dB)	SAR Value (W/kg)1-g	Reported SAR
T171	802.11b	6	Rear Face	0	14	12.93	0	0.0481	0.062
T172	802.11b	6	Right Side	0	14	12.93	-0.05	0.112	0.143
T173	802.11b	6	Top Side	0	14	12.93	0.07	**0.147**	0.188

10. 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 is shown as below picture:



11. ESTIMATED SAR CALCULATION

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

According to KDB 447498 D01,when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standslone SAR was estimated according to following formula to result in substantially conservative SAR values of≤0.4W/Kg to determine simultaneous transmission SAR test exclusion.

$$\text{Estimated SAR} = \frac{\text{Max. Tune up Power}_{(mW)}}{\text{Min. Test Separation Distance}_{(mm)}} \times \frac{\sqrt{f_{(GHz)}}}{7.5}$$

Estimated SAR calculation

Mode	Position	P_{max} (dBm)*	P_{max} (mW)	Distance (mm)	f (GHz)	X	Estimated SAR (W/Kg)*
BT	Rear/Right / Top	6	3.98	5	2.480	7.5	0.167
	Left	-	-	95	-	-	0.4
	Bottom	-	-	204	-	-	0.4
2.4G WiFi	Left	-	-	95	-	-	0.4
	Bottom	-	-	204	-	-	0.4
GSM850	Top	-	-	203	-	-	0.4
GSM1900	Left	-	-	71	-	-	0.4
	Top	-	-	203	-	-	0.4
WCDMA Band 2/4/5	Left	-	-	71	-	-	0.4
	Top	-	-	203	-	-	0.4
LTE Band 2/4/5/7/26/41	Left	-	-	71	-	-	0.4
	Top	-	-	203	-	-	0.4

Note: * - maximum possible output power declared by manufacturer.

12. SIMULTANEOUS TRANSMISSION

Per KDB 447498D01v06, SAR compliance for simultaneous transmission must be considered when the maximum duration of overlapping transmissions, including network hand-offs, is greater than 30 seconds. This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis.

The Simultaneous Transmission Possibilities of this device are as below:

No.	Configuration	Body
1	GSM (Voice)+WiFi	Yes
2	GPRS/EDGE (DATA)+WiFi	Yes
3	GSM(Voice)+BT	Yes
4	GPRS/EDGE(DATA)+BT	Yes
5	UMTS(Voice)+WiFi	Yes
6	UMTS(DATA)+WiFi	Yes
7	UMTS(Voice)+BT	Yes
8	UMTS(DATA)+BT	Yes
9	LTE(DATA)+WiFi	Yes
10	LTE(DATA)+BT	Yes

Note:
i)* VOIP 3rd party applications may possibly be installed and used by the end user.
ii) Wi-Fi and Bluetooth share the same antenna and can‟t transmit simultaneously.
iii) 2G&3G&LTE share the same antenna and can‟t transmit simultaneously.
iv) The device does not support DTM function.
v) Held to ear configurations are not applicable to BT/WiFi/GSM/UMTS/LTE and therefore were not considered for simultaneous transmission.

13. SAR SUMMATION SCENARIO

About BT/2.4G WiFi and GSM/WCDMA/LTE antenna

Test Position / Reported SAR_{1g}	Body				
	Rear	Left	Right	Top	Bottom
GSM850	1.169	0.049	0.223	0.4	0.394
GSM1900	1.248	0.4	0.173	0.4	0.491
WCDMA B2	1.188	0.4	0.137	0.4	0.414
WCDMA B4	1.354	0.4	0.182	0.4	0.258
WCDMA B5	0.898	0.4	0.156	0.4	0.310
LTE B2	1.195	0.4	0.243	0.4	0.430
LTE B4	1.273	0.4	0.260	0.4	0.443
LTE B5	0.959	0.4	0.166	0.4	0.366
LTE B7	0.793	0.4	0.05	0.4	0.839
LTE B26	1.421	0.4	0.227	0.4	0.335
LTE B41	0.948	0.4	0.055	0.4	0.906
2.4G WiFi	0.062	0.4	0.143	0.188	0.4
BT	0.167	0.4	0.167	0.167	0.4
MAX∑SAR1g	1.588	0.8	0.427	0.588	1.306

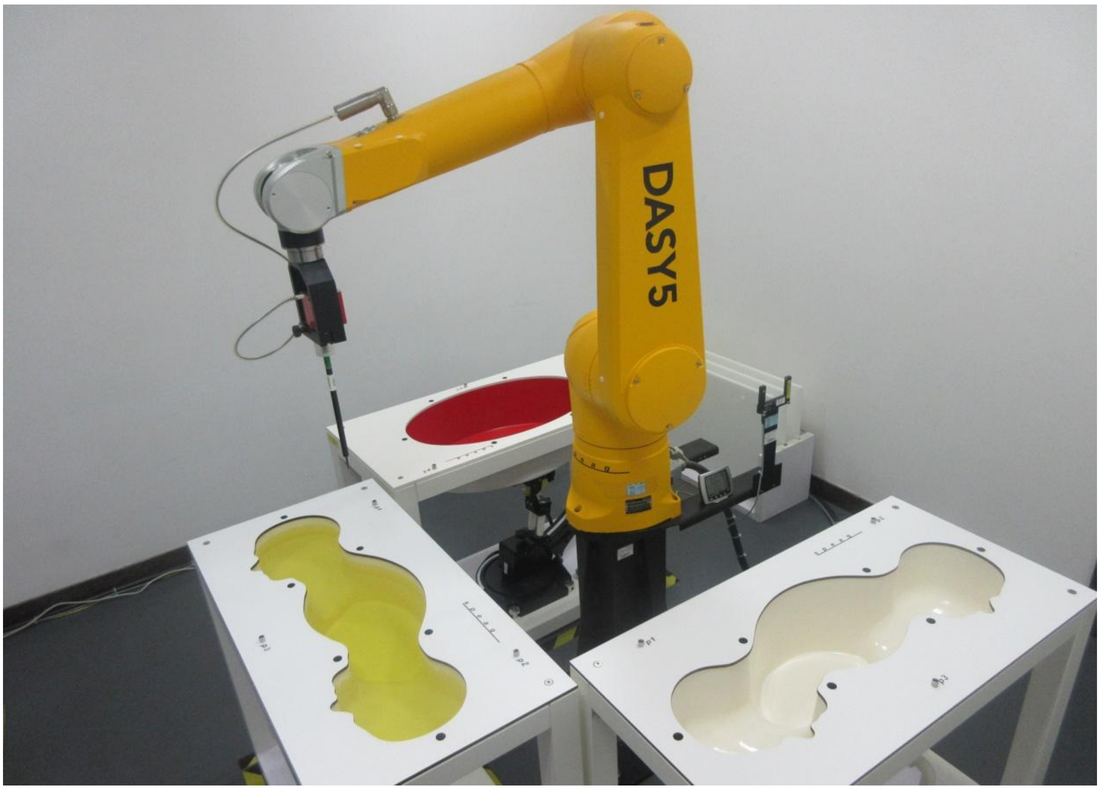
MAX. $\sum SAR_{1g}$=1.588W/Kg<1.6 W/Kg,so the SAR to peak location separation ratio should not be considered.

The highest simultaneous SAR value= $SAR_{LTE\ B26}$+ $SAR_{WiFi\ (2.4G)}$ =1.421+0.062=1.483 W/Kg, per KDB690783 D01

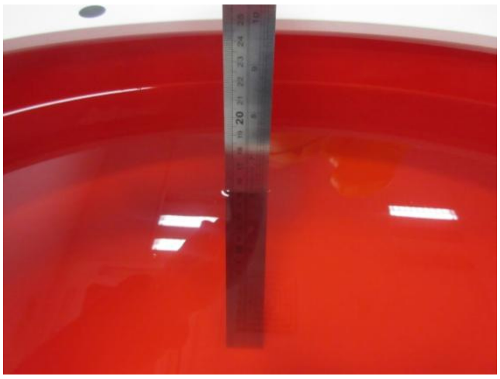
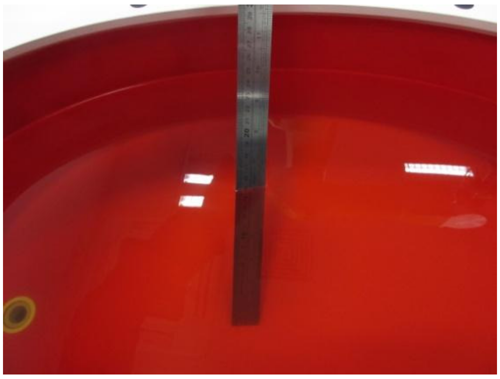
APPENDIX

1. Test Layout

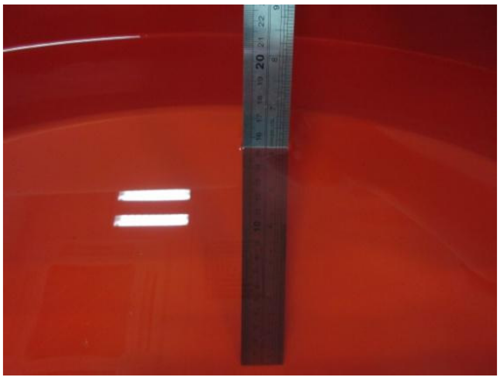
Specific Absorption Rate Test Layout



Liquid depth in the flat Phantom (≥15cm depth)

Body(835MHz)	Body (1750MHz)
	

Body(1900MHz~2700MHz)



Appendix A. SAR Plots of System Verification

The plots for system verification with largest deviation for each SAR system combination are shown as follows.

Appendix B. SAR Plots of SAR Measurement

The SAR plots for highest measured SAR in each exposure configuration, wireless mode and frequency band combination are shown as follows.

Appendix C. Calibration Certificate for Probe and Dipole

The SPEAG calibration certificates are shown as follows.

Appendix D. Photographs of the Test Set-Up

Photo 1: Rear Face_0mm	Photo 2: Left Side_0mm
	
Photo 3: Right Side_0mm	Photo 4: Top Side_0mm
	
Photo 5: Bottom Side_0mm	Photo 6: Rear Face With earphone_0mm